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Reducing occupational exposure to SARS-CoV-2: A survey of changes in caseload and controls among medical examiner and coroners' offices in Pennsylvania during 2020

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Abstract

Like their counterparts in healthcare, workers in medical examiner and coroners' offices are considered *essential workers*. The frequency and urgency of their work during the coronavirus disease 2019 (COVID-19) pandemic have only become of greater importance. Because of the increased mortality in the general population due to SARS-CoV-2, the virus that causes COVID-19, it is reasonable to assume that the workload and risk of occupational exposure to SARS-CoV-2 have increased for these workers who are required by state law to investigate deaths known or suspected to be due to a contagious disease that constitutes a public hazard. Studies investigating the impact of the COVID-19 pandemic on these workers and their operations have been limited. The objective of this study was to conduct an assessment of routine medical examiner and coroners' office duties (e.g., infectious disease testing and decedent transport) by surveying the 67 county medical examiner and coroners' offices in Pennsylvania to characterize how the rise in infectious disease cases from COVID-19 influenced workload and resource needs. Quantitative results demonstrated an increase in workload and use of personal protective equipment (PPE) while engineering control usage remained the same. Qualitative results revealed various challenges experienced by the offices during the pandemic including limitations in access to PPE, insufficient storage space for increased numbers of decedents, personnel shortage/burnout, and limited or no engagement at the state level for emergency response planning and implementation. These data are valuable to inform the need for additional guidance or supplies and may be used to optimize resource planning and implementation (e.g., personnel, facilities, and supplies) for both routine and surge demand scenarios.

Keywords

COVID-19; decedent; medicolegal death investigation; personal protective equipment; occupational safety and health; SARS-CoV-2

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Introduction

Pennsylvania's 67 counties have either an elected coroner or appointed medical examiner. Medical examiner and coroners' (ME/Cs) offices are responsible for providing medicolegal death investigation services using forensic or environmental laboratories and investigations at the scene of death to assist judicial court systems, law enforcement, and environmental agencies within their jurisdictions. ME/Cs offices employ technical staff who engage in activities related to death investigation such as forensic technicians, investigators, laboratory directors, histologists, pathologists, and other scientists (Definitions 2018).

As required by Pennsylvania's statute on county code, each ME/Cs office has the responsibility to investigate the facts and circumstances of a death that is not readily explainable or has occurred under suspicious circumstances. These include a sudden death not caused by a recognizable disease, a death that resulted from violence or trauma, a death occurring in a penal institution or while in the custody of law enforcement, and a sudden death of an infant. More relevant to the coronavirus disease 2019 (COVID-19) pandemic, ME/Cs offices also maintain the responsibility to investigate a death known or suspected to be due to a contagious disease that constitutes a public hazard (Coroner's Investigation 2018).

Workers in these offices have arguably been at higher risk of contracting SARS-CoV-2, the virus that causes COVID-19, than the general population because of their continuing responsibilities working outside of the home (Feehan et al. 2021; Pathela et al. 2021). Performing autopsies, which might involve aerosol-generating procedures, and collecting or handling postmortem samples on the deceased known or suspected to have COVID-19 at the time of death are considered to be tasks at high risk of exposure (OSHA 2020). SARS-CoV-2 viral ribonucleic acid (RNA) has been detected in many tissues and bodily fluids (O'Keeffe 2021) and some studies have identified the infectious virus in respiratory tract specimens (Heinrich et al. 2021; Plenzig et al. 2021). ME/Cs office personnel have likely seen an increase in their workload and general precautions due to COVID-19. To continue operations, they had to reassess current practices and modify standard operating procedures and guidelines to reduce occupational exposure and the spread of SARS-CoV-2 within their workplace. The authors conducted a literature review in Summer 2020 to determine the types of changes implemented and to identify the need for additional guidance or support obtaining crucial supplies, which yielded no previous evaluations of the effect of COVID-19 on ME/Cs operations. Therefore, the objective of this study was to conduct an assessment of routine ME/Cs duties by surveying the 67 county ME/Cs offices in Pennsylvania to characterize how the rise in infectious disease cases from COVID-19 influenced workload and resource needs. These data are valuable to inform the need for additional guidance or supplies and may be used to optimize resource planning and implementation (e.g., personnel, facilities, and supplies) for both routine and surge demand scenarios.

Methods

To investigate the impact of the U.S. Department of Health and Human Services (HHS) COVID-19 public health emergency (declaration first issued in January 2020) (HHS 2020) on county ME/Cs offices in Pennsylvania, the authors collaborated with the Pennsylvania State Coroners Association (PSCA) and conducted a literature review of existing research addressing changes in practices made in medicolegal death investigation workplaces to address similar transmissible illnesses such as influenza. The PSCA is an organization of current and former medicolegal death investigation practitioners and subject matter experts which works to address issues experienced by the 67 county ME/Cs offices in Pennsylvania. At the time of the study, the PSCA's membership included workers from each of the 67 offices who were intimately familiar with operations of the offices. The study team, which consisted of subject matter experts in occupational medicine, personal protective technology, industrial hygiene, and epidemiology, designed a survey based on a literature review and input from the PCSA.

The survey instrument addressed four main occupational tasks undertaken by ME/Cs offices: (1) transportation of decedents, (2) field investigations (death scene), (3) external exams, and (4) autopsies. The PSCA advised that the hazard of occupational exposure to SARS-CoV-2 would require changes to the four occupational tasks, such as personal protective equipment (PPE) usage. The survey contained 65 questions. As displayed in Table 1, the survey was organized by 13 survey categories with questions within each that were developed to elicit information related to specific topics.

Most questions asked the survey participant to answer based upon circumstances ***before*** *the COVID-19 pandemic (January 2019–December 2019)* and ***during*** *the COVID-19 pandemic (after January 1, 2020)*. The survey instrument utilized dropdown selection, number field, and multiple-choice questions. The instrument also included one free text question asking respondents to describe what they felt was the biggest challenge(s) to their office operations due to the COVID-19 pandemic. There was no character limit to the response.

The PSCA and a subject matter expert in occupational medicine reviewed the survey to ensure field practitioner comprehension of the language and content of the questions. The survey instrument and dissemination activity were reviewed by the Centers for Disease Control and Prevention (CDC) and were conducted consistent with applicable federal law and CDC policy related to Human Subjects Committee/Institutional Review Board and Paperwork Reduction Act of 1995 compliance. A Public Health Exemption was provided due to the survey's status as a COVID-19 pandemic response activity.

The survey was conducted using REDCap, a secure, web-based software platform (Harris et al. 2009, 2019). The link to the anonymous survey was distributed by PSCA to each of the 67 county ME/Cs offices in the state. Completion of the survey by a representative of each county ME/Cs office familiar with its operations was requested. The survey was available for completion (live) by participants between December 10, 2020 and January 17, 2021. This time frame allowed ME/Cs offices sufficient preparation time to complete the survey with accurate information, allowing for expected increased workload during the

holiday season. Participants were provided explicit instructions that data from calendar year 2021 were not requested in the event a survey was completed after January 1, 2021. At the close of the survey, 34 counties had a complete submission, and 14 counties had a partial submission. This represents responses by 71.6% of the survey population (50.8% for complete submission). Of the 48 submitted responses, three responses were excluded because they contained no data except for the name of the county. As a result, the final response rate used for data analysis was 45 completed responses, representing 67.16% of the survey population.

Data were analyzed using STATA version 16.1 (StataCorp, College Station, TX). Descriptive statistics were used to describe the measures of central tendency and relative frequency of responses, as appropriate. To allow for inclusion of partial submissions, all frequency data are presented relative to the total number of responses received for that question. Therefore, the denominators presented for the relative frequencies vary throughout. The responses to the free-text question in the survey were informally reviewed for discernable patterns. Number of offices expressing similar issues were tallied and issues shared by multiple offices were identified as patterns.

Results

Data analysis used 45 completed responses from ME/Cs offices across Pennsylvania. Responding offices had a median of 7 employees, mean of 10 employees, and a range of 1–112. Most ME/Cs offices (n = 36/44, 81.8%) did not have their own facilities to conduct autopsies. Among the eight offices with autopsy facilities, only two offices reported having negative pressure rooms, two reported having a downdraft table, and none reported having biosafety level 3 facilities. About half (n = 24/45, 53.3%) had facility vehicles to conduct decedent transports from the death scene to the office. The remaining 21 (47.7%) facilities used another party to conduct transports.

The workloads reported for calendar years 2019 and 2020 are displayed in Table 2. Overall, facility workload increased from 2019 to 2020. The mean percent change in caseload was 27.5%. Transports, autopsies, and field investigations increased by 9.3%, 8.1%, and 24.3% from 2019 to 2020, respectively. Among offices that conducted autopsies, six of six responding offices performed autopsies on decedents known to have COVID-19.

Table 3 presents information regarding the testing of decedents for SARS-CoV-2 throughout the study period. Of 35 respondents, 25 offices (71.4%) reported having the ability to test decedents for SARS-CoV-2 infection, most of which (68%) were submitted to third-party laboratories for analysis. Of 25 offices who reported testing decedents, 23 (92.0%) performed testing on decedents who had signs and symptoms of COVID-19 at the time of death. The majority of offices (66%) began testing in March or April of 2020, but 4 of 25 (16.0%) offices did not begin testing until September or later. The median reported percentage of decedents tested for SARS-CoV-2 prior to intake into the office was 22.5% (range = 1–100%). The median reported percentage of decedents overall testing positive for SARS-CoV-2 prior to intake into the office was 5% (range = 0–100%). The median number

of decedents processed by each office that tested positive for SARS-CoV-2 was 10 (range = 0–560).

Table 4 presents the reported PPE usage practices across the responding ME/Cs offices by occupational task *before* and *during* the COVID-19 pandemic. The arrows pointing up represent an increase in the relative frequency of use of that type of PPE whereas the arrows pointing down indicate a decrease in use. In general, PPE use increased during the pandemic compared to before, independent of occupational task. Specifically, from 2019 to 2020, the relative frequency of use increased for surgical masks (41.2% to 58.8%), N95 filtering facepiece respirators (FFRs) (20.6% to 73.5%), nonabsorbent gowns, aprons (17.6% to 41.2%), Tyvek suits (8.8% to 17.6%), face shield/goggles (26.5% to 50%), shoe covers (26.5% to 41.2%), and surgical caps (2.9% to 5.9%) when conducting external exams. Similarly, during investigations, the relative frequency of PPE use increased from 2019 to 2020 for all types of PPE except for powered air-purifying respirators (PAPRs) and surgical caps by 8.8–44.1%. The relative frequency of use of various types of PPE during decedent transports was reported to have increased for all types of PPE except for aprons, gloves, and surgical caps by 10.5–42.1%. The relative frequency of PPE use during autopsies increased for N95 FFRs (0% to 85.7%), PAPRs (14.3% to 28.6%), Tyvek suits (0% to 14.3%), and shoe covers (57.1% to 71.4%), but decreased for surgical masks (57.1% to 42.9%) and gloves (100.0% to 85.7%).

Table 4 also presents the relative frequency of use of various types of PPE while handling COVID-19 positive decedents. Most facilities (>50%) reported the use of N95 FFRs, gloves, and face shields/goggles when handling COVID-19 positive decedents. Few facilities (<10%) reported the use of elastomeric respirators, PAPRs, or surgical caps when handling SARS-CoV-2 positive decedents.

Table 5 describes the PPE practices reported by the ME/Cs offices. Of 28 responding offices, 21 (75%) reported that their employees are not fit-tested for N95 FFRs or elastomeric respirators. Furthermore, 19 of 33 responding offices (57.6%) reported training their employees on proper use of PPE with a frequency of either “annually or more often” or “every 1–5 years.” Finally, 78.9% (15 of 19) offices reported that their employees received a refresher training on proper use of PPE within calendar year 2020.

Reported workplace protocols related to the COVID-19 pandemic are presented in Table 6. The majority of ME/Cs offices (23/34, 67.7%) reported not attempting to perform field investigations remotely during calendar year 2020. Most offices reported increasing disinfection of decedent handling areas (23/34, 67.7%) and office areas (22/34, 64.7%). Physical distancing of ≥ 6 feet was reported as possible in “all areas” by only 13 of 34 offices (40.6%) and possible in “some areas” by 17 offices (53.1%). Only 3 of 34 (8.8%) offices reported using plexiglass barriers to reduce potential SARS-CoV-2 transmission between employees.

Reported vehicle decontamination and disinfection practices for decedent transportation before and during the COVID-19 pandemic are summarized in Table 7. Of the 18 ME/Cs offices that reported conducting transports, 13 (72.2%) reported using an onsite facility to

decontaminate and disinfect vehicles. Two of 18 offices (11.1%) reported that the vehicles are not disinfected. Before the pandemic, 7 of 19 (36.8%) offices reported conducting vehicle decontamination/disinfection after each decedent transport whereas this practice was reported by 11 of 19 (57.9%) during the COVID-19 pandemic.

Finally, the review of the responses to the free-text question maintained several common challenges. These included ME/Cs offices experiencing (1) limited access to PPE (unable to purchase in the market due to supply chain shortages and inability of state government to provide sufficient allocations), (2) limited or lack of storage space for increased number of decedents, (3) increase in personnel shortage and burnout/stress, and (4) limited or no engagement at the state level for emergency response planning and implementation. Additionally, numerous responses included a theme of insufficient budget or financial allocations for supplies and staffing prior to the pandemic, which respondents directly connected to the challenges they experienced during the pandemic.

Discussion

The authors are not aware of previous investigations evaluating the effect of COVID-19 on ME/Cs offices, suggesting that the findings from this study provide the most comprehensive information available for this worker population at the time of publication. The results of the survey demonstrated an increase in overall workload among the responding ME/Cs offices between 2019 and 2020. Specifically, this included caseload, decedent transports, autopsies, and field investigations.

PPE usage patterns were generally consistent with recommendations provided by government agencies, professional organization guidelines, and published peer-reviewed literature for the specific workplace activities addressed. Recommendations related to SARS-CoV-2 (CDC 2020; Lacy et al. 2020; Osborn et al. 2020) generally coincided with recommendations for safe work practices in laboratories and autopsy suites (Nolte et al. 2002; Miller et al. 2012) included the use of contact and droplet precaution PPE such as goggles/face shields and N95 FFRs or respirators with a greater protection factor (e.g., PAPRs). The decrease in usage of gloves across all activities was not consistent with the recommendations reviewed. The authors speculate this decrease might be due to supply shortages, but it remains unclear why there was a reported decrease in glove usage. While PPE usage patterns changed for ME/Cs offices during the pandemic, the results indicated that frequency of PPE training delivery and respirator fit testing (specific to N95 FFR or elastomeric respirator use) could be improved.

Findings of the survey demonstrate the effects of a pandemic on ME/Cs office operations and personnel, which policy makers or planners may consider for future preparedness and response needs. Specifically, increases in PPE usage might require changes in practices related to PPE acquisition, supply, and allocation from state resources. Among offices that perform autopsies, most were performing autopsies on decedents known to have SARS-CoV-2, but few had the engineering controls recommended to protect workers in autopsy suites (Nolte et al. 2002, 2021; Miller et al. 2012; Lacy et al. 2020). The increased workload associated with the COVID-19 pandemic likely exacerbated long-standing workforce

capacity and workload challenges identified by the National Institute of Justice (U.S. Department of Justice 2019). The findings of increased workload and the reported increase in burnout/stress (in the free text responses) suggest that considerations need to be given to promote mental health of ME/Cs office personnel. Studies focusing on other healthcare sector workers, such as physicians, have demonstrated a greater risk for psychological stress due to the workplace pressures related to the pandemic and the need for processes to provide mental health support (Galbraith et al. 2021). These pressures include increased workload and increased risk of infection to self or family members based on occupational exposure to individuals with SARS-CoV-2 infection (Galbraith et al. 2021; Søvold et al. 2021). While this survey did not assess mental health status of the ME/Cs office workers, the increase in workload from 2019 to 2020, work involving decedents with SARS-CoV-2 infection, and changes in workplace practices can be used to speculate an increase in workplace stress.

This study had several limitations. First, not all ME/Cs offices invited to participate completed the survey. Additionally, not all responding offices completed the entire survey as intended. Therefore, the results might not be representative of the experiences of all 67 ME/Cs offices in the state nor generalizable to those in other states. This study did not include characteristics of non-responding offices which could introduce bias in the estimates. For example, if the non-responding offices were busier, the results would have underestimated the true burden. Second, the analytical approach taken was limited to descriptive statistics only. Therefore, statistical comparison between groups were not made. Third, the increase in workload should not be completely attributed to deaths as a result of SARS-CoV-2 infection. According to the National Center for Health Statistics, drug overdose deaths in the United States rose by 29.4% in 2020 (Ahmad et al. 2021). In the 2020 National Survey on Drug Use and Health, most respondents perceived that the COVID-19 pandemic had a negative effect on their mental health and 25.9 million past-year users of alcohol and 10.9 million past-year users of drugs other than alcohol were estimated to be using these substances “a little more or much more” than they did before the COVID-19 pandemic began (Substance Abuse and Mental Health Services Administration 2021). Therefore, the increase in workload might include other deaths related to challenges during the pandemic, not just SARS-CoV-2 infection. Finally, the survey instrument did not ask why usage decreased or increased for specific PPE. As a result, it is unknown if decreased use in certain types of PPE (e.g., surgical mask) could be the result of increased use in other PPE (e.g., N95) or other limitations such as limited supply or inability to decontaminate PPE.

Conclusion

Like their counterparts in healthcare, workers in ME/Cs offices are considered *essential workers*. During the pandemic, the frequency and urgency of their work have only become of greater importance. This study of ME/Cs offices in Pennsylvania has allowed for characterization of the impact of the COVID-19 pandemic on office operations and personnel. Quantitative results demonstrated an increase in workload between 2019 and 2020. Qualitative results revealed various challenges experienced by the offices during the pandemic including limitations in access to PPE, insufficient storage space for more decedents, and the need for inclusion in broader emergency response planning and

implementation. When these are considered in the context of worker shortages and increased risk of infection to self or family members based on occupational exposure to individuals with SARS-CoV-2 infection, the effects of the COVID-19 pandemic can be speculated to be extremely impactful on human resources of ME/Cs offices. Understanding these issues could help target areas where improved preparedness for future emergencies and response are needed to improve the overall operations and protection of workers in the medicolegal death investigation setting. Although the results have documented an increase in PPE reliance and usage, the frequency of PPE training delivery and respirator fit testing are insufficient within this worker population and need to be improved. While it is recognized that Pennsylvania operates occupational health and safety plans that are similar to federal Occupational Safety and Health Administration (OSHA) standards, it is unknown if employees within the ME/Cs offices follow a comparable respiratory protection program. Therefore, the results in Pennsylvania may not be comparable to states that do fall under OSHA jurisdiction for annual fit-testing requirements. In accordance with the hierarchy of controls, improvements can be made to administrative and engineering controls. It is important that that policy makers or planners consider the lessons learned from this study for future preparedness and response needs.

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Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. The authors confirm that the data supporting the findings of this study are available within the article and/or its supplementary materials.

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Table 1.

Survey category and topics.

Survey category	Topics survey questions elicited information about
General Description of Facility	• County where office is located • Total number of employees • Number of employees by position/title • If office has autopsy suite, negative pressure rooms, downdraft tables • Highest biosafety level • If office transports decedents
Office Workload in Calendar Year 2019	• Caseload (received/processed decedents) • Decedent transports • Autopsies
Office Workload after January 1, 2020	• Caseload (received/processed decedents) • Decedent transports • Autopsies
Testing of Employees for COVID-19	• Availability of testing for employees • Kind of SARS-CoV-2 test used • Frequency of testing • Circumstances for testing employees • When office began testing • Number of employees that have tested position since January 1, 2020 • Number of employees that have been absent from work due to any reason related to COVID-19 since January 1, 2020
Testing of Decedents for COVID-19	• Availability of testing for decedents • Who conducts and analyzes test • Circumstances for testing decedents • When office began testing • Number of decedents that have been tested • Percentage of decedents tested positive before being encountered by office • If employees perform autopsies on decedents known to be positive • Number of decedents processed by office that have tested positive
PPE Practices before January 1, 2020	• Transport of decedents • External exams • Autopsies • Field investigations
PPE Practices since January 1, 2020	• Transport of decedents • External exams • Autopsies • Field investigations • PPE used for handling known or suspected positive decedents
Training and Fit-Testing	• Are employees fit-tested for the respirator they use • If employees have been fit-tested since January 1, 2020 • Frequency of training delivery for employees on proper use of PPE • If employees received any refresher training on the proper use of PPE since January 1, 2020
Offices Characteristics and Changes to Workplace Protocols Related to the COVID-19 Pandemic	• If office attempted to perform field investigations remotely since January 1, 2020 • If workplace/equipment disinfection protocols changed related to decedent handling areas, decedent storage areas, and offices areas

Survey category	Topics survey questions elicited information about
	• Where in office can employees maintain physical distancing of 6 feet • If office installed physical barriers such as plexiglass
Transportation Vehicle Decontamination/Disinfection	• Where vehicles are decontaminated/disinfected • How often vehicles were decontaminated/disinfected in calendar year 2019 • How often vehicles are decontaminated/disinfected since January 1, 2020
Engineering Controls for Autopsies in Calendar Year 2019	• Use and frequency of use of negative pressure room, downdraft table, local exhaust ventilation, biosafety cabinet
Engineering Controls for Autopsies since January 1, 2020	• Use and frequency of use of negative pressure room, downdraft table, local exhaust ventilation, biosafety cabinet
Free Text Question	• What office felt was the biggest challenge to Medical Examiner / Coroner personnel and operations due to the COVID-19 pandemic

Table 2.

Pennsylvania Medical Examiner and Coroner Office Workload in 2019 and 2020.

	Calendar year 2019		Calendar year 2020		Delta*†
	Number of responses	Median (IQR)	Number of responses	Median (IQR)	Mean (SD)
What was the caseload (received/processed decedents) for your office?	37	233 (137–771)	35	287 (133–900)	27.5% (61.2%)
How many decedent transports has your office conducted?	32	100.5 (50–243)	31	115 (47–243)	9.3% (25.7%)
How many autopsies has your office conducted?	36	40 (25–79.5)	35	40 (15–89)	8.1% (45.1%)
How many field investigations has your office conducted?	36	185 (100.5–424)	35	180 (90–425)	24.3% (65.2%)

Survey responses were collected between 12/10/2020 and 1/13/2021.

*Calculated as the percent change from calendar year 2019 to calendar year 2020.

†Only includes records that reported both 2019 and 2020 data (n = 35 for caseload, autopsies, and field investigations, n = 31 for transports).

Abbreviations: IQR = Interquartile range, SD = Standard deviation

Table 3.

COVID-19 testing of decedents.

	Number of responses	Median (Range)	N (%)
Does your office currently have the ability to test decedents for SARS-CoV-2 infection?	35		
Yes			25 (71.4%)
No			10 (28.6%)
If yes, who conducts and analyzes the test?: *	25		
Office conducts tests and analyzes in-house			4 (16.0%)
Office collects samples and submits to third party for analysis			17 (68.0%)
Both			4 (16.0%)
Other, please specify			0 (0%)
Under what circumstances does your office test decedents for SARS-CoV-2? *	25		
All decedents without known positive SARS-CoV-2 test result			1 (4.0%)
Decedents with signs or symptoms of COVID-19 at time of death			23 (92.0%)
Decedents above a certain age (specify age)			0 (0%)
Decedents from certain settings (e.g., long-term care facilities) (specify settings)			2 (8.0%)
At the request of family/next of kin			3 (12.0%)
Other (please specify)			3 (12.0%)
When did your office begin testing decedents for SARS-CoV-2? *	25		
March			8 (32.0%)
April			6 (24.0%)
May			1 (4.0%)
June			2 (8.0%)
July			0%
August			0%
September			1 (4.0%)
October			1 (4.0%)
November			0%
December			2 (8.0%)
Do not know			4 (16.0%)
How many decedents has your office tested for SARS-CoV-2? *†	20	5.5 (0-272)	

	Number of responses	Median (Range)	N (%)
What percentage of decedents have been tested for SARS-CoV-2 before being encountered by your office (approximate if necessary)?[†]			
All Responses	18	22.5% (1-100%)	
1–19%			8 (44.4%)
20–39%			4 (22.2%)
40–59%			2 (11.1%)
60–79%			1 (5.6%)
80–100%			3 (16.7%)
What percentage of decedents tested positive for SARS-CoV-2 before being encountered by your office (approximate if necessary)?			
All Responses	27	5% (0-100%)	
1–19%			17 (65.4%)
20–39%			5 (19.2%)
40–59%			2 (7.7%)
60–79%			1 (3.9%)
80–100%			1 (3.9%)
Do employees from your office perform autopsies (limited in scope or full) on decedents who are known to be positive for COVID-19?[‡]	6		
Yes			6 (100%)
No			0 (0%)
How many decedents processed by your office have tested positive for SARS-CoV-2?[*]	21	10 (0-560)	

[*] Question was skipped if testing was not available.

[†] Question skipped if all decedents without suspected COVID-19 were tested.

[‡] Question was limited to only those who stated the ability conduct autopsies.

Table 4.

PPE used before and during the COVID-19 pandemic by Pennsylvania Medical Examiner and Coroner Offices by Occupational Task.

	External exams (n = 34)			Investigations (n = 34)			Decedent transports (n = 19)			Autopsies (n = 7)			Handling COVID-19 positive decedents (n = 34)
	Before		During	Before		During	Before		During	Before		During	During
Surgical Masks	41.2%	▲	58.8%	23.5%	▲	61.8%	26.3%	▲	42.1%	57.1%	▼	42.9%	55.9%
N95 FFRs	20.6%	▲	73.5%	17.6%	▲	61.8%	36.8%	▲	78.9%	0.0%	▲	85.7%	67.6%
Elastomeric respirators	2.9%		2.9%	0.0%	▲	8.8%	0.0%	▲	5.3%	0.0%		0.0%	8.8%
PAPRs	2.9%		2.9%	2.9%	▼	0.0%	5.3%	▲	10.5%	14.3%	▲	28.6%	5.9%
Nonabsorbent gowns	17.6%	▲	41.2%	5.9%	▲	17.6%	5.3%	▲	15.8%	57.1%		57.1%	35.3%
Aprons	32.4%	▲	41.2%	8.8%	▲	17.6%	15.8%		15.8%	42.9%		42.9%	26.5%
Tyvek suits	8.8%	▲	17.6%	14.7%	▲	26.5%	21.1%	▲	31.6%	0.0%	▲	14.3%	32.4%
Gloves	94.1%	▼	91.2%	79.4%	▲	88.2%	94.7%	▼	89.5%	100.0%	▼	85.7%	94.1%
Face shield/goggles	26.5%	▲	50.0%	14.7%	▲	35.3%	15.8%	▲	47.4%	71.4%		71.4%	50.0%
Shoe covers	26.5%	▲	41.2%	20.6%	▲	29.4%	26.3%	▲	36.8%	57.1%	▲	71.4%	38.2%
Surgical caps	2.9%	▲	5.9%	2.9%		2.9%	5.3%	▼	0.0%	42.9%		42.9%	5.9%

(a)„Before" refers to the period before the start of the COVID-19 pandemic, defined as calendar year 2019.

(b)„During" refers to during the COVID-19 pandemic, defined as after January 1, 2020, through December 31, 2020.

*(c)*Sample size for each task varies due to exclusion of offices that do not regularly perform the tasks in question as well as variable response rates.

*(d)*All survey responses were collected between 12/10/2020 and 1/17/2021.

*(e)*Abbreviations: PPE = personal protective equipment, FFR = filtering facepiece respirator, PAPR = powered air purifying respirator

Table 5.

PPE training practices in your office.

	Total responses	N (%)
If your employees use N95 or elastomeric respirators, are they fit-tested for the respirator they use?	28	
Yes		6 (21.4%)
No		21 (75.0%)
Don't know		1 (3.6%)
If your employees use N95 or elastomeric respirators, have they been fit-tested for respirator use since January 1, 2020?[a]	6	
Yes		5 (17.9%)
No		1 (3.6%)
How often are employees in your office trained on the proper use of PPE?	33	
Never		7 (21.2%)
Only at hire		7 (21.2%)
Annually or more often		14 (42.4%)
Every 1–5 years		5 (15.2%)
Have employees received any refresher training on the proper use of PPE since January 1, 2020?[b]	19	
Yes		15 (78.9%)
No		4 (21.1%)

[a]Question skipped if the facility indicated "No" or "Don't Know" the answer to the question "If your employees use N95 or elastomeric respirators, are they fit-tested for the respirator they use?"

[b]Question skipped if the facility indicated "Never" or "Only at hire" to the question: How often are employees in your office trained on the proper use of PPE?

Table 6.

Office characteristics and changes to workplace protocols related to the COVID-19 pandemic.

	Total responses	N (%)
Has your office attempted to perform field investigations remotely (e.g., by phone or video conference) since January 1, 2020?	34	
Yes		11 (32.3%)
No		23 (67.7%)
Have workplace/equipment disinfection protocols changed at your office since the COVID-19 pandemic?	34	
Did not change		7 (20.6%)
Increased disinfection of decedent handling areas		23 (67.6%)
Increased disinfection of decedent storage areas		15 (44.1%)
Increased disinfection of office areas		22 (64.7%)
Other, please specify		0 (0%)
Where in your office can employees maintain social distancing of 6 feet?	32	
All areas		13 (40.6%)
Some areas		17 (53.1%)
No areas		2 (6.3%)
Has your office installed physical barriers, such as plexiglass, to reduce the potential for SARS-CoV-2 transmission among employees?	34	
Yes		3 (8.8%) *
No		31 (91.2%)

* All three facilities indicated the use of plexiglass dividers.

Table 7.

Vehicle decontamination/disinfection practices.

	Total responses	N (%)
Where are facility transportation vehicles currently decontaminated/disinfected?	18	
Onsite at facility		13 (72.2%)
At local fire station/department		0 (0%)
Vehicles are not disinfected		2 (11.1%)
Other:		3 (16.7%)
How often were facility transportation vehicles decontaminated/disinfected before the COVID-19 pandemic (January 2019–December 2019)?	19	
After each decedent transport		7 (36.8%)
Hourly		0 (0%)
Daily		1 (5.3%)
Weekly		4 (21.1%)
Other		7 (36.8%)
How often are facility transportation vehicles decontaminated/disinfected during the COVID-19 pandemic (after January 1, 2020)?	19	
After each decedent transport		11 (57.9%)
Hourly		0 (0%)
Daily		2 (10.5%)
Weekly		1 (5.3%)
Other		5 (26.3%)

These questions were skipped if facility indicated that they did not do transports.