Drug Overdose Prevention–Coroners' Study

Assessing Coroners' Needs

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UNIVERSITY OF NEBRASKA AT OMAHA
SUPPORT AND TRAINING FOR THE EVALUATION OF PROGRAMS

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Research Purpose

The Nebraska Department of Health and Human Services (DHHS) partnered with Support and Training for the Evaluation of Programs (STEPs) at the University of Nebraska at Omaha to assess the needs of Nebraska county coroners in conducting drug overdose death investigations.

To develop a clear understanding of the Nebraska county coroners' needs, STEPs conducted an online survey of 91 county coroners who are serving 93 Nebraska counties, according to Nebraska DHHS's internal data. STEPs administered the survey on July 23, 2019, and closed it on August 16, 2019. 28 people participated in the survey and 25 completed it, giving a response rate of 27%. At least three responses were received from each of the six Nebraska Behavioral Health regions.

Summary of Findings

The data shows:

1. Nebraska coroners are predominately male, older than 50 years, and have 10 or more years experience in their roles.
2. Nebraska's low drug overdose death rate also means county coroners are completing fewer drug-involved death investigations and have little experience and training for such.
3. While rural county coroners perceive that drug overdose deaths are not a problem in their communities, they also do not believe they have adequate knowledge, information, resources, and financial means to accurately and thoroughly complete drug-involved death investigations when they do occur.
4. The greatest areas of need for Nebraska coroners are increased financial resources for investigations and capacity building, particularly additional medicolegal training.

Recommendations

To meet the needs of Nebraska coroners, STEPs recommends that DHHS:

1. Increase drug-involved death investigation training for coroners, particularly in rural counties.
2. Allocate additional financial support to coroners based on county needs.
3. Develop a state-level medicolegal group of death investigators to support county coroners.

STEPs also recommends to conduct coroner surveys on a regular basis to assess their rapidly changing needs. Also, including interviews or focus groups in future studies would provide richer data on the needs and practices of Nebraska coroners in conducting drug overdose death investigations.

Actors and Organizations

Coroner: An elected public official responsible for completing death investigations in their jurisdiction. In Nebraska, this person is also the county attorney.

Medical examiner: A medical physician who has received general training in completing death investigations.

Pathologist: A medical professional who has received training focused on death and injury.

> **Forensic pathologist**: A specialized medical professional who has received extensive and specialized training to complete death investigations.

ASTHO: Association of State and Territorial Health Officials.

NAME: National Association of Medical Examiners.

NECAA: Nebraska County Attorneys Association.

Statistical Databases

CDC WONDER: CDC Wide-ranging Online Data for Epidemiology Research.

CDC NVSS: CDC National Vital Statistics System, which includes Vital Statistics Rapid Release: drug overdose death counts; and Multiple Cause of Death Mortality files.

NCHS: National Center for Health Statistics.

NVDRS: CDC's National Violent Death Reporting System (NVDRS).

Key Terms

Medicolegal: A hybrid approach of medical and legal frameworks. In this report, this term is used to describe death investigation systems.

Drug overdose deaths: Deaths caused by taking too much of a substance, whether it is a prescription, over-the-counter, legal, or illegal.

Death investigation: A process whereby a coroner or forensic pathologist seeks to understand how and why a person died.

Autopsy: A medical examination that takes place post-mortem (after someone has died.)

The increase in drug overdose deaths in the United States is noticeable[1–4]. The number has increased continuously and reached a peak in 2017. Drug overdose deaths outnumbered deaths from gun violence, HIV, or car crashes at their pinnacles[2]. Investigating drug overdose death rates relies highly on mortality data[5,6] from death certificates, the output of the death investigation system. However, many concerns are being voiced about potential inaccuracies in reporting drug overdose deaths[6–10].

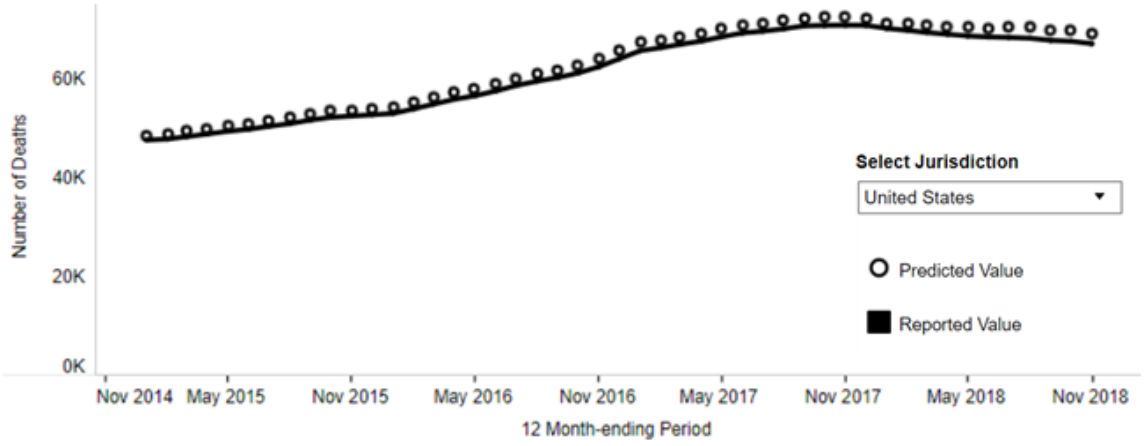
Increasing Drug Overdose Death

CDC Wide-ranging Online Data for Epidemiology Research (CDC WONDER[11]) and the National Vital Statistics System (CDC NVSS[12]) are the main sources of mortality data. The CDC National Center for Injury Prevention and Control provides an Annual Surveillance Report of Drug-Related Risks and Outcomes[4], but there is a time gap in the data. NVSS's Vital Statistics Rapid Release[13] provides the latest surveillance data, and the latest posting was published based on data available for analysis on June 2, 2019, as of June 20, 2019.

United States

The NVSS Vital Statistics Rapid Release provides trends in drug overdose death counts in the U.S. and in each state from January 2015 to November 2018, along with the 12-month provisional counts and the percentage change of the drug overdose deaths. This study shows the counts of drug overdose deaths for the U.S. and Nebraska, accessed on June 20, 2019 (see Appendix 1 for the percentage change).

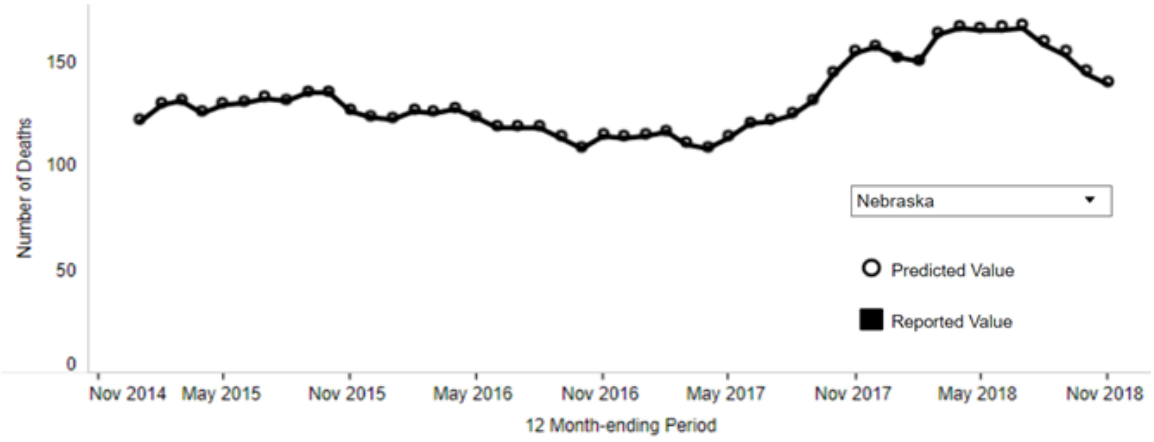
Drug overdose deaths in the U.S. have gradually increased from 47,523 to its peak of 70,723 in November 2017, before decreasing to 66,824 in November 2018.



Increasing Drug Overdose Death (cont.)

Nebraska

The NVSS Vital Statistics Rapid Release provides trends of the drug overdose death counts in Nebraska from January 2015 to November 2018. The number of drug overdose deaths in Nebraska significantly changed recently. The reported number begins with 121 and showed slight increases and decreases until April 2017. Since then, numbers rapidly increased from 108 to 166 in July 2018, with a recent decrease in drug overdose deaths. Drug overdose deaths have consistently decreased since July 2018 and reached 139 in November 2018.



Potential Inaccuracies in Reporting Drug Overdose Deaths

Monitoring drug overdose deaths is highly reliant on death certificate information; thus, it is important to pay attention to potential inaccuracies in reporting drug overdose deaths.

Factor 1: Limitations of the Medicolegal System

Unites States

An analysis of the National Vital Statistics System Multiple Cause of Death Mortality files from 2008 to 2018[5] revealed that states with centralized state medical examiner systems are more likely to specify drugs in reporting drug intoxication deaths.

Average Percentage of Drug Intoxication Deaths with Drugs Specified by States

Medicolegal System	States	Average
Centralized State Medical Examiner	16 states (AK, CT, DL, MA, MD, ME, NC, NH, NM, OK, OR, RI, UT, VA, VT, WV)	92%
Hybrid system: County coroner and medical examiners (state and/or county)	16 states (AL, CA, GA, HA, IL, KY, MN, MO, MS, MT, NY, OH, PA, TX, WA, WI)	73%
Decentralized County or District Medical Examiner (Physician)	6 states (AZ, FL, IA, MI, NJ, TN)	71%
Decentralized County Coroner	12 states (AR, CO, ID, IN, KS, LA, ND, **NE,** NV, SD, SC, WY)	62%

This study assumed that different medicolegal systems may show different levels of drug specification because of the following factors:

- Barriers to using toxicology services
- Organizational structure of the death investigation system and
- Differences in background and training of death investigators.

Participants in a CDC meeting in March 2015[9] discussed "barriers and potential solutions to misclassification of drug intoxication deaths," which included coroners as typically being elected without any professional education requirement, and coroners possibly feeling pressure from stakeholders in determining deaths.

At the Association of State and Territorial Health Officials (ASTHO) Stakeholder meeting on February 23, 2018, titled, "Improving Drug Specificity and Completeness on Death Certificates for Overdose Deaths: Opportunities and Challenges for States," participants indicated limitations that coroner systems have in determining the drug specificity and completeness of death certificates for drug overdose deaths[10]:

- Many coroner offices have limited funding and resources for drug specification in the death investigation process.
- Coroners are less likely than medical examiners to have medicolegal training and education.
- More corroboration needed across death investigation professionals, mainly the coroners and medical examiners.

Potential Inaccuracies in Reporting Drug Overdose Deaths (cont.)

Factor 1: Limitations of the Medicolegal System (cont.)

Nebraska

The coroner system has its own strengths and advantages [14,15]; however, local media companies and Senate Pete Pirsch's Legislative Resolution 276[16] have expressed their concerns about limitations of the Nebraska coroner system, including the lack of forensic training and possible conflicts of interest with coroners.

The *Lincoln Journal Star* on November 18, 2005[7], pointed out that Nebraska is one of five states that has elected coroners without a forensics training requirement. It also wrote about the lack of resources in the rural counties and how the cost to conduct death investigations could bring about negative effects on appropriate death investigations.

Senator Pirsch conducted survey research for LR 276 on the death investigation system in Nebraska in 2008. The report published in 2009[16] presented the county attorneys' survey answers about the weaknesses of the county coroner system in Nebraska. The most significant concerns included coroners' lack of training in forensic science and technology, and possible mistakes caused by this lack of expertise.

One opinion piece of a county attorney in the *Omaha World-Herald* on August 13, 2010[8], called for Nebraska coroner system reform by pointing out the following limitations:

- Forensic training requirement enacted in 2009 is a cosmetic change that cannot fix the death investigation system in Nebraska.
- Nebraska county attorneys may have an inherent conflict of interest in the courtroom: "A witness in a homicide trial he is also prosecuting as county attorney."

Potential Inaccuracies in Reporting Drug Overdose Deaths (cont.)

Factor 2: Limitations of the Surveillance System

United States

Attendees of the ASTHO meeting[10] also discussed the guidance on filling out death certificates. The meeting report shows that many participants expressed a need for general guidance on completing death certificates as well as specific guidance, including example death certificates, scenarios, and model language. The report also expressed the high expectation about "A Reference Guide for Certification of Drug Intoxication Deaths," published by the National Center for Health Statistics (NCHS) in May 2019.

A 2018 study of Buchanich et al.[6] analyzed the unintentional drug overdose deaths from the Mortality Multiple Cause Micro-Data Files and found more than 70,000 unspecified overdose deaths were potentially opioid-related. They also found:

- 438,607 people died from unintentional drug overdoses in the U.S. from 1999 to 2015.
- Unspecified overdose deaths rose 220% (from 2,255 to 29,383) while opioid- related deaths rose 401% (from 5,868 to 29,383) and non–opioid-related overdose deaths rose 150% (from 3,005 to 7,505).
- More than 35% of unintentional overdose deaths were coded as "unspecified" in five states: Alabama, Indiana, Louisiana, Mississippi, and Pennsylvania.

Report authors concluded that the incomplete cause-of-death reporting may cause states to underestimate the current opioid overdose epidemic.

Nebraska

Senator Pirsch's 2009 report[16] revealed that the Nebraska state government did not provide necessary tools for coroners' death investigation, such as established guidelines, standardized forms, and investigative checklists. Currently, the Nebraska Law Enforcement Infant/Young Child Death Checklist is the only Nebraska-made coroner resource posted on the Nebraska County Attorneys Association web page[17].

Buchanich et al.'s 2018 study[6] ranked Nebraska 12th in the percentage of unspecified unintentional drug overdose deaths. More than 20% of the unintentional drug overdose deaths in Nebraska were reported without drug specification.

Potential Inaccuracies in Reporting Drug Overdose Deaths (cont.)

Factor 3: Conflicts of Interest

United States

Attendees of the ASTHO meeting[10] expressed concerns that providing a complete death certificate may make certifiers reluctant to include sensitive information like drug overdose on the report. They wrote, "[C]ertifiers may not include specific and actionable information that they deem too sensitive, such as a drug overdose or conditions that may have led to suicide, on the death certificate because of concern for the family and the stigma related to certain medical issues" (p. 6).

Robbins's 2019 research paper[18] deals with the possible conflict of interest between death investigators and prosecutors. Robbins wrote that the current death investigation system creates a conflict of interest because death investigators and prosecutors are under the same government structure or even in the same office. This study criticizes the coroner system that allows the prosecutor to serve as coroner. Robbins expands on this potential conflict, saying, "On the one hand, prosecutors face pressure to maintain a high conviction rate, while at the same time attempting to seek justice. On the other hand, coroners aim to conduct thorough, objective death investigations and provide accurate medical results" (p. 919).

Nebraska

Senator Pirsch's 2009 report[16] presented slight concern about conflicts of interest by providing a mixed opinion on it. Only 4 responses agreed with the statement: "The coroner position poses possible conflict of interest in investigation of deaths" (p. 7) while 13 responses agreed with the statement, "An independent coroner or medical examiner is useful on the witness stand" (p. 7).

An opinion piece in the *Omaha World-Herald* on August 13, 2010[8] stated that a Nebraska county attorney may have inherent conflict of interest in the courtroom as Robbins' research indicated.

NET News on May 31, 2011[19] reported a sketch of the coroner training for Nebraska county attorneys and quoted a presenter's comment that indicated possible conflicts of interest for county attorneys performing the coroner role. The presenter gave an example of a county attorney prosecuting a police officer, who they work with frequently, as a suspect in a murder occurred in the line of duty. The presenter explained that the victim's family may wonder if the county attorney would be straightforward and honest or lean to protect the police officer.

This section reviews the differences between coroners and medical examiners as well as the history of the death investigation system. Then, it provides more detailed information on the Nebraska coroner system.

History and Current Changes in the Coroner System

Medicolegal System in the United States

Hanzlick et al.'s studies[15,20–24] provide history and trends of the death investigation system in the U.S. Hanzlick and Parrish's 1996 study[20] and Hanzlick and Combs's 1998 study[21] defined the concepts of "coroner" and "medical examiner":

- Coroner: an elected lay person who relies on "whatever medical personnel are available to assist in investigations and perform autopsies."
- Medical examiners: usually appointed physicians and/or pathologists who have specialized training and are able to perform autopsies and forensic death investigations.

Hanzlick's contribution to the Medicolegal Death Investigation System: Workshop Summary[22] illustrates the long history of the coroner system. Coroners have existed for nearly 1,500 years; the system was formalized during the reign of King Richard I in England during the 12th century. The coroner system has evolved since 1860 when Maryland became the first state to require a physician to be present during death investigations. Since 1860, the coroner system in the U.S. continues to vary from state to state due to no federal requirements on how to best investigate deaths.

The coroner versus medical examiner systems arguments span over a century[24], but it is more important to understand that each has its own advantages and disadvantages[14,15,25].

Medicolegal System	Advantages	Disadvantages
Coroner system (county-based)	Autonomy (county-based), access to (legal) power, represents the electorates' will	Lack of forensic knowledge and training, vague role description on death investigations, possible conflicts of interest
Medical examiner system (statewide)	Quality, standard death investigation for all counties, uniformity and centralized administration	Expensive, shortage of professionals

The coroner system is being used less and less, as reported in Hanzlick's studies. Hanzlick's 2007 study[23] found a trend to replace the elected lay coroner systems with systems run by appointed, physician medical examiners in the 20th century. Among 3,137 counties in the U.S., 960 (31%) counties were served by a medical examiner system.

History and Current Changes in the Coroner System (cont.)

Coroner System in Nebraska

For over 100 years, Nebraska has asked that county attorneys also serve as the county coroner by Neb. Rev. Stat. §23-1210: Coroner; duties; county attorney shall perform; expenses; delegation of duties (Laws 1915, c. 224, § 1, p. 493). On May 27, 2009, Neb. Rev. Stat. §23-1213 was amended to require coroners to receive training and continuing education for death investigations:

- Neb. Rev. Stat. §23-1213.01: Guidelines to promote uniform and quality death investigations for county coroners; contents (Laws 2009, LB671, § 3.)
- Neb. Rev. Stat. §23-1213.03: Coroner or deputy coroner; training; continuing education (Laws 2009, LB671, § 5.).

Jenkins wrote in a *Lincoln Journal Star* article7 that the last time a Nebraska lawmaker proposed a state medical examiner's system was in 1999, when Senator Kermit Brashear of Omaha introduced legislation. The report explains that Senator Brashear does not plan on introducing similar legislation again.

Current Status of the Death Investigation System by State

Each state legislates its own medicolegal investigation system. As a result, each state has different standards for the types of deaths that require investigation, the professional and legal requirements to become a medicolegal investigator, and the continuing education training to continue the work. This section overviews the legal profile of the medicolegal investigation system in the U.S. by state.

Coroner/Medical Examiner Laws

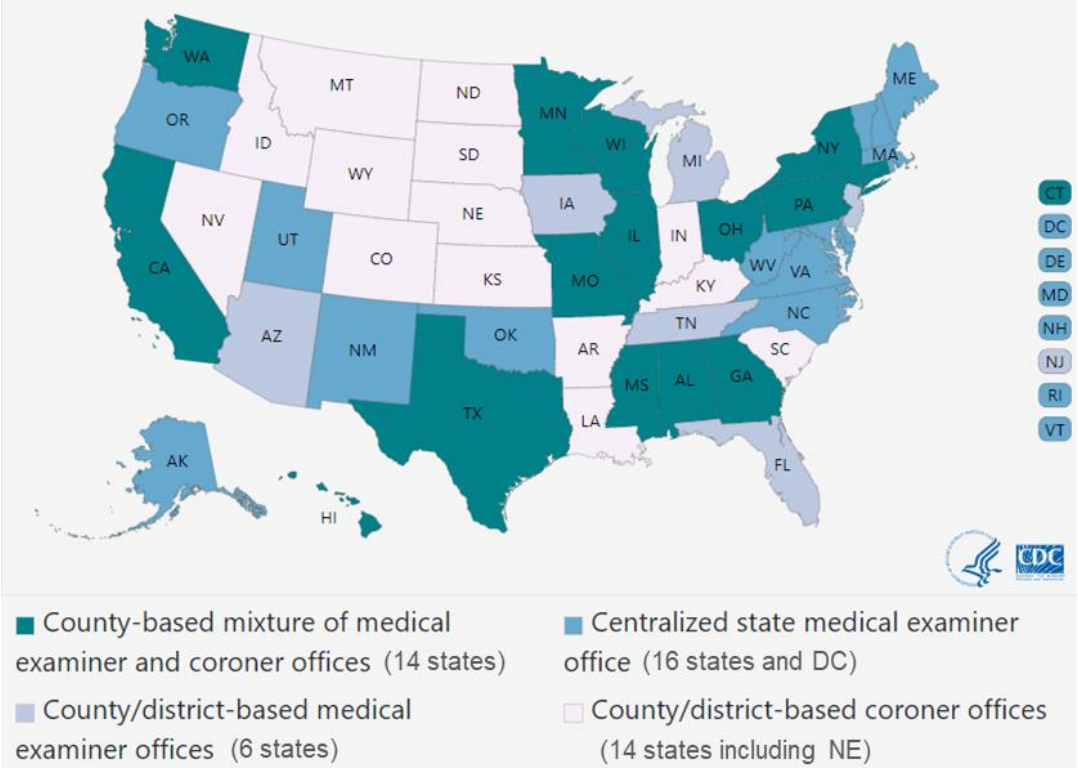
The CDC Public Health Law page provides a summary of the coroner/medical examiner laws by state[26]. This page was published on January 15, 2015, and uses data gathered by the National Center for Health Statistics.

Medicolegal System by State[27]

The CDC categorizes the medicolegal system into four types:

1. Centralized medical examiner system;
2. County/district-based medical examiner system;
3. County/district-based coroner system; and
4. County-based mixture of the medical examiner and coroner system.

14 states including Nebraska adopted a county/district-based coroner system.



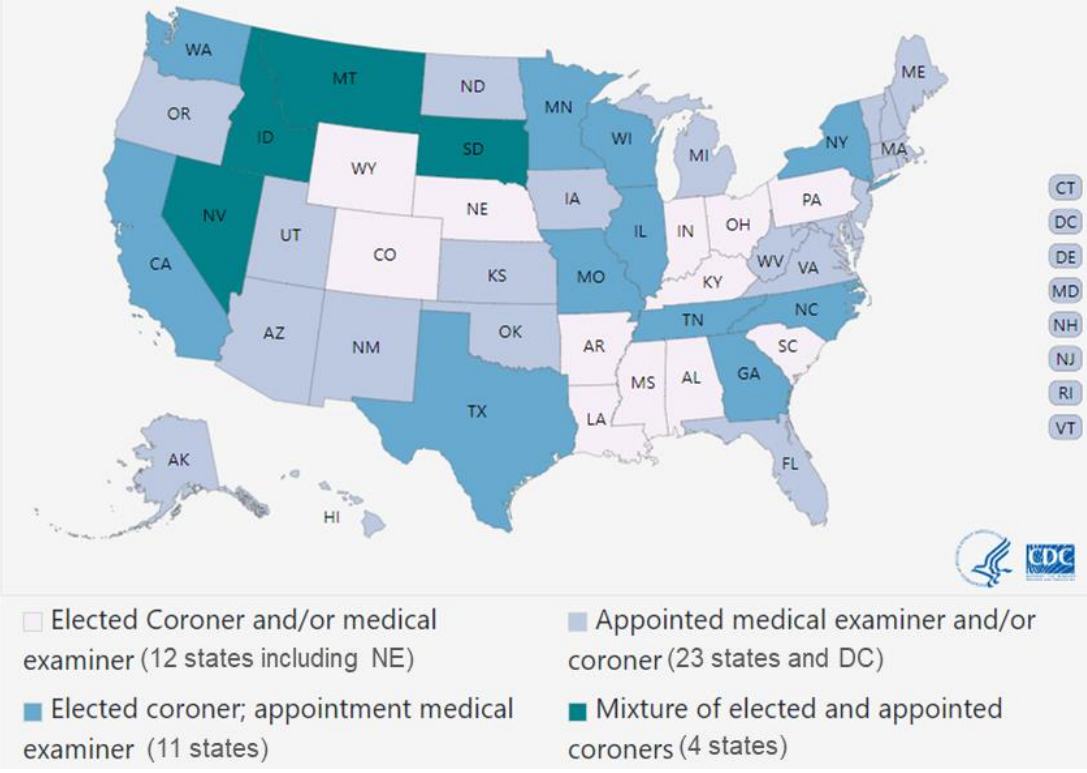
Current Status of the Death Investigation System by State (cont.)

Method to Choose Medicolegal Officers[28]

The CDC categorizes the methods of choosing medicolegal officers into four types:

1. Election coroner and/or medical examiner;
2. Appointment coroner and/or medical examiner;
3. Elected coroner with the appointed medical examiner;
4. Mixture of elected and appointed coroner.

12 states including Nebraska have an election system for choosing their coroner and/or medical examiner.

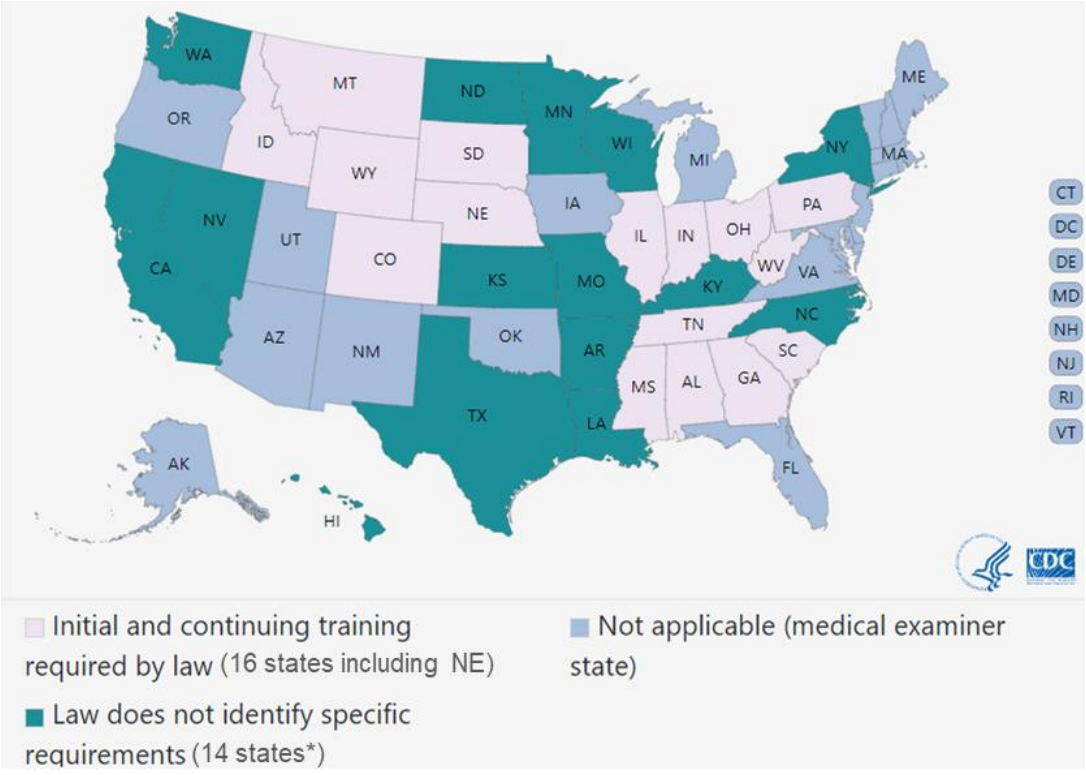


Current Status of the Death Investigation System by State (cont.)

Training Requirements[29]

Most states do not require coroners who conduct death investigations to be physicians or forensic pathologists. Investigating drug overdose deaths requires a certain level of medicolegal knowledge.

- 16 states including Nebraska specify initial and/or continuing training requirements.
- 4 states (Kansas, Louisiana, Minnesota, and Ohio) require coroners to be physicians while their state laws do not specify other training requirements.



Current Status of the Death Investigation System by State (cont.)

Legal Requirements of Drug-Related Death Investigations and Autopsies

States have different standards on requiring investigations or autopsies for drug overdose deaths. CDC's 2013 survey[30] revealed that more than 10 states require investigations and 2 states require autopsies upon coroner/medical examiner discretion for drug overdose deaths.

- Investigations: CA, IL, LA, MA, MS, NH, ND, OR, PA, RI, UT, WA, WY
  - The data table shows 12 states require further investigation for the "Drug use/abuse/overdose"-related deaths while 13 states are marked. This study listed all 13 states from the data table.

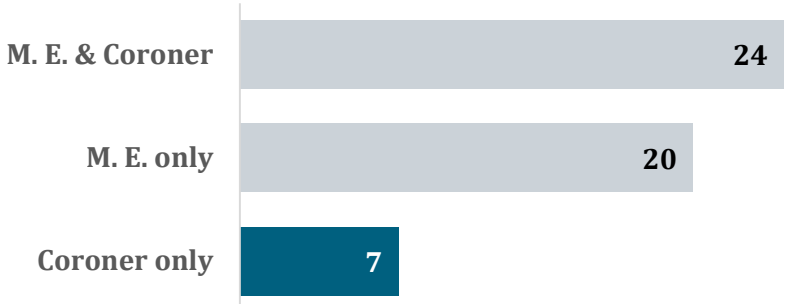
- Autopsies upon coroner/medical examiner discretion: IA (required to be performed by a pathologist), RI.

Change Trends

A recent study[31] provides a snapshot of the medicolegal system in the U.S. by state. It provides change trends in states' medicolegal systems by comparing to the CDC's 2015 study[27].

Investigating Natural and Non-Natural Deaths

Ruiz et al.'s 2018 study[31] investigated who is permitted to complete and sign death certificates associated with both natural and non-natural death by reviewing the medicolegal statutes of all 50 states and the District of Columbia. (See Appendix 2.)



The largest number of states (24 states) authorized both coroner and medical examiner to certify deaths. A similar number of states (20 states) authorized a medical examiner to do so. Only 7 states including Nebraska authorized coroners to certify death.

The Supposition of the Recent Change

The number of states that adopt the coroner-only death investigation system decreased from 14 to 7 between CDC's 2015 study[27] and Ruiz et al.'s 2017 study[31]. Considering the increased number of states that authorize both coroner and medical examiner to certify a death from 14 to 24, it seems the states with coroner-only death investigation system recently added medical examiner system to their coroner system.

The following best practices and recommendations could improve the current drug overdose death investigation system in Nebraska. **Recommended practices include reforming the current medicolegal death investigation system, standardizing death certification and reporting, and increasing drug overdose surveillance or monitoring systems.**

Medicolegal Death Investigation System Reform

As Hanzlick et al.'s studies[20-23] show, the medicolegal system in the U.S. has experienced steady reforms to professionalize the death investigation focusing on medicine. Many studies and reports support the same argument.

From Professional Meetings and Opinions

Workshop on Medicolegal Death Investigation System in 2003

The Institute of Medicine conducted a workshop on March 24-25, 2003, on the medicolegal death investigation system in the U.S. upon the request of the National Institute of Justice. The workshop summary[32] demonstrates the necessity of medicolegal death investigation reform in the U.S.

The strong recommendation coming out of this workshop is to abolish the office of coroner and replace it with a medical examiners' office headed by a pathologist. The summary states, "The coroner's office is an anachronistic institution, predating the Magna Carta" (p. 4) and the office "has conclusively demonstrated its incapacity to perform the functions customarily required of it" (p. 4). This recommendation aims to professionalize the death investigation system with medicine at its center.

Sivick's Opinion Piece on Omaha *World Herald*[8]

This opinion piece from a county attorney in Nebraska urged the coroner system reform. Sivick wrote that Nebraska needs to take the necessary steps to establish a statewide medical examiner system. Sivick also recommended to establish a state-level death investigation system that is more efficient and effective.

Investigation, Diagnosis, and Certification of Drug Overdose Deaths

Improving the quality of death investigation data is a long-standing challenge[33]. Studies recommend various solutions for the various perspectives of drug overdose death investigations.

From Professional Meetings, Reports, and Opinions

National Association of Medical Examiners Position Paper in 2013[34]

Davis and colleagues from the National Association of Medical Examiners (NAME) and American College of Medical Toxicology created best practices for investigation, diagnosing, and certifying deaths related to drug overdoses. The recommendations included:

- A complete scene investigation should extend to the reconciliation of prescription information and pill counts;
- A toxicological panel should be comprehensive and include opioid and benzodiazepine analytes, as well as other potent depressants, stimulants, and anti-depressant medications; and
- Reserve "undetermined" for rare cases in which evidence exists to support more than one possible determination.

Appendix 3 provides a complete list of best practices for drug overdose death investigations.

The workshop summary also suggested increasing salaries for medical examiners and pathologists to attract highly qualified and educated people to the profession and improving and modernizing facilities where autopsies are performed.

NAME ad hoc Data Committee Report in 2014[35]

This study aimed at improving the involvement of medical examiners and coroners in CDC's National Violent Death Reporting System (NVDRS). The committee recommended:

- Establishing an electronic death reporting system;
- Using a compatible case management database within the states and in the U.S.; and
- Placing a public health worker in the medical examiner/coroner office.

ASTHO Stakeholder Meeting in 2018[10]

Participants of this meeting emphasized increasing interoperability across mortality systems at the federal, state, and local levels and coordination of medicolegal death investigations to consolidate activities and supports for the medicolegal death investigation.

The discussion highlighted the necessity of training and education to improve the specificity on death certificates. It also pointed out the gap between resources and capacity among death investigation systems and recommended raising funding for computers, toxicology testing, and personnel to improve drug specificity and completion of the death report.

Investigation, Diagnosis, and Certification of Drug Overdose Deaths (cont.)

From Academic Articles

Lathrop et al.'s 2009 Technical Note[36]

This technical note reported a search for the standardized methods of electronic coding for New Mexico's Office of the Medical Investigator. They reviewed four coding options:

1. Current Procedural Terminology [CPT];
2. International Classification of Disease [ICD] coding;
3. Systematized Nomenclature of Medicine Clinical Terms [SNOMED CT]; and
4. An in-house system.

They recommended SNOMED CT as "the best, most accurate option" for coding pathologic diagnoses as well as building an in-house system that could adopt new methods and utilize the existing methods.

Webster and Dasgupta's 2011 Study[37]

This study proposed two methods to improve consistency and accuracy in the collection and analysis of decedent data in opioid-related poisoning deaths:

1. Improved death certificates for collecting more data about the list of opioids related to the deaths, the usage patterns (alone or combined) of the opioids, prescription history, estimated quantity of opioid consumption, and patient characteristics and medical history related to the drug overdose.
2. Expanded scope of opioid toxicology categories used to classify and code cause-of-death data reported by death investigators.

Slavova et al.'s 2017 Commentary[38]

This commentary dealt with the relationship between death certificates, toxicology reports, and prescription drug monitoring programs in Kentucky. It identified that the many overdose death reports do not specify drugs despite toxicology analyses being available for nearly 89% of all drug overdose autopsy reports.

This study highlights the disconnect between toxicology analyses, death certificates, and drug surveillance in identifying drug overdoses. It proposed further standardization and consensus among medical examiners and coroners to help reduce state variation and improve national death certificate-based drug overdose surveillance.

Investigation, Diagnosis, and Certification of Drug Overdose Deaths (cont.)

From Academic Articles (cont.)

Williams et al.'s 2017 Article[39]

Williams' research team studied a publicly available drug overdose surveillance system in Pennsylvania. It claimed that establishing standardized drug overdose surveillance data systems is critically important to deal with the nationwide drug death epidemic.

The data system is expected to gather drug overdose information and providing easily accessible information to stakeholders (such as law enforcement, public health officials, etc.) in order to focus prevention efforts. It also suggests a data-driven approach to the current overdose crisis.

Ruiz et al.'s Study in 2018[31]

This study recommended driving reforms by the law. They recommended a uniformization and tightening of state statutes pertaining to the death certification process throughout the country. They also recommended the provision of education and training in the medicolegal field including expanding them to all professionals involved in the death certification process.

Survey Methodology

STEPs conducted this study by implementing the research plan[40] published in July 2019. Use of a survey methodology provided a comparative advantage over focus groups or interviews as it could gather standardizable data from many people at a relatively low cost[41,42]. This strategy was appropriate given the lack of current information regarding Nebraska county coroners' drug overdose death investigations. STEPs utilized a survey of Nebraska coroners through Qualtrics[43], a convenient and user-friendly online survey software platform.

Survey Items

The 21-item survey was a combination of closed- and open-ended questions that focused on four topic areas:

1. Current policy and procedure in determining and investigating drug overdose deaths.
   - The number of death investigations, drug overdose death investigations, toxicology tests, autopsies, and other policies and procedures involved in the investigations.
2. Capacity to investigate drug overdose deaths.
   - Trainings, confidence in conducting drug overdose death investigations, and confidence in the organizational capacity to conduct drug overdose investigations.
3. Needs for improving the drug overdose death investigations.
   - Needs for knowledge and training, and organizational supports.
4. Demographic characteristics.
   - Age, sex, years of service, and the region of office.

STEPs and DHHS collaboratively developed the survey questions, all items of which can be found in Appendix 4.

Survey Administration and Follow-Up

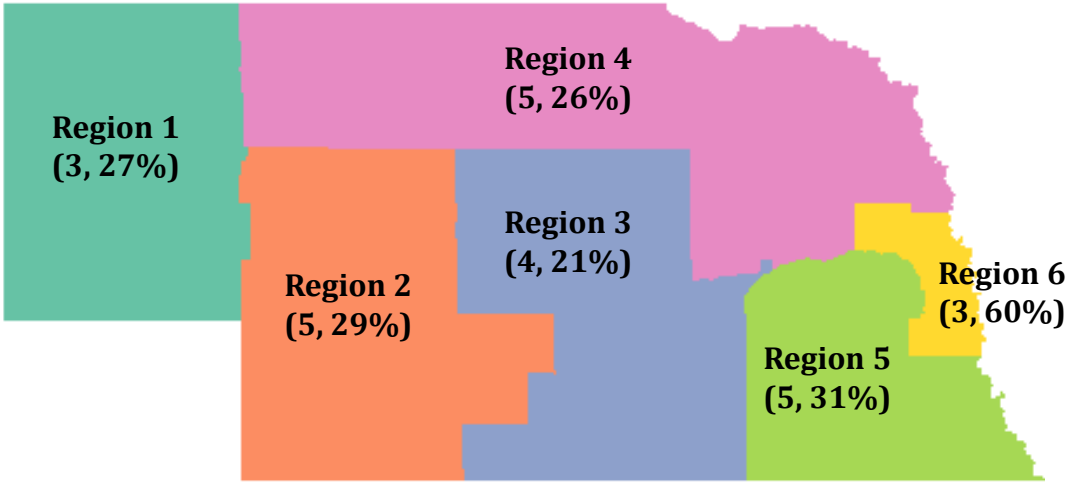
This study targeted the 91 Nebraska county coroners serving the 93 Nebraska counties. STEPs distributed the survey via email by using contact information provided by DHHS and updated by STEPs. The first invitation to the survey was delivered on July 23, 2019. Email reminders were sent two times (July 30 and August 6) and follow-up calls were made to encourage participation (August 1–August 7). The survey was closed on August 16, 2019, a 7-day extension from the original due date.

Survey Responses

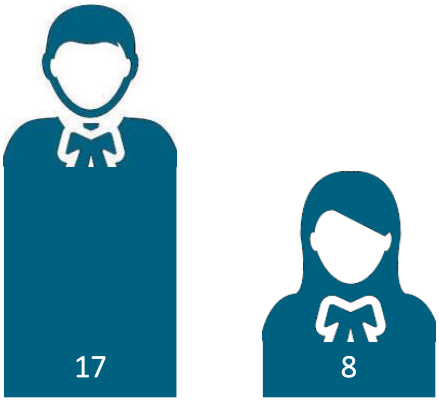
28 respondents participated in the survey, and 25 respondents completed it. The response rate was 27% (25 out of 91). At least three responses were received from each of the six Nebraska Behavioral Health regions (see the Sample Description Map on page 5).

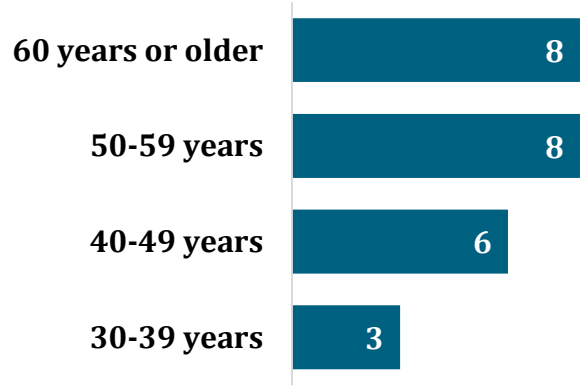
Sample Description

The survey received 25 complete responses. At least three responses were received from each of the six Nebraska Behavioral Health Regions. This map shows the number and percentage of counties covered by the survey respondents.

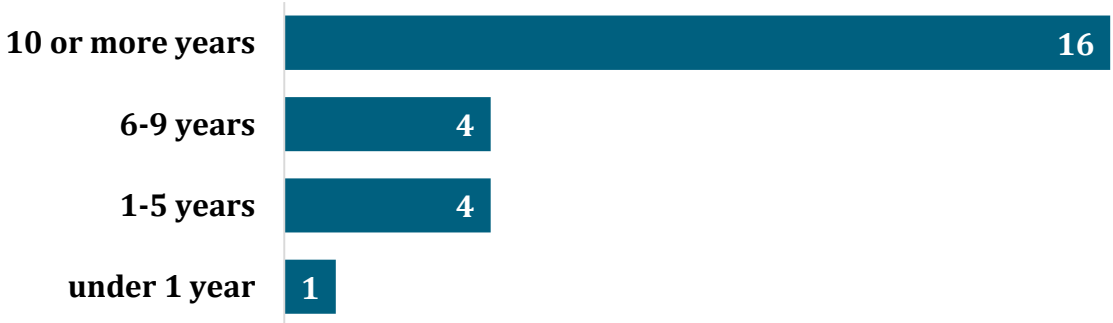


Survey responses were received from 17 males (68%) and 8 females (32%), with ages ranging from their 30s to being in their 60s or older.





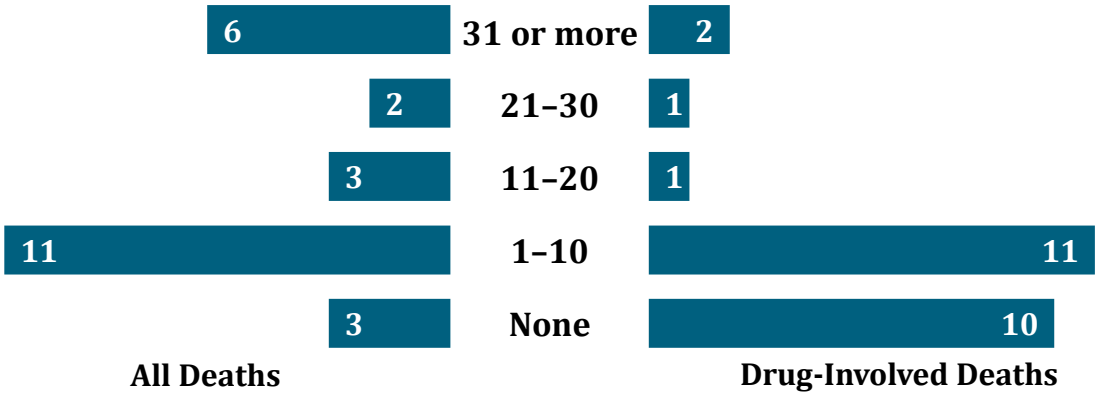
Most respondents (n=16, 64%) had 10 or more years of experience as a coroner.



Drug-Involved Death Investigation Practices

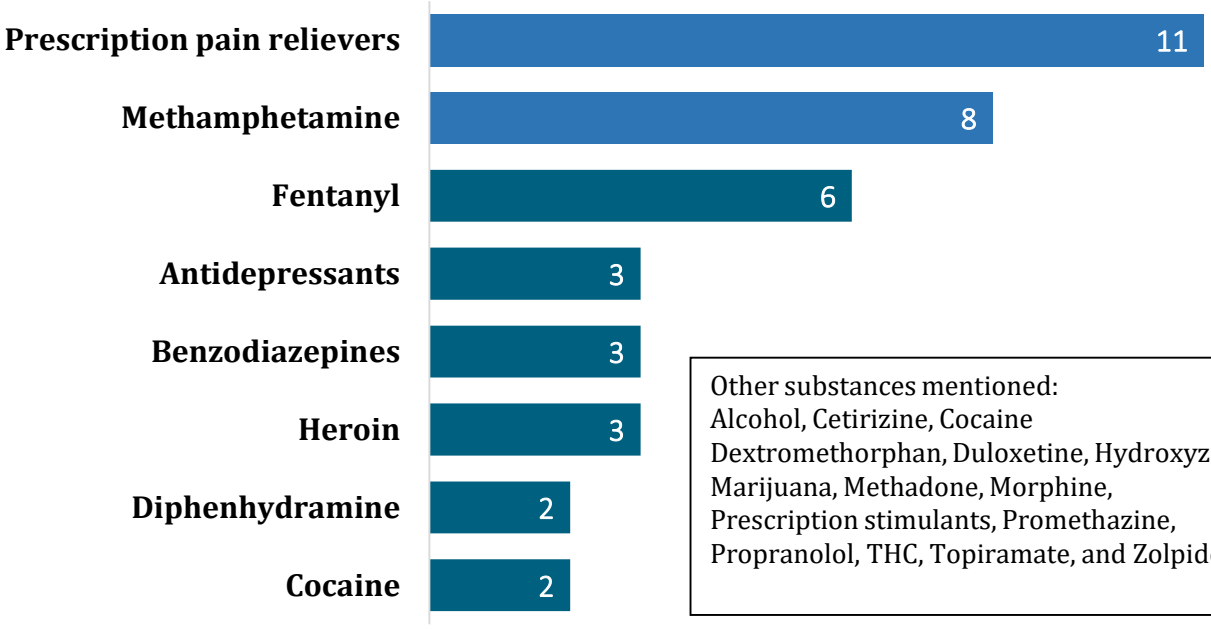
22 respondents (92%) reported they completed at least one death investigation per year. Of all deaths investigated, 10 respondents indicated none were drug-involved deaths (40%), and 11 indicated 10 deaths or fewer were drug-involved (44%).

# of Death Investigations per Year



Substances Found in Drug-Involved Death Investigations

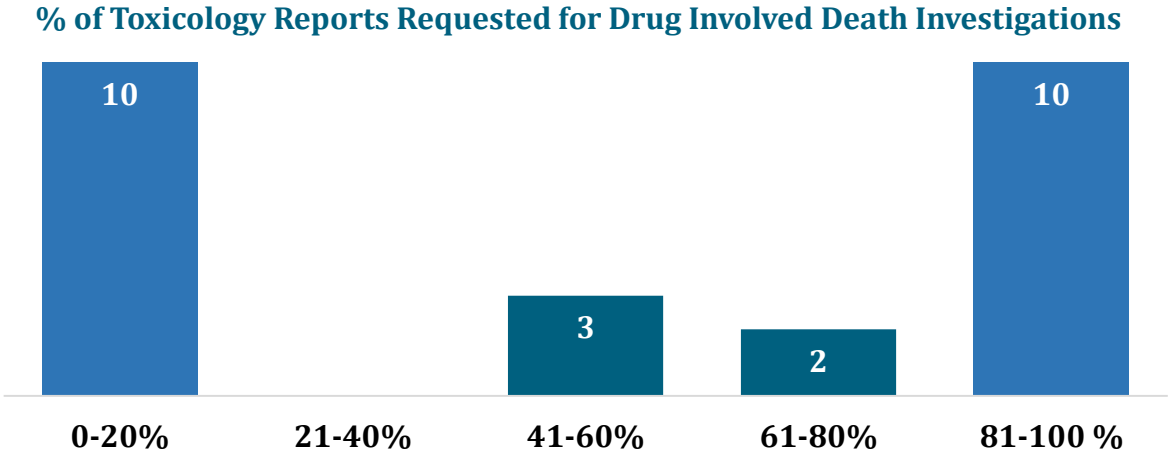
The substances most frequently found in the drug-involved death investigation process were prescription pain relievers (11), methamphetamines (8), and fentanyl (6).



Other substances mentioned:
Alcohol, Cetirizine, Cocaine Dextromethorphan, Duloxetine, Hydroxyzine, Marijuana, Methadone, Morphine, Prescription stimulants, Promethazine, Propranolol, THC, Topiramate, and Zolpidem.

Toxicology Reports

The data shows opposite extremes in respondents' practices of requesting toxicology reports. 10 respondents (40%) answered they did not request toxicology reports for drug-involved deaths while 10 respondents (40%) answered they always (n=8, 32%) or nearly always (n=2, 8%) requested toxicology reports.



Why or Why Not Request Toxicology Reports?

Respondents answered they may request a toxicology report for a suspected drug-involved or drug-overdose death if it is crime-related (n=19, 76%) or a car accident (n=18, 72%). They also responded they may request a toxicology report if they could not find any obvious cause of death or contributing factors (n=17, 68%), if they could not confirm which drug is used (n=14, 56%), or if the deceased had a history of drug use/misuse (n=13, 52%). Only three respondents (12%) mentioned the possibility the family of the deceased might request a further investigation.

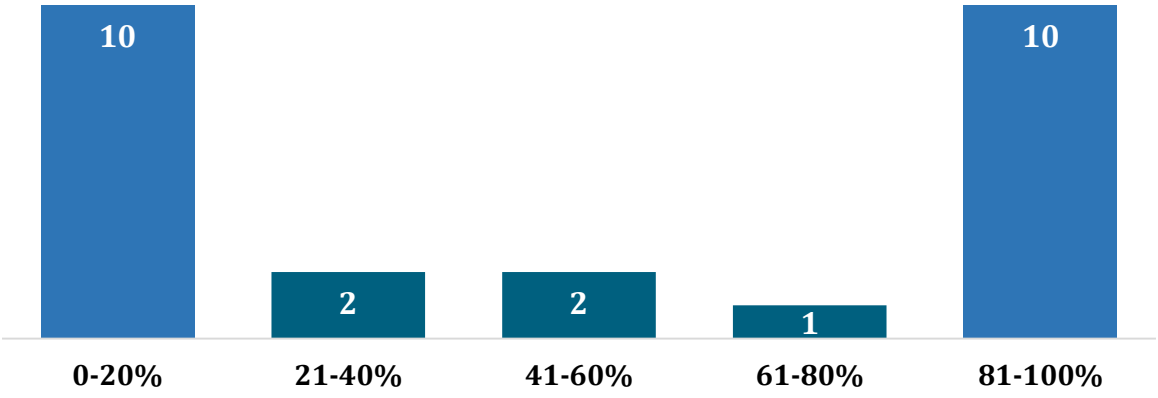
14 respondents (52%) also answered that they request a toxicology report only if it is required (such as a crime-related or car accident death). Six respondents answered they may not request a toxicology report if they do not need to have detailed toxicology information, even if they are sure that it was a drug overdose death. Four respondents answered they may not request a toxicology report because it is too expensive (n=2, 8%) or it takes too long to receive a toxicology report (n=2, 8%). Two respondents (8%) indicated the possibility that the family of the deceased might request not to conduct a further investigation. One other response indicated that the investigation may be too late to take a blood sample.

On the other hand, three respondents (12%) answered for all drug overdose deaths they order at least a minimal toxicology screen.

Autopsy

The data also shows opposite extremes in respondents' practices of requesting a complete autopsy. 10 respondents (40%) answered they request a complete autopsy less than 20% of the time, while 10 respondents (40%) answered they nearly always request a complete autopsy for suspected drug-involved or drug overdose deaths.

% of Autopsies Requested for Drug Involved Death Investigations



Optional Autopsy? Why?

Most respondents do not request an autopsy if it is not required. Seven respondents (28%) answered they very often (n=3, 12%) or sometimes (n=4, 16%) request an autopsy, even if it is not required. Overall, the responses to this question confirmed that coroners request a complete autopsy if the cause of death is unclear or suspicious. One respondent (4%) wrote that a complete autopsy is requested for all unattended deaths.

Frequency of Requesting an Optional Autopsy

Other Findings on Death Investigation Practices

Coroners indicated that it is very unlikely to receive a completed investigation report prior to completing a death certificate. 8 respondents (32%) answered it rarely happened, and 10 respondents (40%) answered it never happened.

The respondents also indicated other parties or partners influence their judgment in drug-involved deaths. Law enforcement, such as a state patrol (n=16, 64%) and other local law enforcement officers (n=7, 28%), were mentioned. Also mentioned were family physicians (n=15, 60%), pathologists (n=15, 60%), toxicologists (n=13, 52%), and funeral directors (n=6, 24%).

The analysis of death investigation procedures showed opposite extremes in respondents' practices in requesting toxicology reports and complete autopsies. Further studies should seek to identify the differences between these two groups.

The correlation coefficient shows that coroners who think drug-involved and drug overdose deaths are a significantly issue in their counties are more likely to request toxicology reports ($r(24)=.6709$, $p<0.01$).

This study did not determine which other factors may be associated with the practice of requesting a complete autopsy. Those who have served as county coroners longer were more likely to request a complete autopsy (correlation coefficient of .5031, and the association is statistically significant at the .05 level).

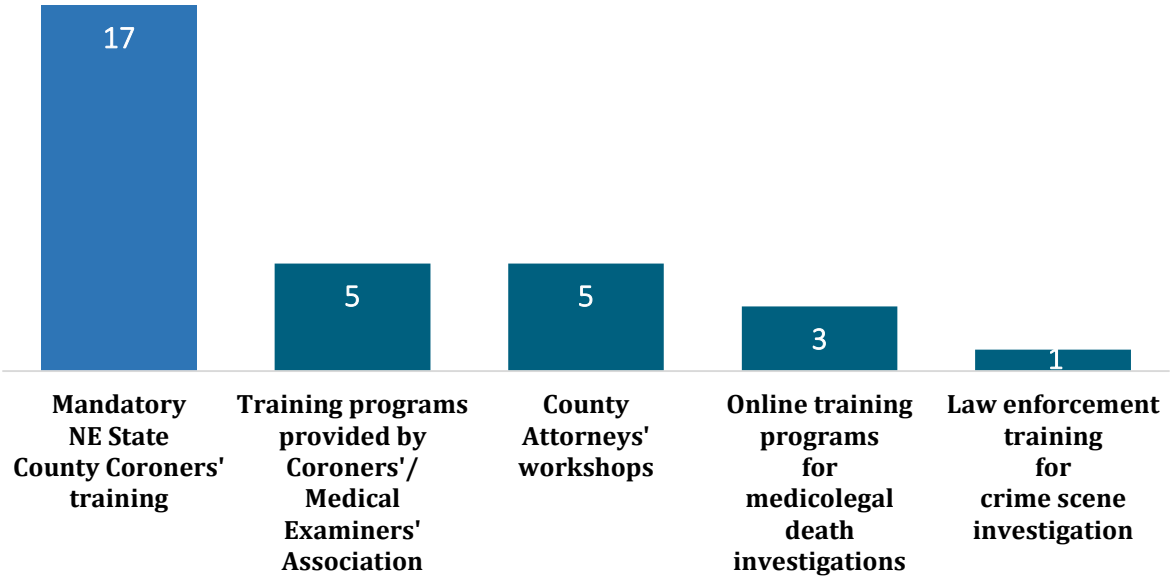
Death Investigation Trainings

The survey inquired into the types of death investigation trainings county coroners received. The results showed county coroners had received various types of trainings for completing death investigations. 22 coroners (88%) reported they had completed at least one type of death investigation training (n=11, 44%), closely followed by coroners who had completed at least two types of training (n=10, 40%). **On the other hand, three coroners (12%) indicated they had received no training at all.**

Number of Trainings Received

17 respondents (68%) said they participated in the mandatory NE State County Coroners' training. Other trainings included those provided by coroners' or medical examiners' associations (n=5, 20%), county attorney's workshops (n=5, 20%), online programs for medicolegal death investigations (n=3, 12%) and law enforcement training for crime scene investigation (n=1, 4%).

Types of Trainings Received

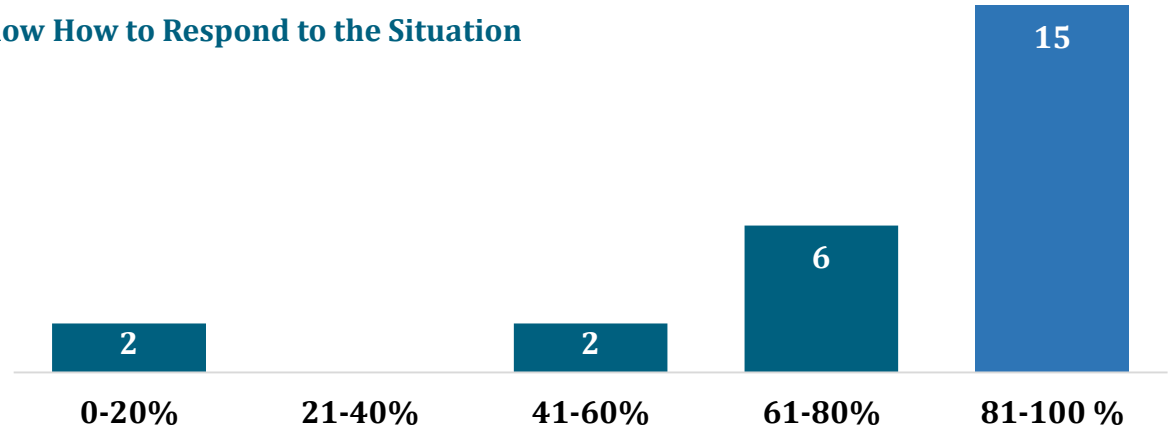


Confidence in Drug-Involved Death Investigations

The survey investigated respondents' level of confidence in handling a suspected drug-involved or drug overdose death investigation across five dimensions.

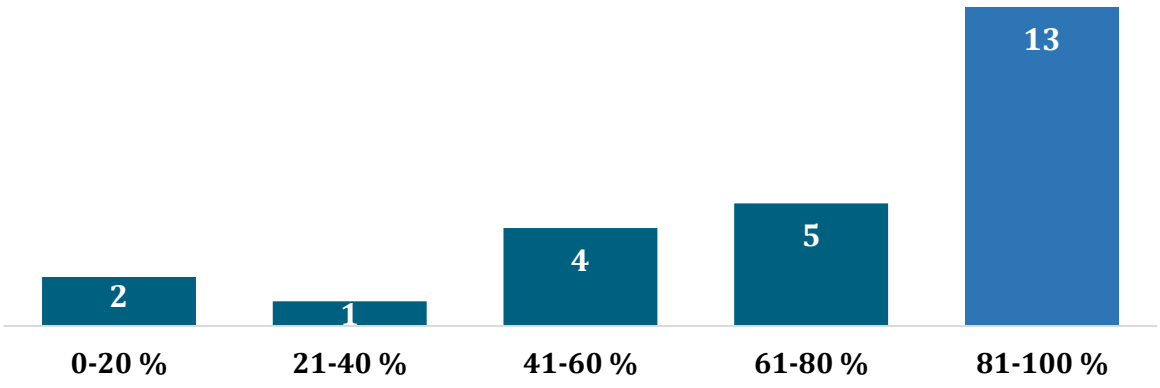
Most respondents were confident in their knowledge about how to respond to the situations that arose during the investigations. Seven respondents (28%) answered they were 100% confident, and eight respondents (32%) answered they were confident at greater than 80% level. Four respondents (16%) answered their confidence level was around/below 50%, and two (8%) reported they had 0% confidence in their knowledge.

1. Know How to Respond to the Situation



13 respondents (52%) answered that they have adequate information and resources to conduct drug overdose death investigations. 7 respondents (28%) stated they were 100% confident in their information and resources. **However, 10 respondents (40%) reported their level of confidence in the resources and information they have is below 80%**, with 3 respondents (12%) reporting 20% or less confidence in their information and resources.

2. Have Adequate Information/Resources

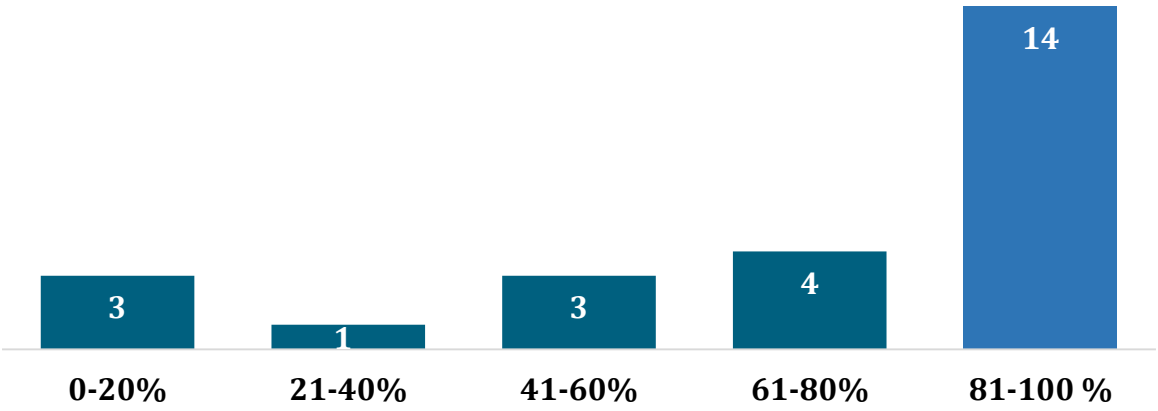


Confidence in Drug-Involved Death Investigations (cont.)

The survey investigated the level of confidence in handling a suspected drug-involved or drug overdose death investigations across five dimensions.

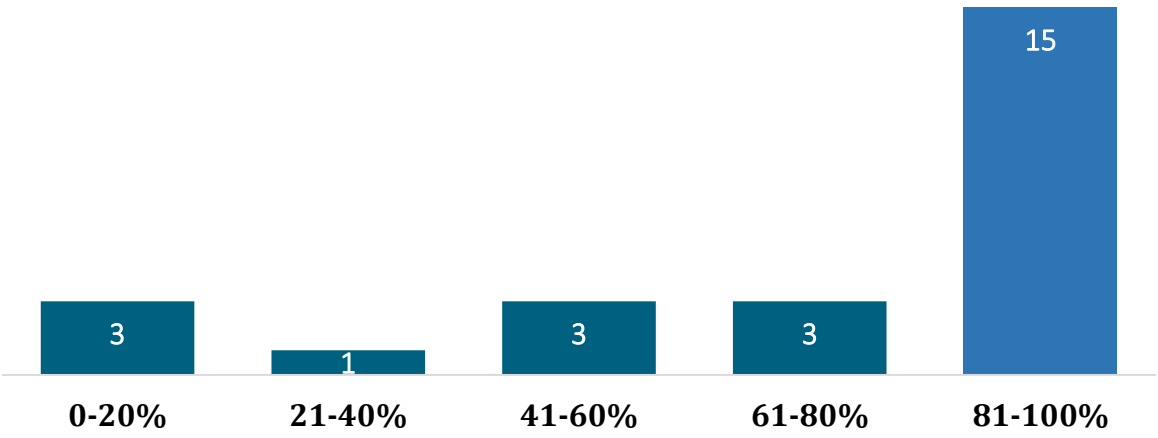
Most respondents (n=14, 56%) **reported that they were more than 80% confident in their awareness of all pertinent issues related to their job at the drug-involved death investigation scene.** Eight respondents (32%) reported that they were less than 80% confident, and three respondents (12%) responded that they had less than 20% confidence in their awareness of all pertinent issues at a death scene.

3. Aware of All the Pertinent Issues



15 respondents (60%) were more than 80% confident in helping the family of the deceased understand the suspicion of drug overdose death and explain the investigation process. 8 respondents (32%) among them answered they were 100% confident. 10 respondents answered their confidence level was below 80%. Three people reported their confidence level was below 20%. Two coroners reported they had 0% confidence.

4. Helping Families of the Deceased Understand the Investigation Process

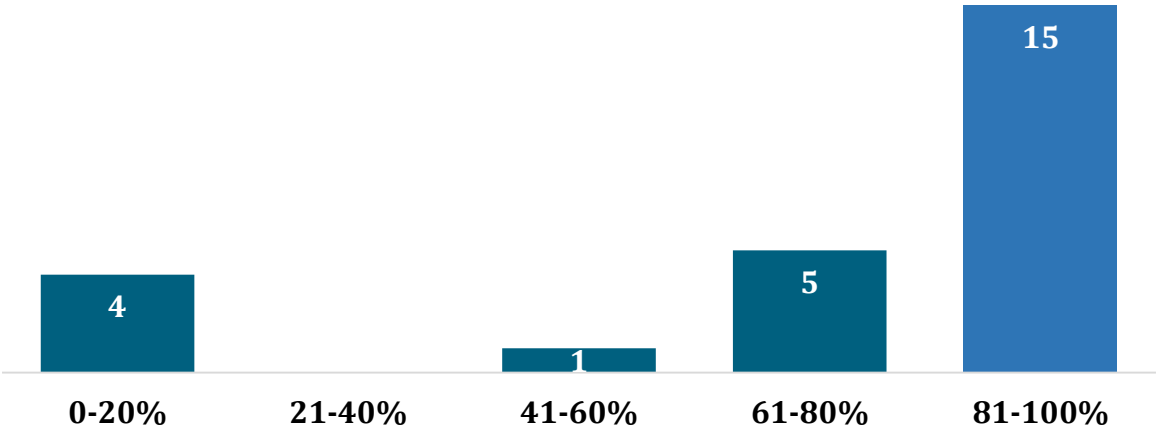


Confidence in Drug-Involved Death Investigations (cont.)

The survey investigated the level of confidence in handling a suspected drug-involved or drug overdose death investigations across five dimensions.

15 coroners (60%) responded that their level of confidence in networking with other agencies was greater than 80%, and 7 (28%) reported that they were 100% confident. Five respondents (20%) answered that their confidence level fell between 61% and 80%. Meanwhile, four respondents (16%) answered that they had 0% confidence in their knowledge.

5. Network with Other Agencies



The data revealed respondents may be divided into two groups: those with a high level of confidence to conduct drug-involved death investigations (greater than 80% confidence), and those with a lower level of confidence (below 80%).

The bivariate analysis investigated the difference between the high- and the low-confidence groups and found expected results:

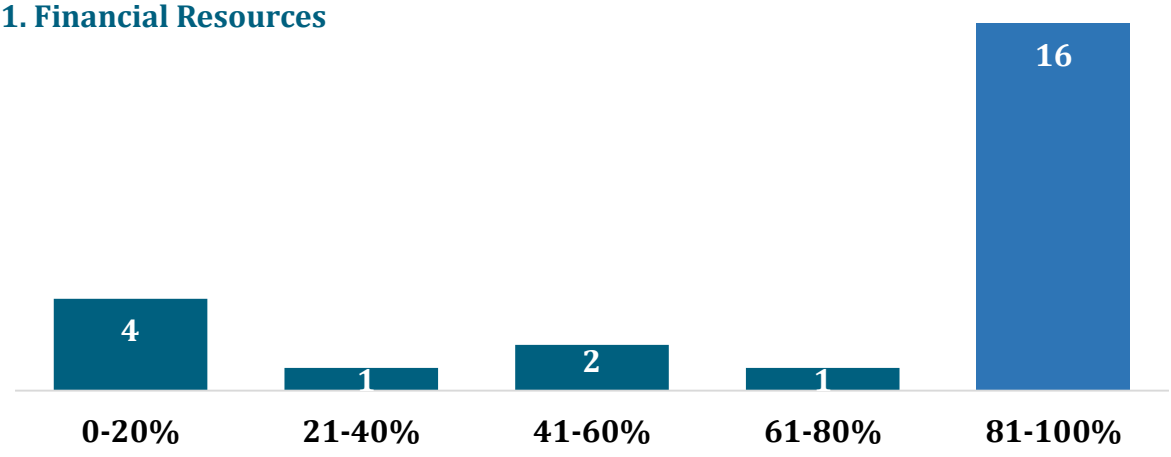
1. The high-confidence group was more likely to think that drug-involved and drug overdose deaths had significant influence in their community ($t(23)=-3.0070$, $p< 0.01$).
2. The high-confidence group was more likely to serve large-sized counties in which the population was greater than 10,000 ($t(23)=-2.3414$, $p<0.05$).

Confidence in Organizational Resources and Supports

The survey investigated the level of coroners' confidence in the resources and support from their organization, whether county government or their offices.

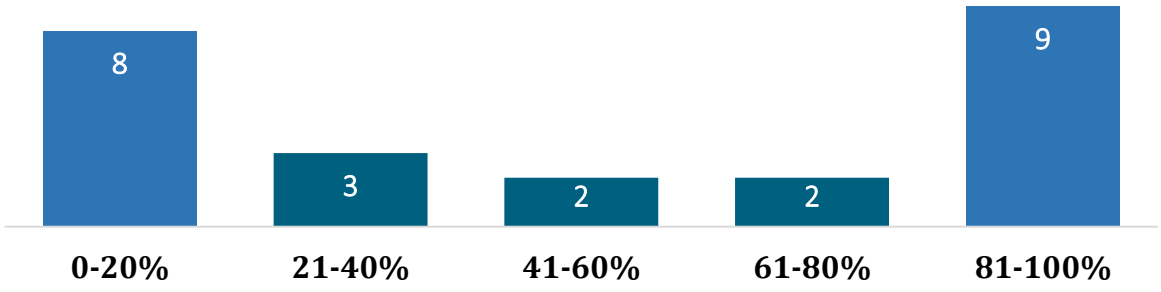
11 coroners (44%) responded that they were 100% confident in financial resources, such as covering the cost of investigation, toxicology, and/or autopsy. Another five respondents (20%) answered that they were confident at greater than the 80% level. Eight coroners (32%) reported less than 80% confidence in the resources provided to them, with three respondents (12%) reporting 0% confidence.

1. Financial Resources



County coroners were split on their confidence in their agency's human resources. 9 respondents (36%) reported over 81% confidence while 8 respondents (32%), on the other hand, reported less than 20% confidence in their agency's HR. Seven coroners among them (28%) answered that they had 0% confidence in their organization's human resources.

2. Human Resources

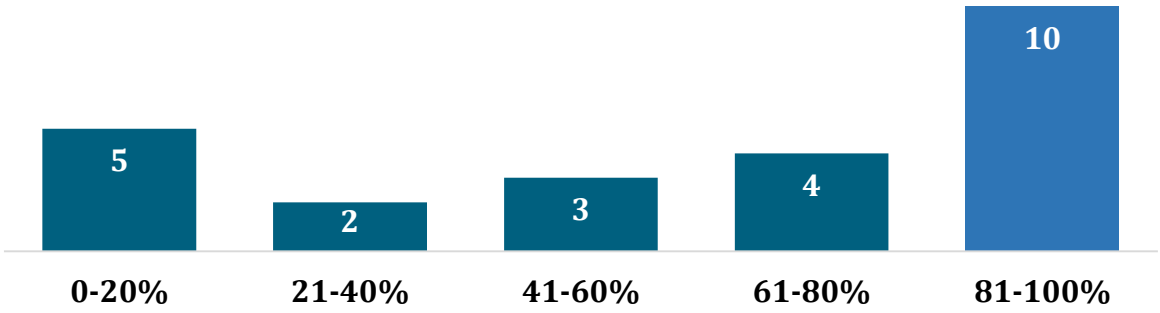


Confidence in Organizational Resources and Supports

The survey investigated the level of coroners' confidence in the resources and support from their organization, whether county government or their offices.

Confidence in organizational support also provided a split in responses. 10 respondents answered that they had a greater than 81% confidence in organizational protection from disputes related to drug overdose death investigations. 14 respondents indicated that they had less than 80% confidence in their organization providing this support, with five answering that they had less than 20% confidence.

3. Organizational Support



The data showed respondents had a relatively low level of confidence in human resources and organizational support. Fewer than 10 respondents were highly confident (greater than 80%) in these two items, while 16 respondents were highly confident in the financial resources of their organizations.

Those who had high confidence in the financial resources did not have a statistically significant association with certain factors except for the years of experience as a county coroner.

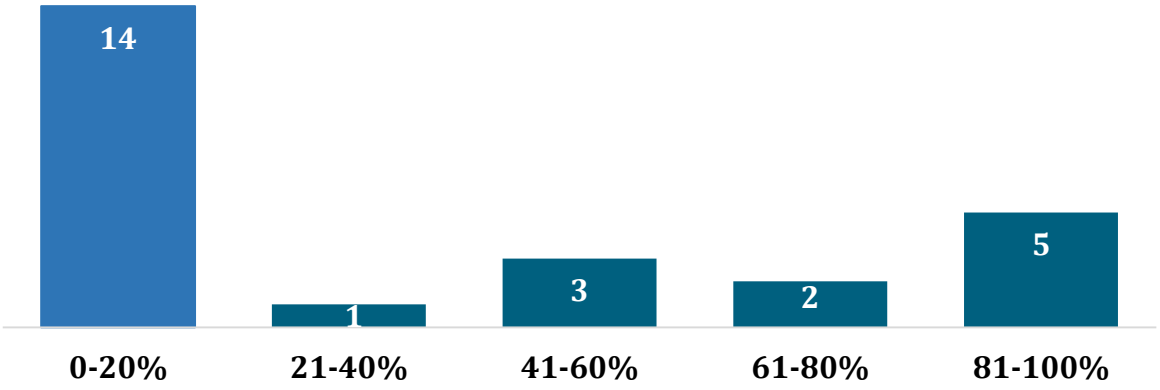
Those with higher confidence in financial resources of their organization are associated with higher years of experience ($r(24)=.5928$, $p<0.01$).

Needs for Drug-Involved Death Investigation

The survey investigated the level of needs of coroners to conduct and/or improve the current drug involved death investigation process.

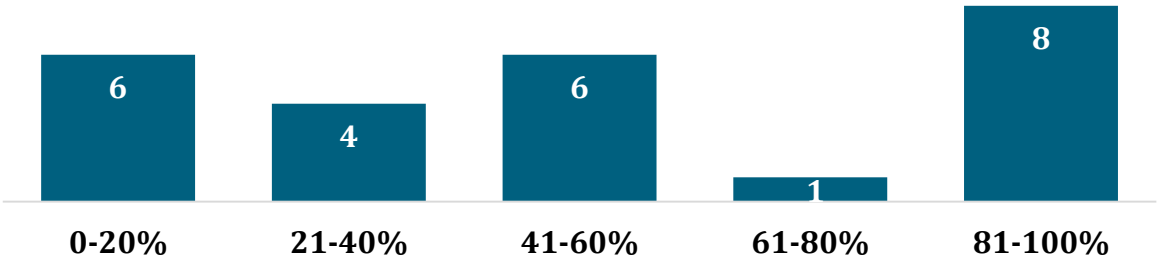
Coroners perceived drug-involved or drug overdose deaths were not a serious problem in most counties. 14 respondents (52%) reported that drug overdose deaths are not a serious problem in their communities with the severity level below 20%. Six county coroners (24%) answered that drug overdose deaths are not a problem at all. These results reflect the data from National Vital Statistics System (CDC NVSS[12]) that Nebraska is relatively less influenced by drug overdose deaths[44].

Severity of the Problem



Mixed results were found in reference to level of organizational need. 16 county coroners (64%) reported their confidence level in resources (such as budget, equipment, and facilities) needed to complete a thorough death investigation was below 60% while 8 respondents (32%) answered that their confidence level in the organizational resources was low.

Capacity to Meet Organizational Needs

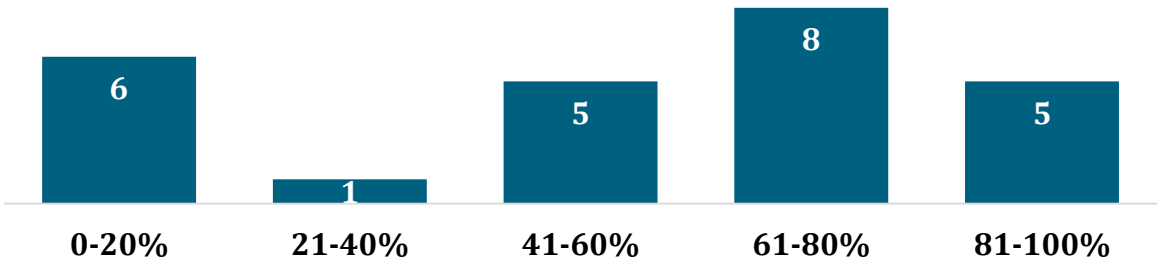


Needs for Drug-involved Death Investigation

The survey investigated the level of needs of coroners to conduct and/or improve the current drug involved death investigation process.

Coroners' levels of needs in knowledge and experiences also varied. Only five respondents answered that they were more than 80% confident they had all the knowledge and experience needed to complete thorough death investigations. Overwhelmingly, 20 coroners (80%) reported that their confidence in their knowledge and experiences needed to conduct drug overdose death investigations was below 80%. 6 coroners (24%) were highly doubtful about their level of knowledge and experiences.

Individual Needs



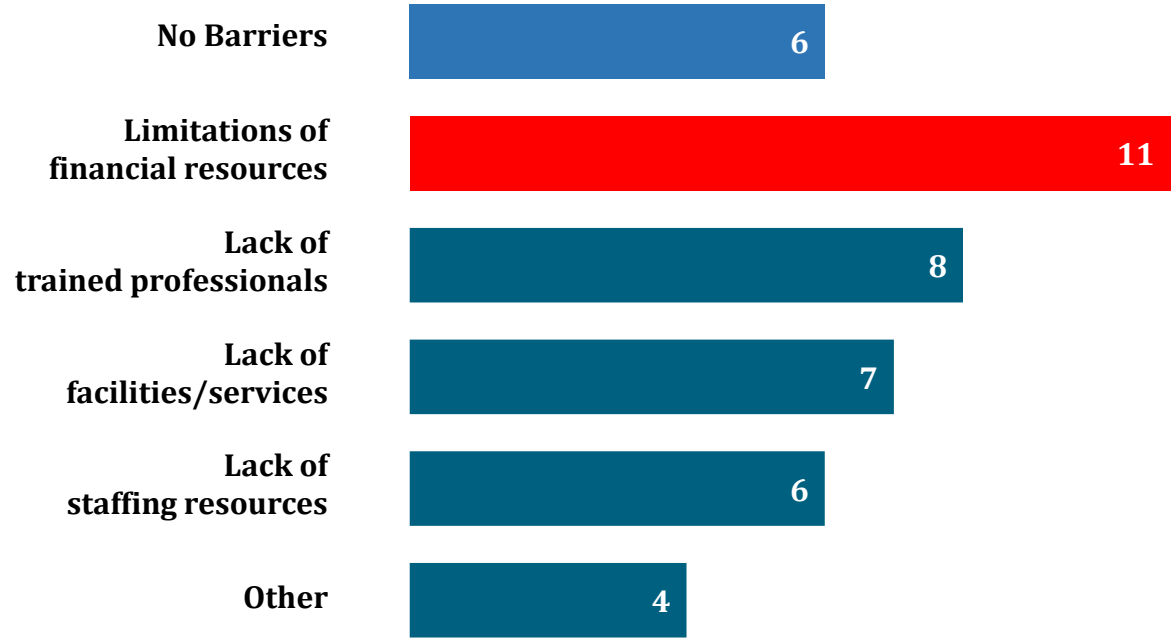
Many coroners answered that drug-involved or drug overdose deaths do not significantly influence their county. Nevertheless, not many of them confidently answered they have all the resources, whether budget, equipment, facilities, knowledge and/or experiences to complete a thorough death investigation.

The coroners who responded drug-involved and drug overdose deaths do not significantly influence their community were more likely to serve rural counties ($r=.6123$, $p<0.01$).

Barriers in Completing Drug-Involved Death Investigations

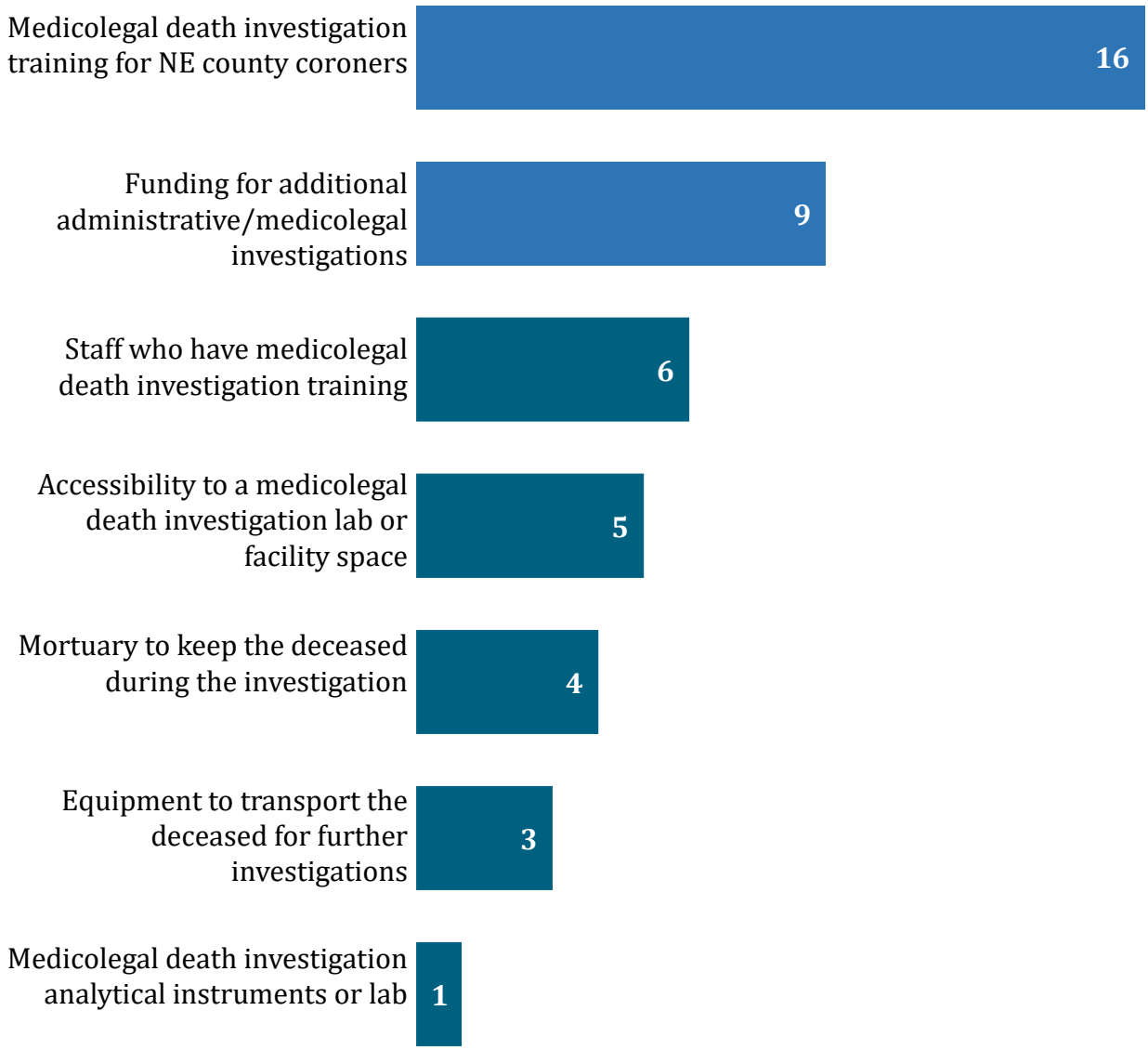
More than half of respondents answered that their organizations rarely (n=12, 48%) or never (n=3, 12%) faced barriers in completing drug-involved death investigations. Seven respondents (28%) answered that they sometimes hit barriers. Three respondents (12%) indicated that they often face barriers.

The types of barriers encountered by coroners included limitations in financial resources (n=11, 44%), lack of trained professionals (n=8, 32%), limited access to the medicolegal death investigations facilities and services (n=7, 28%), and lack of staffing resources (n=6, 24%). The remaining coroners indicated they had no barriers (n=6, 24%).



Needed Resources

The survey investigated which resources county coroners need. The responses showed that coroners wanted more medicolegal death investigation training (n=16, 64%) and more funding for additional administrative and medicolegal investigation (n=9, 36%). Some also indicated training for staff, accessibility to the facility, mortuary, and transportation equipment were other desired resources.



Summary of Findings

Survey participants consisted of 17 males and 8 females. Their ages ranged from 30 years to 60 years and over, with the majority (n=16, 64%) being older than 50 years. Most respondents had more than 10 years of service experience as a county coroner. STEPs collected from all six Nebraska Behavioral Health Regions, with at least three responses from each region.

Survey results shows that a low number of county coroners perform drug-involved death investigations. 10 respondents answered they did not have drug-involved death investigations, and 11 respondents answered they had only 1–10 drug-involved death investigations per year. In the same vein, 14 respondents (52%) answered that drug overdose deaths do not significantly influence their communities.

There are opposite extremes in respondents' practices of requesting toxicology reports or complete autopsies. Results showed that 10 respondents (40%) were highly likely to request a toxicology report and autopsy while another group of 10 respondents (40%) were less likely to request those services. The bivariate analyses using these variables, however, could not find any factors which were significantly associated with the opposite extremes. It only found an established conclusion that those who think drug-overdose deaths are a serious issue in their communities and those who had served longer as county coroners were more likely to request a toxicology report and a complete autopsy.

The data revealed most respondents (n=21, 84%) had received one type of training (n=11, 44%) or two types of trainings (n=10, 40%). Three respondents had received no death investigation trainings. Coroners reported that they received training from the mandatory NE State County Coroners' training (n=17, 68%), professional associations such as coroners' and medical examiners' association (n=5, 20%), and Nebraska County Attorney's association workshop (n=5, 20%). Three respondents (12%) had taken online training programs.

The study found a group of respondents (n=14, 64%) with a significantly higher level of confidence in their capacity in handling drug-involved death investigations, namely those who have had longer experience as a county coroner and think that drug-involved deaths are a significant problem are more likely to be confident in their ability to handle the investigations. This indicated that the amount of experience matters in determining the level of confidence at the individual level.

On the other hand, respondents had various confidence levels in their organizational capacity to handle drug-involved deaths. 16 respondents (64%) had a high level of confidence in their organizations' financial resources while they showed relatively less confidence in human resources and organizational support.

Summary of Findings (cont.)

Overall, coroners do not perceive drug-involved deaths as a significant problem in Nebraska. According to the bivariate analyses, rural counties are particularly less likely to report a drug overdose death problem. Nevertheless, the survey results showed many county coroners need more organizational resources, such as budget, equipment, and facilities, to complete a thorough death investigation. In addition, almost half of respondents answered that they do not have enough knowledge and experience to complete thorough death investigations.

The county coroners reported they rarely or never faced barriers in completing drug-involved death investigations. While six respondents indicated that they have no barriers, the rest of respondents frequently mentioned the limitation of financial resources and the lack of trained professionals, facilities, services, and staffing resources as obstacles. Particularly, respondents requested more medicolegal death investigation training for NE county coroners (n=16, 64%) and funding for additional administrative/medicolegal investigations (n=9, 36%).

Limitations

This study has several limitations.

1. The sample size was limited. While a 28% response rate is not too unusual, 25 responses are somewhat limited in drawing statistically significant implications from the quantitative analysis. STEPs recommends collaborating with the Nebraska County Attorney's Association to reach out to a greater number of county attorneys to participate in future surveys.

2. The survey was intentionally kept short in hopes of attracting more respondents but doing so limited this study's ability to assess a full picture of the problem and to listen to the voices of those in the field. Conducting interviews would provide more detailed and context-based stories, giving a better understanding of the problem and resolving unanswered questions. STEPs recommends that Nebraska DHHS expand this study to include in-depth, qualitative interviews focusing on coroners who are not confident in their individual capacity.

3. This survey invited respondents to share their own experiences, knowledge and perceptions through self-report. However, this kind of data is limited and there is a potential risk of distorted memory. Future studies could include content analysis of death certificate information.

Recommendations

STEPs draws three recommendations from the findings.

1. Provide trainings on drug-involved death investigations for the following groups of county coroners:
   a. Those who serve rural counties. While rural counties are less likely to report drug-involved deaths, they appear to be less confident in completing a thorough drug-involved death investigation because they have less opportunities to experience drug-involved deaths and less amount of organizational resources.
   b. Those who are new to the job. Regardless of other factors, county coroners who have longer years of experiences are more likely to have a higher level of confidence in completing a thorough drug-involved death investigation.

   Trainings should aim to increase county coroners' knowledge about drug-involved death investigations and to build up experiences in new practices. Additionally, these trainings could bring awareness of drug use behaviors which could increase how often coroners consider conducting toxicology or autopsies. Also, consider utilizing existing online medicolegal training programs. This may save time and money for the large number of county coroners who are living in various parts of Nebraska.

2. Provide needs-based financial support for coroners' services. Typically, factors such as geographic location, population size, geographical characteristics (urban or rural areas), are used to allocate financial resources. However, this study could not find any statistical significance between the needs and those factors. It seems all Nebraska counties need support. A qualitative research study utilizing focus groups or interviews may discover more information about the financial needs of coroners. Grants could also provide funding, rather than an overall allocation allowing coroners to identify their own needs. These measures may increase the effectiveness and efficiency of funding specific practices and services.

3. Create a group of medicolegal death investigators or related professionals to support county coroners. The lack of trained human resources was one of the significant needs that NE county coroners identified. It would be very unlikely to supplement the personnel to all counties in need, but a centralized state-level resource to help county coroners successfully conduct drug-involved death investigations may be useful. Benchmarking 14 states that have both county coroners and medical examiners, such as Texas and Missouri, would be useful to prepare for this system[27].

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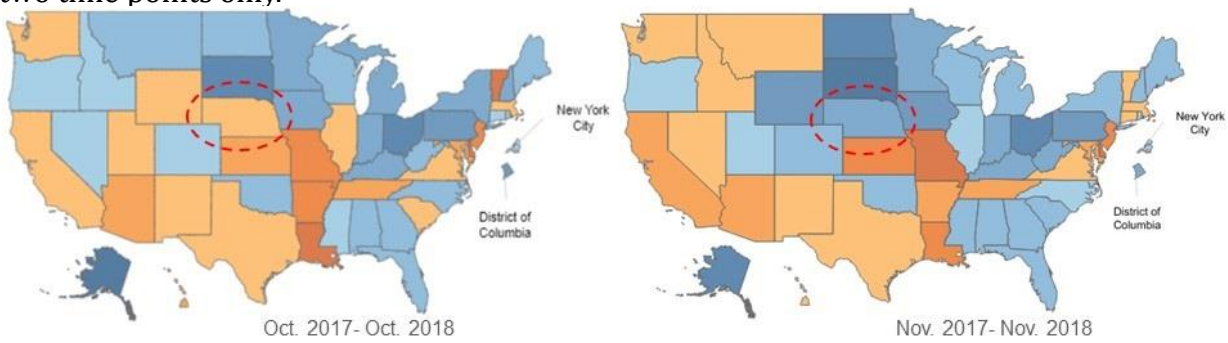
Appendix 1: Limitations of the NVSS Data Visualization

The NVSS Vital Statistics Rapid Release provides a map titled, "Percent Change in Predicted 12 Month-ending Count of Drug Overdose Deaths." However, this data visualization has a significant limitation that requires a careful interpretation: calculating the change by using two time points only.



** note: Maps were downloaded from the same page at a different time point.*

The map on the left, downloaded on May 23, 2019, shows drug overdose deaths increased between October 2017 and October 2018. The degree of increase is only one, from 145 to 146.

On the other hand, the map on the right, downloaded on June 17, 2019, shows that drug overdose deaths decreased between November 2017 and November 2018. The degree of increase is 15, from 155 to 140.

This data visualization has a limitation to reflect the trend change. It does not reflect the rapid increase from 145 to 166 between October 2017 and July 2018.

We recommend not using this map data visualization as it is. If necessary, it is highly recommended to use a different measure of the change, such as moving average and slope of the regression coefficient, for displaying the changing trends.

Appendix 2: Ruiz et al. (2018, p. 1140)

Table 1. Persons authorized to identify manner and/or cause of death

States	M.E.	Coroner	Physician	Other Providers	Law Enforcement	Judicial Personnel	State Registrar
Alabama	✓	✓	✓	✓			
Alaska	✓		✓	✓		✓	
Arizona	✓				✓*		
Arkansas	✓	✓	✓				
California	✓	✓	✓†				
Colorado		✓	✓	✓			
Connecticut	✓		✓	✓			
Delaware	✓		✓				
District of Columbia	✓		✓				
Florida	✓		✓				
Georgia	✓	✓	✓	✓			
Hawaii			✓	✓			
Idaho			✓	✓			
Illinois			✓	✓			✓
Indiana	✓	✓	✓				
Iowa	✓		✓	✓			✓
Kansas	✓	✓	✓				
Kentucky		✓	✓	✓			
Louisiana		✓	✓	✓			
Maine	✓		✓				
Maryland	✓		✓	✓			
Massachusetts	✓		✓				
Michigan	✓		✓				
Minnesota	✓	✓					
Mississippi	✓	✓	✓				
Missouri	✓	✓	✓	✓			✓
Montana	✓	✓	✓	✓	✓		
Nebraska		✓	✓†	✓			
Nevada	✓	✓	✓†				
New Hampshire	✓		✓†	✓			
New Jersey	✓		✓†	✓			
New Mexico	✓		✓	✓			
New York	✓	✓	✓	✓			
North Carolina	✓	✓	✓†	✓			
North Dakota		✓	✓†	✓			
Ohio	✓	✓	✓				
Oklahoma	✓		✓†	✓			
Oregon	✓		✓	✓			
Pennsylvania	✓	✓	✓	✓			
Rhode Island	✓		✓	✓			
South Carolina	✓	✓	✓†				
South Dakota		✓	✓†	✓			
Tennessee	✓	✓	✓	✓			
Texas	✓	✓	✓	✓		✓	
Utah	✓		✓†				
Vermont	✓		✓	✓			
Virginia	✓		✓	✓			
Washington	✓	✓	✓	✓			
West Virginia	✓	✓	✓				
Wisconsin	✓	✓	✓				
Wyoming		✓	✓		✓		

*Tribal police.
†Surgeon.
‡Connecticut, Hawaii, Louisiana midwife allowed.

Appendix 3: Best Practices for Drug Overdose Death Investigations, Diagnoses, and Certifications

Davis and colleagues recommended an autopsy be performed in conjunction with toxicology analyses rather than relying on one or the other. Results of the toxicology analyses should be interpreted with the context of medical history, scene findings, and medical history of the deceased.

Examples of scene findings suggesting opioid misuse or abuse:

- Opioid medications
- History of methadone use
- Evidence of intravenous drug abuse (needles, cooker spoons, tourniquet, crushed tablets, packets of powder or crystals, other drug paraphernalia)
- Overlapping prescriptions for the same type of prescribed controlled substances, prescriptions for controlled substances from multiple pharmacies or multiple prescribers
- Prescriptions in other people's names
- Pills not stored in prescription vials or mixed in vials
- Injection sites not due to resuscitation attempts
- Altered transdermal patches
- Many transdermal patches on the body or transdermal patches in unusual locations, e.g., mouth, stomach, vagina, or rectum
- Application of heat to increase the rate of transfer of drug from transdermal patch to the decedent
- Presence of naloxone

Circumstances that recommend performing a toxicological analysis:

- Known history of prescription opioid or illicit drug use, misuse, or abuse;
- Evidence of opioid or illicit drug abuse revealed by scene investigation;
- Autopsy findings suggesting a history of illicit drug abuse (including needle marks, hepatic cirrhosis, and cases in which birefringent crystalline material is within foreign body giant cells in the lungs);
- Massive lung edema and froth in airways present with no grossly visible explanation (e.g., heart disease) or other non-toxicological explanation (e.g., epileptic seizure);
- Potential or suspected smugglers of illicit drugs (mules);
- No unequivocal cause for death identified at autopsy;
- Decedents with a potential natural cause of death visible at autopsy whenever a drug may have precipitated or contributed to death by an additive mechanism, such as opioid-induced respiratory depression; or
- Traumatic deaths.

Appendix 3: Best Practices for Drug Overdose Death Investigation, Diagnosis, and Certifications (cont.)

The list of fluids that should be tested for optimal toxicology results:

- Blood from the femoral vein
- Urine
- Vitreous humor (tissue located behind the lens of the eyeball)
- Bile
- Contents of the gastric system

Adequate Analyte panel for opioid substances:

- Buprenorphine
- Codeine
- Fentanyl
- Hydrocodone
- Hydromorphone
- Meperidine
- Methadone
- 6-Acetylmorphine
- Morphine
- Oxycodone
- Oxymorphone
- Propoxyphene
- Tapentadol
- Tramadol
- Other Medications: Benzodiazepines, antidepressants, Muscle relaxants, Sleep aids, Ethanol, Stimulants (e.g. cocaine and amphetamines)

Classifying deaths should be as precise as possible. The term "accidental" is preferred over "undetermined" in most drug overdose cases, once the examiner has considered if the deceased intended to self-harm. Undetermined causes should be used sparingly, only when evidence suggests more than one cause of death.

Appendix 4: Online Survey Questionnaire

Invitation to the Survey

Dear [Respondent's Name Here]

Thank you for your service as a county coroner.

The NE Department of Health and Human Services Division of Public Health is partnering with STEPs at the University of Nebraska at Omaha to assess coroners' needs to improve drug overdose death investigations in Nebraska. Combined information will be used to help allocate and develop training and/or resources for counties.

We invite you to complete a short survey, which consists of four parts: 1) demographics, 2) capacity to investigate drug overdose deaths, 3) current drug overdose death investigation process and policy, and 4) needs for improving the current drug overdose death investigations. It will only take 10–15 minutes to complete.

As a third-party evaluator, STEPs will keep survey participants' anonymity. Your responses will be combined with others and solely used for assessing NE coroners' needs for improving current drug overdose death investigations. Feel free to contact STEPs if you have any questions.

Thank you for your participation.

Sincerely,
Brittany Willmore
Program Evaluator at STEPS
223A CEC, 6001 Dodge Street
Omaha, NE 68182
Phone: 402.554.3663
Email: steps@unomaha.edu

Appendix 4: Online Survey Questionnaire (cont.)

Questions about Death Investigation Procedure

P1 Over the past 12 months, approximately how many death investigations did you do?

- ☐ My office did not complete any death investigations in the past 12 months.
- ☐ 1-10 death investigations
- ☐ 11-20 death investigations
- ☐ 21-30 death investigations
- ☐ 31 or more death investigations

P2 Over the past 12 months, approximately how many death investigations were drug-involved deaths or suspected drug overdose deaths?

- ☐ My office did not complete any death investigations in the past 12 months.
- ☐ 1-10 death investigations
- ☐ 11-20 death investigations
- ☐ 21-30 death investigations
- ☐ 31 or more death investigations

P2-1 What kind of substances were responsible for the drug-involved deaths or suspected drug overdose deaths that you investigated in the past 12 months. (select all that apply)

- ☐ Prescription pain relievers
- ☐ Fentanyl
- ☐ Heroin
- ☐ Cocaine
- ☐ Methamphetamine
- ☐ Benzodiazepines
- ☐ Antidepressants
- ☐ Others (please list them) _____
- ☐ Unknown drugs
- ☐ Not applicable

P3 Of the drug-involved or suspected drug overdoses deaths you investigated, approximately what percentage did you request a toxicology report?

Appendix 4: Online Survey Questionnaire (cont.)

Questions about Death Investigation Procedure

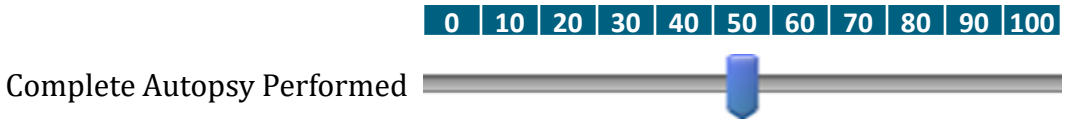
P4 What are the main reasons you may request a toxicology report for a (suspected) drug-involved or drug overdose death? (select all that apply)

- ☐ It is a death related to a crime.
- ☐ It is a death related to a car accident.
- ☐ The deceased has a drug use/misuse history.
- ☐ I'm sure it is a drug overdose death, but not sure which drug is used.
- ☐ Not an obvious cause of death or contributing factors.
- ☐ The family of the deceased requested further investigation.
- ☐ Others (please explain) _____

P5 What are the main reasons you may not request a toxicology report for a (suspected) drug-involved or drug overdose death? (select all that apply)

- ☐ I'm sure it is a drug overdose death, but do not need to have a detailed toxicological information.
- ☐ The cause of death does not require a toxicology report (not a crime/accident-related death).
- ☐ It is too expensive to request a toxicology report.
- ☐ It takes too long time to receive a toxicology report.
- ☐ The family of the deceased requests not to conduct a further investigation.
- ☐ Others (please explain) _____

P6 On approximately what percentage of (suspected) drug-involved or drug overdose deaths you investigated is a complete autopsy performed?



P7 If a complete autopsy is not required, how often is an optional autopsy performed?

- ☐ Very often (more than 61%)
- ☐ Often (41–60%)
- ☐ Sometimes (21–40%)
- ☐ Rarely (1–20%)
- ☐ Never (0%)

Appendix 4: Online Survey Questionnaire (cont.)

Questions about Death Investigation Procedure

P8 If an optional autopsy was performed for a (suspected) drug-involved or drug overdose death, what is the main reason you requested an autopsy? Please explain.

_____
_____
_____
_____
_____

P9 How often does your office complete death certificates for (suspected) drug-involved or drug overdose deaths prior to receiving all completed investigation reports (toxicology, medical history, autopsy report)?

- ☐ Very often (more than 61%)
- ☐ Often (41–60%)
- ☐ Sometimes (21–40%)
- ☐ Rarely (1–20%)
- ☐ Never (0%)

P10 Please indicate the other parties/office partners that influence your decision to determine if a certain death is a drug overdose death. (select all that apply)

- ☐ State patrol
- ☐ Funeral director
- ☐ Family physician
- ☐ Toxicologist
- ☐ Pathologist or forensic pathologist
- ☐ Others (please list) _____
- ☐ None of above

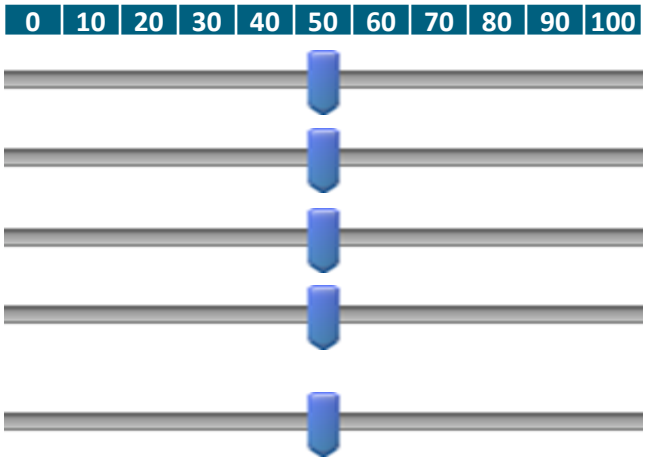
Appendix 4: Online Survey Questionnaire (cont.)

Questions about Capacity/Confidence at the Workplace

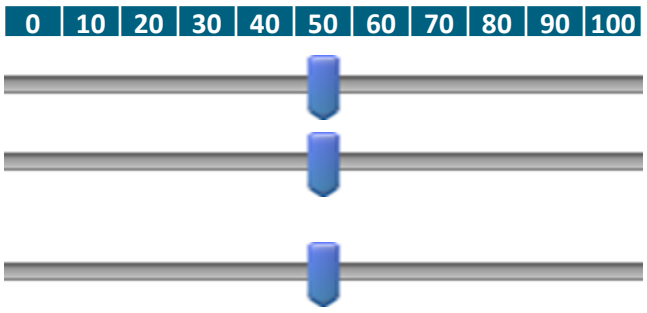
C1 What training(s) have you received for completing death investigations? (select all that apply)

- ☐ Mandatory NE State Coroner training
- ☐ Online training programs for medicolegal death investigations
- ☐ Training programs provided by international/national/regional conferences of Coroners/Medical Examiners
- ☐ Certification/degree in medicolegal death investigations
- ☐ Others (please list) _____
- ☐ None of above

C2 Consider the times you encountered a suspected drug-involved or drug overdose in performing a death investigation. How confident were you that you could…



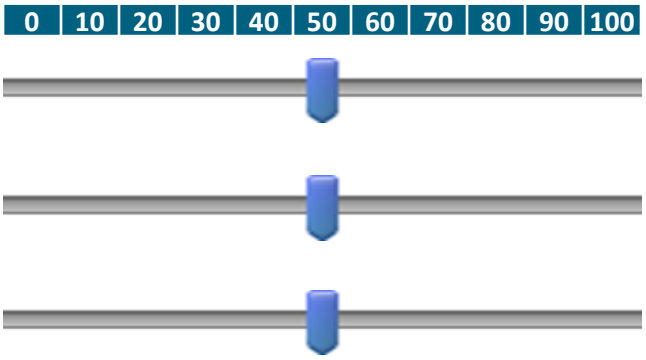
C3 Consider the times you encountered a suspected drug-involved or drug overdose in performing a death investigation. How confident were you that your office/county government provided necessary organizational resources and support?



Appendix 4: Online Survey Questionnaire (cont.)

Questions about Needs

N1 Please indicate your level of agreement with the following statements:



-The community I work in is significantly affected by drug-involved or drug overdose deaths

-I have all the resources (such as budget, equipment, facilities) I need to complete a thorough death investigation

-I have all the knowledge and experience I need to complete a thorough death investigation

N2 How often does your department face barriers in completing drug overdose death investigations?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

N2-1 What are the barriers your department faces in completing drug-involved or drug overdose death investigations? (select all that apply)

- ☐ Limitations of financial resources
- ☐ Lack of trained professionals
- ☐ Lack of staffing resources
- ☐ Limited access to the medicolegal death investigation facilities/services
- ☐ Concerns the effort might impact my jurisdiction
- ☐ Other (please describe)
- ☐ My department experiences no barriers

Appendix 4: Online Survey Questionnaire (cont.)

Questions about Needs

N3 What main resources does your department need to better complete investigations related to drug overdose or suspected drug overdose deaths? (select all that apply)

- ☐ Need more staff who have medicolegal death investigation training
- ☐ Need to have more medicolegal death investigation training for NE county attorney/coroners
- ☐ Need to have greater accessibility to the medicolegal death investigation lab or facility space
- ☐ Need to have a mortuary to keep the deceased during the investigation
- ☐ Need to have more equipment to transport the deceased for further investigation
- ☐ Need to have a medicolegal death investigation analytical instruments or lab supplies
- ☐ Need more funding for additional administrative/medicolegal investigation expenses
- ☐ Other (please describe) _____

N4 What else would you like to say in regards to the needs of coroners across Nebraska in responding to drug-involved or drug overdose death investigations?

_____
_____
_____
_____
_____

Appendix 4: Online Survey Questionnaire (cont.)

Questions about Demographics

D1 What is your age?

- ☐ 20–29 years
- ☐ 30–39 years
- ☐ 40–49 years
- ☐ 50–59 years
- ☐ 60 years and above

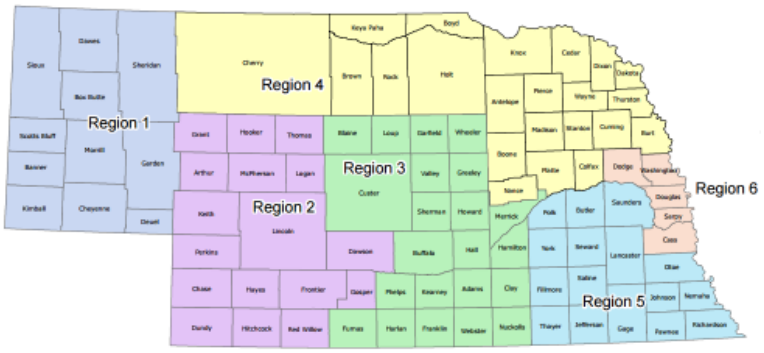
D2 What is your gender?

- ☐ Male
- ☐ Female

D3 How many years have you worked as a county coroner?

- ☐ Under 1 year
- ☐ 1–5 years
- ☐ 6–9 years
- ☐ 10 or more years

D4 Which behavioral health regions does your office serve?



- ☐ Region 1 – Banner, Box Butte, Cheyenne, Dawes, Deuel, Garden, Kimball, Morrill, Scotts Bluff, Sheridan, Sioux
- ☐ Region 2 – Arthur, Chase, Dawson, Dundy, Frontier, Gosper, Grant, Hayes, Hitchcock, Hooker, Keith, Lincoln, Logan, McPherson, Perkins, Red Willow, Thomas
- ☐ Region 3 – Adams, Blaine, Buffalo, Clay, Custer, Franklin, Furnas, Garfield, Greeley, Hall, Hamilton, Harlan, Howard, Kearney, Loup, Merrick, Nuckolls, Phelps, Sherman, Valley, Webster, Wheeler
- ☐ Region 4 – Antelope, Boone, Boyd, Brown, Burt, Cedar, Cherry, Colfax, Cuming, Dakota, Dixon, Holt, Keya Paha, Knox, Madison, Nance, Pierce, Platte, Rock, Stanton, Thurston, Wayne
- ☐ Region 5 – Butler, Fillmore, Gage, Jefferson, Johnson, Lancaster, Nemaha, Otoe, Pawnee, Polk, Richardson, Saline, Saunders, Seward, Thayer, York
- ☐ Region 6 – Cass, Dodge, Douglas, Sarpy, Washington

Appendix 4: Online Survey Questionnaire (cont.)

Survey End Message

Dear [Respondent's Name Here]

Thank you for taking the time to complete this survey. Your response has been recorded.

As a third-party evaluator, STEPs will keep survey participants' anonymity. Your responses will be combined with others and solely used for assessing NE coroners' needs for improving current drug overdose death investigations. Feel free to contact STEPs if you have any questions.

Thank you for your participation.

Sincerely,
Brittany Willmore
Program Evaluator at STEPS
223A CEC, 6001 Dodge Street
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Phone: 402.554.3663
Email: steps@unomaha.edu