



### **E25 How Thorough Medicolegal Death Scene Investigations and Autopsies Impact Public Health and Safety**

*Margaret Warner, PhD\*, CDC/Natl Ctr Health Statistics, 3311 Toledo Road, Hyattsville, MD 20912; Kelly Keyes, BS\*, Orange County Sheriff Coroner, Coroner Division, 1071 W Santa Ana Boulevard, Santa Ana, CA 92703; and Julie A. Howe, MBA\*, Saint Louis University, Franklin, Jefferson & St Charles M.E. Offices, College of Health Sciences, 3084, St. Louis, MO 63104-1028*

After attending this presentation, attendees will be able to establish the importance of the medicolegal death scene investigation and autopsy with toxicology in order to accurately complete death certificates. Death certificate data is used to monitor public health and safety, allocate resources, and develop initiatives.

This presentation will impact the forensic science community by demonstrating why a thorough medicolegal death investigation, including scene, autopsy, and toxicology testing, is necessary to accurately certify the death.

The incidence of drug intoxication mortality continues to rise with more than 47,000 people dying from a drug overdose in 2014. Since 2000, the drug intoxication death rate has increased 137%, including a 200% increase in the rate of drug intoxication deaths involving opioids.<sup>1</sup> Opioids are currently the leading cause of drug intoxication deaths as these drugs were involved in more than 61% of overdose deaths in 2014.<sup>1</sup> These data from the Centers for Disease Control and prevention (CDC) are derived from death certificates and are the only national source data on drug intoxication deaths.

While death certificate data provide a national picture of drug intoxication mortality, there are limitations to these data due to variations in death certification practice, as well as variations in death investigation practice, which impacts all data on drug intoxication deaths regardless of the data source. Inconsistency in death certification practice influencing the utility of the data include reporting metabolites (e.g., morphine rather than heroin) and not identifying the specific drugs involved (e.g., “multidrug intoxication”) on the death certificate. Death investigation practices may also vary, including when decedents are tested for the presence of drugs, substances tested for, and circumstances under which the tests are performed. These factors may vary by jurisdiction, decedent, and temporally (e.g., routine fentanyl testing). Both death investigation and certification practice is reflected in the reported data, which in turn impacts not only monitoring trends but also initiatives to prevent deaths as well as resources allocated.

In order for public health and safety to accurately monitor the opioid epidemic, information reported (including on death certificates) on opioid deaths by medical examiners and coroners is critical. Therefore, assuming jurisdiction in these cases is essential and should include both a scene investigation and complete autopsy, including toxicology. A trained medicolegal death investigator should look for evidence of medication, both prescription and illicit substances, at the scene. This evidence should be thoroughly inventoried. Information should be obtained by observing the actual bottles and not from medication lists obtained from family members on scene. The presence of paraphernalia, such as needles, should also be documented, photographed, and collected, when possible, for future testing; however, the absence of medications or paraphernalia on scene has a low predictive value for drug intoxication, which should not eliminate suspicion of drugs causing death.<sup>2</sup> Medical history is also essential to document, as well as prescription history, which may be obtained from a Prescription Drug Monitoring Program



(PDMP) if the investigator has the authority to access it.<sup>3</sup> Evaluations have shown PDMPs to be a valuable tool for medicolegal death investigation.<sup>4</sup>

Death scene investigations may be hampered by scene tampering particularly for deaths involving the use of illicit or illegally obtained substances. For example, illicit substances may be removed before investigators arrive and, in some cases, bodies may be moved from the place where the death occurred. Witnesses and family may share limited details surrounding the deaths. This may impact both cause of death and manner of death. Drug intoxication is a leading mechanism of suicide among men, and the leading cause among women. Of all causes of death, drug intoxication is most likely to have a manner that could not be determined.<sup>5</sup>

Medical examiners, coroners, and medicolegal death investigators are at the front lines of this evolving crisis and are in a unique position to gather the information needed for monitoring the new and emerging drugs of interest, as well as monitoring consistent drugs of abuse, such as heroin, cocaine, and methamphetamine. For drug intoxication deaths, in addition to all the other information gathered, the death scene may influence when decedents are tested, what drugs are tested for, and the interpretation of the toxicological tests. Information from the death scene needed to assess for risk and protective factors may go beyond that needed for determining cause and manner of death.

Improving the quality of death investigation and certification will maximize the utility of our existing national registration of deaths for public health surveillance and research and contribute to the design of programs to prevent drug intoxication deaths.

### Reference(s):

1. Centers for Disease Control and Prevention. *Increases in Drug and Opioid Overdose Deaths — United States, 2000–2014*. MMWR 2015; 64; 1-5.
2. Hall A.J., Logan J.E., Toblin R.L., et. al. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA*. 2008. Dec 10; 300 (22): 2613-20.
3. Prescription Drug Monitoring Program Training and Technical Assistance Center (PDMP TTAC). *PDMPs Authorized and Engaged in Sending Solicited and Unsolicited Reports to Law Enforcement Entities*. 2016; Available from: [http://www.pdmpassist.org/pdf/Law\\_Enforcement\\_Entity\\_Table.pdf](http://www.pdmpassist.org/pdf/Law_Enforcement_Entity_Table.pdf).
4. Prescription Monitoring Program Center of Excellence at Brandeis, Drug-Related Deaths in Virginia: Medical Examiner Use of PMP Data. 2011. [http://www.pdmpexcellence.org/sites/all/pdfs/va\\_medical\\_examiner\\_NFF\\_final.pdf](http://www.pdmpexcellence.org/sites/all/pdfs/va_medical_examiner_NFF_final.pdf)
5. Warner, M., et al., *State Variation in Certifying Manner of Death and Drugs Involved in Drug Intoxication Deaths*. *Acad Forensic Pathol*, 2013. 3(2): p. 231-237.

### Opioid Deaths, Overdose, Death Certification