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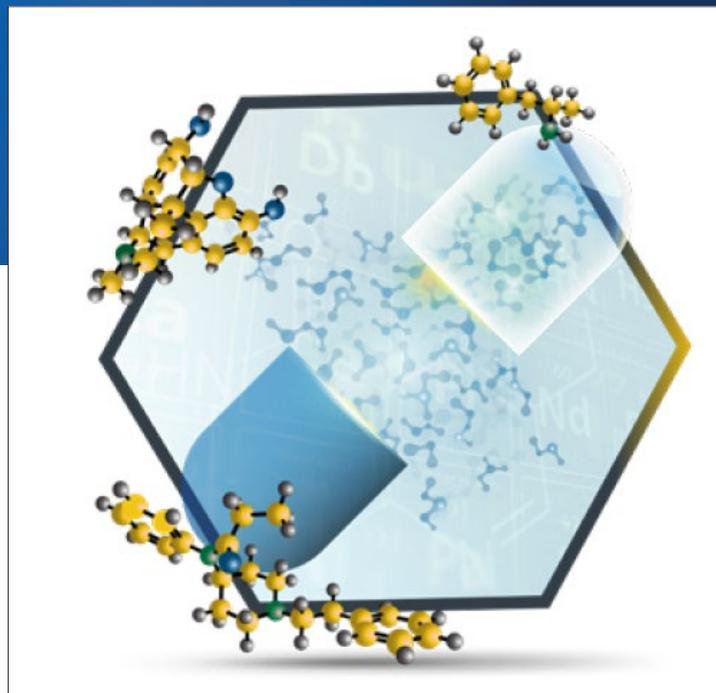
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National Institute of Justice's
Forensic Technology Center
of Excellence 2019 National
Opioid and Emerging Drug Threats Policy and
Practice Forum

Jeri D. Roper-Miller and Hope Smiley-McDonald, Editors

Sarah Norsworthy, Rebecca Shute, Crystal M. Daye, and Paige Presler-Jur, Authors



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RTI International
3040 East Cornwallis Road
PO Box 12194
Research Triangle Park, NC
27709-2194 USA

Tel: +1.919.541.6000
E-mail: rtipress@rti.org
Website: www.rti.org

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About the Editors and Authors

Jeri D. Roper-Miller, PhD, F-ABFT, is the senior director of the Center for Forensic Sciences (CFS) at RTI International and the Project Director for NIJ's Forensic Technology Center of Excellence (FTCoE).

Hope Smiley-McDonald, PhD, directs the Investigative Sciences Program (ISP) and conducts research on forensic agency operations and needs, drug surveillance, and social and justice issues in the context of substance use.

Sarah Norsworthy, MS, is a research forensic scientist in RTI's CFS and serves as a DNA subject matter expert and project manager for the FTCoE.

Rebecca Shute, MS, is an innovation analyst for RTI's Innovation Advisors and supports the reports development and technology transition activities on behalf of the National Institute of Justice's FTCoE.

Crystal M. Daye, MPA, manages the ISP at RTI and conducts research on law enforcement operations, forensics, and improving the criminal justice response to victims of crime.

Paige Presler-Jur, MS, is a Research Public Policy Analyst in RTI's ISP and supports research initiatives addressing health, social, and justice issues in the contexts of substance misuse and abuse community programs, sexual assault case reform, forensics, and multidisciplinary approaches.

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Abstract

The National Institute of Justice (NIJ) and its Forensic Technology Center of Excellence (FTCoE) hosted the National Opioid and Emerging Drug Threats Policy and Practice Forum on July 18–19, 2019, in Washington, DC. The forum explored ways in which government agencies and programs, law enforcement officials, forensic laboratory personnel, medical examiners and coroners, researchers, and other experts can cooperate to respond to problems associated with drug abuse and misuse. Panelists from these stakeholder groups discussed ways to address concerns such as rapidly expanding crime laboratory caseloads; workforce shortages and resiliency programs; analytical challenges associated with fentanyl analogs and drug mixtures; laboratory quality control; surveillance systems to inform response; and policy related to stakeholder, research, and resource constraints. The NIJ Policy and Practice Forum built off the momentum of previous stakeholder meetings convened by NIJ and other agencies to discuss the consequences of this national epidemic, including the impact it has had on public safety, public health, and the criminal justice response. The forum discussed topics at a policy level and addressed best practices used across the forensic community.

Steering Committee

Emma Hall
Bruce Houlihan
Linda Jackson
Tara Kunkel
Barry Logan
Stephen (Mac) McConachie
Jonathan McGrath
Roger Mitchell
Chauncy Parker
DeMia Pressley
Timothy Rohrig
Jeri D. Roper-Miller
Frances Scott
Margaret Warner
Eric Wish

Planning Committee

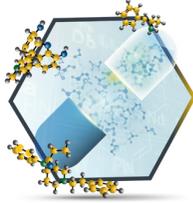
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Steven Schuetz
Frances Scott

Introduction to Event



National Opioid and Emerging Drug Threats Policy and Practice Forum

Strengthening Forensic Response and Informing Public Safety and Health
July 18-19, 2019, Washington, D.C.

Objectives

- Promoted cooperative initiatives to leverage available funding as efficiently as possible
- Highlighted important federal resources such as the Bureau of Justice Assistance's (BJA's) Comprehensive Opioid Abuse Program, the Drug Enforcement Administration's (DEA's) National Forensic Laboratory Information System, Prescription Drug Monitoring Programs across states, and the Centers for Disease Control and Prevention's (CDC's) Enhanced State Opioid Overdose Surveillance program
- Identified and promoted scientific research, best practices, and lessons learned for forensic science organizations and practitioners
- Assessed strategies to improve surveillance methodologies to encourage use and collaboration of existing programs
- Identified strategies for workforce development, casework efficiency, and issues related to increased caseloads in state and local forensic science organizations

518 attendees



In-person

144



Virtual

233



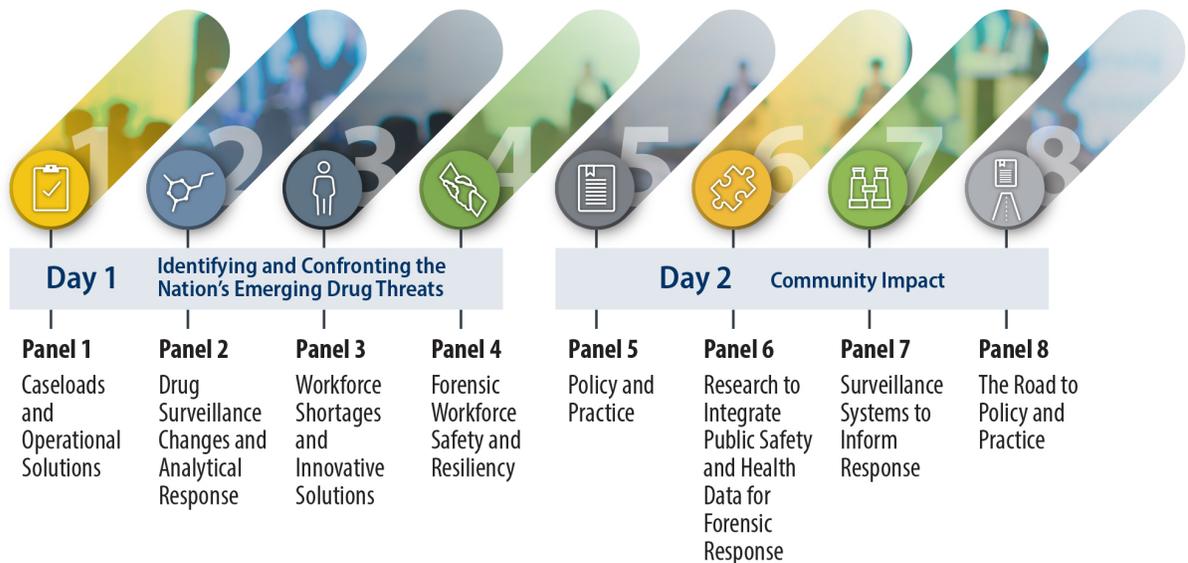
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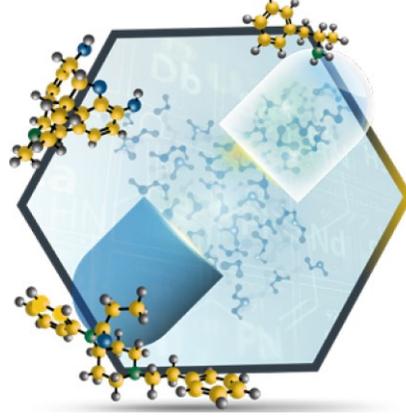
policymakers; staff from federal, state, and local governmental programs; state and local law enforcement personnel

Key topics



Panels and Moderators

Day 1		
Day 1	Opening Keynote: Identifying and Confronting the Nation's Emerging Drug Threats	Dr. Jonathan McGrath
	Panel 1: Caseloads and Operational Solutions	Dr. Timothy Rohrig
	Panel 2: Drug Surveillance Changes and Analytical Response	Dr. Jayne Morrow
	Panel 3: Workforce Shortages and Innovative Solutions	Dr. Roger A. Mitchell
	Panel 4: Forensic Workforce Safety and Resiliency	Dr. Frances Scott
Day 2		
Day 2	Opening Keynote: Community Impact	Dr. Jeri D. Roper-Miller
	Panel 5: Policy and Practice	Dr. Jeri D. Roper-Miller
	Panel 6: Research to Integrate Public Safety and Health Data for Forensic Response	Emma R. Hall
	Panel 7: Surveillance Systems to Inform Response	Dr. Margaret Warner
	Panel 8: The Road to Policy and Practice	Tara Kunkel



DAY 1

Day 1 Opening Keynote: Identifying and Confronting the Nation's Emerging Drug Threats

Summary

Drug use and misuse have taken a costly toll on American public health and safety. The Centers for Disease Control and Prevention (CDC) reports 702,568 deaths resulting from a drug overdose from 1999 to 2017, with 57 percent of those deaths involving opioids (Scholl, Seth, Kariisa, Wilson & Baldwin, 2019). This equates to roughly 17 American deaths each day. CDC longitudinal mortality data show that the opioid epidemic is in its third wave, with the primary threat in recent years being synthetically manufactured opioids like fentanyl and fentanyl-related substances. These trends are reflected in data from the US Drug Enforcement Administration (2017), which show increases in both the number and variety of fentanyl and fentanyl-related substances between 2015 and 2017. Data from the National Survey of Drug Use and Health showed that in 2018, 9.9 million people aged 12 or older misused prescription pain relievers in the past year compared with 808,000 Americans who used heroin. The majority of people who misused prescription pain relievers had not used heroin (9.4 million) (Substance Abuse and Mental Health Services Administration, 2019).

Meanwhile, other drug threats that threaten public health and safety are beginning to emerge, including the reemergence of methamphetamine, which has increased in past year use among adults aged 26 or older between 2016 and 2018 (Substance Abuse and Mental Health Services Administration, 2019). Methamphetamine was the most frequently identified drug (386,272 reports) in 2018 by crime laboratories analyzing controlled substances seized during law enforcement actions (US Drug Enforcement Administration, 2019). Although national prevalence use studies are not capturing these drugs to date, novel psychoactive substances, including synthetic cathinones and synthetic cannabinoids, are increasingly coming into view as drugs with the potential to have devastating public health impacts. We are only just beginning to understand the pharmacokinetic and physiological impacts of these emerging drugs (Hall & Miczek, 2019).

Panelists provided an overview of federal government responses to emerging drug threats and strategies in place to build intelligence and infrastructure to address them. In particular, the National Institute of Justice is responding to the ongoing opioid epidemic through research, including examining epidemiological patterns; identifying, implementing, and evaluating prevention and intervention strategies to create an evidence base to disrupt drug markets and drug-related crimes; supporting forensic science through grants to identify drugs; providing tools and resources such as the *2019 Needs Assessment of Forensic Laboratories and Medical Examiner/Coroner Offices* (DOJ, 2019); and supporting drug death investigation and drug intelligence via grants.

Moderator

Dr. Jonathan McGrath,
National Institute of Justice
(NIJ)

Panelists

Dr. David Muhlhausen,
NIJ Director

Ms. Katie Sullivan, Office of
Justice Programs Principal
Deputy Assistant Attorney
General

Ms. Amanda Liskamm, US
Department of Justice (DOJ)
National Opioid Coordinator

Mr. Michael Gottlieb, Deputy
Chief of Staff, White House
Office of National Drug Control
Policy (ONDCP)

“When is the opioid crisis over? When the new drug or the new threat comes onboard.”

—Katie Sullivan, Office of Justice
Programs, Principal Deputy
Assistant Attorney General

The Office of Justice Programs is supporting initiatives that expand drug courts, enhance prescription drug programs, bolster law enforcement response, and support programs that provide access to treatment and social services.

ONDCP is identifying emerging threats faster by coordinating efforts through the National Drug Threats Committee. The National Drug Threats Committee includes 14 representatives from state, local, tribal, and nongovernmental agencies. Moreover, ONDCP has established a national opioid coordinator, who develops, directs, and implements national drug policies.

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Panel 1: Caseloads and Operational Solutions

Overview

Crime laboratories, medical examiners' offices, and coroners' offices are seeing impacts of the opioid crisis in both increased caseloads and opportunity costs.

Key Takeaways

- "Crisis states" (states with more than 30 drug-related deaths per 100,000 people) are seeing an increased average cost per case in the areas of controlled substances and toxicology, both ante- and postmortem.
- To address drug threats effectively, laboratories must stay current on instrumentation, have adequate staffing, appropriate procedures and standards, safety measures, good communications, and access to multiple data sources.
- Unifying data between public and private labs, coroners, medical examiner offices, and hospitals (which often possess overlooked data) are critical to addressing drug threats so that an appropriate response can be formulated.

Summary

Effectively addressing drug threats requires the forensic and public health communities to be current on instrumentation and have adequate staffing, appropriate procedures and standards, safety measures, good communications, and access to multiple data sources. In particular, the ability to unify data between public and private laboratories, coroners, medical examiner offices, and hospitals is vital for identifying drug threats early so that appropriate responses can be formulated (e.g., seeing prescribing patterns among overdose victims and providing education).

As part of California's Orange County Sheriff-Coroner Department, the Orange County Crime Laboratory offers both controlled substances and ante- and postmortem toxicology testing, which provide a comprehensive view of patterns of use within the jurisdiction. In particular, the laboratory has historically reported methamphetamine, heroin, and cocaine as the identified controlled substances most commonly reported; each of those substances showed increases between 2017 and 2018. Compared with the East Coast, however, southern California had largely been spared from the opioid epidemic until recently. In 2018, the Orange County Crime Laboratory saw a 101 percent increase in fentanyl and other highly toxic substances in seized drug submissions compared with 2017. Across driving under the influence of drugs (DUID) and postmortem cases collectively, Orange County saw spikes between 2016 and 2017, particularly for fentanyl (see Figure 1).

Moderator

Dr. Timothy Rohrig, Sedgwick County Regional Forensic Science Center

Panelists

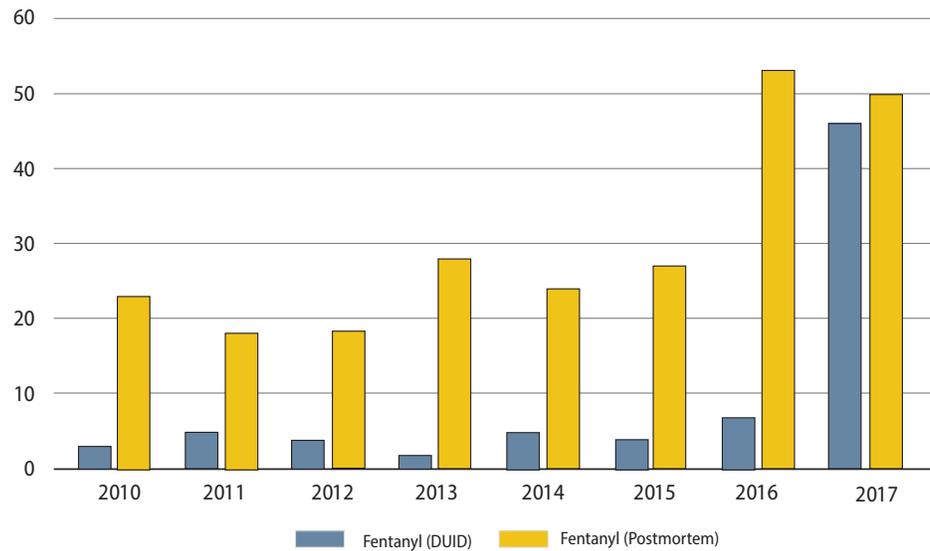
Mr. Bruce Houlihan, Orange County Crime Lab

Dr. Kent Harshbarger, Montgomery County Ohio Coroner's Office

Dr. Carl Schmidt, Wayne County Medical Examiner's Office and the University of Michigan

Dr. Paul Speaker, West Virginia University

Figure 1. Orange County Crime Lab fentanyl toxicological findings across driving under the influence of drugs and postmortem cases, 2010–2017



Source: Bruce Houlihan, Panel 1, National Opioid and Emerging Drug Threats Policy and Practice Forum, July 2019.

“If we had been watching the data on seized drugs from the East Coast, we could have been more prepared for the epidemic when it got to Orange County. It took time for us to catch up.”

—Bruce Houlihan, Orange County (California) Crime Laboratory

Seized drug and DUID cases provide a temporal window into use patterns on the street before people die from these drugs. Given this temporal pattern, it is important to build capacity for using DUID toxicology testing results, particularly to inform public health and safety. However, not all laboratories have the toxicology testing capacity or instrumentation needed to tap these data effectively.

Medical examiners Dr. Kent Harshbarger and Dr. Carl Schmidt provided postmortem data from their jurisdictions in Ohio and Michigan, respectively. In Montgomery County, Ohio, Dr. Harshbarger is an elected coroner and board-certified pathologist. Schmidt is the medical examiner for the Wayne County Medical Examiner’s Office. Dr. Harshbarger and Dr. Schmidt noted increases in opioid-related overdoses and overdose deaths in their regions, which have in turn increased toxicology and drug analysis caseloads. Prevalence of fentanyl use contributes to the number of opioid-related deaths: in Montgomery County, fentanyl analogs were present in roughly two-thirds of all overdose deaths between January and May of 2017, and in Wayne County, 87 percent (846 of 978) of the drug-related deaths included fentanyl.

Both noted key insights for understanding and addressing the opioid crisis adequately. There is a correlation between locations of prevalent opioid-related deaths and locations of common opioid prescribers. Medical examiners may not be able to rely on emergency room urine drug screens for complete information on drugs in an individual’s system, because these screens are not substance specific and are qualitative. Although antemortem or perimortem blood is most likely to yield causal drugs, if an overdose victim survives for a period of time, a substance may no longer be in a postmortem sample due to metabolism and/or clinical procedures (e.g., naloxone administration, gastrointestinal

decontamination), or the clinical samples may be discarded, not ordered, or not fully processed and analyzed.

Overdose victims in Montgomery County commonly have two or more opioids in their system at the time of death: 30 percent (110 of 372) of individuals with a fentanyl analog detected in their toxicology screen had multiple fentanyl analogs in their system. Postmortem analyses are often difficult to interpret when multiple drugs are identified; pathologists must choose the primary drug(s) as the cause of death, and other substances may not be listed on the death certificate, giving an incomplete account. Including all drugs detected on an individual's death certificate significantly helps the community document all drugs related to overdose deaths for accuracy in public health surveillance. To adequately handle the casework from this growing issue, offices must consider developing workflows that optimize auxiliary staff, investing in equipment to provide redundancy and efficiency, changing drug chemistry processes to efficiently process samples and ensure staff safety, and switching to a fee-based regional system that may support caseloads through associated funding increases.

Across the United States, the opioid crisis has taken not only a significant toll on human lives but an economic toll as well. Dr. Paul Speaker, an economics professor from West Virginia University, has been working to understand the true cost of the opioid crisis through data gathered by Project FORESIGHT. Project FORESIGHT is a business-oriented self-evaluation that provides laboratory managers with actionable insights into the performance of their laboratories. These metrics are broken down by investigative area and are based on analysis of a rich set of multiyear data from a growing number of US laboratories. These data can be used to understand expenditures for opioids casework. The Council of Economic Advisors estimated total costs of the opioid crisis to be \$504 billion in 2016, nearly a 600 percent increase from previous estimates (Florence, Zhou, Luo, & Xu, 2016). Dr. Speaker used Project FORESIGHT data, which contain data from fiscal years (FY) 2005–2018 and 160 crime laboratories, to estimate that the opioid crisis added roughly \$270M in costs to forensic laboratories in 2017 (Roper-Miller & Speaker, 2019). Facing increased demand to drug chemistry and toxicology services, laboratory budgets are unable to keep up with these costs.

Drug deaths rates per capita have been increasing sharply since the early 2010s. Although laboratories are becoming more efficient with technological advances and resources like Project FORESIGHT that provide actionable recommendations to improve performance, the average cost over time for crime laboratory analyses has not shown dramatic increases. Speaker noted that many states are “crisis states,” in which there are more than 30 drug-related deaths per 100,000 people and experience an opioids cost as high as 15 percent of their gross state product. Project FORESIGHT data indicate that the average annual growth rates of expenditures for these states are 7.65 percent for controlled substances, 11.12 percent for antemortem toxicology, and 6.94 percent for postmortem toxicology; noncrisis states experience a significantly lower growth rates of 1.1 percent for controlled substances, 4.7 percent for

antemortem toxicology, and 3.25 percent for postmortem toxicology. Likewise, average turnaround time for crisis states in controlled substances and ante- and postmortem toxicology cases are all significantly higher than for noncrisis states.

Dr. Speaker explained the costs incurred by the opioids crisis as an “opportunity cost” for these states, meaning that the state is effectively dedicating resources at addressing the opioid epidemic that could be directed toward other measures, including other forensic testing. Although annual budgets for total laboratory expenditures are growing at approximately 3 percent nationally, crisis states will need an additional 2 to 3 times more resources to address the demand of drug analysis cases. These data are helpful in informing policymakers in distributing resources for the most impact.

Dr. Speaker and the National Institute of Justice Forensic Technology Center of Excellence have created a [workforce calculator tool](#) to help laboratory leadership identify the personnel required to support a given level of casework within each area of identification, given their associated investments.

Moving Forward

The opioid crisis is causing challenges in keeping up with casework, with crisis states’ average cost per case in controlled substances, antemortem toxicology, and postmortem toxicology increasing at a significantly higher rate than noncrisis states. This opportunity cost directs resources away from other important areas. Laboratories can effectively address drug threats through investing in instrumentation, workforce, and workflows streamline cases. Data from these public and private laboratories, coroners, medical examiner offices, and hospitals (which often possess overlooked data) should be aggregated and leveraged to formulate an appropriate response to emerging drug threats (e.g., seeing prescribing patterns among overdose victims and providing education).

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Panel 2: Drug Surveillance Challenges and Analytical Response

Overview

Addressing emerging drug threats effectively requires a holistic response with broad participation from governmental agencies at all levels, as well as the public health, public safety, and research communities.

Key Takeaways

- Data use and sharing between stakeholders can paint a clearer picture of the illicit drug market, improving the ability of federal and state legislation and the legal system to respond effectively.
- Pharmacological and physiological studies are needed to understand short- and long-term health and behavioral impacts of novel analogs and synthetic substances.
- Laboratories are weighing different technology and workflow options for safely triaging in both lab and field settings and identifying substances without contributing to backlogs.
- Law enforcement agencies and laboratories are encouraged to participate in research so that innovations in the field align with their needs and considerations.

Summary

The proliferation of illicitly produced synthetic drugs—including fentanyl and fentanyl-related compounds and other novel psychoactive substances (NPSs)—has resulted in a wide variety of substances difficult to detect and monitor, and, therefore, difficult to regulate. By design, these substances circumvent drug laws by having slightly different chemical structures than illicit substances currently regulated by the Controlled Substance Act but producing similar physiological effects on the user (United Nations Office of Drugs and Crime, 2013). Figure 2, for example, shows that minor modifications to the fentanyl structure yield fentanyl analogs, which can in turn be manufactured in illicit drug laboratories in high yield.

Data from law enforcement seizures and crime laboratories provide a window into how quickly these synthetic substances enter the drug marketplace. CBP sees an average of three new drugs per month in their seizures. Trend data from DEA's National Forensic Laboratory Information System (NFLIS) program showed that between 2009 and 2015, the numbers of different synthetic cannabinoids and synthetic cathinones reported to the DEA show remarkable, concurrent increases. Specifically, in 2009, two synthetic cannabinoids and five synthetic cathinones were reported to NFLIS. By comparison, in 2015, 84 different synthetic cannabinoids and 35 different synthetic cathinones were reported to NFLIS (DEA, 2016). More recent NFLIS data show that seven new drugs were reported to the NFLIS drug program between October 1, 2019, and December 31, 2019 (NFLIS, 2019).

The importance of regular surveillance during this period of unprecedented synthetic substances and analogs is exemplified by the District of Columbia (DC).

Moderator

Dr. Jayne Morrow, Montana State University

Panelists

Dr. Michael McCormick, US Customs and Border Protection (CBP)

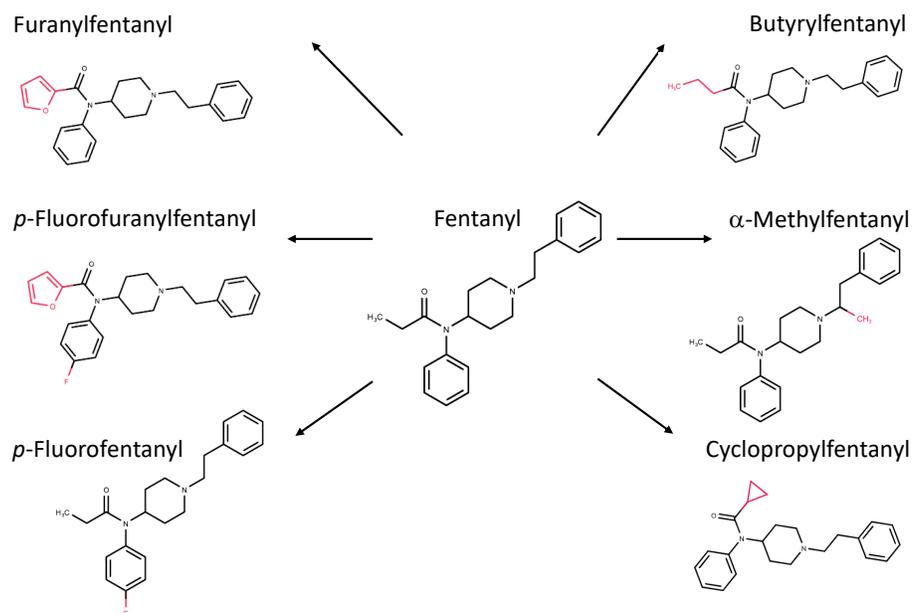
Emily Lockhart, US Drug Enforcement Agency (DEA)

Dr. Michael Baumann, National Institute on Drug Abuse

Dr. Jenifer Smith, Washington DC Crime Lab

Dr. Edward Sisco, National Institute of Standards and Technology (NIST)

Figure 2. Fentanyl and selected fentanyl analogs available in the street drug marketplace



Source: Adapted from Michael Baumann, Panel 2, National Opioid and Emerging Drug Threats Policy and Practice Forum, July 2019.

“Since August 2012, synthetic cannabinoid patient cases reported by the D.C. Fire and EMS department remained below 30 a month until May 2014, spiking at 439 cases [in June 2015].”

—Abigail Hauslohner and Peter Hermann, Washington Post (2015)

The DC Fire and Emergency Medical Services Department documented a significant spike in synthetic cannabinoid cases starting in May 2014 (50 cases) and extending into June 2015 (439 cases).

With these increases and with an eye on potential for other emerging drug threats, the DC government expanded its Department of Forensic Sciences (DFS) capabilities for controlled substances testing. A Centers for Disease Control and Prevention grant further enhanced their ability to test for novel synthetic opioids by supporting two high-throughput opioid analyzers, two forensic chemists, a statistician, and key infrastructure enhancements. Now, DFS tests for substances found from a sample of syringes from syringe collection sites (with direct analysis in real-time mass spectrometry); provides statistical mapping of data, including heat maps and predictive modeling; generates monthly surveillance reports; and reports discoveries of new drugs identified via the [National Capital Region Threat Intelligence Consortium](#).

When unknown substances are discovered by law enforcement in the field, presumptive testing allows agents to triage the evidence to determine what should be sent to the laboratory. In response to the many new types of drugs they encounter monthly, CBP has implemented field infrared spectroscopy to overcome analytical challenges. Now, CBP can process these tests within 24 hours following lab interpretation, which allows for a substantial amount of data to be collected between presumptive and confirmatory results.

Testing limitations on what laboratories can test and identify across the novel synthetic substances complicates surveillance efforts. For example, toxicology screens that use immunoassays for heroin and its metabolites do not detect novel

synthetic opioids (Mohr et al., 2016). Fentanyl can be detected with a separate immunoassay and fentanyl analogs may cross-react with the assay at certain concentrations (Tiscione & Wegner, 2017). In the postmortem setting, it has been reported that medical examiners do not test for novel synthetic opioids unless there is a specific reason to do so (Prekupec, Mansky, & Baumann, 2017). DEA survey data show that 43 percent of MECs reported always testing for synthetic cathinones and 31 percent for always testing synthetic cannabinoids, but this varies by type of office (coroner or medical examiner) and by jurisdiction size (DEA Diversion Control Division, 2020). This means that some overdose-related deaths may be classified with unknown drugs listed on the death certificate.

Laboratories looking to enhance their analytical preparedness as they encounter more unknown substances and NPSs can learn more from professional organizations. Online resources include professional websites—the Clandestine Laboratory Investigating Chemists Association (CLIC), the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG), the European Project Response, and the United Nations Office of Drug Control (UNODC) Novel Psychoactive Substances Portal—provide timely, relevant updates about new emerging substances of abuse. [CLIC](#) hosts a secured online forum to enable members an effective means for answering technical questions regarding interpretation of mass spectra, extraction techniques, and best practices with difficult clan labs or samples. [SWGDRUG](#) provides regularly updated drug monographs, searchable mass spectral and infrared libraries, and SWGDRUG bulletins that have been compiled by year. Emerging NPSs identified abroad can be found in the monographs, reports, and data from the [European Project Response](#) and [UNODC NPS](#) websites.

Annual meetings from the American Academy of Forensic Sciences, the Society of Forensic Toxicologists, the Regional Societies on Forensic Science, and the International Conference on NPS provide forums for the forensic community to learn about emerging NPSs, analytic methods, and best practices for testing. Training opportunities provide face-to-face networking with chemists from domestic and foreign forensic laboratories. The International Law Enforcement Academy offers a course on emerging drug threats that brings together agents, chemists, and diversion investigators to provide training on investigating groups involved with NPS trafficking. Finally, DEA's Reference Materials Program offers more than 2,000 drug compounds as reference materials to toxicologists, forensic scientists, and medical researchers. Commercial reference material providers may also be a source of important information to augment analytical capabilities.

Yet because synthetic substances are new, their psychopharmacological properties are not fully understood and much remains unknown regarding the risks for dependence, overdose, and other behavioral outcomes (Baumann et al., 2014; Hall & Miczek, 2019). As Graziano et al. (2019) observed, improving the detection and identification of these substances is challenging because of the wide range of NPS chemical structures and the variety of conventional and non-conventional biological matrices. During the proceedings, Dr. Michael Baumann

The Centers for Disease Control and Prevention (CDC), in conjunction with Cayman Chemical and Cerilliant Corporation, have developed [Traceable Opioid Material \(TOM\) Kits](#), which provides reference materials for emerging opioids. This effort, based on DEA Emerging Threat reports and NFLIS data, has led to the development of a fentanyl analog screening kit and emergent panels, as well as an opioid certified reference material (CRM) kit.

reviewed his research on selected novel synthetic opioids and noted that novel synthetic opioids vary widely in analgesic potency, and in vitro binding affinity does not predict in vivo potency. Through his recent animal studies, for example, he discovered that butyrylfentanyl, U-47700, and MT-45 are opioid agonists in animals whereas W-18 did not have this same effect. Thus, the overdose reversal drug naloxone will not be useful for reversing overdoses associated with W-18. This has broader implications for public health as the nation seeks to decrease overdoses by equipping law enforcement and the lay community with naloxone.

Moving Forward

Addressing emerging drug threats effectively requires a holistic response with broad participation from the public health, public safety, governmental agencies at all levels, and research community (Morrow et al., 2019). Effective data use and data sharing will ensure that federal and state legislation matches what is happening in communities across the United States so that the legal system can keep up with the ongoing flow of new analogs and synthetics introduced into the illicit drug market each day. Given the unknowns about drug potency surrounding these novel analogs and synthetic substances, more pharmacological and physiological studies are needed to investigate their short- and long-term health and behavioral health impacts.

Key challenges in the field include identifying ways to help the criminal justice system increase the use of field testing and helping laboratories overcome testing limitations so that they can identify these new substances without contributing to backlogs. Evidence packaging testing could provide a promising avenue for presumptive testing and triaging in the field and on receipt within the laboratory. NIST demonstrated the use of ion mobility spectrometry and thermal desorption direct analysis in real time mass spectrometry to detect small amounts of fentanyl, fentanyl analogs and other opioids from wiped surfaces (Sisco, Verkouteren, Staymates, & Lawrence, 2017). Trace detection measures like these have the benefits of lowering exposure risk to harmful substances while increasing the speed of identification and analysis. Moreover, highly sensitive and specific analytical instrumentation can have a wide threat detection range to include not only drugs but other forensically relevant compounds such as explosives. Drawbacks include costs for equipment, maintenance and training, and library dependence given searching requirements. Law enforcement agencies and laboratories are encouraged to participate in research to ensure that the research is based on “real-world” circumstances.

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Panel 3: Workforce Shortages and Innovative Solutions

Moderator

Dr. Roger Mitchell, DC Office of the Chief Medical Examiner

Panelists

Dr. Jonathan Arden, Arden Forensics, PC, and West Virginia Office of the Chief Medical Examiner

Dr. M.J. Menendez, Department of Justice's Organized Crime Drug Enforcement Task Force

Dr. Carl Schmidt, Wayne County Medical Examiner's Office and the University of Michigan

Dr. Lauren Decker, New Mexico Office of the Medical Investigator (OMI)

Ms. Linda Jackson, Virginia Department of Forensic Science (DFS)

Overview

The United States has a critical need for trained forensic pathologists to serve the population adequately. To address this shortage, medical schools, medical examiners, and coroners must employ actionable and innovative solutions to attract students to the profession and retain current practitioners. Crime laboratory resources for controlled substances and toxicology analyses are also needed.

Key Takeaways

- Currently, there are between 400 and 500 practicing forensic pathologists in the United States; however, the country needs an estimated 1,200–1,500 forensic pathologists to serve its population adequately since the rise of the opioid epidemic.
- Several factors contribute to this shortage, including lack of exposure to forensic pathology in medical schools and noncompetitive residency salaries compared to those of other physicians.
- Actionable, innovative solutions (e.g., paid intensive training opportunities, improved workload efficiencies, and stronger recruiting strategies) are needed to increase staffing in forensic pathology.

Summary

By 2032, the Association of American Medical Colleges (American Hospital Association, 2019) predicts there will be a shortage of 46,900–121,900 physicians—including a shortage of 24,800–65,800 physicians in non-primary care specialties. Even now, there is particularly a critical shortage of forensic pathologists. Currently, there are between 400 and 500 practicing forensic pathologists, but it is estimated that the United States needs 1,100–1,200 forensic pathologists to serve its population adequately (Department of Justice, 2017). That number has increased since the rise of the opioid epidemic.

Although this is a national problem, it is not easily amenable to federal solutions. Because all medical examiner and coroner (MEC) offices are county- or state-funded agencies, the federal government does not have much influence on addressing this need. Furthermore, there are several other factors that add to this burden. Students are not receiving enough exposure to forensic pathology in medical schools and residencies. In 2018, 10 out of 39 forensic pathology programs achieved full enrollment. In total, all 39 programs were only able to fill 44 out of 85 slots, for a 51.8 percent enrollment rate. In the 2016–2017 school year, there were 40 forensic pathology programs and 46 forensic pathology fellows. There is also an issue of noncompetitive salaries and increasing amounts of student loan debt, thus making the field less attractive to medical students. Drawing individuals to these positions will continue to be a challenge until

leaders in the field closely examine the obstacles and implement some incentives to increase the practitioner pool.

Some jurisdictions have started to implement other methods to address their overburdened MEC system. Panelists highlighted approaches from the following two MEC systems: Wayne County (Michigan) and the New Mexico OMI.

Until 2008, Wayne County forensic pathologists investigated 12,000 cases. That number has steadily increased to about 16,000 cases per year. Caseload for forensic pathologists in the jurisdiction ranges from 750 to 900 cases per year. Between 2011 and 2018, drug-related deaths in the county increased from 420 to 978 per year. Many of these deaths involved fentanyl in 2016, 2017, and 2018. With this steady increase in drug-related deaths, Wayne County took a close look at case-management procedures to determine how the medical examiner's office could optimize workflow to address the growing caseload. In July 2018, Wayne County had five forensic pathologists but held funding for eight positions. To address this gap, three pathology assistants were employed to act as extensions of the pathologists. The assistants conducted most of surgical pathology procedures and received gross autopsy pathology training, including how to conduct autopsy. They also assisted with X-rays and toxicology screening and assisted with cases unlikely to have major legal involvement (e.g., drug deaths, motor vehicle accidents, natural deaths).

The New Mexico OMI is a statewide medical examiner's office that services New Mexico and some tribal communities in Arizona. On average, the office investigates approximately 7,000 cases annually, including 2,100 autopsies and 1,000 external exams. In 2011, the New Mexico OMI received funding from the NIJ (2010-DN-BX-K205) to purchase a computed tomography (CT) scanner for triaging traumatic deaths with the use of this forensic imaging technology (Lathrop & Nolte, 2016). All cases are scanned by a board-certified CT technician before the morning report, so staff can review and discuss cases with the investigator and triaged to determine if an autopsy or external exam is needed.

Using the CT scanner for a National Institute of Justice (NIJ)-funded study, four cohorts of cases were scanned: blunt trauma, firearm, pediatric, and drug poisoning deaths. Each case received a full-body postmortem X-ray computed tomography (PMCT) and a complete autopsy. The pathologist who performed the autopsy was blinded to the PMCT, and the radiologist who reviewed the PMCT was blinded to the autopsy results. Findings were scored for each autopsy and PMCT. Then, a separate radiologist and pathologist reviewed the data for agreement. Focusing on the drug poisoning cohort, the cause-of-death statement generated from only autopsy and from external examination and the PMCT agreed in about 75 percent of cases. When the decedent was under the age of 40 and isolated from this larger group, this agreement increased to 86 percent, possibly attributed to an interplay between drug use and natural disease in older individuals. At the conclusion, the study revealed that PMCT may act to replace autopsy in decedents under the age of 40 in some circumstances. It should be noted that in the 2013 position paper, National Association of Medical Examiners and Coroners (NAME) recommended that a complete autopsy

“While the forensics field receives much attention in the areas of DNA and crime laboratories, forensic pathology receives much less attention as it is in a different paradigm—the medical profession.”

—Dr. Jonathan Arden

examination be performed for all opioid- and toxicology-related deaths (NAME, 2019).

Using data from NIJ-supported and similar studies in other jurisdictions, New Mexico OMI created new standard operating procedures involving a combination of CT scans and urine drug screens (UDS) to decrease the workload on forensic pathologists. At this time, all drug-related deaths are still transported to the New Mexico OMI, and they all receive a full-body PMCT to rule out trauma and identify any natural disease. Toxicology-related cases then fall into one of five categories: young and healthy (under 40), significant natural disease, lethal natural disease, acute versus chronic ethanol, and other. These categories are determined at the morning report conference. At that point, it is determined whether a UDS should be performed. When a UDS is positive or significant natural disease is present, an external examination can be considered instead of a full autopsy examination. The combination of PMCT and UDS to triage drug-related deaths has helped the New Mexico OMI alleviate caseload concerns, especially at a time when the office is short-staffed and over budget.

Staff shortages, increased caseloads, and increased backlogs are also issues in forensic crime laboratories that require innovative approaches to address the situation. In May 2018, the Virginia DFS worked with internal finance staff to address case backlogs based on potential submission rates and staffing levels. Between 2018 and 2022, Virginia DFS projected a case submission rate increase of 7 percent through June 2019 and 3 percent thereafter. Taking into consideration additional factors like outsourcing cases, staffing changes (e.g., leave, turnover), training, and overtime, it was determined that to maintain a 30-day turnaround time, the backlog needed to be below 3,478 cases (Virginia DFS, 2020).

The Virginia DFS documented a strategic plan in a policy brief, which justified additional resource needs using best-case and worst-case scenarios in the projections and proposed solutions. In addition to items that would impact the agency's budget, the plan also addressed budget-neutral initiatives like using grant funding for a Lean Six Sigma project and evaluating submission policy changes. With costs assigned, Virginia DFS leadership presented the strategic plan to policymakers and received an additional \$1.66M for FY19 to increase staff, purchase additional equipment, outsource a portion of their backlog, dedicate two forensic scientists to training, and provide for travel opportunities for staff to learn from other DFS laboratories).

Moving Forward

To address this critical need, the MEC profession will need to implement actionable solutions to increase staffing. Some possible solutions include increasing exposure to forensic pathology in medical schools and residency programs and improving salaries. Currently, medical examiner government salaries are only 50 to 65 percent of private salaries. Making salaries more competitive may attract more students to the field. MEC offices should also work closely with forensic pathology programs to recruit students. Additionally, training and education incentives tied to debt reduction may help. Student loan forgiveness programs can provide some incentive

by offsetting an extra year of specialized training and reducing student loan debt. Another tactic to consider is offering visas to international students. J-1 visa waivers can provide opportunities for and attract non-US residents, as they are designed to promote educational and cultural exchange and are used to attract international medical graduates pursuing a residency or fellowship training in the country.

Fellowships can be used to draw post-graduate or post-residency students, because they provide paid intensive training opportunities in forensic pathology, allowing people to determine if they would like to stay in the field. There are already a number of fellowship opportunities across the country; however, as of 2018, many such positions remained unfilled. Historically, this type of program has been largely underfunded and difficult for forensic pathologists because autopsies are not recognized as medical procedures. The programs are also often aimed at primary care physicians and those practicing medicine in rural or underserved areas and often require participation in Medicare/Medicaid.

NAME is actively working to address the issue of fewer medical students pursuing pathology and has created an ad hoc committee on workforce development. This committee is charged with outreach and recruitment at medical schools, residencies, and with younger age groups to educate individuals on the forensic pathology profession. The committee also conducts presentations at national meetings for organizations like NIJ, US Public Health Service, and National Association of Counties to bring awareness to this issue. Finally, NAME continues to collaborate with several national organizations (e.g., DOJ, College of American Pathologists, Association of American Medical Colleges, US Public Health Service Commissioned Corps) to better understand the needs within the medicolegal death investigation field and find potential solutions.

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Panel 4: Forensic Workforce Safety and Resiliency

Moderator

Dr. Frances Scott, National Institute of Justice (NIJ)

Panelists

Mr. John Fudenberg, Clark County Las Vegas Coroner's Office

Dr. Andrew Levin, Columbia University

Ms. Selena McKay-Davis, Riverside California Police Department

CDR Jennifer Hornsby-Myers, Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health

Overview

Medical examiners and coroners (MEC) experience many types of stressors and vicarious trauma while performing job duties. It is important for leadership to understand these stressors, find ways to educate employees on stress and its implications, and promote coping mechanisms to support workplace resiliency.

Key Takeaways

- Forensic professionals face many types of stress, including physical stress, psychosocial stress acute or chronic stress, trauma or vicarious trauma, and organizational stress while performing job duties.
- Secondary stress and vicarious trauma for these individuals is often overlooked and can affect attrition and effectiveness and may lead to compassion fatigue and burnout.
- Leadership in MEC offices need to understand the full mind and body effect of secondary stress and vicarious trauma to help employees build and strengthen proper coping mechanisms.

Summary

The effects of secondary stress and vicarious trauma in the workforce have many implications. To understand the impact of secondary stress and trauma on employees, it is important to understand the types of stressors forensic professionals face within the workplace, including stress associated with traumatic, sometimes large-scale events and the everyday pressures and demands that come with the job duties. As noted in one presentation, types of stress can include physical stress, psychosocial stress (e.g., available resources versus what is needed to perform a job), either acute (immediate) or chronic stress (accumulates over time), trauma/vicarious trauma, and organizational stress.

Researchers have studied various effects of secondary stress and trauma for first responders and those working with trauma survivors, including compassion fatigue and burnout. Classic signs of vicarious trauma include intrusive thoughts; avoidance of reminders; withdrawal from others; negative perceptions; disturbed sleep; changes in identity, worldview, spirituality, and self-esteem; and diminished sense of safety and control. Vicarious trauma can result in burnout, meaning employees may show symptoms of fatigue, cynicism, decreased effectiveness, absenteeism, substance abuse, and attrition (Abdollahi, 2002; Anderson, Litzenberger, & Plecas, 2002; Anshel, 2000).

To study the impact of secondary stress and vicarious trauma, researchers at Columbia University used NIJ funding to perform a gap analysis among American Society of Crime Laboratory Directors members to examine the

significance of vicarious trauma and burnout, risk factors (e.g., interaction with victims and families; frequency of testimony), as well as how organizations are addressing these issues and supporting the effects of vicarious trauma and burnout among employees (Department of Justice [DOJ], 2018, 2020). The study population included crime laboratory personnel and medical examiners in several agencies, who used an adapted version of the Office for Victims of Crime *Vicarious Trauma—Organizational Readiness Guide for Victim Services* (DOJ, 2013).

Using a survey and site visits, researchers found that all agencies were aware of stress within the organization. Common stressors highlighted include handling intense workloads/backlogs, conducting testimony, having communication issues, working crime scenes, contacting families of the decedents, learning stories accompanying DNA samples, and responding to high-profile events (e.g., the mass shooting in Las Vegas). Despite awareness, the study also noted that there were varying degrees of managing this awareness. For example, acknowledging and coping with these stressors was not always a regular part of supervision and communication in the workplace. Reasons for this include privacy concerns, mistrust of management, stigma that comes with someone who is burnt out or stressed, and impact on performing job duties. Alternatively, the study highlighted interventions employed by some offices—some more comprehensive than others. The interventions identified include wellness initiatives, coordination of resources, screening for resiliency, training, and post-event debriefs.

This panel also discussed the effects of increased workload demands on MECs associated with the rise in drug-related deaths, particularly deaths caused by opioids. Deaths in these cases may involve contact with mixtures of stimulants, depressants, opioids, and cannabinoids. Unintentional exposure to unknown substances may consequently result in increased stress among employees. One study noted that first responders have experienced health effects that interfered with their ability to continue with duties. Researchers concluded that education and training regarding how to properly handle illicit drugs are the primary intervention methods to minimize adverse health effects.

Moving Forward

The effects of trauma on medical examiners and coroners (MECs) is often overlooked. It is important for leadership in MEC offices to understand the full mind and body effects of secondary stress and vicarious trauma, be aware of the signs of stress, and find ways to help employees cope with the effects of workplace stressors both inside and outside the workplace. Leadership should aim to educate employees on stress and its implications and promote coping mechanisms in support of workplace resiliency. Some ways that MEC organizations can promote health and wellness to support forensic professionals include developing support groups/networks, providing proper training on preparedness and workplace hazards, evaluating peer support and mental health programs on a regular basis, and destigmatizing access to mental health support.

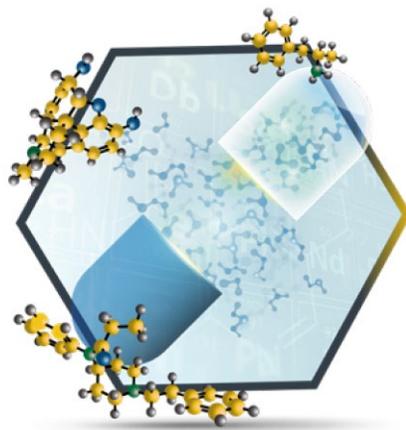
Following the mass shooting in Las Vegas in October 2017, Clark County Coroner, John Fundenberg, implemented several programs to address vicarious trauma experienced by their staff. Initiatives to help staff with health and wellness following the event included meditation and yoga sessions, chair massages, and therapy dogs.

Positive Stress Coping Mechanisms

- Distancing
- Improve communication skills
- Proper diet
- Physical fitness
- Planned problem solving
- Recreation & vacations
- Social support seeking

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DAY 2

Day 2 Opening Keynote: Community Impact

Moderator

Dr. Jeri D. Ropero-Miller,
RTI International

Panelists

Mr. Donald Holman,
Impacted Parent

Mr. Thomas Synan,
Newtown Police
Department, Hamilton
County, Ohio

“The ‘enable or give tough love’ debate goes away when the person dies.”

“It is never just the one that is impacted. It is the loved one, community, state, nation.”

—Thomas Synan, Newtown
Police Department

Summary

The opioid and emerging drug threat crisis impacts its victims on both deeply personal and community levels. Both families and neighborhoods face stigma and hardship while trying to navigate mental health, substance use, and addiction.

For Mr. Donald Holman, an advocate in the fight against the opioid crisis, the battle to provide for his son’s mental health needs while navigating his son’s addiction resulted in loss. Mr. Holman’s son, Garrett, passed away just 8 days before his 21st birthday in February 2017. This experience mirrors that of so many families, speaking to the need for more advocacy and a public impact “voice” in the opioid and emerging drug threat response conversation from the people directly affected by this crisis. Mr. Holman now collaborates with the Office of National Drug Control Policy—as well as the Department of Health and Human Services and the Surgeon General’s Office—in his advocacy efforts.

In Hamilton County, Ohio, Police Chief Thomas Synan saw his community in desperate need of help as he witnessed whole families die when fentanyl and carfentanil hit their streets, which increased deaths from 1 or 2 a week to 20. His community faced an unprecedented epidemic with the fentanyl crisis, showing the need for stakeholders to come together to focus on addiction with a steering committee that included treatment experts, first responders, public health experts, law enforcement, hospitals representatives, and elected officials. Mr. Synan’s experiences in his community led him to help form the Hamilton County Heroin Coalition, where he serves on the Steering Committee and Chair Interdiction. His work has been used in national and international media outlets and is archived in the National Law Enforcement Museum.

Both Mr. Holman and Mr. Synan have found that each day, everyone should be reminded of the need to share more data, ideas, and treatment methods.



Panel 5: Policy and Practice

Overview

Data metrics play a critical role in forming and measuring outcomes for drug policy and substance use disorder response. The current need to develop new surveillance metrics is coupled with the need to ensure stakeholders throughout a jurisdiction have access to inform a cohesive response to the opioid and emerging drug threat crisis.

Key Takeaways

- It is imperative that local practitioners can collect and report real-time data to better understand current issues and to enhance collaboration across stakeholders more effectively.
- Creating policies to address opioid overdose response requires collaboration between national-, state-, and local-level government agencies, health care providers, law enforcement and judicial personnel, emergency responders, and advocacy organizations.
- While confirmatory testing is a key element of the intersection of public health and the criminal justice system, presumptive testing provides an understanding of what is happening immediately in the streets of local jurisdictions.

Summary

The Policy and Practice session highlighted the role data metrics play in forming and measuring progress and success for drug policy and opioid overdose response. The medicolegal death investigation (MDI) community sees a need in developing new metrics and ensuring all stakeholders have access to current data to address the challenges of the opioid and emerging drug threat crisis.

The New York City RxStat data collection tool was developed to help reduce crime through new measurements of success that would provide guidance for drug policies (New York City Office of the Mayor, 2018). This has allowed the New York/New Jersey High-Intensity Drug Trafficking Program to collect and use evidence for fatal drug overdose cases to understand the drug composition of what is being used in their jurisdiction in real time.

Additionally, the US Army is taking a proactive approach in collecting data on opioid use in the military to implement policies and develop treatment options before it becomes a widespread issue, thus preventing burden on civilian medical systems (NIDA, 2019; Meadows et al., 2015).

CDC is implementing strategies and programs to assist communities in compiling and using data in ways that will reduce silos and link surveillance and prevention data (Haegerich, Jones, Pierre-Olivier, Robinson, & Ross, 2019). This could allow the public health community to understand where individuals are

Moderator

Dr. Jeri D. Roper-Miller,
RTI International

Panelists

Mr. Chauncey Parker, New York/New Jersey High-Intensity Drug Trafficking Program (HIDTA)

Dr. Puja Seth, Centers for Disease Control and Prevention (CDC) National Center for Injury Prevention and Control

Lieutenant Colonel

David Sartori, Medical Corps, US Army Division of Forensic Toxicology, Armed Forces Medical Examiner System (AFMES)

Mr. Stephen McConachie, US Customs and Border Protection (CBP)

misusing opioids, how the illicit opioid drug supply enters communities, and when critical surveillance interventions are needed. Programs highlighted for the MDI community are found in Table 1.

Table 1. Programs highlighted for the medicolegal death investigation (MDI) community

Highlighted Centers for Disease Control and Prevention Program	Offers the MDI Community
Prescription Drug Monitoring Program (PDMP)	Tools to collect, monitor, and evaluate prescription and dispensing data authorized in 49 states, the District of Columbia, and Guam.
Enhanced State Opioid Overdose Surveillance (ESOOS)	Funding previously awarded to 32 states to track, analyze, and disseminate findings for timelier and more comprehensive fatal and nonfatal overdoses provided by MECs, emergency department visits, and Emergency Management Systems transports.
State Unintentional Drug Overdose Reporting System (SUDORS)	Data that include unintentional and undetermined opioid deaths from death certificates, MEC reports, and toxicology results as a component of ESOOS.
Overdose Data to Action (OD2A)	Ability to link surveillance and prevention data together through a state grant program to provide an interdisciplinary and cohesive approach to the opioid epidemic.

In addition to collecting data and making it available in real time to support surveillance activities and interventions, collaboration is noted as a crucial step in creating successful policies and practices (Haegerich, Paulozzi, Manns, & Jones, 2014; Hallas, Klar, & Rattner, 2019; High et al., 2019; Salmond & Allread, 2019; US Department of Health and Human Services, 2018). CBP and Office of National Drug Control Policy (ONDCP) believe that they can support law enforcement efforts through the HIDTA grant program for local agencies as a critical step in surveillance and to help track what makes it across US borders. The program is a great source of information for what CBP might have missed at the border to identify where gaps in intelligence are located.

Moving Forward

Proactive partnerships that include national-, state-, and local-level government agencies, health care providers, law enforcement and judicial personnel, emergency responders, and advocacy organizations are still needed across the nation to address gaps and needs of communities in facing emerging drug threats. Data collection systems need to be optimized for local practitioners, including more effective and collaborative data gathering, analysis, and dissemination to enhance national data analysis and to provide local stakeholders the ability to access their data in real time. Stakeholders must also evaluate the intelligence value of presumptive testing in criminal justice system; while the confirmatory test is a key element of prosecution, presumptive tests can help understand what is happening immediately and in the streets, which is

vital information for local jurisdictions. Panel 7, Surveillance Systems to Inform Response, provides more information on programs that use presumptive drug testing.

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Panel 6: Research to Integrate Public Safety and Health Data for Forensic Response

Moderator

Emma Hall, Boulder County Colorado Coroner's Office

Panelists

Dr. Jason Graham, New York City (NYC) Office of the Chief Medical Examiner

Dr. Chikarlo Leak, District of Columbia (DC) Office of the Chief Medical Examiner

Ms. Paula Braun, CDC National Center for Health Statistics

Dr. Chris Delcher, University of Kentucky, College of Pharmacy

Overview

Real collaboration and timely metrics are critical for a community's response to the drug crisis. However, implementation is complicated by turnaround times for high-quality toxicology testing, barriers to linking multiple data sources, and difficulties with comprehensive data integration.

Key Takeaways

- Increasing the use of prescription drug monitoring program (PDMP) data across the criminal justice system can improve investigations and collaboration at the local level across all stakeholders.
- Ensuring access to the PDMP for the medical death investigation (MDI) community is critical to address community challenges with communication around the substance use crisis.
- Promising practices to improve collaboration at the local level include evaluating PDMP data against self-reported use in emergency rooms to identify nonprescribed opioids access. Further, National Center for Health Statistics occupation data could be used to identify professions/occupations that are more prone to particular types of drug use to aid intervention efforts.

Summary

As noted in the Policies and Practices Forum, the ability to access real-time mortality data and collaborate across disciplines is crucial to enhance the response to the opioid and emerging drug threat crisis. The challenges of real-time mortality reporting are impacted by the turnaround time for high-quality toxicology testing, the ability to link data sources, the availability of integrating comprehensive data, and the ability to analyze the data for actionable information. The NYC Medical Examiner's office rectified the lag problem of mortality reporting with drug issues by bringing together a multidisciplinary Drug Intelligence & Intervention Group that implemented successful changes for their community including

- a medical examiner epidemiologist to extract, mine, analyze, and interpret data increasing cross coordination and data usage;
- social worker integration to improve outreach efforts;
- syringe testing for drug overdose sites to enhance key surveillance; and
- development and improvement of partnerships to guide data acquisition and targeted dissemination including daily and monthly reports.

The DC Medical Examiner's office is also addressing community challenges through increasing collaboration, engaging community stakeholders, and improving communication with multidisciplinary case review. Employing

forensic epidemiologists allowed the office to bring together and holistically analyze data to support more timely public health surveillance; thus, the office was able to identify important trends and disseminate information about those trends across the community. CDC is working to address real-time mortality reporting challenges with their efforts on MDI Data Sharing and Investigation, which includes ensuring that data submission happens automatically and without burden (Robinson, Christiansen, & Bacon, 2019). A partnership between CDC and NIST OSAC [National Institute of Standards and Technology, the Organization of Scientific Area Committees for Forensic Science] to identify core data elements will improve cause and manner of death investigations in a way that data can be collected and exchanged in a cost- and time-efficient manner.

PDMP data are used by state insurance programs, health care licensure boards, state health departments, and law enforcement. Research shows that public health officials are using PDMPs more to understand the landscape of controlled substance use, including showing trends in the number of individuals obtaining multiple controlled substance prescriptions (Kentucky and Florida [Jalal et al., 2018; Higham, Horwitz, & Rich, 2019]), in prescribing practices (New York [Bachhuber, Tuazon, Nolan, Kunins, & Paone, 2019]), and with prescriptions being fraudulently filled after the death of recipients. PDMP research has evaluated the effect of opioids on communities by looking at child removal statistics (Morris et al., 2019; Quast, Storch, & Yampolskaya, 2018) and numbers of fatal opioid poisonings (Pauly, Slavova, Delcher, Freeman, & Talbert, 2018) after PDMP implementation. In New York, a large decrease was observed in opioid prescriptions after implementing the PDMP. Increasing law enforcement use of the PDMP in investigations may help increase communication between prescribers, pharmacists, and law enforcement and enhance investigations. The ability for medical examiners to use the PDMP would also enhance the system and death investigation; currently, there are challenges for this community to gain access (Delcher, Pauly, & Moyo, 2020).

Moving Forward

Public safety and health data can provide key insights to the forensic community in their response to the opioid crisis. Increased knowledge and dissemination of PDMP data have multiple benefits, including improved communication at the local level between prescribers and pharmacists. The data can help enhance local collaboration by stakeholders such as law enforcement and medical examiners. The community must increase access of real-time data and use additional innovations to increase data-informed decisions. For example, evaluating the PDMP data against self-reported use in emergency rooms could identify areas where opioid access is unrelated to overprescribing (Hawk et al., 2018). Furthermore, the National Center for Health Statistics has plans to start coding occupation data to identify professions and occupations that are more prone to particular types of drug use, which could aid intervention efforts.

“DC is unique in that their demographics are black men ages 40–69 as the predominant unintended opioid deaths. This is due to long-standing heroin use in those communities, which now also contain fentanyl and poly-drug use (usually 1–7 drugs in system).”

—Chikarlo Leak, DC Office of the
Chief Medical Examiner

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Panel 7: Surveillance Systems to Inform Response

Overview

Surveillance programs provide data on current drug use in communities, helping to inform local, state, and national responses to opioid and emerging drug threats. This data and subsequent analysis provide the most value when disseminated properly to stakeholders.

Key Takeaways

- Field drug identification programs enable rapid charging of arrestees, and many programs use instruments, such as Raman spectrometers, that help officers analyze substances safely.
- Field identification of drugs leads to collection of data that can be compiled and analyzed for trends and implications of illicit drug activity.
- Important drug surveillance programs include the Drug Enforcement Administration (DEA) National Forensic Laboratory Information System (NFLIS) and Real-Time Communication Network, NMS Labs' Novel Psychoactive Substance (NPS) Discovery resource, and the National Institute of Drug Abuse's National Drug Early Warning System.

Summary

Data on current drug use in communities help inform local, state, and national responses to opioid and emerging drug threats. But any subsequent data analysis is only valuable if it is disseminated to stakeholders. The panelists demonstrated the need for surveillance programs to accurately and rapidly detect drugs in the field, monitor drug use through data analysis, share the information, and engage communities to activate change.

The first step in a surveillance system is to be able to identify drugs being used and causing deaths. PPD recognized the need to develop a solution for the field identification of opiates that would allow for the rapid charging of arrestees. A pilot program was established to study the identification of heroin and fentanyl in the field, using a Raman field device with full laboratory analysis follow-up. The successful program trained officers how to use the field test as a preliminary test for safety and analytical purposes and to identify 22 controlled substances, including cocaine, cocaine base, marijuana, and methamphetamine. This valuable program has allowed streamlined charging of arrestees and has enabled the PPD Bomb Squad to determine whether unknown powders are explosives or controlled substances. PPD saw the need for this type of program, and other agencies may also benefit from developing a similar program. Ms. Nancy Crump outlined the characteristics of a successful field-testing program so that other agencies with a gap would be able to build on the PPD's success.

Moderator

Dr. Margaret Warner, Centers for Disease Control and Prevention (CDC), National Center for Health Statistics

Panelists

Ms. Nancy Crump, Phoenix Police Department (PPD) Crime Laboratory

DSFC Adam Polhemus, New Jersey State Police Drug Monitoring Initiative

Dr. Barry Logan, NMS Labs and the Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation

Ms. DeMia Pressley, US DEA

Ms. Erin Artigiani, Center for Substance Abuse Research, University of Maryland

Characteristics of a Successful Field-Testing Program

- Identify the (initial) main purpose of the program
- Perform a laboratory validation of any instrumentation before implementation
- Compare your options to determine what works best for your agency
- Pilot the program in the field to determine feasibility
- Collect and evaluate metrics
- Use safety nets along the way
- Communicate with all partners/stakeholders

Across the United States, the identification of drugs in the field or in the laboratory leads to a vast amount of data being collected by hundreds of separate agencies. Several efforts exist to compile and analyze the data being collected. For example, fusion centers are located in states and major urban areas to gather and share threat-related information (Department of Homeland Security, 2019). In New Jersey, the fusion center collects data to aid drug trend monitoring—drug-related hospital visits, including emergency room-administered naloxone administration data, addiction treatment admissions, urine analysis from jails and prisons, overdose tracker reports, including any instances where the stamp was involved in an overdose (fatal or not), and distinct packaging from a few laboratories. This data collection effort is part of New Jersey’s Drug Monitoring Initiative, a multi-jurisdictional drug incident information sharing environment that establishes an intelligence capacity to support law enforcement and public health experts in better understanding trends and implications and illicit drug activity threats within their jurisdictions. This surveillance program has been instrumental in providing real-time information to partners when a spike occurs, identifying areas where homes should have naloxone, shutting down three pill mills in 2 months, and identifying those at highest risk. New Jersey’s initiative illustrates how integrated data sets from public health and law enforcement focused on treatment, enforcement, and prevention allow stakeholders to understand the scope of the drug problem, understand the presence and prevalence of specific drugs, and enhance policies and practices.

At the national level, DEA established NFLIS to provide accurate and chemically verified data in support of drug scheduling. NFLIS supplements and complements other databases and supports federal, state, and international control actions. Drug analysis results are collected from federal, state, and local crime laboratories, representing a total of 282 individual laboratories. Notably, the NFLIS participation rate, defined as the percentage of the national drug caseload represented by laboratories that have joined NFLIS, is currently more than 98 percent.

DEA recognizes that data are not valuable unless shared with stakeholders. In fact, NFLIS disseminates drug chemistry data from a near-complete census of forensic crime labs (NFLIS, 2009). Data show trends and patterns across the United States via annual, midyear, and special reports and publicly available data tables. A new NFLIS-Drug Quarterly Snapshot series is in progress that will provide more real-time data of substances submitted to NFLIS-Drug during a specified time period. This will highlight new synthetic cannabinoids, synthetic cathinones, fentanyl-related substances, and other substances of relevance to the forensic community. The DEA Real-Time Communication Network (synth-opioids@usdoj.gov) is managed out of the DEA Southeast Laboratory to promote sharing information and resources about new substances being detected and identified. In collaboration with NFLIS, a “Bulletin Board” platform is being created to permanently house this type of information so that practitioners and stakeholders can have the opportunity to view real-time risks that people have in their communities. Additionally, NFLIS is expanding

to include two new programs that collect toxicological data from public and private toxicological laboratories (NFLIS-Tox) and deaths in which any drug was identified from medical examiner and coroner offices (NFLIS-MEC). NFLIS-Tox and NFLIS-MEC components will extend DEA's radar to identify new and emerging substances and make appropriate scheduling decisions under the Controlled Substances Act.

In addition to field programs developed by crime laboratories, commercial laboratories are also a valuable resource for detecting new drugs. For instance, NMS Labs has discovered several new substances from seized drug and death investigation casework, as well as from emergency room populations, government datasets, electronic databases, peer-reviewed literature, drug scheduling actions, conferences, drug user forums, and field surveys. The online NPS Discovery documents the first known reports of NPS in the United States through analyses of seized materials and biological materials (Center for Forensic Science Research and Education, 2020). This effort is a collaboration between NMS Labs and the Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation. The reports are intended to assist the forensic science community in rapidly identifying NPSs in casework.

A part of this resource, the NPS Early Response Network disseminates key information to crime laboratories. Dr. Barry Logan of NMS labs, who presented on the resource, noted that crime laboratories may not know when or which drugs are debuting in their communities. Data in the network stem from postmortem cases, clinical outbreaks, and seized drug material. The network also includes a variety of resources, including real-time reporting in a dashboard format, trend reporting, quarterly reports, and public health notices. Additionally, alerts are issued if a substance is highly lethal. Similarly, NIST is collaborating with the DEA and the Federal Criminal Police Office of Germany to develop an interactive, online NPS data hub for real-time data curation and dissemination of spectral data and associated metadata of NPSs (NIST, 2018).

Another example of a federal surveillance system is the National Drug Early Warning System (NDEWS), established by the National Institute on Drug Abuse within the National Institutes of Health (NIH) (University of Maryland, n.d.). NDEWS is a public health surveillance system designed to detect, monitor, and follow up on emerging drugs and drug use trends to inform state and local responses. Additionally, NDEWS generates critically needed information about drugs and their public health consequences and leverages resources and collaborations to harmonize approaches to analyzing and presenting data. Bringing together all aspects of a successful surveillance system, NDEWS supports sentinel community sites, HotSpot studies, and the NDEWS Network. Epidemiologists at the sentinel community sites provide regular updates and publicly available annual reports. Currently, there are 12 sites that stretch across the United States. HotSpot Studies are rapid local studies that answer specific research questions that could be identified by local or federal agencies. The studies are supported by a community-based participatory research model in conjunction with local experts and stakeholders to synthesize, efficiently analyze,

NFLIS Highlights

- Provides national, regional, and local data on drug trafficking and abuse patterns for the DEA and others
- Identifies changes in indicators of drug distributions geographically and over time
- Provides information about the diversion of prescription drugs
- Identifies emerging drugs of abuse and changes in drug availability
- Supports international, national, and local drug policy initiatives

“These new novel substances, what is in the environment and informing [stakeholders in] treatment, prevention, and recovery of what is going on at the ground level allows them to act more swiftly and inform users at risk. You cannot put a price tag or number on the amount of lives saved with that type of information sharing, but it is a partnership to automate these processes and allow the data to inform those partners.”

—Adam Polhemus, New Jersey State Police Drug Monitoring Initiative

and strategically disseminate emerging drugs and drug trends. The NDEWS Network is a virtual community comprising more than 1,500 experts from a variety of fields that allows stakeholders to gain rapid access to information on emerging drugs and drug trends. Network users are able to join cross-disciplinary discussions and learn about new resources and successful local solutions.

Moving Forward

Discussing their stories of success establishing surveillance programs or efforts that could support a surveillance program, the panelists demonstrated the need for all communities to build partnerships and proactively monitor drug trends and the importance of sending data to a data collection center like a local or state fusion center or a federal system like NFLIS.. Even if emerging drugs are not yet on the radar, stakeholders across all disciplines can work together to prevent death due to those drugs. However, this can only be accomplished if drugs are rapidly identified and data are rapidly compiled and disseminated. Building on pilot programs, a national system should be established to coordinate and communicate toxicology, medical, and MEC data with public safety and health stakeholders (Morrow et al., 2019).

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Panel 8: The Road to Policy and Practice

Overview

Addressing the opioid crisis will require collaboration between many types of stakeholders, including state and local government, law enforcement, and public safety.

Key Takeaways

- The United States is challenged by a variety of drug threats, including high volumes of drugs shipped through online orders, increasing numbers of counterfeit prescription drug tablets, and overprescription of stimulant drugs.
- Resources from federal agencies, such as the Bureau of Justice Administration (BJA) Comprehensive Opioid Abuse Program (COAP) and the Overdose Detection Mapping Application Program (ODMAP) Statewide Expansion and Response opportunity help communities address emerging drug threats and develop coordinated public safety and public health responses to the data.
- Political associations such as the US National Governors Association (NGA) provide opportunities to collaboratively address challenges of opioid addiction.

Summary

Panelists provided an overview on their path to implementing policy and practice from multiple perspectives, including local and state government, law enforcement, and public safety. Discussion topics focused on data integration efforts and laboratory program implementation.

CBP is challenged by the volume of drugs being shipped through online orders and an increasing number of counterfeit prescription drug tablets. Furthermore, seizures do not always accurately reflect the flow of drugs coming into the United States. In addition to emerging drug threats, medical professionals may be overprescribing stimulants, which may lead to an emerging stimulant crisis.

Several US federal agencies create funding opportunities to address challenges created by drug threats (Morrow et al., 2019). For instance, BJA's COAP has awarded \$389M to public safety and public health agencies over the past 3 years to enable initiatives that reduce overdose deaths, promote public safety, and support access to treatment and recovery services. COAP is composed of three complementary components—site-based solicitation, training and technical assistance, and demonstration projects. The most popular area of funding in the past 3 years has been the law enforcement and first responder diversion partnerships, which work to prevent people from entering the criminal legal system by engaging in treatment with those who might have illustrated an addiction. This program helps communities develop sustainable programs that assist with jail-based addiction initiatives. Overall, COAP encourages

Moderator

Ms. Tara Kunkel, BJA

Panelists

Ms. Tara Kunkel, BJA

Ms. Cheryll Moore, Erie County Department of Health

Mr. Stephen McConachie, US Customs and Border Patrol (CBP)

Dr. Jeffrey Locke, NGA

partnerships to support data-driven responses to emerging drug threats and to assist rural communities respond to the opioid epidemic.

A recent BJA funding opportunity, “ODMAP Statewide Expansion and Response,” supports statewide adoption of ODMAP and the development of coordinated public safety, public health, and behavioral health responses to the data. ODMAP, an overdose mapping tool developed by the Washington/Baltimore High Intensity Drug Trafficking Area, enables real-time logging of overdoses by first responders into a centralized database (NIJ, 2018; Comprehensive Opioid, Stimulant, and Substance Abuse Program, n.d.).

“We had to look at [everybody] because it took our preconceived notions and threw them out the window. We were talking about kids and the homeless. That is not what was. The average age of death, for 5 years running is a 38-year-old male to be specific. Everybody was worried about the children and this is the dad.”

—Cheryll Moore, Erie County
Department of Health

In response to a 303 percent increase in opioid-related deaths from 2012 to 2015, Erie County, New York sought funding for a BJA COAP grant to address this increase and provide quicker incident reporting (BJA, n.d.). Erie County implemented a pilot program in 2017 that leverages ODMAP data and police report information to identify service needs to provide more prompt, comprehensive services from peers and first responders after an overdose. As part of this program, peer connection is established about 24–72 hours following an overdose event. The peers give brochures, ask permission to talk about harm reduction strategies and options, and work with families of overdose victims. The pilot program was so successful that police routinely began to tell overdose victims someone would contact them to offer services, and the individuals very much appreciated and wanted the connection. Some individuals had been on waitlists; others did not know where to go to seek help. Currently, eight police departments are participating in the program, and they have started referring people to the program as an “Overdose Possibility.” Throughout this process, Erie County discovered that collaboration and trust are essential to success, as is constantly leveraging data and results to inform new processes to increase connection to care.

In addition to federal agencies, political associations may also support efforts to address the opioid epidemic. NGA has been the face and voice of the nation’s governors since 1908 and has been involved in the opioid epidemic for the last 9 years. In 2016, the governors agreed that collective action is needed to end the opioid crisis and they signed the “Governors Compact to Fight Opioid Addiction” (NGA, 2016). Through this compact, they created recommendations for federal action, held roundtable series, and developed several publications to bring attention to opioids. NGA recognizes that communities and states need funding, governance, and comprehensive, near real-time data. They also need partnerships, data sharing agreements, and effective ways to visualize data. NGA has made it a priority to focus on partnerships, coordinate with local entities, and engage with tribal communities on shared challenges. Governors want to work with medical examiners and coroners, particularly around polydrug and fatal/nonfatal issues. NGA recognizes that there are several current state and local gaps that make it challenging to address this epidemic. There are many federal funding streams to aid agencies in this struggle, but it can be difficult for states to use all of the funds being offered to them strategically, sustainably,

and responsibly, because they might not have the infrastructure or capacity to effectively or efficiently coordinate and use available resources or funds.

Moving Forward

Several funding sources exist to help agencies combat the opioid epidemic and address emerging drug threats, but states may not know the funds exist or know how to use them strategically, sustainably, and responsibly. Associations and public-facing events like this forum can help agencies learn about funding opportunities and demonstrate through success stories how the funds can be used. Additionally, associations like NGA want to hear from stakeholders to learn how they can help. For example, they want to be able to assist the medical examiner community with their shortage of medical examiners. Collaboration is the key to ending this public health crisis.

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Addressing Current State and Local Gaps

- Improve universal data, surveillance, and health information technology tools
- Develop and scale evidence-based prevention and models of substance use disorder care
- Increase access to treatment for underserved populations

About the Moderators

Ms. Emma Hall is in her third term serving as the Boulder County Coroner in Colorado. She studied criminalistics at Metropolitan State University of Denver, Colorado, and interned with the Denver Police Department Crime Lab analyzing controlled substances. Ms. Hall serves as a board member on the International Association of Coroners and Medical Examiners and is a past board member of the Colorado Coroners Association.

Ms. Tara Kunkel serves as a senior drug policy advisor on detail to the Department of Justice Bureau of Justice Assistance through an interagency agreement. Ms. Kunkel oversees the Bureau of Justice Assistance's Prescription Drug Monitoring Program and the Comprehensive Opioid Abuse Program.

Dr. Jonathan McGrath is a senior policy analyst with the US Department of Justice (DOJ) National Institute of Justice (NIJ) in the Office of Investigative and Forensic Sciences. He supports the NIJ Forensic Technology Center of Excellence program, the DOJ Needs Assessment of Forensic Laboratories and Medical Examiner and Coroner Offices, the NIJ Forensic Laboratory Needs Technology Working Group, and the NIJ Drug and Crime Program; he also serves as a vice co-chair for the Federal Medicolegal Death Investigation Working Group. Prior to joining NIJ, he served as a forensic scientist with the US Customs and Border Protection's Laboratories and Scientific Services Directorate. Dr. McGrath holds a doctoral degree in analytical chemistry from Georgia Tech, a master's of science in forensic science from the University of Illinois at Chicago, and a bachelor's of science in chemistry from the University of Dallas.

Dr. Roger A. Mitchell, Jr., is board certified in anatomic and forensic pathology by the American Board of Pathology and a fellow with the National Association of Medical Examiners (NAME). Dr. Mitchell is the chair of the Strategic Planning Subcommittee for NAME and is the immediate past chair for the Deaths in Custody Subcommittee. He recently served as the national co-chair for the

National Medical Association's Working Group on Gun Violence and Police Use of Force. He is a graduate of Howard University, Washington, DC, and New Jersey Medical School in Newark. Dr. Mitchell is licensed to practice medicine in Washington, DC, has performed more than 1,400 autopsy examinations in his career, and has testified as an expert for numerous cases. As the Chief Medical Examiner of a major city, Dr. Mitchell is uniquely positioned to understand the social determinants that lead to the violence affecting our most vulnerable communities.

Dr. Jayne Morrow is the Assistant Vice President of Research and Economic Development at Montana State University. Dr. Morrow formerly led national science and technology strategic policy development as the Executive Director of the National Science and Technology Council in the Executive Office of the President during the Obama Administration. She led biothreat response and metrology for biological science programs at the National Institute of Standards and Technology (NIST). Dr. Morrow earned her Master of Science and doctoral degrees in environmental engineering with a specialty in molecular and microbiology from the University of Connecticut.

Dr. Timothy Rohrig is the Director of the Sedgwick County Regional Forensic Science Center, a combined medical examiner's office and crime laboratory. Dr. Rohrig holds several academic positions in the United States and has a visiting professorship in forensic toxicology at the University of Lincoln in the United Kingdom. He holds a doctorate in pharmaceutical sciences with an emphasis in pharmacology/toxicology and is board certified by the American Board of Forensic Toxicology. Dr. Rohrig has given numerous scientific oral presentations in the field of toxicology, authored more than 25 papers and several book chapters, and has published the book *Postmortem Toxicology: Challenges and Interpretive Considerations*.

Dr. Jeri D. Roper-Miller is the Chief Scientist in the Applied Justice Research Division at RTI International, where she supports projects that include the National Institute of Justice Forensic Technology Center of Excellence and the Drug Enforcement Agency–funded National Forensic Laboratory Information System. Dr. Roper-Miller is currently the president-elect for the American Academy of Forensic Sciences and serves on the Toxicology Subcommittee of the National Institute of Standards and Technology, Organization of Scientific Area Committees.

Dr. Frances Scott is a physical scientist at the National Institute of Justice, where she manages the Controlled Substances and Forensic Toxicology research and development portfolios under the General Forensics portfolio; she also co-manages the Research for Publicly Funded Labs program. Dr. Scott received a bachelor's of science in chemistry from the University of California at Davis and a doctoral degree in physical chemistry from the George Washington University.

Dr. Margaret Warner is an injury epidemiologist with the Centers for Disease Control and Prevention, National Center for Health Statistics. Dr. Warner's research focuses on fatal injury, poisoning, and sudden death. Currently, she is working to improve national mortality data quality using multiple cause of death data from the National Vital Statistics System, free text from death certificates, and death investigation data from medical examiners and coroners.

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