

Good afternoon. I'm Commander Ibad Khan, and I'm representing the Clinician Outreach and Communication Activity (COCA) with the Emergency Risk Communication Branch at the Centers for Disease Control and Prevention. I'd like to welcome you to today's COCA call, Guidance for Certifying Deaths Due to COVID-19. For participants using the Zoom platform to access today's webinar, if you're unable to gain or maintain access or if you experience technical difficulty, please access the live stream on the webinar on COCA's Facebook page at www.facebook.com/CDCclinicianoutreachandcommunicationactivity. Again, that is www.facebook.com/CDCclinicianoutreachandcommunicationactivity. The video recording of this COCA call will be available immediately following the live call on COCA's Facebook page.

The video recording will be posted on COCA's webpage at emergency.cdc.gov/COCA a few hours after the call ends. Again, that web address is emergency.cdc.gov/COCA. Free Continuing Education is offered for this webinar. Instructions on how to earn Continuing Education will be provided at the end of the call. In compliance with Continuing Education requirements, CDC, our planners, our presenters, and their spouses/partners wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters. Planners have reviewed content to ensure there is no bias.

The presentation will not include any discussion of the unlabeled use of product or product under investigational use. CDC did not accept commercial support for this Continuing Education activity. At the conclusion of today's webinar, participants will be able to accomplish the following, list the uses of mortality data, define underlying cause of death, explain how to report causes of death appropriately, including when due to COVID-19, and describe when to refer a case to the medical examiner or coroner. After the presentation, there will be a Q&A session. You may submit questions at any time during the presentation to the Zoom webinar system by clicking the Q&A button at the bottom of your screen and then typing your question.

If you are unable to ask the presenters your question, please visit CDC's COVID-19 website at www.cdc.gov/COVID-19 for more information. You may also email your question to COCA@CDC.gov.

If you're a patient, please refer your questions to your healthcare provider. For those who have media questions, please contact CDC Media Relations at 404-639-3286 or send an email to media@CDC.gov. For more clinical care information on COVID-19, you may contact CDC's COVID-19 Clinical Call Center at 770-488-7100. The center's available 24 hours a day.

Again, that number is 770-488-7100. This call center is staffed by trained clinicians, who can assist with questions about CDC guidance for healthcare professions, healthcare facilities, health departments, and laboratories. We'd also like to remind clinicians to please refer patients to state and local health departments for COVID-19 testing and test results. Clinicians should not refer patients to CDC to find out where or how to get tested for COVID-19 or to get COVID-19 test results. Also, please continue to visit emergency.cdc.gov/COCA, as we intend to host COCA calls to keep you informed of the latest guidance and updates on COVID-19. For instance, we are hosting another COCA call tomorrow afternoon at 2:00 PM Eastern, where the topic will focus on COVID-19 in the United States and insights from healthcare systems. In addition to our webpage, COCA call announcements for upcoming COCA calls will also be sent via email. So, please be sure to subscribe to COCA@CDC.gov to receive these notifications and share them with your clinical colleagues.

Before I introduce our presenters for today's call, it is my pleasure to welcome Dr. Ann Schuchat, who's providing opening remarks. Dr. Schuchat is the Principal Deputy Director for the Centers for Disease Control and Prevention, and she is the Incident Manager for CDC's Coronavirus 2019 Response.

Dr. Schuchat, we are privileged to have you with us, please proceed.

Thank you so much. I'd like to thank everyone for joining today's COCA call, and for those of you working in clinical care or in public health, in the medical examiner's offices, or studying to learn how to do those things, I want to thank you for your service. There are enormous demands placed on each of you right now, and thank you for making time to learn about this topic.

Deaths, of course, are among the most tragic aspects of this pandemic, but deaths are very important for us to understand. Data on pandemic deaths not only help us track the course of the pandemic, but they help guide development of interventions and assess the impact those interventions are having. The information is not just important to CDC, but it's important to your communities, your states, and to the nation. Death certificates themselves are important, and I have to say that from the first time on-call as an intern, when I was asked to complete a death certificate, to the time when my niece was trying to get a death certificate for my brother, so that she could take care of all of the terrible things that had to be done after his untimely passing, I have had increasing respect for the value and importance of death certificates. They are important for families to settle estates, to obtain benefits that are due, and to provide closure.

They're important for official mortality statistics at the state level and aggregated for the national statistics. Their timeliness and quality are more important than ever in the midst of a fast-breaking pandemic such as this one. Timeliness is important, but death certificate registration is required to issue the final disposition permits. And it's especially critical when there are mass fatalities, such as unfortunately we're seeing in some jurisdictions right now. The timeliness affects our surveillance activities and our understanding of what is going on.

The completeness and accuracy of death certificate information is crucial, but it's complicated. Of course, it matters to families what's written on the death certificate, and it also matters for official statistics, whether we're tracking overdose deaths related to opioids or now in the midst of the COVID-19 pandemic. These data truly inform our public health response. So, I want to thank everyone for the essential job that each of you is doing on the frontlines of the pandemic and thank the speakers for the technical expertise they're bringing to this topic and for the fast pace that they are exhibiting in developing ways for us to track COVID-19 as part of the death certificate process. So, thank you all for being here and back to you, moderator.

Thank you, Dr. Schuchat. We appreciate your time and thank you for your leadership. I would now like to welcome our presenters for today's COCA call. We're pleased to have with us today Dr.

Robert Anderson, who is the chief of the Mortality Statistics Branch in CDC's National Center for Health Statistics. Dr. Margaret Warner, who's an injury epidemiologist with CDC's National Center for Health Statistics. Dr. Lee Anne Flagg, who is a health statistician also with CDC's National Center for Health Statistics, and Farida Ahmad, who's the mortality surveillance lead in CDC's National Center for Health Statistics.

I'm now going to turn it over to Dr. Margaret Warner. Dr. Warner, please proceed.

Thank you, and thank you for Dr. Schuchat for opening the conversation and underscoring the importance of having complete and accurate information on the death certificate. My name is Margaret Warner, and I'm an epidemiologist at the National Center for Health Statistics. And I want to thank all of you for taking the time to learn how to properly complete a death certificate and particularly for deaths due to COVID-19. The death certificate provides essential information about the deceased, such as age, race, and sex, and also about the causes of death.

As Dr. Schuchat mentioned, death certificates are important for so many purposes, including providing closure for families and to help them with settling estates and for obtaining insurance and other benefits and for official mortality statistics. Data derived from death certificates is a powerful tool for public health, because there's coverage across country -- across the country and also across time. These data often are used in allocating resources for research and public health programs. To promote data comparability, the National Center for Health Statistics works in partnership with the World Health Organizations, as well as the State Vital Statistics Offices to standardize the processes and procedures involved in death certification and also in the protection of vital statistics mortality data. In anticipation of an increase in deaths due to the novel Coronavirus, the National Center for Health Statistics published guidance documents on how to certify deaths due to COVID-19.

We'll be going over that guidance today. In addition, we'll cover the ways that NCHS is making provisional death counts from our national statistics system available in more real time to track the epidemic as it unfolds. We'll conclude with resources to help you complete the death certificate and then have a question and answer session. I'm now going to turn it over to Dr. Lee Anne Flagg, who will walk you through on how to complete a death certificate.

Thank you. Thanks, Margy. So, I'm going to be providing the guidance for how to certify deaths to COVID-19. Next slide. So, there are a lot of people involved in registering deaths, and I'm going to touch on some of the key roles and responsibilities, one of which is for funeral directors.

They report the demographic information on the death certificate, and they generally report the age, sex, race, and ethnicity and things like that. But today, I'm going to focus a little more on the keys and roles - - key roles and responsibilities in medical certification. Next slide. So, physicians and other medical professionals will certify deaths due to natural causes, where medical examiners and coroners should certify deaths due to injuries and poisonings, suspicious deaths, or sudden and unattended deaths. In the case of COVID-19, most of these will be natural.

Next slide. So, deaths due to injuries, poisonings, and related complications should be referred to the medical examiner or coroner. Some states require referral for deaths involving threats to public health, such as a pandemic like COVID-19. Laws and regulations regarding referral vary by state. So, we just encourage certifiers to be aware of them.

One note is death certificate reporting may not meet mandatory reporting requirements for notifiable diseases. So, contact your local health department regarding regulations specific to your state. Next slide. So, some deaths can appear to be natural, but could be a complication of an injury or poisoning possibly occurring long ago, and this is just a list of examples. It's not exhaustive, but some deaths might seem like they're due to natural conditions, but if you look further back in the history, it could have been due to an injury or poisoning. So, that may indicate a referral to the medical examiner or coroner. If you're unsure, contact the medical examiner or coroner in the jurisdiction in which the death occurred.

Next slide. So, I'm going to start with some just general principles that are important when certifying all deaths, and then a little later on, I'll get into the specific guidance for deaths due to COVID-19.

Next slide. So, in general, we ask certifiers to use any information that's available, such as medical history and records, laboratory tests, an autopsy report, if one is available, or any other relevant source of information. Like a lot of other diagnoses, a cause of death statement is an informed medical opinion that should be based on sound medical judgment drawn from clinical training and experience. And a note is that we're not merely asking what conditions the decedent had, but your opinion as to which conditions caused death. So, all cause of death statements are a medical opinion. There's just no such thing as an objective measure of cause of death. So, we just ask certifiers to use their best medical opinion regarding the causes and circumstances of death.

Next slide. So, this is just an image of the cause of death section from the 2003 standard death certificate. It does follow the guidelines recommended by the WHO. There's a lot of fields here, but for today, we're just going to focus mainly on parts one and two.

Next slide. So, here I have part one highlighted, and this is where the direct causes of death go. Next slide. So, part one is where the sequence of conditions that led directly to the death should go, starting with immediate cause at the top, any intermediate causes below, and the underlying cause of death on the lowest line used.

Next slide. So, part one line A is where the immediate cause of death should go. This is the disease or condition that directly preceded death. Here, we asked certifiers to not report mechanisms of death, things like cardiac arrest, respiratory arrest, anything like that, as these just merely attest to the condition of death and don't really give us any information as to what caused the death. And then later in this presentation, I'll give some examples of immediate causes that would be relevant to COVID-19.

Next slide. Part one should be also where any intermediate causes would be reported, and so they would generally go online B and sometimes C, usually not online D, but sometimes that does happen, if you're adding lines. Regardless, the condition should be reported in a logical sequence in terms of time and etiology. You do not have to use all the lines. So, if you don't need them, you can just leave them blank, and then if you need more lines, you can do a due to statement between conditions on the same line, and that is sort of like adding an additional line. So, if you write one condition due to another condition on the same line, that second condition would be treated as if it was on the line below.

And again, later, I'll give some examples of intermediate causes that would be relevant to COVID-19. Next slide. So, part one, the lowest line used should be where the underlying cause of death is reported, and this is the disease or injury that initiated the train of morbid events leading directly to death or the circumstances of the accident or violence that produced a fatal injury. One note is the primary diagnosis or reason for admission and the underlying cause of death are not necessarily the same.

Next slide. So again, here's part one, and online A should be the immediate cause of death. So, next, and next to be the intermediate cause of death online B, and then next should be the underlying cause of death on the lowest line used, and in this case, it was line C. So, it should be the immediate cause at the top, going back to any intermediate causes and the underlying cause on the lowest line used in part one. Don't put multiple conditions per line, again, unless you're doing a due to statement, then that is okay. Avoid stating complications of a condition.

We would prefer that you specify those complications on lines above, and another thing is just avoiding numbering causes, or including ICD codes, or writing in fillers, like blank or NA in fields that you don't use, as that can just cause problems when processing these records.

Next slide. Here is the interval between onset to death highlighted and next slide. So, in this field or fields, each condition that's reported in part one, the time interval between the presumed onset of the condition, and not necessarily the date of diagnosis, and the time of death should be reported. You can use general terms like minutes, hours, days, et cetera.

You can also approximate the interval, if you don't know the exact interval, and you can also report it as unknown, if it's unknown.

Next slide. So, here, again, is the interval box. Hit next, and there -- yes, so there are just some examples. So, 30 minutes, 10 days, and approximately five years, and that would be an acceptable way to report intervals. One note about this is that we ask or encourage certifiers not to use dashes here, because that can also cause problems when processing these records. Next slide, and this is part two for other significant conditions.

Next slide. So, part two is for other significant conditions that contributed to death but did not result in the underlying cause given in part one. So, part two should not be used to continue the sequence from part one. It really should just be other significant conditions that contributed to death, and we don't really want a laundry list of every condition the decedent had at the time of death. We really just want the ones that actually contributed to death.

Next slide, and then next, so here you would just list any contributing conditions that aren't a part of that sequence in part one, but just somehow still contributed to the death. And here, it's helpful to separate conditions with a comma or semicolon.

Next slide. So, here, I'll give some specific guidance when it comes to COVID-19. Next slide. So, if COVID-19 is determined to be a cause of death, it should be reported on the death certificate, and it likely will be the underlying cause of death. And if that's the case, then it should be on the lowest line used in part one, and then any life-threatening complications that it leads to, such as pneumonia or ARDS would be on the lines above. If possible, testing should be conducted following CDC's recommendations for reporting, testing, and specimen collection, along with post-mortem testing as well.

If a definitive diagnosis cannot be made but it is suspected or likely, meaning you think the circumstances are compelling within a reasonable degree of certainty, then you can report it on a death certificate as probable or presumed. And here we asked certifiers to just use their best clinical judgment in determining if COVID-19 was likely. One note that I would like to make that we've been seeing is people reporting possible COVID-19 exposure. We don't really want people to report that. So, what we're asking you to do is to make a determination if you believe the decedent had COVID-19 and it was a cause of death, not merely that they were exposed.

Of course, lots of people can be exposed to the virus but not develop the disease. So, we want certifiers to make that determination. If they think COVID-19 was likely a cause of death, and then they can report it as probable or presumed. Generally, it is best to avoid abbreviations and acronyms, but COVID-19 is unambiguous. So, it is okay to report on the death certificate, and then any pre-existing

conditions that may increase the susceptibility to the disease or exacerbate the disease, such as COPD, asthma, hypertension, diabetes, et cetera, those should be in part two.

Next slide. I'm going to also cover some common problems when it comes to certifying deaths. Next slide. The first one is intermediate causes being reported without an underlying cause of death. So, the reported underlying cause of death, the condition on the lowest line used in part one should not be something that has multiple possible underlying etiologies.

So, in this example on the left is pneumonia, and it's an intermediate cause, because a lot of things can cause pneumonia, various infectious agents or by inhaling a liquid or a chemical. So, an underlying cause of death is really missing here. So, on the right is an example of a statement that would be complete. So, pneumonia due to COVID-19, and that takes us back to the underlying cause of death. Now, we recognize sometimes clinicians may not know what was the underlying cause. So, if that is the case, you can write the immediate cause or intermediate, excuse me, intermediate cause, and then on the line below specify etiology unknown, and that is acceptable.

Next slide. Another common problem we see is specificity, and, of course, we want the conditions reported to be specific enough for -- to be useful for research and public health purposes. So, the example on the left, viral infection, of course, is not very specific, but a more specific cause of death statement on the right would be sepsis due to COVID-19. One note is COVID or Coronavirus isn't really specific enough.

We really want certifiers to specify the 2019 strain, if that is what it is. Next slide, and then the last common problem we see has to do with sequencing. So, on the left here we have COVID-19 due to COPD, which is an illogical sequence. While COPD could increase the risk of developing the disease or dying from the disease, it doesn't cause COVID-19. It's caused by the SARS-CoV-2 infection.

So really, COPD should go in part two. On the right is a logical sequence, so ARDS due to pneumonia due to COVID-19. While there can be reasonable differences in medical opinion concerning a particular sequence, regardless, all sequences should be logical in terms of time and etiology.

Next slide. So, I'm going to go through a few examples today.

Next slide. The first of which is for a 77-year-old male with hypertension and COPD. He presented to the ED four days of fever, cough, and increasing shortness of breath. He had been exposed to a neighbor with flu-like symptoms, and his wheezing was not improving with his usual bronchodilator therapy. He was found to be febrile, hypoxic, and in moderate respiratory distress. Chest x-ray indicated hyperinflation. ABG was consistent with severe respiratory acidosis, and testing of respiratory specimens indicated COVID-19. He was admitted to the ICU. And despite the treatment, his respiratory acidosis got worse, and he suffered a cardiac arrest on day three.

Next slide. So, here, the certifier reported the acute respiratory acidosis on line A as immediate cause of death and COVID-19 as the underlying cause of death on the lowest line used in part one. And then the COPD and hypertension, since they aren't part of that sequence in part one, they reported it in part two.

Next slide. In this example, we have a 34-year-old female with no significant medical history. She presented to her primary care physician six days of fever, cough, and myalgias.

She was found to be febrile, hypotensive, and hypoxic. She was admitted. A CT scan of the chest showed diffuse ground-glass opacification, indicating viral pneumonia. PCR confirmed COVID-19. Her condition got worse, and she developed ARDS.

She's transferred to the ICU and started on ventilation and eventually expired on day four. Next slide. So, in this instance, the certifier reported the ARDS due to pneumonia due to COVID-19, and this is a good cause of death statement, because it is a logical sequence, and it takes us all the way back to a specific underlying cause of death. Next slide, and then in our last example, we have a 86-year-old female with unconfirmed COVID-19, who passed away at home. Her husband reported she was non-ambulatory after an ischemic stroke three years ago.

Five days prior, she had a high fever and severe cough after exposure to an ill family member, who was later diagnosed with COVID-19. She refused to go to the hospital, even when her breathing became more labored and her temperature escalated, and she was unresponsive that morning. When EMS arrived, she was pulseless and apneic. Her husband said that they had advanced directives and she was not to be resuscitated. EMS consulted medical command. She was pronounced dead, and then they notified the coroner.

Next slide. So, in this example, we're showing that it's okay to report a condition, if you are not certain, but you determine that it is a probable or likely cause of death, using your best clinical judgment. So, although no testing was done, this coroner determined that the likely underlying cause of death was COVID-19, given her symptoms and exposure to an infected individual. So, they reported COVID-19 on the lowest line used in part one.

Her ischemic stroke was a factor that contributed to her death, but it's not part of that sequence in part one, so they reported it in part two. Next slide, and then this has a screenshot of the Vital Statistics Reporting Guidance document. So, if you would like more detail and information, you can go to that URL there, but if you remember three main principles for proper cause of death certification, including deaths due to COVID-19, you will likely have a high quality cause of death statement. And these are one, reporting an underlying cause of death that is two, specific and so in this case COVID-19 and three, a logical sequence to which it gave rise in part one with comorbidities in part two. So again, one, report an underlying cause of death; two, be specific; and three, report a logical sequence, and you will likely be providing the high quality cause of death information that we need.

So, with that, I'm going to turn it over to Farida now, and she's going to share some of our surveillance activities that are related to COVID-19.

Thank you, Lee Anne. Next slide. Good afternoon, I'm Farida Ahmad, and I'll be discussing Provisional Death Counts of COVID-19. Next slide.

So, I wanted to start my presentation with the NVSS COVID-19 webpage, which is where you can find links to our Death Certification Guidance and news about our COVID-19 data releases.

Next slide. Our death counts for COVID-19 are the provisional number of deaths that are coded to ICD-10 code U07. 1. This includes deaths with COVID-19 as the underlying or contributing causes.

It also includes deaths with confirmed or presumed COVID-19. To obtain these numbers, we used data from death certificates that have been received and coded as of the date of analysis. That means the data

are incomplete and do not include all deaths occurring in the reporting period. We do update the site daily, Monday through Friday, so the numbers are constantly revised and updated.

Next slide. Currently, we have publicly released national COVID-19 death counts on week of death, age at death, sex, and place of death. We also have state-based death counts for the 50 states, District of Columbia, New York City, and Puerto Rico. This Tuesday we released data on deaths by race and Hispanic origin for the United States and select -- for select jurisdictions. Unfortunately, I wasn't able to incorporate that data into this presentation, but you can access that information through links from the NVSS COVID-19 page.

Next slide. Here is an example of the tables we update daily. We give the counts of COVID-19 deaths, deaths from all causes, and the percent of expected deaths. This gives us an idea of how many death certificates we have received to date, so we can gauge how complete the data are for a particular week. If you look at the very last row, it shows that we had about 26% of expected death certificates for that week as of Monday, which is when I updated the slide. And today, if you check our website, we have 50% of the expected deaths for that week.

So, that gives you an idea of how our numbers are changing daily. We also give death counts for pneumonia deaths, pneumonia deaths without COVID, and influenza deaths. These numbers are helpful for providing additional context to COVID-19 deaths. Next slide. So, we also present COVID-19 deaths by age group.

Consistent with our current knowledge about COVID-19, our data show higher numbers of deaths in older populations. Next slide. Looking at the differences in COVID-19 by sex, we see that there are more male deaths than female deaths. Males generally account for 51% of overall deaths. With COVID-19, we're seeing that 59% of all deaths are among males.

Next slide. When looking at our provisional data, please keep the following considerations in mind. If you're comparing death counts with other sources, you'll see that our numbers are lower. We're about one to two weeks behind media sources in death count totals. This is because the completeness of data vary by jurisdiction, week of death, decedent's age, cause of death, et cetera.

There's a lot of factors that go into the timeliness of the data. Delays in reporting can happen throughout the chain of the data flow. It takes time to complete the death certificate, send that information to the health department, and for that data to come to NCHS. Once we have the death certificate, it takes us about a week to code the cause of death data for COVID-19 deaths. Finally, please be cautious when comparing numbers of deaths between states.

Timeliness and reporting characteristics vary by state, and if a state has -- so if you see that a state has no deaths, that may be because they haven't reported the deaths to NCHS or that the deaths are still being coded and not necessarily, because they have no COVID-19 deaths. Next slide. We're continuously working to add new data to our provisional releases. As I mentioned, we have already added data by race and Hispanic origin, and we intend to update that data weekly. We also plan to add state-specific tables by week age, sex, or other characteristics.

And finally, we're looking at comorbidities and excess deaths, and we hope to release data on those topics in the near future. I encourage you to check our site often, as we continue to update our numbers and add additional data. Thank you, and I believe Bob is going to be presenting after me.

Yes, thank you, Farida. My name is Bob Anderson. I'm chief of the Mortality Statistics Branch at CDC's National Center for Health Statistics, and I just wanted to take a few minutes here at the end, before we address questions, to just reemphasize some key points. You know, mortality data from the National Vital Statistics System is really an important part of the collection of statistical information that describes the nation's health. And cause of death certifiers are a critical piece to that system, and so we need you, who are certifying the cause of death, we need your knowledge and experience in order to accurately describe how we die in the United States. And this is particularly important during the pandemic as we try to track and document and describe the resulting deaths. When formulating a cause of death statement, use all available information that you have, including medical records, lab tests, autopsy reports.

Also, it's good to talk to others that may have information about the decedent. The more information you have at your disposal, the better able you will be to apply your knowledge and experience to provide an accurate and detailed cause of death. Now, that said, as Lee Anne mentioned earlier, we recognize that sometimes you just don't have much information. Sometimes you don't really know for sure. In such cases, just do the best that you can and provide your best medical opinion, as to what you think the cause of death is.

We trust that you'll provide information based on your knowledge and experience. Now, with regard to COVID-19, things should be relatively straightforward, when a test provides confirmation of infection. Now, in the absence of testing, where a definite diagnosis of COVID-19 can't be made, but you think it's likely based on your clinical judgment, it's okay to report COVID-19 on the death certificate as probable or presumed. It's best to describe the disease in specific terms that make it clear that the infection was the 2019 strain of Coronavirus. So, we generally prefer that you use the term COVID-19 or COVID, Coronavirus Disease 2019 or something along those lines.

You know, other specific terms are acceptable as well, including SARS-CoV-2, 2019 Novel Coronavirus or similar terminology. We would ask that you avoid reporting just Coronavirus or even COVID without the 19 suffix. We have a few Coronavirus deaths each year not related to the 2019 strain, and we definitely want to be able to make the distinction. So, please make it clear that when reporting that the Coronavirus is the 2019 strain. Now, we do have some resources available to help you with cause of death certification, and these are shown on our very last presentation slide.

If you can advance the slide one more, there they are, and, you know, there is a lot of information there. And I realize that many of you are really busy at the moment, and you probably won't have time to review all of these materials. We don't expect you to. Well, one thing I did want to point out, we developed a mobile app recently, which is intended as a quick reference guide for cause of death certification. And this app is available for both iOS and Android platforms.

The links are here on this last slide, but you can usually find them just by searching for CDC cause of death. You should be able to find it, if you do that. The app also will allow us, as we update it, to provide some additional information. We're going to be pushing out some information on that app on certifying deaths due to Coronavirus, and so it would be really good, I really encourage you to download that app to your tablet or smartphone and use it. Now finally, let me just express my appreciation to all of you who are on the frontlines of the battle with COVID-19.

Your efforts really mean a lot to those of us who are working in the rear echelon. And with that, I'll thank you again and turn the time back over to Ibad. Presenters, thank you for providing our audience

with such useful information on this rapidly evolving pandemic. We appreciate your time and value your clinical insights on this matter. We will now go into our Q&A session.

For our Q&A session, I would like to welcome Dr. Marcus Nashelsky and Dr. Sarah Reagan-Steiner, who are joining our Q&A session. Dr. Nashelsky is the Assistant Iowa State Medical Examiner and Clinical Professor of Pathology at the University of Iowa, and Dr. Sarah Reagan-Steiner is a medical officer in CDC's Infectious Diseases Pathology Branch and is currently serving as lead of the mortality unit on the Health Systems and Worker Safety Task Force Clinical Team for CDC's COVID-19 response.

Audience, please remember, you may submit questions through the webinar system by clicking the Q&A button at the bottom of your screen and then typing your question.

So, for our speakers, we received a lot of questions regarding what options do clinicians have for testing COVID-19 post-mortem. I was wondering if you could please address that.

Thank you, Ibad. This is Dr. Sarah Reagan-Steiner. As described in CDC's interim guidance for collection and submission of post-mortem specimens from deceased persons with known or suspected COVID-19, COVID-19 testing can be performed on post-mortem nasopharyngeal or NP swabs, and lung swabs can also be tested, if an autopsy is performed. Healthcare professionals considering swab-based testing for COVID-19 should continue to work with our state and local health departments to coordinate this testing through public health laboratories or use COVID-19 diagnostic testing authorized by the FDA under an emergency use authorization or EUA through clinical laboratories. Additionally, if an autopsy is performed, formalin-fixed or formalin-fixed paraffin-embedded autopsy tissues can be tested for COVID-19 at CDC's Infectious Diseases Pathology Branch.

Healthcare professionals interested in testing of autopsy tissues at CDC should contact their state or local health department. Additional information on specimen submission procedures is available in the guidance document previously mentioned, which is available on CDC's COVID-19 website for healthcare professionals. This document also describes recommended biosafety and infection control practices for collecting specimens in the post-mortem setting, including during autopsy. Thanks. Thank you for your response.

Our next question is asking about signs and symptoms during death investigation. So, I guess the question sums up if a death occurs outside a healthcare setting, are there signs and symptoms that could be obtained via investigation that might suggest COVID-19 should be suspected? Can you please elaborate on that?

Sure. This is Dr. Nashelsky. I'm not sure whether Dr. Steiner or I will handle this case. This question centers on what question or questions a death investigator may ask when investigating a death has occurred outside of a hospital setting. The key question is whether the decedent had a recent unexplained respiratory illness. The investigator can further ask whether there were symptoms such as fever, cough, or shortness of breath. Thank you for that.

Dr. Reagan-Steiner, did you have anything to add before I moved on to the next question? Sure, thanks. So, this is Dr. Reagan-Steiner again. As Dr. Nashelsky mentioned, fever and acute respiratory symptoms are experienced commonly. The signs and symptoms of COVID-19 at onset vary, but some other

symptoms experienced commonly include things like fatigue, anorexia, and myalgias. But there have been atypical presentations described, particularly in older adults and persons with medical comorbidities who may have a delayed presentation of fever and respiratory symptoms. Thank you. Thank you so much.

Our next question asks that there was mention of allowing the certifiers to use probable and likely. So, won't that overcount the number of deaths, and can you also account for how many death certificates mentioned probable?

This is Farida, and I can answer that question. So, currently we see about 10% of death certificates mentioned the word probable or likely, and we do encourage use of those words when testing is not available, and we know that testing isn't always available before or after death. And additionally, for other causes of death, we also accept the words probable or likely. So, these are things that we routinely use on the death certificate, and we're not worried that we're overcounting the number of deaths by using -- by allowing the use of these words.

Thank you for the response.

There are multiple questions regarding the discussion of causes of death and the logical order. One of our inquirers asks, "When certifying, should you name every microorganism that caused or contributed to death, if there happens to be more than one?"

This is Dr. Nashelsky. The answer is certainly yes. Best practice death certification includes the practice of naming a causative organism, if it is known. For example, rather than entering bacterial pneumonia in part two of a death certificate for a COVID-19 death, one should enter the name of the causative agent, if it is known. Therefore, one could say staphylococcus aureus pneumonia, if the causative agent is known to the certifier. Thank you for that response.

Our next question is along similar lines and asks, "What is the underlying cause of death, if patients are HIV positive?" And the example they give is, "If death was caused by an opportunistic infection in, you know, hypothetically speaking COVID-19, what would the underlying cause of death be HIV or COVID-19?"

So, this is Bob Anderson. I could take that one. It will really depend on how the death certificate is completed. So, if HIV is reported as the underlying cause, it certainly could be the underlying cause. If HIV is reported in part two, it will not be the underlying cause. So ultimately, what the certifier has to decide is how they felt things played out in terms of the cause of death.

Was COVID -- the COVID-19 severe enough that HIV, while it may have contributed or it may have made the decedent more likely to get infected, would it -- was it severe enough that it would have killed them likely anyway, or if -- or not? So ultimately, whether it will be the underlying cause will determine -- will be based on your formulation of the cause of death statement and how you think things played out. Thank you so much for the clarification.

A question going back to suspected or probable causes. The question asks if you have hospital death certificates with either suspected or probable COVID-19, because testing was not completed by the time of death? They were able to track down testing and follow up that it was indeed positive. Is there a need to issue a new death certificate and remove suspected and probable and fill out conformed COVID-19?

Well, this is Bob Anderson again. I'll take that one as well. It's -- every state has a mechanism to amend the cause of death or to provide additional information, if it becomes available. And we generally like the certifiers, when they find new information or when new information becomes available, to do that, to file an amendment to the certificate and to change the cause of death, if needed. This is, I think, more important if you're waiting for confirmation before providing a final cause of death. What we're seeing in many instances is COVID-19 pending test results or things like that, in those cases, yeah, we would like you to amend the certificate with the positive test results.

If you're pretty sure that it was a COVID-19 infection and you've written probable COVID-19, I don't think that there's necessarily a need to amend the death certificate. And, of course, you may do that if you like, but in a case of probable COVID-19 we will count it as COVID-19.

Thank you for elaborating on that. We have received multiple questions regarding autopsies.

Can you first, just to set the stage, please share what you think is the value of autopsy examination in a death, when the obvious cause is COVID-19?

This is Marcus Nashelsky. At this point in the pandemic, the clinical data greatly exceed the pathology data. As most of you on the call know, the autopsy examination is a tool to better describe the breadth of tissue injury and tissue response and how these structural abnormalities in the decedents correlate or don't correlate with a patient's clinical appearance prior to the fatal outcome of the disease. Thank you. So, the follow-up question on that is, "Can you also elaborate on the findings during an autopsy that might suggest that COVID-19 should be suspected?" Yes. Reports from pathologists regarding their COVID-19 autopsies are still early and largely anecdotal.

But there is a predictable pattern of acute lung injury, which is generally known to pathologists by the terminology "diffuse alveolar damage". For now, there is little information about consistent pathologic abnormalities in other organs, such as the brain, heart, liver, and kidneys. There is much more to come, as pathologists examine more decedents. Thank you.

Next question asks, "In some cases, decedents with COVID-19, as you mentioned, may have significant comorbidities that make death a more likely result. Can you please repeat how these comorbidities should be documented on death certificates?"

Yes, hi, this is Lee Anne again. So, like I mentioned in the presentation, comorbidities that decrease the likelihood of survival from COVID-19, we know things like COPD, asthma, diabetes, hypertension, et cetera, those should go in part two. And again, they don't go on part one, as COVID-19 is caused by the SARS-CoV-2 virus and not these comorbidities. So again, those comorbidities should go in part two. Thank you for that, and again, if you need to refer to those, the slides will be available.

They are available on the COCA call's webpage.

The next question is, "COVID-19 happens to be disease, so can -- how can you justify a medical examiner's office or coroner's office being involved in certifying a COVID-19 related death?"

Marcus Nashelsky here again. A medical examiner's office or a coroner's office may be involved in certifying this type of death, because some of these decedents will die outside of the hospital. These decedents will often be within the investigative jurisdiction of the local medical examiner's office or coroner's office. Further, in some states, as was mentioned earlier, there's a public health mandate for a

medical examiner's office or coroner's office to assume jurisdiction on every public health emergency or evolving public health condition, as we see here with COVID-19. In that situation, if state law mandates that the local death investigation system will certify those deaths, even if the patient died within a hospital.

Thank you for that. Next question asks, "If my patient dies of acute respiratory distress or pneumonia and I know that they did not have COVID-19, is it important that I report the death was not due to COVID-19?"

Sorry, I forgot to unmute myself there. This is Bob Anderson. Generally, we prefer that you not report that something was not due to a cause. Generally, if -- well, in all cases, if you do not report COVID-19, we will not code COVID-19.

We will not attribute it to COVID-19. We code what we see, and so we will only code COVID-19, if you report that it was due to COVID-19. Reporting not COVID-19 or not due to COVID-19 or something like that can complicate things from a coding standpoint in terms of processing. Thank you very much. Next question asks, "If patients have multiple serious medical conditions and I am not sure which one is the underlying cause of death, how do I then report the cause of death for those patients?" Yeah, hi, this is Lee Anne again, and this is a very common question that we get.

So, here, again, we encourage certifiers to use their best medical judgment. Like I mentioned earlier, there's no objective cause of death statement. We're not just asking, you know, what the decedent had, what conditions those were, but what you think which ones you think caused the death. So again, just use your medical judgment, and using that, just pick the one cause or causes that you think had the greatest impact on death and put those in a logical sequence in part one. And then, that will sort of also determine what would go on part two.

So, those other serious medical conditions that you think contributed to death but aren't part of that sequence in part one, those go on part two. And then, a little hint that I sometimes like to give to certifiers is, it can be easier sometimes to think of the immediate cause of death and then try to work back. So, if you feel more confident about what the immediate cause of death is, you would put that on line A in part one, and then looking at the other conditions the decedent had, which one's looking at which ones might be more likely to cause that. And then, that can help you sort of work back to the underlying cause of death to put in part one, and then just put those other conditions in part two. Thanks.

Thank you very much.

Our next question asks that, "I'm very concerned that suicides will increase during this pandemic. Are you monitoring for increases in suicides?"

So, this is Margy Warner again. I wanted -- yes, we are able to monitor deaths from suicide, using the vital statistics data in the similar way to the way we're doing it with -- for COVID-19. And we will be monitoring suicide deaths during the pandemic, and we'll release that data, using our rapid release system. Thank you. Thank you very much.

Our next question asks, "I've heard that CDC is not keeping track of race. Do you have information on -- do you have that information on death certificates, and how accurate do you feel that information to be?"

This is Bob Anderson. We are keeping track of race. The death certificate contains an option to report race and Hispanic origin, and we do take that information, and we classify it, and we report on it on a regular basis. As Farida mentioned earlier, we are -- we've just recently incorporated that into our surveillance information on COVID-19. Now, there are some issues with the accuracy of race and Hispanic origin. Obviously, the death certificate is not a self-reported document, and a person's race and Hispanic origins is often a sort of a personal thing. We rely on -- typically, it's the funeral directors that report that information.

We rely on them to get that information from the next of kin or someone close to the decedent, and we ask them to report that. Generally, the reporting is pretty good for most groups. The one group that we really have serious problems with is the American Indian population. We know we underestimate deaths due to -- deaths for American Indians, and if you're interested in that, you can contact us, and we can provide you with a lot of information.

Thank you for that clarification, and we have time for one last question, and this question is regarding coding for COVID-19. Can you please share with our audience if there is an ICD-10 code for COVID-19, and can you also share your process for getting the data from death certificates to those ICD-10 codes?

Sure. This is Bob again. We do have an ICD-10 code for COVID-19. The code is U07. 1. That's an emergency code the WHO issued back at the end of January. What we do to change -- to transform the terms that are reported on a death certificate and ICD codes, it's a fairly complex process that involves a set of coding rules that are developed by WHO with input from the international community. And about 75% or so of deaths are generally automatically coded. We have an auto coding system that reads the text and converts to ICD-10 codes. About 25% are -- require some manual review and manual coding.

Our COVID-19 deaths, at the moment, are currently all manually coded, because our auto coding system currently can't handle that terminology. But we are working to develop an auto coding process for these COVID-19 deaths. Hopefully, we won't need it, but if the number of deaths increases substantially, we want to be able to handle that volume and still report in a timely fashion. Thank you very much.

On behalf of COCA I would like to thank everyone for joining us today with a special thank you to our presenters, Dr. Anderson, Dr. Warner, Dr. Flagg, and Ms. Ahmad, to Dr. Reagan-Steiner and Dr. Nashelsky for joining us for the Q&A session and to Dr. Ann Schuchat for providing opening remarks. All Continuing Education for COCA calls are issues online through CDC Training and Continuing Education Online System at <https://tceols.CDC.gov>.

Those who participated in today's COCA call and wish to receive continuing education, please complete the online evaluation by May 18, 2020, with the course code WC2922. The access code is COCA041620. Those who will participate in the on demand activity and wish to receive continuing education should complete the online evaluation between May 19, 2020, and May 19, 2022, and use course code WD2922. The access code is COCA041620. Continuing education certificates can be printed immediately upon completion of your online evaluation.

A cumulative transcript of all CDC/ATSDR Continuing Educations obtained through the CDC Training & Continuing Education Online System will be maintained for each user. A closed caption video and transcript for this call will be posted on COCA's webpage a few days after the live call at emergency.CDC.gov/COCA. A video recording of this call will be available immediately after the call ends with unedited closed captioning on COCA's Facebook page at

www.facebook.com/CDCclinicianoutreachandcommunicationactivity. Again, that web address is www.facebook.com/CDCclinicianoutreachandcommunicationactivity.

Please continue to visit emergency.CDC.gov/COCA over the next several days, as we intend to host COCA calls to keep you informed of the latest guidance and updates regarding COVID-19. In addition to our webpage, COCA call announcements for upcoming COCA calls will also be sent via email. So, please subscribe to COCA@CDC.gov to receive these notifications.

Please join us again tomorrow at 2:00 PM Eastern Time for another COCA call, where the topic will focus on COVID-19 in the United States and insights from healthcare systems. To receive information on upcoming COCA calls or other COCA products and services, join the COCA mailing list by visiting the COCA webpage at emergency.CDC.gov/COCA and click on the join the COCA mailing list link.

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