



OSAC MEDICOLEGAL DEATH INVESTIGATION SUBCOMMITTEE:

RECOMMENDATIONS FOR MEDICAL EXAMINER/CORONER DRUG-RELATED DEATH INVESTIGATIONS

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BACKGROUND

The United States is in the midst of an epidemic of drug overdose deaths. Since 2000, the rate of deaths from drug overdoses has increased 137%, including a 200% increase in the rate of overdose deaths involving opioids (opioid pain relievers and heroin) (1). There were more than 52,404 drug overdose deaths in 2015 in the United States, exceeding the per capita death rate of motor vehicle deaths (2). As significant as these numbers are, it is the consensus of the Organization of Scientific Area Committees (OSAC) Medicolegal Death Investigation Subcommittee that drug overdose deaths are likely underestimated. This represents an epidemic that is largely preventable, and prevention relies on accurate and comprehensive data that are only available through the efforts of the medicolegal death investigation community.

Strategies to address this epidemic require collaboration at federal, state, local, and tribal levels and include health care professionals, medicolegal death investigators, policymakers, law enforcement, and public health agencies. Medical examiners and coroners are generally responsible for investigation and certification of drug-related deaths in the United States. The medical examiner/coroner professional community is in a unique position to help define the drug death epidemic and is a singular national resource to inform about fatal drug use and abuse and its consequences. Two problems in fully assessing the opioid threat in the United States that relate directly to medical examiner/coroner investigations are 1) the inconsistent patchwork of death investigation systems that exist throughout the United States and 2) variations in the accuracy, timeliness, and availability of data on drug overdose deaths (3,4).

Death investigation systems and practices in the United States vary greatly between and within states, with great variation in quality (4, 5). Systems vary greatly in budgets, staffing, equipment, training, and infrastructure (4, 5). Inconsistencies also exist among jurisdictions within a particular state, especially in county medical examiner, county coroner, and hybrid death investigation systems. Because of the marked variation in death investigation practices, there is a wide range in the completeness and accuracy of identification and certification of drug overdose deaths. There

is also variation in investigative efforts and abilities among different death investigation jurisdictions. This, combined with nonstandardized toxicology testing and noninteroperable datasets across jurisdictions, inhibits timely and meaningful analysis of death data that would inform public health and public policy responses to the opioid crisis (6-10).

Death certificate data are the sole source of national drug mortality. Because of inconsistencies in death investigation and reporting by different death investigation jurisdictions, cause of death reported on the death certificate is inconsistent and often incomplete (1-2, 9-12). Analyses of death certificate data indicate that on nearly one-quarter of death certificates, the medical certifiers fail to specify the types of drugs involved in the cause of death (9). Although availability of national death certificate data has recently improved to one year, this is still insufficient for rapid assessment of mortality trends due to specific drugs. Efforts are underway to make more timely national data available. Many states' vital statistics offices are currently providing information to stakeholders more quickly to meet state specific needs. Real-time reporting of suspected drug-related deaths to relevant stakeholders, via multi-agency task forces, occurs in some local jurisdictions.

Cause and manner of death information from death certificates is converted to codes using the International Classification of Disease (ICD) coding system. While this confers many advantages, a limitation of relying on death certificates for data trends is that ICD codes do not convey all of the information about drugs named on the death certificate (11). However, many states are supplementing the ICD-coded data with information on the drugs specified on the death certificate (12). International Classification of Disease coding only identifies classes of drugs rather than individual drugs, with rare exceptions (e.g. methadone, cocaine, heroin) (11-13). Information on specific drugs can be used to identify trends in overdose deaths involving prescription medications or illicit drugs, provide implications of certain drug combinations, and also inform about the diversion of prescription drugs over time (15). Because the public health and law enforcement responses will differ greatly depending on the types of drugs involved, data regarding specific drugs causing or contributing to death are of utmost importance (9). However, access to vital statistics data can be restricted in some states, particularly if data with personally identifying information are needed. For instance, some regional medicolegal systems in which local medical examiners refer cases to a central autopsy referral center suffer because the medical examiners

who perform the autopsy are denied access to the death certificates for case review and quality control.

Given that such variations in death investigation and certification produce inconsistent, inaccurate, and incomplete drug mortality data, three initiatives are essential for informing timely and effective public health, law enforcement, and public policy responses to the opioid crisis: adoption of standardized drug-related death investigation for medical examiners and coroners, developing strategies for increased drug death surveillance by medical examiners and coroners, and ensuring that medical examiners and coroners have access to death certificates and other essential information for quality control and data analysis.

CURRENT PUBLISHED RECOMMENDATIONS

Death investigation best practices to improve the quality and consistency of death investigation have been recommended by The National Association of Medical Examiners (NAME, a national medical examiner professional organization) and by governmental agencies such as the National Institute of Justice and The Substance Abuse and Mental Health Services Administration (SAMHSA) (10,12,16). It is suggested that such best practice recommendations, if followed, will both assure the quality of the medical examiner/coroner work product and also assist the public health and public safety responses to the opioid and drug epidemic (10,12).

The foundation of standardized death investigation, *Death Investigation: A Guide for the Scene Investigator*, serves as a set of best practices for death scene investigators for all types of death investigations (16). These guidelines provide a set of investigative tasks that should be performed by the medicolegal death investigator at every death scene. Specific to drug-related deaths, NAME and SAMHSA have published evidence-based recommendations for the practice of death investigation and autopsy, toxicological analysis, interpretation of the toxicology findings, and death certification (10,12).

The SAMHSA consensus panel for classifying opioid-related deaths published uniform standards and case definitions that can assist medical examiners, coroners, and public health officials with classifying potential drug-related deaths. The panel recommended standardized approaches in four areas: scene investigation, toxicological testing and analysis, case definitions, and determination and documentation of causality. The consensus panel emphasized 1) the

importance of a “complete inspection” of the scene, including documentation of potential exposure to drugs and review of prescription history and prescription drug monitoring program, 2) the most reliable toxicological specimen is blood drawn from a peripheral site (iliac or femoral veins), and 3) the importance of individual drug names causing or contributing to death should be listed on the death certificate, rather than use of generic terms such as “polypharmacy” or “drug intoxication.” The Subcommittee disagrees with some recommendations regarding cause of death statements on death certificates. The Subcommittee agrees with the panel recommendations that proper determination of cause and manner of death requires integration of death scene circumstances, medical and drug use history, drug source, autopsy findings, and laboratory test results.

The NAME position paper for investigation of potential opioid-related deaths sets forth the following seven specific recommendations for investigation of opioid-related deaths:

“1) a complete autopsy is necessary for optimal interpretation of toxicology results, which also must be considered in the context of the circumstances surrounding the death, medical history, and scene findings; 2) a complete scene investigation includes reconciliation of prescription information and pill counts; 3) blood, urine, and vitreous humor, when available, should be retained in all cases, and femoral blood is the preferred specimen; 4) a toxicology panel should be comprehensive and include opioid and benzodiazepine analytes, as well as other potent depressant, stimulant, and anti-depressant medication; 5) interpretation of postmortem opioid concentrations requires correlation with medical history scene investigation, and autopsy findings; 6) the certifier should list all responsible substances by generic name in the autopsy report and on the death certificate; 7) the best classification for manner of death in deaths due to the misuse or abuse of opioids without any apparent intent of self-harm should be “accident” (10).

After publication of the NAME and SAMHSA drug-related death investigation recommendations, the Centers for Disease Control and Prevention (CDC) issued a Health Advisory on fentanyl-related overdose fatalities (17). There has been an increase in overdose fatalities in many states from fentanyl; however, not all death investigation jurisdictions routinely

test for fentanyl. Therefore, the CDC recommends screening specimens from fatal drug overdoses using methodology to detect fentanyl and to implement standardized mechanisms to ensure that the word “fentanyl” is in the cause of death statement on the death certificate for appropriate cases. Because of changing drug use patterns, this should apply to any named drug.

PROPOSED RECOMMENDATIONS OF THE MEDICOLEGAL DEATH INVESTIGATION SUBCOMMITTEE FOR DRUG-RELATED DEATH INVESTIGATIONS

The Medicolegal Death Investigation Subcommittee recommends the following guidelines for medical examiner/coroner investigation of potential drug-related deaths, as developed from the published guidelines including the NAME position paper developed through the joint efforts of NAME and American College of Medical Toxicology in addition to SAMHSA, National Institute of Justice, and CDC:

- 1) Within the bounds of state law, medical examiners and coroners should accept jurisdiction of cases where a death is unexpected or unexplained and the person was in apparent good health, or when the death is known or suspected to be unnatural.
- 2) An autopsy in addition to toxicology is considered best practice for accurate determination of cause of death for potential drug-related deaths, where allowed by law. An exception to the need for autopsy is a delayed death after prolonged hospitalization.
- 3) A thorough and complete scene investigation should include photographic documentation of any findings suggestive of drug use, misuse, or abuse (e.g., opioid medications, illicit drugs, cut straws, needles, needle puncture marks, mixed pills, medications of the same type from multiple prescribers, medication bottles with no labels, history of methadone use) and photographic documentation of and an inventory of all medications found at the scene. The inventory should include the prescriber information, number of pills prescribed, number of pills remaining, and, where allowed by law, an inquiry of the prescription drug monitoring program in the decedent’s state.
- 4) Toxicology testing should be performed when there is/are 1) a known history of prescription opioid or illicit drug use, misuse, or abuse; 2) evidence of prescription opioid or illicit drug abuse revealed by scene investigation; 3) autopsy findings suggesting a history of illicit drug abuse; 4) massive lung edema and froth in airways with no grossly

visible explanation or other nontoxicological explanation; 5) potential or suspected smugglers of illicit drugs; 6) no unequivocal cause of death identified at autopsy; and 7) decedents with a potential natural cause of death visible at autopsy whenever a drug may have precipitated or contributed to death.

- 5) Because of postmortem redistribution, the best source of blood for toxicological testing is from the iliofemoral vein. If iliofemoral vein blood is not available, then another peripheral site (e.g., subclavian vein, axillary vein) is the next desirable specimen. Blood samples should be collected with sodium oxalate/sodium fluoride in the specimen container. Vitreous humor and urine should be routinely collected and retained for potential additional testing. If the case of hospitalization prior to death, antemortem samples collected by the medical facility should be obtained by the medical examiner/coroner for toxicological testing. In decomposed cases in which blood samples are unobtainable, appropriate tissue/fluid samples should be collected.
- 6) A comprehensive toxicological analyte panel should include opioids, benzodiazepines, antidepressants, muscle relaxants, sleep aids, ethanol, and pharmaceutical and illicit stimulants. Common opioids that should be included in the analyte panel include buprenorphine, codeine, fentanyl (and common analogues such as acetyl fentanyl), hydrocodone, hydromorphone, meperidine, methadone, 6-monacetylmorphine, morphine, oxycodone, oxymorphone, propoxyphene, tapentadol, and tramadol.
- 7) Interpretation of postmortem drug concentrations must be performed in the context of scene findings, the decedent's medical and drug history, and autopsy findings, with the understanding of the principle of postmortem redistribution. In addition, interpretation of postmortem toxicology should include understanding of specific drug metabolism. For example, detection of morphine in the blood (without heroin metabolite) demands reflex testing of other specimens such as urine and vitreous to seek supporting evidence of heroin use.
- 8) Accurate determination of cause and manner of death must include consideration of scene investigative findings, the decedent's medical and drug use history, autopsy findings, and toxicological testing. The cause of death statement, both on the autopsy report and death certificate, should include the list of generic names of drugs believed to have caused or

contributed to death. Vague descriptions, such as “polypharmacy,” “drug abuse,” or “mixed drug intoxication” should not be used.

- 9) Deaths from the misuse or abuse of drugs without apparent intent of self-harm are best classified as “accident” for manner of death. Reserve “undetermined” manner for use in cases in which evidence may support more than one possible determination.

FURTHER RECOMMENDATIONS

Medical examiners and coroners are integral in the drug-related death surveillance public health imperative. The Subcommittee recommends that medical examiners and coroners maintain accurate, timely, and readily accessible drug-related death data and statistics. The Subcommittee urges medical examiner and coroners to share drug-related death information with other stakeholder agencies (i.e., local, state, and federal law enforcement agencies, public health agencies, drug prevention coalitions), while maintaining investigative independence, where allowed and to the extent allowed by law, and efforts should be made to amend laws that prohibit this. For example, the New York City Office of the Chief Medical Examiner is presently collaborating with the New York and New Jersey High Intensity Drug Trafficking Area initiative with the goal to rapidly inform policy and program interventions for preventing overdose mortality as well as informing death investigation practice. Initiatives that enhance the medical examiner/coroner surveillance of drug deaths, such as developing regional and/or national incident/data incident surveillance systems, are strongly encouraged. Access to death certificate data for medical examiners/coroners will provide death surveillance and quality control measures to enhance the reporting of drug related deaths. Similarly, access to prescription drug monitoring programs will provide an additional investigative resource in suspected drug related deaths. The Subcommittee recommends funding of medical examiner- and coroner-based research that will help establish and further refine evidence-based death investigation practices. The lack of funding is a primary obstacle for medical examiner/coroners in adequately investigating the increased volume and complexity in drug-related deaths.

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