(MUSICAL INTRO)

HOST: NCHS closed out the year in December with the release of final data on deaths in the United States for 2020. As in past years, these final death statistics focus on conditions or injuries that are listed as the underlying cause of death on the death certificate, and do not include conditions or injuries listed as a contributing cause on the death certs.

Many of the 2020 findings had been released previously, in preliminary or provisional form: The final number on life expectancy showed a decline of 1.8 years in 2020. The final overall death rate in America rose from 715 deaths per 100,000 in 2019 to 835 per 100,000 in 2020 – a nearly 17 percent increase. Death rates increased for 6 of the 10 leading causes of death in 2020, including a nearly 17 percent increase in deaths from accidents or unintentional injuries… as well as a nearly 15 percent increase in deaths from diabetes. Meanwhile, death rates decreased for 2 leading causes of death - cancer and chronic lung disease - and remained unchanged for another cause: kidney disease. Also, suicide fell out of the top 10 leading causes of death in 2020 after the number and rate of suicide dropped for a 2nd consecutive year.

And of course there was a new entry to the list of 10 leading causes of death in 2020. COVID-19 was the 3rd leading cause of death in 2020, with nearly 150,000 more deaths than the 4th leading cause of death, accidents, and over 250,000 fewer deaths than the 2nd leading cause of death, cancer. The final, official tally of COVID-19 deaths in the U.S. for 2020 was 350,831. CDC had reported a higher number of deaths from its case surveillance reporting system, and NCHS had also posted a higher number on its web site, closer to 385,000 deaths - which included any death mentioning COVID. The official 350,831 COVID-19 deaths for 2020 reflects deaths in which COVID was the underlying cause of death.

Joining us today to talk about these 2020 numbers for COVID-19 numbers, as well as the difference between tracking underlying causes of death and contributing causes of death, is Mortality Statistics chief Robert Anderson.

HOST: The final data for 2020 show over 350,000 deaths from COVID-19, meaning the virus was the underlying cause of death. Can you explain what the underlying cause of death means?

ROBERT ANDERSON: The underlying cause of death is the condition that initiated the chain of events leading to death. When the death certificate is filled out, the person who's reporting the cause of death is asked to identify a chain of events, sort of a causal pathway, working from the immediate cause back to the underlying cause. So an example of a chain of event or pathway would be viral pneumonia due to COVID-19. That's a causal pathway - COVID-19 causes viral pneumonia which then would kill the person, so COVID-19 in that instance is considered the underlying cause of death – that condition that started everything forward. And the reason why we tend to focus on the underlying cause is because that's the condition that's considered most amenable to public health prevention, the idea being that if you can prevent the underlying cause then you can prevent the entire chain of events from occurring.

HOST: Now there might be some confusion because the number that had been reported for 2020 was close to 385,000 deaths. So what about those other (almost) 34,000 deaths that some people thought were COVID-19 deaths but aren't included in this latest tally?

ROBERT ANDERSON: Right, so the 385,000 deaths that we would refer to as "involving COVID-19." The other 34,000 would be deaths in which COVID-19 was a contributing factor but not the underlying cause. So it may have exacerbated an existing disease or it may have contributed in some way but it wasn't what initiated the chain of events leading to death. And the person who is certifying the cause of death - usually it's a physician, medical examiner, or coroner - has to determine what role COVID-19 played in causing the death, and this is essentially three options: it was the underlying cause and it initiated that chain of events; it was a contributing factor and played some role but it wasn't the underlying cause; or it wasn't a factor at all, in which case it shouldn't be reported on the death certificate.

HOST: OK so it seems like there's a fine line there and this sort of prompts another question: In the new 2020 final data, we see significant increases in deaths from diabetes, for example, also from Alzheimer's disease… heart disease… and those are the underlying cause of death so is it possible that some of those deaths, COVID-19 was listed as a contributing factor?

ROBERT ANDERSON: Sure it's likely, actually, that for some of those conditions COVID-19 was listed as a contributing factor, and it may have been a contributing factor in cases in which COVID-19 wasn't listed as well - particularly in the beginning of the pandemic back when we didn't know very much about the disease and when there wasn't widely available testing. It's possible that some of those deaths are actually COVID deaths but were attributed to those other causes. So the increase may be COVID-related. There is also this other category that's sort of important to recognize as well, and these are cases in which the death may have been related to the pandemic but not to the virus specifically. This would be cases where people perhaps didn't get the care that they needed for whatever reason - either they were afraid to go to the hospital or the doctor or they weren't able to get into the doctor. Particularly with a disease like diabetes that requires a fair amount of maintenance and monitoring. If people are not going to the doctor to get checked out they're gonna be at higher risk of dying.

HOST: So again, for those who might be confused about this, obviously with COVID-19 you have a very wide spectrum of severity - you've got people who may have had it but never knew they had it, or people who have tested positive but never had any symptoms, to the other end where people are severely ill. How is it determined on the death certificate for COVID to be just a contributing cause? It would seem like, wouldn't it be like one or the other? Either it was an underlying cause or didn't really play a factor?

ROBERT ANDERSON: Well it's a complicated issue. So you could have for example somebody with COVID who has symptoms, is symptomatic, but the symptoms aren't particularly severe, but in a case with somebody with like chronic obstructive pulmonary disease or somebody with a heart condition, a serious heart condition, even fairly mild COVID symptoms could sort of push them over the edge and then the certifier has to make a judgment as to what role COVID played in that scenario. And it's not not always easy - sometimes it can be quite straightforward, other times not so much, particularly when you have somebody who has

multiple serious chronic diseases or people who perhaps are terminally ill. The certifier has to decide what caused that person to die when they did and in some cases it might be that COVID caused them to die when they did, but it might also be a case where COVID just sort of made things worse and they died from the pre-existing condition. It can be a difficult decision to make.

HOST: I know I've asked you this one before but just again to clarify: If someone is admitted to the hospital with an injury – a car accident for example – and they are tested for COVID and test positive, and then they die from their injuries in the crash –COVID would not be a "contributing cause" on the death certificate correct?

ROBERT ANDERSON: In most cases I think not, but it is possible that COVID could complicate the clinical situation such that it makes survival less likely. It would depend on the severity of the injuries - maybe the person comes in and they've got a very severe injury and they simply test positive for COVID and there are no symptoms that are likely be incidental to death. But if you had somebody who let's say had chest trauma from the car accident and they were, they're struggling to breathe already… They get COVID in the hospital and they're showing some symptoms… there, it could contribute. So it's really - the certifier has to look at the whole clinical picture and then make a judgment as to whether COVID played a role and then what role it played in the death, if they determine that it played a role.

HOST: In looking at some other examples the one that comes to mind would be influenza –does influenza turn up a lot on death certificates as a contributing but not an underlying cause of death?

ROBERT ANDERSON: Not very often - influenza is substantially underreported on death certificates to begin with. It's a little better now than it used to be with the rapid testing, but very often when people die from the flu they're dying of the complications of the flu, and often after the point at which it can be determined that they had the flu. So somebody gets the flu, they're at home for seven to 10 days with that, they develop a secondary infection, bacterial infection, let's say bacterial pneumonia, and struggle with that for a few more days and then go to the hospital. Even if they're tested for the flu they're not going to test positive, flu is not gonna show up, so it can be very difficult unless the certifier knows that the person had the flu and understands the chain of events to figure out what happened. So I think we'd have similar issues with COVID if COVID wasn't so prevalent. And if the flu was a lot more prevalent and we did a lot more testing for the flu, I think it would tend to show up on death certificates more often. Again, it goes to trying to figure out what the chain of events looks like and what initiated that chain of events. And the certifier needs some sort of evidence that the flu was a factor and if they don't have it, they're not likely to report it on the death certificate. So what we end up with is, we end up with a few thousand deaths a year where the flu is reported on death certificates, where modeling analysis show that it's more like 30 to 60,000 depending on the severity of the flu season.

HOST: Are there any other conditions which often turn up as "contributing" but "not underlying?"

ROBERT ANDERSON: Yeah I mean diabetes is one of those conditions. If you look at the total number of diabetes deaths where diabetes is the underlying cause, you see, well just take 2020 for example, the number is about 100,000 deaths but if we look at how often it's actually reported on the death certificate we see a whole lot more. Something on the order of - I don't know what the number is for 2020 at this point but in in previous years it's been somewhere on the order of 250,000 cases. So diabetes is one of those conditions that frequently shows up as a contributing factor and it certainly does often contribute, it complicates the clinical picture and makes survival a lot less likely in many instances. It's also one of those conditions where it's hard to understand for sure where it fits in the chain of events, unless somebody has sort of a hyper osmolar reaction or something like that, they kinda have to figure out - OK, well, this person had diabetes, it wasn't well controlled, and they died from stroke, what role did diabetes play if any? And it likely would have played a role because it tends to make cardiovascular diseases like heart disease and cerebrovascular disease worse.
HOST: So for the 2020 data then there could be some diabetes deaths where COVID-19 was a contributing factor. And it could also be the opposite, right? Where it could be a COVID-19 death where diabetes was maybe a contributing cause?

ROBERT ANDERSON: Sure yeah, I mean, we do know people with diabetes are very susceptible to severe disease and COVID. And so it's likely in many cases that you would see diabetes reported along with COVID on the death certificate, as a contributing factor.

HOST: Just one more question about the contributing causes. So then, that section of the death certificate would also be where contributing health behaviors -- or unhealthy behaviors more likely -- would that be where, like, smoking, alcoholism, drug abuse… would that be listed as a contributing cause assuming it wasn't like an overdose or something like that?

ROBERT ANDERSON: Yeah it could be and we do see that. It's not reported very consistently though - a lot of certifiers don't like to list behaviors on the death certificate. They want to report clinical conditions, diseases, or injuries, and so they will often leave off sort of behavioral type things. So while we do see it - you can see smoking reported, for example, and there's a checkbox item as well that asks the certifier of tobacco played a role or not. That's one of the reasons why we added that checkbox was to try to capture that information because it wasn't reported consistently on the death certificate. We do see things like drug abuse and alcohol abuse reported on the death certificate but normally if alcohol abuse contributed to, say, cirrhosis of the liver and killed someone, normally the certifier would report alcoholic cirrhosis and so the alcohol abuse would be implied there.

HOST: Any other points about this you feel are important to note?

ROBERT ANDERSON: I think it's important to note - you mentioned the 385,000 deaths that we were reporting in our surveillance website and compared with the 350,000 underlying cause deaths. And some have asked questions about that and my answer typically is that for surveillance purposes we like to cast a slightly wider net, because we want to get a better sense for the impact of the disease or the pandemic on overall mortality. But when we start to really boil down the numbers and start comparing causes of death, we need to have a single cause reported for each person and that's the underlying cause of death. Because we don't want to

double-count deaths in our in our tabulation so we limit to the underlying cause when we're ranking leading causes, for example, or when we're creating a table of various causes of death. But for surveillance purposes, when we're trying to capture the impact of the disease we cast a slightly wider net and so we look at both underlying and contributing factors.
HOST: Thanks for joining us again Dr. Anderson.

ROBERT ANDERSON: Happy to do it.

(MUSICAL BRIDGE)

HOST: NCHS capped the year with four more reports released in the final week of 2021. The first report focused on emergency department visits to people with mental health disorders, featuring data from the National Hospital Ambulatory Medical Care Survey. A second report looked at pre-pregnancy body mass index and infant outcomes, showing that infants fared better among women who were at normal weight prior to their pregnancy. A third report also looked at pregnancy – in particular, maternal and infant health outcomes among women who had confirmed or presumed COVID-19 during their pregnancy. Data from 14 states and DC were examined for this study. The fourth and final study from NCHS in 2021 featured the final, official numbers of drug overdose deaths in the U.S. for 2020, a report that is updated annually.

(MUSICAL OUTRO)