COVID-19 Investigation Training – Epidemiology and Public Health Response Transcript

0:04
Hello everyone. My name is my Maayan Simckes. I'm an epidemiologist with the Washington State Department of Health. And today, I'll be talking with you about COVID-19 investigation training, specifically on the topic of epidemiology of COVID-19 and public health response here in Washington State.

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There are a number of topics we will cover in this training, including some background on the COVID-19 illness, epidemiology of COVID-19, the concept of flattening the curve, contact tracing, and the ideas of isolation and quarantine. First, some background, COVID-19 was first reported in late December in China under the name novel coronavirus. There has been rapid International spread since then, with the first known US case reported in Washington State in late January.

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WHO declared a pandemic and gave the official name of COVID-19, which stands for coronavirus disease 2019. It is caused by the SARS-CoV-2 virus. I want to make a distinction here because the difference between these two is important to note. You'll see the terms used interchangeably sometimes in the media, but the correct terminology is that COVID-19 is the disease and SARS-CoV-2 is the virus that causes the disease.

1:22
From a global perspective, we've seen around 3 million confirmed cases, and approximately 200,000 deaths in almost all countries around the world. In the United States, we've seen approximately 1 million cases, and at this point, over 60,000 deaths in all states. Washington State has had around 14,000 cases and around 750 deaths in all, except one county.

1:55
We actually aren't able to identify every case of COVID-19 around the globe unless we've all been tested. And then, finally, there's some delayed reporting and that's because the time between when somebody is symptomatic and they get tested and when that testing information makes it into these counts can be pretty long and it can have at least a two-day delay for us to know about it, particularly in Washington state. So keep in mind that these numbers all have a bit of a lag to them.

2:31
Let’s look a little bit more in Washington State. But as I said, we've had around 14,000 confirmed cases. At this point, we're actually at around 800 deaths or so, and that works out to be around 5.7% case fatality. That means that we've had about 5.7% of the individuals who tested positive for COVID-19, die in our state. We had a total of a hundred and eighty-seven thousand eight hundred, roughly, tests in the State of Washington, and 7.5 percent of those have tested positive.

3:03
This is relatively comparable to other places around the country. Within Washington, most of the cases have been clustered in Snohomish, King and Pierce Counties, and we're also seeing more cases now in Yakima.

3:21
I want just to show you an epidemic curve because this is an image or graphic that has been really circulating quite widely in the past several weeks. An epidemic curve is really just a chart that shows you the date of onset, and the case count. In other words, if we were to look at say March, let's call this

March first, we would know that there were let's say roughly 45 individuals who have a symptom onset in our state on this particular date.

3:51
Each bar represents the number of individuals with symptom onset on that date that are shown here on our horizontal axis. So, we can look from early February to late January here, follow it over time and you see an increase in the number of individuals experiencing a symptom onset.

4:06
When you start to see a drop-off, what's important to remember back to the early part of the presentation when I talked about the delay in reporting, and the delay in our identification of these cases- so everything in this box is likely a decent under estimate. If we look even at today, individuals who have symptom onset today are not going to end up in our actual list of cases for another few days yet, until they've been tested, they've tested positive and then we've also been interviewed. So keep in mind that these all will jump up to better reflect the true number of individuals who have experienced symptom onset during those days. And again, this is called an epidemic curve or what we call an Epi curve.

4:48
It also shows that we are looking right now at person-to-person transmission. It means that the disease is traveling between individuals, and it's not just a single point source. So if we had a foodborne outbreak of salmonella in a restaurant, we would expect all of the cases to be clustered much closer together just to give you a little bit of some epidemiologic knowledge here.

5:10
What is a case? It seems like a simple term, and we're using it pretty widely in the public right now. But really it's a strict definition that we use to separate cases into confirmed and probable. So a confirmed case is an individual who has a positive PCR lab test for COVID-19. It's a viral RNA test, and it must detect it in your sample in order to be considered a confirmed case.

5:34
A probable case is a bit different. The probable case has not had any PCR testing, but must have some sort of an epidemiologic link, an epi link. That means having contact with somebody who is a confirmed case. If you have an epi link, and you have either these types of symptoms, these are respiratory symptoms, and non-respiratory, but other symptoms, then you are considered a probable case. The list of symptoms has been changing slightly. We've seen additional symptoms added to our standard definition by the CDC and by the Council of State and Territorial Epidemiologists. All this information will be provided to you separately, as well, so that you'll be able to talk with folks about it during your calls.

6:22
You have reviewed some of these concepts already in some of the earlier training you completed. So let's touch on them is with regard to COVID-19. The incubation period is the time between exposure to the virus and when someone starts to feel symptoms. It tends to be around 2 to 14 days, but usually, it's about five days.

6:44
Symptoms tend to last one to two weeks. Now, this is an average. There are certain individuals who are experiencing symptoms for quite a lot longer, and some who have much milder symptoms that last for a very short amount of time. So again, this is an average. We talked about case fatality a little bit earlier when we looked at the map of Washington. Overall, we're looking at an average of around 2% case fatality, meaning for every hundred people who are infected, we expect roughly two people to die.

7:11
In Washington, that number is closer to about 5%. That's really more of a reflection of who is getting sick in our state rather than suggesting there's anything wrong with, necessarily, with the way our health system is providing care related to COVID-19. So, if we have individuals who are more likely to experience complications that's going to inflate this number for our particular population.

7:37
Two other concepts that are very important in the epidemiology of infectious conditions: This is the concept of having a vaccine and a particular treatment that's going to prevent somebody from being infectious any longer. So at this point, we do not have a specific treatment that we use for COVID-19, nor do we have a vaccine. This was very important to underline why we're doing our investigations the way we are, more on this in a moment.

8:01
Transmission, you've also learned a bit about the infectious period. How long can somebody actually spread this virus? How long are they contagious? It's also called the contagious period. It'ss still under study for COVID-19 and we'll talk a bit more about this a little later on in this presentation. But keep in mind that as the evidence changes, leaders in Washington and leaders of the Department of Health, are looking to make changes within the way that we do our investigations to best reflect the science.

8:31
So again, more on this in a moment. Evidence suggests that people who are infected can still spread the virus before they develop symptoms. This affects how we actually do our investigations. That means, we consider the contagious period or infectious period to actually extend a little bit before when somebody starts feeling symptoms. We'll talk about that as you get more familiar with the actual tools you'll be using to conduct your interviews.

9:00
The last piece here is around asymptomatic individuals. People who are not experiencing any symptoms at all, and never experience any symptoms, but still are infected, and there is some evidence to suggest that they're able to spread the virus. And this is a topic that's currently being examined further within our state, within the scientific community.

I want to shift over and talk about the reproductive number. R_0, as you've heard, I'm sure, in the news or the reproductive number is a concept gaining quite a lot of attention.

9:29
But it's really nothing new. It's something we've been using for quite a long time in infectious disease investigations. So the R_0 is the average number of susceptible people that one person with the virus infects. This is specifically in a context where there is no public health intervention. So, for example, when we think about measles in a community that has no vaccination, and there is no effort to separate individuals who may be infected from those who are susceptible.

9:59
The R_0 can range from around 12 to 18. Meaning, that one person with measles can infect up to 12 to 18 other individuals. That's quite high. The R_0 can be affected by a number of factors.

10:14
The first is the infectiousness of the pathogen; next is the duration of your contagious period, and last one is the contact rate between the infected and susceptible people. This last point here is what we're really focusing on when it comes to COVID-19. How do we limit that contact rate, or how can we limit

the amount of time that infected individuals spend with those who are susceptible? The reproductive number essentially changes over time based on what we do within our community. So the work we're doing in Washington is to help bring that $R_{0,}$ that R value, reproductive number, below one. This means that every individual would be likely to affect less than one person throughout their particular illness.

11:03
Transmission: How is COVID-19 actually spreading? We know that it spreads person to person through respiratory droplets and probably also through feces.

11:14
We also know that those respiratory droplets can end up contaminating surfaces or objects, and that too can infect another individual. We are most concerned about when a person coughs, or sneezes, or is also within close contact with another individual. Generally, around six feet and usually for an extended period of around 10 minutes.

11:41
There are several symptoms for COVID-19 and some of them we've already talked about. The three that we see the most, and people talk about the most, tend to be fever, cough, and difficulty breathing. Additional symptoms include, chills, and fatigue, sore throat, headache, muscle aches, diarrhea, and loss of taste or smell. And it really can be any combination of the above.

12:05
Symptoms tend to appear in a few is 2 days or as long as 14 days, after someone has been exposed to the virus. That is the incubation period that we've talked about.

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How severe is this illness? Well, reported cases range from quite mild, which can look kind of like common cold, to very severe where an individual must be hospitalized, and sometimes intubated to help with the breathing. But, generally around 75% cases have mild to moderate illness.

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Deaths have mainly been reported in older adults who had other health conditions, but we are seeing cases where individuals die and they're younger and maybe have no underlying conditions whatsoever.

12:51
In Washington State, we have several public health priorities related to COVID-19 and the first one we'll talk about here is this concept of flattening the curve. heard about this in the news and you've probably seen this graphic at some point but I wanna come back to it because I think it's a really helpful illustration of what we're trying to do here in Washington. The first goal is to reduce the number of ill at any point. If you think of this like our epidemic curve that we looked at earlier, at this particular point, that's a whole lot of people in our daily number of cases that are ill at that particular moment.

13:21
If we can take this whole area under this curve and spread it out over time, what does that do? It gives us more time to help shore up our resources within the healthcare system to improve the information we have on the disease, to develop new and more effective diagnostics and therapies, and also to consider the possibility of useful and effective vaccines.

13:51
So again, to flatten the curve ultimately supports our ability to do good public health work and help support our healthcare system to be able to provide continuing good and supportive care.

14:06
So how do we flatten the curve? There's a variety of steps we can take and we are working on all of them here in Washington. The first is expanded testing, next is physical distancing and community closure, environmental cleaning as appropriate, and providing support services for those who are at home in isolation or quarantine so that they remain home, they don't have to go out, and then can get the care that they need.

14:49
Where you all will come in is in the disease tracking stats to help flatten the curve, and that is case and contact investigation. One of the key objectives is isolation of sick cases, and the other objective is to quarantine of exposed contacts.

Our response in Washington is an interesting one. We are considered a decentralized or home rule state when it comes to public health, which means that normally local health jurisdiction would be performing all of these interviews. But, due to the tremendous volume of work associated with this pandemic, some local health jurisdictions have turned over some of their investigations to the Department of Health, who will investigate on behalf of the local health jurisdiction. In other words, the Department of Health, which is a state agency, is invited by the local jurisdiction, to assist in their work. So, we are calling this our centralized investigation approach.

In that approach, we are calling each case, meaning anyone who has had a positive PCR lab result. We are asking about symptoms, exposure, and contagious period. We are gathering close contact information for contact tracing, and providing them with quarantine guidance. Finally, we are interviewing contacts who actually have symptoms, and those are the cases that we're calling probable cases because they don't necessarily have a positive lab result but they do have symptoms and they're a known close contact of a confirmed case.

I wanna take a moment and walk through this concept of contact tracing with a visual.

16:05

It is a complicated concept to follow and unless you have something in front of you to think through each of the different scenarios and a visual to which you can compare it, it really can be difficult to grasp at first. Let's take a few minutes and walk through this.
16:21
Here we have a known case, number one. This is a test positive case of COVID-19. We call this case and do an interview and find out that they had contact with individuals two, three, four, and five while they were infectious. Individuals two and three, we call them for a contact investigation and we speak with each of them and find out neither has reported any symptoms.

16:51
Those two individuals last saw our known case within 14 days before we called them. Meaning they saw the known case, we called them, it has been, let's say, six days since they saw the known case, and they do not have symptoms. For these individuals, we instruct them to follow the quarantine guidelines because they don't have symptoms yet and we ask them to monitor and stay at home.

17:15
Individuals four and five, however, both identified that they did have symptoms. Those individuals are instructed to follow isolation practices as they are considered probable cases. We also conduct a

followup interview then with each of these probable cases, rather than simply a contact interview. When we interview number four, we find out that they had contact with nine, 10, and 11. 10 is asked to sit under quarantine guidance.

17:39

11 is considered a probable case and is told to isolate. We speak with 12 and 13 here because 11 had contact with them during the infectious period. Both 12 and 13 are considered to be contacts who are not symptomatic, so they are simply going to be asked to follow our quarantine guidance.

18:02
Let's jump over here to number five. Number five developed symptoms and is considered a probable case. Six and eight will be asked to follow quarantine guidance. Seven developed symptoms, meaning that seven is a probable case.

18:21
Seven and four both had contact with number nine.

18:26
So when we think about number nine, when do we tell number nine that they no longer need to quarantine? For each of these individuals, like ten, and six, and eight, they had contact with only one probable case of COVID-19, so we know exactly when the last time was they saw that individual, so we can tell them when to start counting their fourteen days of quarantine. More on that in a moment. But, for number nine, this individual has had contact with two people who have both been identified as probable cases.

19:00
For number nine, we need to find out the last date that number nine was in contact with either four or seven. That latest date is the date you will use to calculate the duration of number 9 quarantine period. This sort of double connection with some of the more complicated lines that are here, this is more of what we see in the real world. It's unlikely that somebody will have only one or two contacts, and it’s unlikely that one individual will only come into contact with two people. The challenge is we don't always know about when people are in contact with others. We also don't always know who has symptoms and who doesn't.

19:34

And one of the benefits of having our current practice of staying at home as directed by the governor is it does help us tease out these relationships a bit more clearly since folks really aren't traveling and visiting with others as much. So I wanted to walk through that process, we'll go back a slide, to make sure that everybody understands this is complicated and it's okay. We know and we're gonna work with you all to make sure that you have the resources you need to understand how this process works.

20:07
So what's the actual guidance that we give to people when we interview them? Let's talk about isolation versus quarantine. These are terms that are often misused in the media, in the public sphere, and it's important that you, as representatives of the public health world, understand these concepts. So let's talk about them. Isolation, as we've talked about before, is taking sick people and making sure they're separated from others to stop the spread of infection.

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So isolation, again, is when you find a sick person and you separate them from others to stop them from spreading the disease. Quarantine is when we find people who were exposed to a sick person but who are not yet sick themselves. So you've been exposed to an individual who is sick, you're not sick. And we're asking those individuals to separate from others to monitor for symptoms.

21:06
The governor's order to stay home and stay healthy is neither a quarantine nor an isolation order. This is an order for social distancing and movement restrictions. It's important to emphasize to you all at least that quarantine and isolation mean something different. So when people say they're self-quarantining or self-isolating, the correct way to use that phrase is when you are truly in isolation or you are truly under quarantine.

21:36
We like to make sure that people are using the correct terminology because, particularly in times like this when fears are high and people are stressed and anxious, we don't want to make worse any of those particular symptoms. We don't want to make people more worried or more concerned by using terminology that may sound scarier than it needs to be. So let's allay fear and make sure we understand the difference between isolation and quarantine. What does isolation actually mean?:

22:06
When someone's in isolation, they must stay home until three days after the last symptoms clear, and at least seven days after symptoms began. This is tricky. We'll go over it again on the next slide.

Quarantine, this is somebody who must stay home until 14 days after the last exposure to an ill person.

22:30
So this is an individual who is not symptomatic but was exposed to a case who is symptomatic, who is sick, and now they must stay home for 14 days to ensure that they do not develop the illness and spread it to others. If symptoms develop, this person becomes a probable case because they have an epidemiologic link and because they've developed symptoms that align with COVID-19.

23:02
If they end up testing positive because they go in for a test for COVID-19, then they become a confirmed case.

23:07
Let's walk through a common example. We see this one quite a lot. Sarah started feeling sick on April 1st and she tested positive for COVID-19 on April 3rd. On April 10th, all of Sarah's symptoms were gone. So let's think about what Sarah needs to do. First of all, Sarah's sick so we're thinking about her as a confirmed case, not as a contact, so the terminology we're thinking about here is isolation. So Sarah must stay home and isolate for three more days after her symptoms cleared. She can leave her house on April 14th.

23:43
And why is that?

23:49
On April 1st, she tested positive. The first rule, let's scroll right back a slide, here, she must stay home until three days after her symptoms clear and at least seven days after her symptoms began.

24:05
Her symptoms cleared on April 10th. Three days after April 10th, a full three days, is April 14th. If we think about that seven-day directive, the 14th is certainly more than seven days after the first date that she felt sick. So if she leaves home on the 14th, she meets both the need for the three days after she has her symptoms cleared and the seven days after her symptoms started.

24:36
I know it's a bit complicated. We can walk through this again down the line with team leads and we'll have examples for you written out as well

24:45
Let's think about Sarah's two children though. Sarah has two kids. They stayed home with her through the duration of her illness. Neither of them developed any symptoms whatsoever but they did stay home with Sarah. They must stay home until 14 days after their last exposure to an infectious case.

25:14
Because they were home with Sarah, they have to start counting their 14 days from Sarah's last day in isolation. So that means the two kids still need to complete their 14 days of quarantine because they do not have symptoms, it's quarantine, not isolation, and they start counting from Sarah's last day in isolation. Sarah's last day in isolation was April 13th. The kids must stay in quarantine until the 27th. That is 14 days after Sarah's last day in isolation, which is the 13th.

25:43
When in doubt, ask. We know there's a lot to learn. Some of these situations can be particularly complicated. But we also know that everyone has a very different background when it comes to public health. Some of you may have public health training or clinical training, but many of you don't and that's totally fine. We are happy to have volunteers with a range of backgrounds and we're hopeful that your team leads will be able to provide you the support you need to walk through those complex scenarios.

26:13
They will be able to also answer your questions related to your investigation work. Please ask questions. It's how we all learn. Thank you all so much for tuning in and we look forward to working with you.