



# Q&A on the Coronavirus with a Top Infectious Disease Specialist - Transcript

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by Advisor Perspectives

We held a Q&A webinar with Julie Parsonnet, a top infectious disease specialist at Stanford University. Here is the transcript for your reference.

Here's a link to the replay if you would rather just listen.

**Bob Huebscher** Welcome to today's webinar, a Q&A session on the Coronavirus with a top infectious disease specialist. This is your opportunity to ask questions, so please use the Q&A tab on the webinar console to submit your medical questions. I'm going to do a two-minute introduction and then we'll jump into the Q&A during this crisis. Our goal is to provide you with accurate and timely information, information that will enable you to help your clients meet their financial goals. That's our mission. We believe this information should be free. We're aware that other publications are charging for presentations similar to this, but that is not the approach we're taking. My guest is Julie Parsonnet at the George DeForest Barnett Professor in Medicine and Professor of Health Research and Policy at Stanford University. She specializes in adult infectious diseases.

She has had an active research enterprise in which she studies the way infections contribute to the development of chronic diseases, including cancer, allergy, and obesity. She has had continuous funding from the National Institutes of Health for over 25 years and has served as a member of numerous advisory boards, professional societies, and scientific review committees. We're very privileged to have her here to answer our questions. But I also want to take one minute to give you another explanation as to why she's here. If you look closely at our pictures, you may notice a slight resemblance because we are second cousins. But Julie's mom and my dad were first cousins and grew up together in Vienna and we're very close as children. And that was until my dad left in 1938 and I believe her mom left in 1939. Julie's grandmother and my grandfather were brother and sister, and Julie and I have a common great grandparent. So it is also through the oral and written histories that her mother and her grandmother provided that we know much of the ancestry and the history of my family. So I'm indebted to Julie in more ways than one. So during this Q&A, you will see a number of pop-up questions that will be polling questions. Those are intended for financial advisors. If you're not an adviser, you can ignore them if you want to see the results of those polls. Please send us a note through the Q&A tab. We will display the results of the final polling question, which I think all attendees will be interested in seeing. Please stay tuned for the entire 45 minutes.

With that, let's jump into the Q&A.

**Bob Huebscher** Julie, first question, what are the metabolic pathways by which the virus enters your body and what happens in your body that the virus causes the symptoms that we've heard of?

**Dr. Julie Parsonnet** First of all, it's important to know most people who are infected with this are really asymptomatic and actually have very little entry of the virus into their body. It spends most of its time in the upper respiratory tract and doesn't really go much further than that. It attaches to receptors on the mucosa of the respiratory tract, but it doesn't seem to do anything further. But a subset, probably around 20 percent or so, will get significant symptoms from it. A subset of them will get very significant symptoms.

**Dr. Julie Parsonnet** The organism itself attaches to a receptor called the ACE2 receptor on respiratory cells, which are in the upper respiratory tract, but also in the lung in their lower respiratory tract and they can penetrate into the cells and actually cause lysis of those cells. The organism does seem to have some very complex phenomena that are unclear, imperfectly understood in humans yet about why the infection is so differently manifested in one person than another - why it's so clearly related to age, for instance, that people get severe disease and why it has cardiac effects. The organism does seem to have profound effects on the heart in some people, which are not yet at all understood.

**Bob Huebscher** What do we know about how long the virus persists in the air or on surfaces until it loses its infectious ability?

**Dr. Julie Parsonnet** There was a recent paper that just came out yesterday in the New England Journal of Medicine where they looked at how long it lasts and it depends on the type of surface. For instance, on copper, it doesn't survive at all. On cardboard, it lasts for less than 24 hours. Those surfaces seem easier to get rid of it than others, but it can last for longer periods of time on things like stainless steel that can last for over 48 hours and on glass. It does last longer on some substances than others, which means it's incumbent on us to clean those surfaces. Those, fortunately, are very cleanable surfaces with alcohol and bleach and surfaces like cardboard, which are less cleanable, it seems to last a shorter duration of time.

**Bob Huebscher** What do we know about whether people will develop immunity once they recover from the virus?

**Dr. Julie Parsonnet** That's a great, great question, and that is one of the huge holes in our knowledge and is absolutely critically essential for this virus. We expect just based on other viruses that people are likely to have some degree of protective immunity once they have been infected. But we really don't know that for sure. There has been at least one reported case of somebody being infected, possibly twice, which suggests that there may not be much protective immunity, although it wasn't clear to me that that person was sick the second time around. It is essential that we know that because that's how we create vaccines by knowing that we can get protective immunity from exposure to the organism. I expect that there are a ton of people working on that? There has been nothing published that I'm aware of today that demonstrates that we do have protective immunity. But it is certainly the hope. It is consistent with many other viruses that we'll get some level of protective immunity. How much protective immunity is unclear.

**Bob Huebscher** How soon, from the time when the virus enters someone's body and the incubation period begins, will the test be effective or will the test only work when the symptoms are present?

**Dr. Julie Parsonnet** The test can work before symptoms are present, and it is definitely one of the strategies that people are using now or we're thinking about it to test everybody who's asymptomatic, we just don't have enough tests. But what we'd like to do is to test a broader swath of the population, including people who are asymptomatic and including people who are pre-symptomatic (so before they go on to get the disease). We know that you can see it in people who are completely asymptomatic and we know that you can identify it in some people before they have symptoms. It is identifiable in presymptomatic and asymptomatic people probably a couple days before symptoms occur.

**Bob Huebscher** What are the risks that our hospital systems will be overwhelmed by demand for treatment? And what are you seeing at Stanford and what are you hearing about elsewhere that hospitals are doing to ramp up for greater demand?

**Dr. Julie Parsonnet** The reason for all the controls that we're having right now, I think are largely because of the potential overwhelming of the health care system. So I can tell you, I've heard from colleagues, one in New Jersey and other ones in California, that they are already in this state of being overwhelmed. I was supposed to actually go in for some training tomorrow on protective gear because I'm starting on service next week and they canceled the class because they're out of personalized protective gear so they can't give it. These are huge risks for hospitals as they run out of equipment. I missed rounds this morning because I was in another conference call, but my impression is that we have somewhere between around 13 or 14 patients in the hospital right now and three of them are on ventilators in the ICU and a fourth is in the ICU, not on a ventilator. That's a lot of people. You have to realize that we still have other patients to take care of. People have heart attacks and people have strokes and other things that bring them into the hospital. It's been an enormous increase just in the last week alone. If we keep increasing at this rate, we will have a very challenging time and we'll have to try to figure out where and how to house these people and what to do with our other patients. There is a lot of talk going on about how to manage it. We are trying our best to keep people who don't need to be in hospitals out of the hospital. We are doing our best to improve having spaces where transmission is going to be prohibited. One of the issues about this infection is that you have to have rooms that are either filtered or that have negative pressure so that when air doesn't get blown out into the hallways, but rather it gets sucked in, so people in the hallways don't get hit by the virus in the room. There are very few of those in most hospitals - negative pressure rooms. This is a very complicated thing. The hospitals are all working extremely hard on it, but there comes a point in which they will become overwhelmed, just like they were in Italy. That's the main reason for having all these isolation and quarantine requests and these lockdown requests is to keep the medical system from being overwhelmed. We can see it. We can see it's going to happen. It's very probable.

**Bob Huebscher** It is a sobering and scary thought. What are the realistic prospects for a vaccine and will it require human testing?

**Dr. Julie Parsonnet** Yes, all vaccines require human testing. You need to know if it works. You're not going to give it to a ton of people - you're not going to give it to 300 million people in the United States unless you know it works. It's too much work to produce it and too much work to deliver it. So, yes, it has to have human testing and it has to be safe. We can't give the vaccine to people without knowing it's safe. I'll start with that. Yes, all require testing. They will fast track the testing, but it will require testing. Whether we'll have a vaccine depends again on that last question, whether we develop protective

immunity and what we develop protective immunity to. I know that there are already vaccines in clinical trials and they're looking at that right now. In humans, they've already started phase one trials in humans for safety.

Tony Fauci, the head of NIAID, said at least a year to maybe 18 months before we have a vaccine. They have a big vaccine center at NIH and he knows what he's talking about. I'm hoping that maybe we could squish that down a little bit, but I don't see it happening, just given the challenges of finding whether it works. And then even the bigger challenge of then revving it up and making enough for a lot of people. I think it'll be a while. They won't it won't be in the next few months.

**Bob Huebscher** Of all the preventative measures that we hear of, like washing our hands and social distancing. Are there any that you think have been underemphasized?

**Dr. Julie Parsonnet** I'm just going to mention social distancing first. If we all stayed in our houses and lived in our closets and didn't talk to anybody, this would die out, so I can tell you the social distancing works. Absolutely. In an ideal world, it would work better than hand-washing. Better than masks. Better than closing schools. If everybody stayed home, you would see it disappear. That would be the number one thing. But that's not feasible. People don't do it. Some people have to go in to work. Positions have to go in. People have to deliver mail. We have to have food. We have to do all sorts of things that require people to go out. But the more that you can stay away from other people, the greater the probability that that this will disappear. Again, that's why that's been the big emphasis. On other strategies - hand-washing, not touching your face. First of all not touching your face is very hard.; People do it all the time. Handwashing with soap and water works better than the hand sanitizers which don't kill viruses as efficiently. I think actually if you do have to go out, probably wearing gloves would be helpful because when you have gloves on, you're less likely to touch your face and you'll notice that they're there. You're less likely to touch them. When you put your hands on a shopping cart and things like that, I think having gloves might be helpful. Doesn't even matter what kind of gloves. They're just there really to remind you to not touch your face and to keep you, give you a little bit of barrier between you and the environment. I think social distancing is what we need to do and why the government is emphasizing it.

**Bob Huebscher** What do we know about the origins of COVID-19 and what does it say about the risk for future pandemics? Are we in a world where we should expect viruses like this to pop up and pose pandemic like threats with some regularity?

**Dr. Julie Parsonnet** Yes. I mean, we are. Microbes are infinitely smarter than we are. They can mutate much faster than humans and their job is to spread themselves around the world. That's to infect as many people as they possibly can and to reproduce. That's their job and they're good at it. No matter what we do, we will see viruses arise and infect humans and plants and animals and trees and all sorts of things that they can reproduce successfully. Just like live oak disease in California. We're not the only beings that are going to be subject to these viruses that arise. This particular virus came from a bat. A lot of viruses, interestingly, do come from bats. I'm not really quite sure why bats are such a prominent vector, but it was a bat that infected a pangolin, which is this armadillo-like anteater animal, a very endangered animal. That is one of the most prized animals for black market use for herbal medicines and remedies and things. It was likely sold at a wild market in China. China has now banned wild markets so that you can't sell endangered species anymore on the market and you can't have these markets where you're selling these animals that come from the depths of the jungle, which may help us, because that was probably the cause of SARS as well as MERS. Hopefully doing that might lessen our exposure to these sorts of organisms, but it won't end them. Every year we seem to have a new virus come out to threaten us, whether it's H1N1 or whether it's Zika or whether it's Ebola. I mean, we live in a world that there are more microbes than us and they're more adaptable than us. Yes, we're going to see it all the time. It just depends on the virus itself. How bad is going to be? I want to say, by the way, this is not a very bad virus. Most people are asymptomatic. The problem with this virus is that it spreads really easily and so people who are at risk are going to be exposed.

**Bob Huebscher** What is the roadblock to widespread testing? And will that make a substantive difference in the spread of the Coronavirus?

**Dr. Julie Parsonnet** The big obstacle right now is reagents. Stanford has its own test, but we don't have enough reagents. We don't even have enough nasal swabs to test people if we wanted to. The problem right now is the pipeline of reagents and sampling equipment so that that is the main obstacle. I'm sure if we wanted to, we could sample everybody if we had the reagents and we had the testing machinery - it's not a problem of getting to people. The problem is having the reagents and the infrastructure to run them. All the machines, the reagents and the swabs, all those are problems.

**Bob Huebscher** Can you explain what a reagent is?

**Dr. Julie Parsonnet** Reagents are the chemicals that you need to run the tests. You get the swab and then you have to put it in one solution and another solution and mix them all together. And those solutions are missing. We don't have

enough of them. And people are fighting over them and hoarding them and trying to get them for their own groups. There is just not enough. That's the first problem. Would it help us? I think one thing that will really help us, but we haven't even gotten yet, is an antibody test to show who's been exposed. Because if we knew that there was protective immunity, if we knew that once you're infected, you are protected and you couldn't get it again, then all those people who are asymptomatic and who are protected could go out back into the workforce. We wouldn't have to worry about them. They're all healthy. They're all good. They're protected against disease and they can go back to work. There may be a lot of people like that out there. We just don't know because we don't have a test that's ready to be run with respect to the nasal swabs and knowing who's carrying it. Absolutely it would help us because we could tell those people to stay home until they're negative and have the only people out working or recirculating as people who are not infected. Yes, it would help. It would also help us diagnose people and randomize them to the right treatment.

**Bob Huebscher** How close are we to an antibody test?

**Dr. Julie Parsonnet** I don't know the answer that - I wish I knew. There's one publication from Europe that said they had an antibody test, but I haven't seen any good follow up of that to know that it's actually true.

**Bob Huebscher** When you look at the policy, the policy responses to the Coronavirus, are there any aspects that you think were overreactions? Are there any additional responses that you would like to see?

**Dr. Julie Parsonnet** I think the closure of schools has been an overreaction in some scenarios. I think where that where the infection is very prevalent like it is now in my area where we are seeing a lot of people sick in Northern California, I do think that closures of schools is reasonable, just because you want to get everybody off the streets. In other areas that are closing schools where there's not very much infection, I think closing schools is a mistake. Personally, and the reason I think that is, because children do not get sick and they are not known at this point to be very important vectors. They don't seem to transmit infection very effectively. So they don't seem to be really the problem. Having children home from schools is a huge blow sociologically for children, psychologically for children who really need those sorts of routines. It's very challenging for parents and especially parents who I can least afford to be home from work. I think closures of schools should be something that is really very, very carefully considered and depends on the prevalence of disease in the population and how worried you are and how much you have to close down everything.

**Bob Huebscher** What will be the process for unwinding this crisis? I assume that there will not be a time when the government rings a bell and declares all clear, but once it is clear that the worst is over, how long do you think it will take for things to get back to normal?

**Dr. Julie Parsonnet** You know, I wish I could tell you. I don't really know. This is this number is the number one question, right? How long are we going to be sealed off from this? How long are all of our industries is really going to be threatened by this? So it's a very challenging question. I don't know the answer. Looking at China, there is a model for us of what's going on. China has now really started opening things up again. A little hard to know how much, but they start opening stores, they start opening businesses, they've started having life a little bit, then returning to normal bit by bit. They really started closing things down in January and December, January so it's taken them two and a half, three months before they've started moving things forward again. It will be interesting to see whether they have a relapse of infection, because we don't know whether that will happen or not. To see what happens when they loosen things up a little bit, whether they're going to see rebounds of infections or not, I suspect they might because they still have circulating virus. In the United States, I think if people follow the quarantine issues and follow the lockdowns, they may be able to start to loosen things up within a month. But how much and how long before things get back to normal, it's very hard to know. I think some of it, again, depends on what the climactic effects are - the weather effects on the virus. It's possible as the weather heats up and we get higher humidity that the virus will extinguish itself or it'll be much easier to deal with. Nobody knows that. A lot is depending on what happens with lockdowns, what happens when the weather gets warmer, and what happens in other countries that are ahead of us that can give us some instructive lessons.

**Bob Huebscher** What is known about the effects of COVID 19 on the mother and fetus for pregnant women? Are the effects and risks different depending upon trimester?

**Dr. Julie Parsonnet** I wish I knew. I don't know the answer to that. I know that there are some questions about whether it can be vertically transmitted from mother to fetus. I'm sorry to say I haven't looked at those data, so I can't answer it. Women of pregnancy age are generally spared the adverse effects of this disease pretty well. I suspect that it will actually have very little consequence on pregnancies and fetuses, but I don't know that for a fact. I haven't looked at the data and I don't know that we have enough data to really analyze it at this point.

**Bob Huebscher** If we get items from China or other countries where the disease is prevalent, is there any reason to suspect the Coronavirus germs on those items?

**Dr. Julie Parsonnet** No, I think it's very unlikely, again. I mentioned how long these last on the environment and it may last up to 48 hours, but it's sending being sent from China. It's likely been much longer than 48 hours before then before it was shipped and arrived. I think, no, I wouldn't worry about it.

**Bob Huebscher** Will testing after a potential infection runs its course still show that someone had the virus?

**Dr. Julie Parsonnet** Viral shedding lasts a long time. The thought was that you can shed virus for about two weeks after you acquired it. That might be depending on how symptomatic you are. It could be two weeks after you are totally asymptomatic. There are now data showing that they might shed light for even longer than that. We certainly can find the RNA sequences, the genetic sequences, and saliva for a longer period of time. That doesn't necessarily mean it's transmissible, though, so there's still a lot of work going on to figure out how long it's transmissible. One of the optimistic things that people haven't been really asking about in your group is that we actually are having some successes with anti-viral therapies. Most of the successes that we're seeing are decreases in viral shedding so that we can treat people. There have been a number of drugs that look promising where the viral shedding drops if you take the medication and some of these medications are being tried on people who are asymptomatic or minimally symptomatic and are outpatients, not inpatients in the hospital. I think there are some promising drugs out there. Whether those drugs can be ramped up enough to give them to the number of people that might benefit from them is another question.

**Bob Huebscher** What is the probability that we will soon have a treatment that reduces the mortality rate?

**Dr. Julie Parsonnet** I think it's very likely that we'll have one. I think there are a lot of trials with one drug called Remdesivir and there are a fair number of people in the country on that drug right now. There are indications from the United States and from some of our own anecdotal experience that it may be having some benefits in preventing mortality and severe disease. We'll probably know that within a few weeks. I think we'll have enough data within a few weeks to know how well that particular drug, which is made by Gilead, will work. There is a lot of interest in a medication called hydroxychloroquine, also known as Plaquenil. We know that there was a recent paper published today that suggests Plaquenil may have benefits against severe disease. Because it's already available and is on the market, it may become sort of the standard of care. We're waiting for more guidance on who should be receiving that medication. But that one does look like it may have benefits both in decreasing shedding and decreasing severity of illness and duration of illness. There are some promising things out there. There's a lot of work that still needs to be done to explore them. But again, one of the reasons that we want the social distancing is that we need some time to figure these things out so that we can not have such a huge burden of disease, that we're so overwhelmed that we can't manage these kinds of questions.

**Bob Huebscher** What are your thoughts on having food delivered to a home? Could the virus potentially live on the food or on the items that it's packaged in for some period of time?

**Dr. Julie Parsonnet** I wouldn't be worried about it. I think you should wash your food if it's fresh fruits or vegetables. You should cook your food. I'm not particularly worried about it. I think it's safer to do that than to go to the supermarket if you can afford it and you can do it. It's probably safer to have your food delivered than to go out and get it. You have the same problem with the market, right? People are touching all the food. They're squeezing oranges. You know, you might as well have it delivered and probably has a smaller number of people handling it. There has been no evidence yet that these things are important vectors of disease.

**Bob Huebscher** We hear a lot about masks, are masks effective?

**Dr. Julie Parsonnet** Yes, masks are effective. But you shouldn't wear them. If you're not infected, say you're a healthy person, you're not infected and you wear it out in the street. It's not going to protect you much more than washing your hands and social distancing. That's because most of the people out on the street and the people that you see are not infected. Which is why they're out on the street. You're not going to get very close to them because you have to be fairly close and have pretty close contact with people to get this virus, at least as far as we know it now. So if you stay away, it will probably protect you a little bit more, but not a lot more. The people it's going to really protect are the people who are in hospitals. If you live in a household with somebody who's infected, don't wear a mask because that mask will protect them from spreading it around the house and it will protect your family members. So you want them to have access to masks. That's an important person to have it. The other people who really need it are health care providers, because we have very close contact with these patients. They're very sick, so they're shedding a ton of virus. Then we do things to them that make the virus shed even more. We give them nebulizers inhalers, things that make the virus go out in the air. There is so much virus that gets out if there's a dental emergency from these people. They absolutely need masks and we don't have enough of them. We encourage people, please don't get masks because you're preventing somebody else from having them. I'm supposed to get my training before I go into the hospital next week and they can't get the training because they don't have enough masks to do the training. That's really bad. We want to make sure that there are enough masks for the people who need them.

**Bob Huebscher** Africa is poised to be devastated as people can't practice social isolation there, they don't have access to clean water, they may not have nearly as good health care there. How what are the fears about the virus spreading, particularly in Africa?

**Dr. Julie Parsonnet** There's terrible fears and it's spreading in Africa. The good thing in Africa is that their population is quite young. The average age is much younger than it is in the United States and so their risk is, at a population level, of death and mortality, is substantially lower than it is in other parts of the world. That's part one. They have some protection against that. Apart from the megacities, Africa is not very densely populated. Spread may be a little bit more limited in the less densely populated places. Although in the megacities like Lagos, places like that, transmission can be incredibly fast and aggressive. Yes, there's a lot of concern so far and there's a lot of concern about even being able to recognize it early on in the point where you're able to try to address it. There just may not be the surveillance and the ability to recognize the disease to really deal with it. It's a huge concern and again, a reason why people are trying to limit international travel.

**Bob Huebscher** What are the prospects that the warmer weather, the onset of spring in the northern hemisphere, will reduce the virus?

**Dr. Julie Parsonnet** With things like influenza, it's great. Influenza does not do well in this in the summer. It does not do well with humidity. It decreases its transmission dramatically. For influenza, which is a different virus, it looks good and first for warmer weather. But we don't know about this new virus. We have not seen it before so no one can predict. There's a lot of hope that maybe it'll act like influenza. Some of that hope is based on the fact that when there's a lot of humidity in the air it binds to these viruses and they drop on the floor. They just don't stay in the air as easily when there's a lot of humidity in the air. A lot of it is just based on that physical property how particles act in a human environment, but there's no data. We don't know. We're keeping our fingers crossed that maybe that'll be the case, but this is a different virus from influenza and it doesn't act the same as influenza in many respects. We can only just anticipate and hope that that's the case.

**Bob Huebscher** While we're on the subject of influenza, to what degree does a flu shot provide any level of protection either against the virus or against its symptoms?

**Dr. Julie Parsonnet** It provides no protection against Coronavirus. Zero. What it does, though, is it protects you from getting influenza and influenza it can look a lot like coronavirus. It can be very confusing to medical care practitioners. We encourage people to get the flu vaccine because it'll prevent you from getting flu. There still is actually we're getting a second sweep of flu in the United States right now. We had a recent death in our area and influenza in one of the same hospitals that had coronavirus. We do encourage people to get the flu vaccine because it just will make things easier on the whole society to not have two viruses circulating at the same time.

**Bob Huebscher** What have you seen in countries like South Korea that they've done differently to prevent this spread as opposed to, say, Italy, as well as not just preventing the spread, but having lower death rates?

**Dr. Julie Parsonnet** Italy has a lot of elderly people, so they have a lot of people at risk and that can explain at least some portion of their higher mortality rates. Italy was a little bit slow in shutting things down and they had a lot of people move out of the area that was at highest risk. There were 10,000 people sort of run away from the area that was having transmission within the first week or so. When they were saying, please don't travel, a lot of people left. Italy was slow in shutting things down and has a lot of high-risk populations and was very quickly overwhelmed. Korea had a very localized infection to start, as Italy did. Italy had a very localized outbreak to start, but they didn't close it down. Korea had a very localized outbreak to start as well that was in a religious community, a religious sect, and the government was very quick to pounce on it. There were practices that made the virus transmit really effectively in the small group. Because it was a very clear and isolated group, they were very quick to be able to pounce on it and get those people to stay in one place. They were very quick to impose travel restrictions and they also had a lot of testing. They had a very rapid increase in testing that we have not had in the United States. They did a really good job. I have to say that Asian societies, in general, are much more willing to comply with these sorts of social restrictions than the United States, where we have such a high value on independence and being able to do what you want and not having these sorts of impositions from governments. We have a hard time with that. People don't like to comply. We also have a lot of states and they all do things differently.

**Bob Huebscher** Is it true that that health care workers have to change their protective gear after they see a patient, particularly one who's been infected?

**Dr. Julie Parsonnet** Yes, you're supposed to change your protective gear. The CDC is coming up with new guidelines this week about that because they're very aware of the shortage in and protective gear. I will say that the CDC is not in charge of the supply lines for these things, they have nothing to do with it, but they are out there trying to say what you do when the supply lines fail. We're going to get some new guidelines about that, new guidance on the protective gear this week. It would be nice if we didn't have to change it on each patient - if you could just stick it in your pocket and then use it for the

next patient that you see. But we have not been given guidance on that yet.

**Bob Huebscher** Are there any prospects for treatment with antibiotics?

**Dr. Julie Parsonnet** There are antivirals, not antibiotics. I mentioned before that there are quite a number of treatments that are being tried and some of them are looking promising. I wouldn't say that they are a cure-all because we've had people on them who have died, but there are some that are looking promising and improving outcomes.

**Bob Huebscher** Can you be more specific about who is at the greatest risk? It's obviously the elderly people with certain underlying health conditions, but are there any specific underlying factors that stand out to you?

**Dr. Julie Parsonnet** The obvious one is the very elderly people, over 80, just massively increased risk, and there's no question about that. The elderly have a lot of senescence, aging of their immune responses, and just seem to be at massively increased risk because of that. That, by the way, raises the prospect that maybe a vaccine will work because it is the lack of immune response that makes you at highest risk. Being able to boost the immune response should put you at lower risk. Hopefully, a vaccine will be effective. Others at risk are those with disease are those with hypertension, obesity, has a history of smoking, people who have underlying lung disease, seem to be at higher risk. People who are smokers, have emphysema, asthma and those people seem to be at higher risk. People over age 80, their increased risk is 10, 15 fold higher. People with hypertension, maybe one and a half to two-fold higher. It's not a ton more risk. We are seeing people with no risk factors be quite sick. Those are some of the things that are risk factors. I will say in California, we've had now quite a number of deaths and none of them has been below the age of 50. You start really seeing that increased risk at the age of 50, a lot of them 60, and then increasing risk as you get older.

**Bob Huebscher** My wife is a dentist. Should she stop seeing even emergency patients?

**Dr. Julie Parsonnet** Depends where you are. I would say that in California and northern California, all dentists have shut down except for emergency patients. We have a lot of Coronavirus here and dentists have a very high risk, probably as high a risk as anybody could have because of the aerosolization of particles. If you're in a community that hasn't seen any disease at all and you don't see it coming in in the near future, then I think she can keep her business open. I had a conversation yesterday with a dentist in Colorado that's had a couple of cases in his town and they have shut down all the dentist office to anything except emergencies. I think if you have cases in your town, I probably would not see patients except as emergencies and I would try to calibrate how much of an emergency it really is.

**Bob Huebscher** All right, Julie, we're going to administer one more polling question, and I'm going to ask you one final question and then we will read the results of that poll and we'll be done. So last question: if we're able to contain the virus in the U.S., but there is clear evidence that it is still growing fast in other countries, what measures would you expect us to employ to prevent its reemergence in the U.S.?

**Dr. Julie Parsonnet** It depends on how we've contained it in the United States. If we have contained it very effectively through just containment, mitigation, keeping people at home, then we'll restrict migration for sure. We'll restrict movement of people from one country to another. If we've developed good diagnostic tests, we might test people before they're allowed into the country. We're going to have much better testing along the way. We'll have a point of care testing within, I'd say two weeks, much more effective things that can happen very quickly. If we are able to control it and by just social distancing, then we will restrict people coming in. If we've controlled it through a vaccine or through having developed a lot of herd immunity in society, then people will be allowed to come in. It really depends on how that control has been achieved. We'll have to see how things go over the next few months and how we're able to stop it.

**Bob Huebscher** The poll question that we asked was "When do you expect the Coronavirus crisis to end in life, but not necessarily the stock markets to return to normal?" So unlike your information, Julie, which is highly scientific, we're asking a non-medical audience for their opinion on this question. The responses seem to cluster around 90 days- 30 percent of the responses were that life would be back to normal in 90 days, but 23 percent said six months. Seven percent said a year and 8 percent said it could take more than a year. Julie, thank you very much for your very generous time. I want to wish everyone on the call here a healthy rest of the year or however long it takes. And we really appreciate Julie's time and contributions. Thank you all very much.

**Dr. Julie Parsonnet** It was a pleasure. Thank you for having me.