

THE  
**TEDMED**  
FOUNDATION

Dear friends and colleagues,

As Director of the TEDMED Foundation, I review hundreds of science articles every month and talk with dozens of doctors and scientists.

The volume and complexity of information can be daunting. But at last week's 3-day TEDMED gathering in Boston, I had opportunity to interview on stage the world's top virologist, Professor Peter Piot.

We talked about the coronavirus.

In plain English, Peter provided solid scientific knowledge about COVID-19 and how to cope with it. Short answers, clear explanations.

Based on that live-on-stage interview that we plan to release next week on TEDMED.com, here is a written Q&A that I hope you will find as useful as I did. This document is intended to be shared with the public, so please pass it along to anyone you know who might benefit.

Please accept my best wishes for you and yours in a challenging time for health and medicine.

Regards,



Jay Walker  
Director  
The TEDMED Foundation

# Q&A with Peter Piot

100 Questions of Peter Piot, Director of London School of Hygiene & Tropical Medicine by Director, TEDMED Foundation, Jay Walker



**PETER PIOT**  
Director of London School  
of Hygiene & Tropical Medicine

**1. TEDMED: Let's start with the basics. What is a virus?**

A virus is a very tiny particle of RNA or DNA genetic code protected by an outer protein wrapper.

**2. TEDMED: How common are viruses?**

Viruses are everywhere. It's amazing to realize that if you add them all up, all the viruses in the world weigh more than all the living matter in the world – including all of the plants, animals and bacteria. 10% of the human genome is derived from virus DNA. The Earth truly is a “virus planet!”

**3. TEDMED: Why is it so hard to stop a virus from spreading?**

Because virus particles are so incredibly small, billions can float on tiny droplets in the air from just one cough.

**4. TEDMED: Exactly how small is a virus?**

Tiny. Even with a regular microscope, you can't see a virus. 100 million viral particles of the novel coronavirus, can fit on a pinhead. That's how incredibly small they are.

**5. TEDMED: What do virus particles do?**

Virus particles try to insert themselves into living cells in order to multiply, infect other cells and other hosts.

**6. TEDMED: Why do viruses try to get into living cells?**

It's how viruses “reproduce.” Viruses act like parasites. They hijack living cells in order to force each cell to make more viruses. When a cell is hijacked, the virus sends out hundreds or thousands of copies of itself. It often kills the hijacked cell as a result.

**7. TEDMED: What does it mean to be infected with the new coronavirus, which scientists have designated “SARS-CoV2”?**

It means that SARS-CoV2 has started reproducing in your body.

**8. TEDMED: What is the difference between SARS-CoV2 and COVID-19?**

SARS-CoV2 is the virus; COVID-19 is the disease which that virus spreads.

**9. TEDMED: Is it easy for a virus to get into a living cell?**

This depends in the first place whether the cell has the right receptor for the particular virus, just as a key needs a specific keyhole to work. Most viruses are blocked by our immune

system or because we don't have the right receptors for the virus to enter the cell. Thus, 99% of them are harmless to humans.

**10. TEDMED: How many kinds of viruses exist, and how many of them are harmful to humans?**

Of the millions of types of viruses, only a few hundred are known to harm humans. New viruses emerge all the time. Most are harmless.

**11. TEDMED: On average, how many particles of the virus does it take to infect you?**

We really don't know yet for SARS-CoV2. It usually takes very little.

**12. TEDMED: What does it look like?**

SARS-CoV2 looks like a tiny strand of spaghetti, wound up in a ball and packed inside a shell made of protein. The shell has spikes that stick out and make it look like the corona from the sun. This family of viruses all have a similar appearance; they all look like a corona.

**13. TEDMED: How many different coronaviruses affect humans?**

There are 7 coronaviruses that have human-to-human transmission. 4 generate a mild cold. But 3 of them can be deadly, including the viruses that cause SARS and MERS, and now the new coronavirus, SARS-CoV2.

**14. TEDMED: Why is it called the "novel" coronavirus?**

Novel just means it is new to humans, meaning that this specific virus is one that we've never seen before. Our immune system has been evolving for 2 million years. But since our bodies have never seen this virus before, there has been no opportunity for humans to develop immunity. That lack of immunity, combined with the virus's ability to spread easily and its relative lethality, is why the arrival of SARS-CoV2 is so disturbing.

**15. TEDMED: How often does a novel virus emerge that we need to care about?**

It's rare... but it happens. Examples include the

viruses that cause diseases such as HIV, SARS, MERS and a few others. It will happen again. The emergence of a novel virus is a very big problem ... if it can easily spread among people and if it is harmful.

**16. TEDMED: How easily does the new virus spread?**

SARS-CoV2 spreads fairly easily from person to person, through coughs and touch. It is a "respiratory transmitted" virus.

**17. TEDMED: Is there any other way that the virus spreads?**

Recent reports indicate that it may also spread via fecal and urine contamination, but that requires confirmation.

**18. TEDMED: How is this new virus different from the earlier known coronaviruses that spread SARS or MERS?**

SARS-CoV2 is different in 4 critical ways:

First, many infected people have no symptoms for days, so they can unknowingly infect others, and we don't know who to isolate. This is very worrisome because SARS-CoV2 is highly infectious.

Second, 80% of the time, COVID-19 is a mild disease that feels like a minor cold or cough, so we don't isolate ourselves, and infect others.

Third, the symptoms are easily confused with the flu, so many people think they have the flu and don't consider other possibilities.

Fourth, and perhaps most importantly, the virus is very easy to spread from human to human because in the early stages it is concentrated in the upper throat. The throat is full of viral particles so when we cough or sneeze, billions of these particles can be expelled and transmitted to another person.

**19. TEDMED: I thought the virus leads to pneumonia? How is the throat involved?**

The disease often starts in the throat (which is why tests often take a swab from the throat) and then as it progresses it moves down to the lungs and becomes a lower respiratory infection.

**20. TEDMED: I hear the word “asymptomatic” used a lot. What does it mean?**

It simply means having no symptoms.

**21. TEDMED: Are you saying that someone can be infected with the new virus and never show symptoms at all?**

Unfortunately, yes. Many infected people do not show any symptoms for the first few days and then a mild cough or low fever shows up. This is the opposite of SARS, where you had clear symptoms for a few days but were only contagious when sick.

**22. TEDMED: If you have no symptoms, can you still infect other people?**

Unfortunately, yes. And that makes it much more difficult to slow the spread.

**23. TEDMED: How likely is it that scientists will develop a vaccine to prevent people from getting infected?**

It is reasonably likely, but there are no guarantees that we will even have a vaccine. Failure is possible. For example, we’ve been searching for an HIV vaccine for 35 years and we still don’t have one. I’m optimistic that we will develop a vaccine for SARS-CoV2, but we will have to extensively test it for efficacy and safety – which takes a lot of people and time.

**24. TEDMED: Assuming that a vaccine for coronavirus is possible and further assuming that it will be discovered fairly quickly, how long before we have a vaccine that we can start to inject into millions of people?**

We will have vaccine “candidates” in a month or two. But because of the need for extensive testing to prove it protects and is safe, it will be at least a year before we have a vaccine we can inject into people that is approved by a major regulatory agency. In fact, 18 to 24 months is more likely by the time we scale it up to millions of doses, and that is optimistic.

**25. TEDMED: Why will it take so long to develop a vaccine if this is an emergency?**

It’s not necessarily vaccine discovery that takes

so long, but vaccine testing. Once a “candidate” vaccine exists in the lab, a series of clinical trials are needed, first on animals and then on successively larger groups of people.

**26. TEDMED: Have we made progress already?**

The good news is that only weeks after the discovery and isolation of SARS-CoV2, which occurred in early January of 2020, vaccine development started immediately. Funding has been allocated by many governments and many companies and scientists around the world are working on it with great urgency.

**27. TEDMED: Are scientists in these countries cooperating, or are they competing with each other?**

A bit of both, and that is not a bad thing. But international cooperation has generally been good. That’s encouraging.

**28. TEDMED: Can’t we develop a vaccine faster?**

Unfortunately, there are no shortcuts. The human body’s immune system is complex and unpredictable. Viral mutations may occur. Children are different from adults. Women may respond differently than men. We need to be sure that any vaccine is 100% safe for everyone who gets it. To accomplish that, we need to test drugs and vaccines at various doses on a wide range of healthy human volunteers under carefully measured conditions.

**29. TEDMED: How deadly is the new virus?**

Most scientists believe that it kills 1% to 2% of all the people who become infected. The WHO currently reports a higher figure of more than 3%, but that estimate is likely to come down as they figure out how to count many unreported or mild cases. Mortality is clearly higher in older people and those with underlying conditions.

**30. TEDMED: Is the average death rate the figure to focus on?**

Not really. You can drown in an “average” of 3 inches of water. A better way to understand the risks are recognizing that it can be deadly for certain groups of people and much less so for other groups – with a wide range of outcomes.

**31. TEDMED: So what are the numbers and checkpoints to focus on?**

80% of the time it's a mild disease, but in 20% of cases it becomes more severe, with the worst cases reporting high fever or shortness of breath. As a result some people require hospitalization, and some will need intensive care to survive through a few critical days when their lungs are extensively infected.

**32. TEDMED: Which groups of people are most at danger here?**

First of all, older people like me: I'm 71. The older you are, the higher your risk. Also at greater risk are people with underlying diseases such as diabetes, chronic obstructive lung disease and pulmonary disease or cardiovascular disease or immune deficiencies.

**33. TEDMED: How much danger do these high-risk groups face?**

Their mortality rate can be as high as 10% or even 15%. And, your risk increases when you have more health conditions. The scientific data about all of this is regularly updated on the web.

**34. TEDMED: So your risk increases significantly if you have other conditions, such as diabetes. Why?**

Because your immune system reacts poorly to any infectious virus, but particularly to this one.

**35. TEDMED: It seems that generally speaking, children and young people are only mildly affected, if at all. Is that true?**

This is what it looks like, but as with so many other issues on COVID-19, this requires confirmation.

**36. TEDMED: If true, why would SARS-CoV2 affect older people much more, but not younger people and children?**

We actually don't know. It's going to be a while before we figure it out.

**37. TEDMED: Anything else unusual?**

You can infect other people even if you are totally asymptomatic and feeling fine. That's unusual, though it can also happen with HIV infection.

**38. TEDMED: We often hear COVID-19 compared to the seasonal flu. What's the right way to frame this comparison? For example, are the seasonal flu and coronavirus equally dangerous?**

The seasonal flu typically infects up to 30 million people a year in the U.S., and fewer than 1/10th of 1% of the infected group will die – but that is still a big number. Worldwide, in an average year, a total of 300,000 people die from seasonal flu. But, on an average basis, the new coronavirus is 10-20 times more deadly, and in contrast to influenza, we cannot protect ourselves through vaccination.

**39. TEDMED: Does the new virus spread as easily as the flu?**

The new virus appears to spread as easily as the flu.

**40. TEDMED: Continuing with the comparison of flu and COVID-19, what about causes? Is the flu also caused by a virus?**

Yes. Flu is caused by the influenza virus. But the influenza virus and coronavirus are very different. A flu shot doesn't help you with the new coronavirus, but it greatly reduces your risk of flu. The common cold, for which there is no vaccine or cure, is often caused by another type of tiny virus called a rhinovirus, and occasionally another coronavirus.

**41. TEDMED: How does the infection progress when the new coronavirus gets a foothold in your body?**

It usually starts with a cough. Then a low fever. Then the low fever turns into a high fever and you get shortness of breath.

**42. TEDMED: At what point is good medical care the difference between life and death?**

It is usually when your fever is very high and your lungs are compromised so that you are short of breath or you need help to breathe.

**43. TEDMED: How is the new virus different from a disease such as the measles, mumps or chicken pox?**

SARS-CoV2 is currently far less infectious and



dangerous but there is still a lot we don't know about it. The other diseases are well understood.

**44. TEDMED: If the new coronavirus is less dangerous than other viruses, why are many people so afraid of it?**

Because new things that can kill us or cause us to be sick, make us very nervous. But accurate knowledge is the antidote to fear, so here in the U.S., I urge you to pay attention to CDC.gov. In other countries go your national health ministry or WHO websites.

**45. TEDMED: How often should people check the CDC or WHO websites, or the website of their national health ministry?**

We continuously update our knowledge as we learn more about the new virus, so these sites should be checked frequently.

**46. TEDMED: Has mankind ever wiped out a virus completely?**

Yes. Smallpox, which used to kill millions of people. And, we're very close with polio thanks to the Gates Foundation and many governments around the world such as the U.S. Let's not forget what a terrible plague that was in the world.

**47. TEDMED: How does the new virus get to new places around the world?**

By road, air and sea. Viruses travel by airplane nowadays. Some of the passengers may carry SARS-CoV2.

**48. TEDMED: So, every international airport is a welcome mat for the new virus?**

The reality is that SARS-CoV2 is already firmly present in most countries, including in the U.S., and far from any major international airport.

**49. TEDMED: Since the epidemic began in China, do visitors from that country represent the biggest danger of importing coronavirus into the U.S.?**

Since the new virus emerged in China in 2019, 20 million people have come into the U.S. from countries all over the world. The U.S. stopped most direct flights from China 4 weeks ago, but

it did not prevent entry of the virus. Now cases of COVID-19 in China are often imported from other countries as the epidemic in China appears to be declining for the time being.

**50. TEDMED: In other words, major airports are all you need to guarantee that any country will have the virus everywhere in less than 3 months.**

Yes. I think you say in America, "The horse has left the barn." This is not a reason to completely stop all travel.

**51. TEDMED: Why might a country like Japan close its schools?**

Other countries such as Italy and France are doing the same. It's because scientists don't know how much of the spread is accelerated by children who are carriers. Japan is trying very hard to slow the spread. Children generally pass along viruses quickly since they don't wash their hands or practice much personal hygiene. They play a big role in how the flu spreads which is why many countries have been closing schools in affected areas.

**52. TEDMED: If I get infected, are there drugs I can take to make the virus less severe, or make it go away entirely?**

No drugs have yet been proven effective as a treatment or what doctors call a "therapy." A lot of different drugs are being tested in clinical trials, so hopefully that will change for the better soon.

**53. TEDMED: How likely are we to come up with new therapeutic drugs, and how soon?**

I'm quite confident that probably in a matter of a couple of months, we are very likely to find "off-label" uses of current drugs that help treat an infected person. In other words, we'll have a new use for existing drugs that were originally used against other viral infections such as HIV. It will take time and a lot of real tests to be sure though. New therapeutic drugs are being tested in clinical trials, particularly in China, but also elsewhere. It looks promising.

**54. TEDMED: What about antibiotics?  
Everybody always turns to them in a crisis.**

This is a new virus, not a bacteria. Antibiotics work against bacteria but they do not work against viruses. They may be helpful in hospital usage with secondary infections that are bacterial, but antibiotics have no effect at all on the new virus itself.

**55. TEDMED: What about all kinds of new cures and therapies and treatments I've heard about on the Internet?**

There are going to be endless false claims. Only when you read about it on multiple reliable websites, can you feel confident there is real science. But most of what you hear will be total rubbish, so be very careful, and don't spread unconfirmed rumors.

**56. TEDMED: How about masks? Are those blue surgical masks or an N95 facemask useful?**

Masks have very limited value except in certain specific circumstances. For example, depending on the type of N95 mask, just under 50% of inbound virus particles will be filtered out, but they may reduce spread from airborne droplets.

**57. TEDMED: What are the advantages of masks when used properly and who should wear masks?**

The best masks, carefully fitted and worn properly, slow down the spread FROM sick people coughing. Meaning, the mask is not to protect you from other people; it is to protect other people from you. It is a courtesy to others to wear a mask when you get what you think is a cold, and you start coughing. Masks have an additional benefit: they make it less likely that you will touch your mouth, so it becomes less likely that if you have the virus on your hands, you will transfer it into your body. Masks provide benefits for healthcare workers. If you work in a health-care setting or in elder care, masks are mandatory.

**58. TEDMED: Is there anything I can do to prevent from becoming infected in a global pandemic outbreak?**

Washing hands frequently, not touching your face, coughing and sneezing in your elbow or

a paper handkerchief, not shaking hands or hugging all reduce your risk. If you are sick, stay home and consult with a doctor over the phone to see what to do next, and wear a mask when seeing other people.

**59. TEDMED: What does "mitigation" mean? I hear scientists using that word a lot.**

Mitigation means slowing the spread of the virus, and attempting to limit its effects on public health services, public life and the economy. Until there's a vaccine, what we can do is slow it down. That is really important.

**60. TEDMED: What other ways can we slow down the spread of the virus?**

Good hygiene and common courtesy can slow down the spread. In addition, "social distancing" measures — such as working from home, not taking a plane, closing schools, and banning major gatherings — will help slow the spread of SARS-CoV2.

**61. TEDMED: Do different viruses spread more easily than others?**

Yes. Measles is the worst. You can get measles by walking into an empty room that an infected person left 2 hours earlier! That's why we have measles outbreaks when vaccination rates go down. It's a very tough disease. The common cold spreads fairly easily. HIV is much harder to spread, and yet we've had 32 million deaths.

**62. TEDMED: What will it take to stop this virus?**

Nobody really knows for sure, but China has shown that it is possible to stop the spread significantly. A vaccine may be necessary to fully eliminate SARS-CoV2.

**63. TEDMED: How long will it take for the new virus to spread through a population the size of the United States?**

Left to spread with normal measures of good hygiene, SARS-CoV2 appears to double its infected population about every week. That means it will go from 50 people who are infected to 1 million people infected in about 14 weeks. That's the simple arithmetic of contagion. Of course, we can do things to slow it down.

**64. TEDMED: How effective is good hygiene in slowing down the spread of coronavirus? Do the numbers of infected people decrease noticeably if people follow the guidelines?**

The numbers change based on how careful people are, and even small changes are important to avoid stressing the healthcare system more than absolutely necessary.

**65. TEDMED: Can a few thousand cases be hidden among our population? How would that be possible?**

Every year, there are millions of flu cases. This year, some of these cases are actually COVID-19. In addition, many infected persons show no symptoms or very mild symptoms, so they are hiding in plain sight.

**66. TEDMED: Exactly what does it mean to test positive?**

It means that a sensitive test has detected that the virus is present in fluids from that person.

**67. TEDMED: Should everyone be tested as quickly as possible?**

Testing for COVID-19 should be much more widely available because we still don't know enough about who is infected, and how the virus spreads in the community. We need far more testing to learn important data.

**68. TEDMED: Why has South Korea set up a system of "drive-through" testing?**

South Korea has drive-through testing because they are trying very hard to slow the outbreak by finding every infected person as fast as they can.

**69. TEDMED: What is the main symptom that people should be on the lookout for?**

Coughing is the #1 symptom.

**70. TEDMED: Is fever a good way to identify infected people?**

A high fever may be cause for concern and is worth getting medical attention. But screening for fever alone, at an airport or checkpoint for example, lets a lot of infected people pass.

**71. TEDMED: What percentage of the people who tested positive in Chinese hospitals arrived without a fever?**

About 30% of Chinese coronavirus patients had no fever when they arrived at the hospital.

**72. TEDMED: Is the new virus likely to come back to a country again once it peaks and the number of new cases drops off?**

SARS-CoV2 is likely to never leave us without the same effort that eliminated smallpox and has almost eliminated polio.

**73. TEDMED: Meaning, the only way to beat the new coronavirus in the long term is global population-wide vaccinations?**

We really don't know. Population-based measures may work, but a vaccine may be necessary and is probably viable as long as the virus stays stable and does not mutate too much.

**74. TEDMED: Might the new virus "burn out" like other viruses have seemed to do?**

We don't know, but it is unlikely. SARS-CoV2 is already too well established around the world. This is no longer just a Chinese issue; there are probably hundreds of thousands of people infected but not yet tested — not only in China but in close to 100 other countries. SARS-CoV2, like the influenza virus that causes the seasonal flu, will likely be with us for a long, long time.

**75. TEDMED: Will the new virus come back in waves or cycles, and if so, when?**

Again, we don't know, but it is a very important question. Probably, although at this early stage, nothing is sure. The 1918 pandemic flu circled the world in 3 waves. The new virus may have a second wave in China with the reopening of schools and factories. But until we see what actually happens, we don't know how SARS-CoV2 will behave.



**76. TEDMED: If we get a “lucky” break or two in the coming months, what does being “lucky” look like?**

Warm weather may slow down the spread, although we don't have any evidence yet that this is the case. Singapore, which has 120 cases already, and has one of the best COVID-19 control programs in the world, is just 70 miles from the equator — so at least in that case, a warm climate has not stopped the virus from spreading. It's possible that SARS-CoV2 could steadily mutate into a less dangerous form so that fewer people die from it, as happened before with the swine flu in 2009. But I wouldn't count on it. Quickly finding an effective drug therapy or cocktail of drugs would be excellent news. That's about it for luck.

**77. TEDMED: Do people who are at high risk for COVID-19 have the same chance of dying everywhere?**

Unfortunately, your risk of death depends a lot on where you are in the world. If you need and get cared for in a well-equipped modern hospital, which we hope is accessible to lots of people, the death rate will be far lower because of intensive care respirators and fewer secondary infections.

**78. TEDMED: How do I know if I'm going to be in the mild group or the one that needs hospitalization?**

You don't know for sure, but being over 70 or having a chronic condition increases your risk of severe illness, and even death. We can only speak in terms of probabilities, because we don't yet know enough about COVID-19.

**79. TEDMED: Should I be worried that I'm going to get COVID-19? How worried are you, Peter?**

If you're not at high risk, I wouldn't worry too much, but I would do everything I can to avoid becoming infected as you don't know individual outcomes. Everyone is eventually going to be at risk for acquiring this infection in the next few years, just as no one avoids the common cold or the flu over time. So all of us should be ready to stay home at the first signs.

**80. TEDMED: What do you mean everyone is going to be at risk for getting the virus?**

I mean that all humans spend time with other humans, so we are all connected -- and biology is relentless. However, I would take sensible precautions and, at the same time, not worry obsessively. That isn't helpful.

**81. TEDMED: If everyone is going to get the new virus, why try to avoid getting it? If I get the virus immediately, then I can be done with it and move on.**

We want to slow down the infection, which means slow down the number of new cases and total cases, so our hospitals can handle the most affected patients without getting overwhelmed or turning away patients with other types of illnesses that require immediate attention.

**82. TEDMED: It appears that after people recover from the new virus, they may still be contagious. Is that true?**

We don't know, although it appears that may be the case for a while after recovery. We are not totally sure. More research is needed.

**83. TEDMED: Once you get the virus, are you then permanently immune to getting it again, like with measles or mumps?**

Here again, we don't know the answer to that important question yet.

**84. TEDMED: Obviously, permanent immunity against COVID-19 would be important for individuals who came through one bout of the disease. Is such immunity also important for society as a whole? Why?**

This question is extremely important for the vaccine development, because vaccines rely on the ability of our body to mount a protective immune response and on a stable virus. And obviously the number of people susceptible to becoming infected would gradually decrease over time.

**85. TEDMED: Is the new virus seasonal, like the flu?**

We haven't gone long enough to see if there is

a seasonal mutation to SARS-CoV2, or how the trillions of new virus particles change as they pass through millions of people.

**86. TEDMED: So this virus can mutate by itself into new forms with new symptoms?**

We don't know at all. If it does, new vaccines may be necessary to prevent the mutated version of SARS-CoV2 from spreading.

**87. TEDMED: If the virus naturally mutates, does that mean it could become more deadly, and on the other hand, it could also become less deadly?**

Yes, either one is possible. It's a new virus, so we have no idea what the mutations will do.

**88. TEDMED: If coronavirus becomes a threat that doesn't go away, what does that mean for myself and my family?**

It means we will all learn to deal with it, and make sure we are all adopting safe behaviors. We should be particularly mindful of the needs of older family members.

**89. TEDMED: I heard the virus can live for 9 days on a countertop. Is that true?**

It's probable that SARS-CoV2 can stay viable on some surfaces for quite a while, but we don't know for how long.

**90. TEDMED: The greatest pandemic of modern times was the 1918 flu pandemic right at the end of World War I. In that pandemic, influenza simply mutated – it was not a new virus. How does SARS-CoV2 compare to that mutation?**

SARS-CoV2 is just as contagious as the 1918 influenza pandemic and appears to be nearly as lethal, but time will tell. Remember, back in 1918 there was no medical system anything like what we have in the developed world, and there were no antibiotics to treat bacterial pneumonia, which was a major cause of death.

**91. TEDMED: Is there any chance that this is one giant false alarm and that we're going to look back this summer and say "wow, we all panicked over nothing!"?**

No. COVID-19 is already in well over 100 countries and it's highly contagious. Virtually every day there are more and more cases, in more countries. This is not a drill. It is the real thing.

**92. TEDMED: It's hard to believe that suddenly a truly new virus that mankind has never seen can infect millions of people. When is the last time that happened?**

SARS and MERS were new – but they did not reach scale. HIV was new to the world and has infected 70 million people – of whom 32 million have died from the HIV Pandemic.

**93. TEDMED: HIV affects poor countries much more than wealthier ones. Will that likely be true for the new virus?**

Yes, absolutely. Wealthy countries such as the U.S. are going to have much lower death rates because of better hydration, supplemental breathing equipment, proper handling of infections, and the like. This is potentially a giant problem for low-resource countries that have poor health systems. Many countries in Africa will face enormous risks. When it reaches the most resource-challenged countries of the world, it's very likely to be catastrophic.

**94. TEDMED: It sounds like the bottom line is that you are not terribly optimistic.**

In general, I'm definitely an optimist but at the same time, there is a lot to be very uncomfortable and nervous about. I understand people have fears, especially if they are in one or more of the high-risk groups. But there is also good news, because we are already seeing progress in global cooperation, especially in science and medicine. We are seeing more transparency among governments. The number of cases in China is currently rapidly declining, but that could change. And, we are seeing very rapid development of therapeutics, for example.

**95. TEDMED: You also said there is a lot to be concerned about. What are your biggest worries for the new virus?**

Poorly managed, the spread of coronavirus can quickly overload any country's healthcare system and block people who really need all kinds of medical access. Another worry is that overreaction and fear can cripple a country's economy, which causes another kind of suffering. So, this is a very tough trade-off.

**96. TEDMED: And, what should we be psychologically prepared for?**

We should be psychologically prepared to hear about lots of "new" cases being reported in every city in the U.S. that begins testing, as well as an increasing number of deaths, particularly among the elderly. In reality they are often not "new" cases; they are existing cases that have become visible for the first time.

**97. TEDMED: What things are you encouraged about?**

1. Modern biology is moving at breakneck speed.
2. In addition to the public health community worldwide, including the World Health Organization, Government leaders at the highest levels are focusing on the threat.
3. We isolated the virus in days and sequenced it quickly.
4. I am confident we will soon have a treatment.
5. We are hopefully going to have a vaccine.
6. This is truly the age of modern communication. That can help us, as long as we debunk fake and dangerous news.

**98. TEDMED: How ready is the U.S. for this?**

The U.S. has had ample time for a head start to prepare for this pandemic, and so have other high-income countries. We all benefitted from China's unprecedented mass quarantines that slowed down the spread. The U.S. will handle the serious cases correctly from the start by being more prepared.

**99. TEDMED: Who are you most worried about?**

It's the low-resource countries that I am very worried about. Each death is a tragedy. When we say that on average, 1% to 2% of infected

people will die from coronavirus, that is a lot. After all, 1% of a million is 10,000 people, and it is the elderly I am very worried about. But 98%-99% of people won't die from this. The seasonal flu kills tens of thousands of Americans every year and you don't panic – even if we actually should take flu far more seriously and make sure we are all vaccinated against it every year. Just as we have learned to live with seasonal flu, I think we will need to learn how to go about our lives in a normal fashion, despite the presence of COVID-19, until an effective vaccine becomes available.

**100. TEDMED: Are there more pandemics in our future?**

Definitely yes. This is part of our human condition and of living on a "virus planet." It is a never-ending battle. We need to improve our preparedness. That means committing ourselves to seriously invest in pandemic preparedness and building a global fire brigade, long before the house catches on fire next time.

**Peter, all of us at TEDMED thank you very much for your insights on this worldwide challenge. The better informed we all are, the better opportunities we will have to slow the spread of this – or any other – pandemic, and eventually either cure it or prevent it.**

## **ABOUT PETER PIOT**

**Peter Piot, co-discoverer of the Ebola virus, is the Director of The London School of Hygiene & Tropical Medicine, renowned for its research, postgraduate studies and continuing education in public and global health.**

Described by the Financial Times as “one of the world’s most famous ‘virus hunters,’” Professor Piot co-discovered the Ebola virus in Zaire in 1976. From 1995-2008, as the founding Executive Director of UNAIDS and Under Secretary-General of the United Nations, he made UNAIDS the chief advocate for worldwide action against AIDS. He also served as an Associate Director of WHO’s Global Programme on AIDS.

Professor Piot has held important posts at the Institute of Tropical Medicine, Antwerp, the Free University of Brussels, the University of Nairobi, the University of Washington, the Ford Foundation, and the Bill & Melinda Gates Foundation. He was the Director of the Institute for Global Health at Imperial College, London, and held the chair "Knowledge against poverty" at the College de France. A Fellow of the Academy of Medical Sciences, he was elected a foreign member of the National Academy of Medicine of the U.S. National Academy of Sciences. He is also a member of the Academy of Sciences Leopoldina of Germany, the Académie Nationale de Médecine of France, and of the Royal Academy of Medicine of his native Belgium, and a fellow of the Royal College of Physicians.

He has received numerous scientific and civic awards including an honorary doctorate from seven universities, the Canada Gairdner Global Health Award, and Robert Koch Gold medal, (2015). He was a 2014 TIME Person of the Year (The Ebola Fighters), and received the Prince Mahidol Award for Public Health. In 2013 he was the laureate of the Hideyo Noguchi Africa Prize for Medical Research. He received the Thomas Parran Award from ASTDA, the Nelson Mandela Award for Health and Human Rights in 2001, the Frank A Calderone Prize in Public Health in 2003, and the Prix International INSERM, Paris, RSTMH Manson Medal, and Bloomberg Hopkins Award. He was knighted as a Baron in 1995 in his native Belgium, and awarded an Honorary Knighthood KCMG in 2016, and the Grand Cordon of the Order of the Rising Sun of Japan (2018). He has published over 600 scientific articles and 17 books, including his memoir 'No Time to Lose' in 2012 (WW Norton), translated into French, Dutch, Japanese and Korean, and 'AIDS between science and politics' in 2015 (Columbia University Press).

## **ABOUT THE TEDMED FOUNDATION**

The TEDMED Foundation (TEDMED) is a 501(c)(3) Public Charity supporting a year-round global community focused on health and medicine, with a mission of applying its community’s broad insights from the full spectrum of science and culture to specific challenges that can lead to a healthier world.

## **ABOUT THE TEDMED GATHERING**

Best known for its annual event, TEDMED organizes and hosts an annual gathering that is the independent health and medicine edition of the world-famous TED conference, dedicated to “ideas worth spreading.” TEDMED convenes and curates extraordinary people and ideas from all disciplines both inside and outside of medicine in pursuit of unexpected connections that accelerate innovation in health and medicine.