

# Coronavirus: where we are and the path forward on this fight, the investigation of two Bolivian scientists in the USA

By: Milenka Arévalo, and Karen Gomez

Drs. Milenka Arévalo and Karen Gomez are scientists who were born in Bolivia. Both moved to the U.S. to pursue their graduate degrees and have been living there ever since. With the objective of helping Bolivia, they interviewed a diverse panel of U.S. scientist and medical experts who shared their expertise and knowledge about the new coronavirus.

This publication is intended for most readers with a desire to obtain up-to-date scientific information. However, some sections of this article provide details that are more appropriate for people with a scientific background.

Interviews for this article were conducted from April 27<sup>th</sup> to May 1<sup>st</sup>. Since then, and since the time this publication was prepared, more information continues to be uncovered.

## The New Coronavirus, Its Spread, and Symptoms of the Disease it Causes

On February 11, 2020, The International Committee on Taxonomy of Viruses and the World Health Organization (WHO) announced the name of the new coronavirus that had been spreading around the world. It was called “severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)” and coronavirus disease 19 (COVID-19) was the name of the disease it caused.

[Dr. Alan Schenkel](#), an Associate Professor in the Department of Microbiology, Immunology and Pathology at Colorado State University in Fort Collins, Colorado indicates that although “there are seven coronaviruses that infect humans (four cause the common cold, and three cause acute respiratory distress syndrome), SARS-CoV-2 is different because it has a very long shedding period (10-40 days) and long incubation time (4-14 days).” We now know that these features contribute to its rapid spread and make it very contagious.

According to the [Centers for Disease Control and Prevention](#) (CDC), SARS-CoV-2 spreads among people who are in close contact to each other (6 ft = 1.8 m) through respiratory droplets produced when an infected person coughs, sneezes or talks (as shown in the figure below). A study published in the *Journal of the American Medical Association (JAMA)* filmed the close up of a sneeze showing that mucosal droplets can travel up to 8 m. The video is available to view in [YouTube](#).

COVID-19 symptoms appear 2-14 days after exposure to the virus, as stated by the CDC. A list of reported [symptoms](#) to date is also on display at the CDC website. These may include fever, cough, shortness of breath or difficulty breathing, chills, repeated shaking with chills, muscle pain, headache, sore throat, and *new loss of taste or smell*. Severe symptoms that warrant emergency attention include trouble breathing, persistent pain or pressure in the chest, new confusion or inability to arouse, and bluish lips or face.

“SARS-CoV-2 and influenza spread similarly but due to the high number of COVID-19 asymptomatic carriers and higher death rates, SARS-CoV-2 is much more dangerous” explains Dr. Schenkel.

Asymptomatic patients make an important group of people that could play a major role in the spread of SARS-CoV-2. These silent spreaders are grouped into 3 categories: presymptomatic carriers who are incubating the virus before showing symptoms; asymptomatic carriers, who are infected but do not present symptoms; and very mildly symptomatic carriers who feel a little sick from COVID-19, but continue to be in contact with other people (source: National Public Radio ([NPR](#))).

## Why is COVID-19 so Dangerous?

Even though most people who get infected recover at home, some people develop severe symptoms that require hospitalization.

Severe COVID-19 related complications can include “Pneumonia, respiratory failure, acute respiratory distress syndrome, clotting disorders such as strokes and blood clots” says specialist in emergency medicine [Dr. Shelley Moore](#) at the Associates in Family Medicine in Fort Collins, Colorado.

Older adults and people with chronic medical conditions like heart or lung disease, diabetes, and high blood pressure seem to be at higher risk for developing serious COVID-19 complications, according to reports from the CDC. Dr. Moore explains that “the prognosis for patients with COVID-19 is worse for the elderly population. However, in some younger patients their immune system goes into overdrive and creates what is called a cytokine storm syndrome, that is when the immune system goes rogue and starts attacking and killing everything, including healthy cells in the body. We believe that this process is killing around half of severe COVID-19 patients.”

[Dr. Nicholas Pullen](#), an Assistant Professor in the School of Biological Sciences at the University of Northern Colorado in Greeley, Colorado explains that “the most common issues have to do with the lungs, nose, and throat, because of how the new coronavirus is acquired. Preliminary data seem to indicate that the virus starts attacking cells in these areas because of their expression of the ACE2 receptor.”

ACE2 is an enzyme found in the surface of cells in the lungs thought to mediate entry of the new coronavirus, according to a recent report in the *Journal of Cell*. “Particularly concerning is that cells in the deep structures of the lungs expressing this receptor are also responsible for producing biological surfactants, which functions to prevent lung collapse” says Dr. Pullen. So, the very cells needed to keep our lungs healthy are the ones that allow SARS-CoV-2 to invade them.

“It has been observed that in at least half of all patients, liver function is affected. Other areas targeted by the new coronavirus, probably through ACE2 receptor, are the intestines, blood vessels, and the heart. This could lead to diarrhea, embolism, and heart attack. A substantial number of cases have resulted in kidney failure requiring organ transplant, and there have been reports of brain issues,” he continues.

A concerning COVID-19 related complication has been recently reported in children. This condition, primarily reported in New York City and the United Kingdom (source: [Time](#); [The Lancet](#)), exhibits symptoms of severe inflammation. These include: prolonged fever (more than 5 days), abdominal pain (severe), diarrhea or vomiting, rash, eye irritation, swollen lymph nodes, swelling of the hands and feet, trouble breathing, chest pain, and lethargy or confusion (source: [NPR](#)). In this regard Dr. Pullen states that “Physicians and epidemiologists have asked for open communication on this so the impact can be better gauged.” The CDC puts up-to-date [information for pediatric healthcare providers](#) in its website.

## **Prevention and Mitigation Efforts**

*Social or physical distancing* is by far the best measure at controlling the spread of the new coronavirus, but it involves public will. To do social distancing you should maintain a physical space between you and other people. The CDC recommends maintaining a distance of at least 1.8 m person to person while in public. The spread of the new coronavirus through air in closed spaces can be visualized in a [3D model](#) developed by researchers at Aalto University in Finland. Recently, scientists in Italy have detected coronavirus in particles of air pollution, however, it remains unclear whether the virus continues to be infectious or not (source: [USA Today](#)). Hence, it is important to understand the reasoning behind maintaining social distancing, wearing masks and avoiding crowded places.

The CDC indicates that a face cover should not be used as a substitute for social distancing. Preliminary data show that not all face coverings offer the same level of protection. N95 masks, are known to filter out 95% of air-borne particles, thus are the most effective. However, public health officials in the U.S. have stressed that these masks should be reserved for frontline medical workers, for obvious reasons.

Homemade masks and surgical masks offer different levels of particle filtration, as reported in a [preliminary study](#) conducted by Texas A&M University, Center for Atmospheric Chemistry and the Environment. Compared to N95 masks, surgical masks filter out 71% of airborne particles, homemade masks made of four layers of 600-count pillowcase can block up to 60% of particles, four-layer wool scarfs can filter out 49% of particles, and two-layer cotton bandanas filter out 18% of particles (source: [Oregonlive](#)). It is important to stress that *any covering is better than no covering at all* to slow the spread of the new coronavirus (source: [CDC](#)).

## **What are clinics in the United States doing to reduce the risk of infecting others?**

To reduce potential exposure of staff and healthcare workers to the new coronavirus, Dr. Moore explains that “All patients are first offered a virtual visit, including patients with potential COVID-19 symptoms. If an in-person visit

is required, possible COVID-19 patients are diverted to 2 of 3 Associates in Family Medicine (AFM) urgent care clinics. One of 3 of our urgent care clinics is designated specifically for non-respiratory patients.”

“All patients are screened (temperature and COVID-19 symptoms) at the front door of all nine AFM clinics. Chairs in the waiting room are spread 1.8 m apart. In many cases, patients wait in their cars until the exam room is ready,” she says.

“Every person working in the clinics has their temperature taken at the beginning of each shift. All patients, staff, and providers are *always required to wear masks* inside the clinic. We are maintaining physical distancing within the clinics as much as possible. We have created innovative ways to reduce total foot traffic by converting more than half of our patient encounters to virtual visits, reducing patient volume within our clinic walls” she explains.

Similar protocols could be implemented in other countries, if they are not already in place. A [guideline for treatment of COVID-19 patients](#) is also available at the National Institutes of Health website and the CDC. This guideline is updated with new developments as they emerge.

### **The Value of Social Distancing**

Social distancing when practiced properly and early has proven to be effective to slow down the spread of the new coronavirus. “Implementing social distancing early works. Social distancing is the first line of defense,” says [Dr. Peter Hotez](#), co-director of the Center for Vaccine Development at Texas Children’s Hospital and Dean of the National School of Tropical Medicine at the Baylor College of Medicine in Houston, Texas,

[Dr. Pedro Piedra](#), a Virologist, Pediatric Physician, and member of the Vaccine Research Center at Baylor College of Medicine adds that “lockdown measures imposed in Houston, Texas, not only decreased the spread of the new coronavirus but also of other viruses such as respiratory syncytial virus (RSV), influenza, and rhinovirus. If you can do social distancing correctly, it has many benefits.”

But the better example yet comes from New Zealand where the government implement lock down measures on March 25, just 8 days after the first case of COVID-19 was detected. As of May 4, 2020, no new cases of the new coronavirus were reported in a 24-hour period (source: [The Hill](#)). The mitigation measures that New Zealand adopted included massive testing, isolation, quarantine, and contact tracing along with very robust border measures (source: NZ COVID-19 [alert](#) levels).

*How could people in Bolivia understand the importance of social distancing?*

“Social distancing is complex to explain, is disruptive, and economically challenging. The problem is that if you wait to see many patients in hospitals and intensive care units (ICUs) to finally get the message, it is already too late. It does not matter whether you have 2,000 patients versus 200 patients in the ICU, but it is how quickly you implement these measures” explains Dr. Hotez.

“Unfortunately, it is hard to get people to change their behavior in a city where they are not yet seeing their family and friends going to the hospital with COVID-19. Even if you ask people to do social distancing, how do you do that in poor neighborhoods or crowded households? My heart goes out to Bolivia in this regard,” he adds.

Dr. Piedra adds that “pictures are worth a thousand words. If you could show people, visually, at what distance they should be from each other by putting signs or marks in the floor in public places you would be giving an example of what they should do to reduce exposure to other people.”

Around the world, visual cues to maintain social distance help communities and are not costly; the use of spray paint or even tape, as seen in the images, one from India (left) and the other one from a street in a neighborhood in Texas (right) will do the job. |

### **Current Detection and Testing Methods**

The standard technique that is used to detect the new coronavirus is reverse transcription quantitative real-time polymerase chain reaction (RT-qPCR). Many countries, including the United States and Bolivia, are using this molecular approach to detect the genomic RNA of SARS-CoV-2 in patient samples because of its sensitivity and

accuracy. Dr. Schenkel comments that “it is possible that this test can produce false positives and negatives if it is not well designed or if the experiment does not include the proper controls. It also needs to have repetitions of the same sample to be sure nothing has changed.”

Shortage of reagents for RT-qPCR, especially the kits that are used to extract RNA, PCR primers, and positive controls for the machines (source: [The Lancet](#)), and the need to speed up testing led to the development of other methods such as antibody testing or what are called rapid detection tests. In the U.S., the Food and Drug Administration (FDA) granted emergency approval for hundreds of these types of tests in an effort to ramp up massive testing (source: [PROPUBLICA](#)).

Antibody testing is based in the detection of antibodies. Dr. Schenkel explains that “antibodies are blood proteins every animal, including humans, make against pathogens. Antibody testing involves using monoclonal antibodies against SARS-CoV-2 (and include a control for exposure to other common cold coronaviruses) to design what is called an enzyme-linked immunosorbent assay (ELISA) that determines whether someone has been exposed to SARS-CoV-2. However, this test cannot determine if someone is actively infected.” It is known that antibodies can remain in the body even after the infection is no longer present.

“Rapid detection tests work similarly to pregnancy and rapid flu tests, they also use laboratory-made monoclonal antibodies, but in this case against SARS-CoV-2. They are fast, but they are not sensitive,” he says.

Dr. Piedra indicates that his “main concern with rapid detection tests is that these tests give a high percentage of false positives. There are other coronaviruses that cause upper respiratory infections that are human endemic. These can induce antibodies that can cross react with SARS-CoV-2 giving a false positive result.”

In summary, “Using RT-qPCR and antibody testing together are our best hope” says Dr. Schenkel, and “the best approach” adds Dr. Piedra.

On May 9, 2020, The U.S. FDA issued an emergency use authorization of the first COVID-19 antigen test. The agency expects to authorize more tests of this type in the coming weeks. “These diagnostic tests quickly detect fragments of proteins found on or within the virus by testing samples collected from the nasal cavity using swabs” (source: [FDA](#))

### **What can be done if massive testing is not available?**

“Testing, unfortunately, is not going to scale up ahead of time so we have to warn the population that is most at risk; the elderly and people with underlying diseases. The best you can hope for is that people will wear masks. *Wearing a mask will prevent you from spreading COVID-19 to others if you are infected,*” says Dr. Hotez.

“If people are not doing true social distancing, and massive testing isn’t in place, then you must assume that most of the people are infected but do not show symptoms. Consequently, the only way you can protect yourself and the community is to practice good social distancing by 1) putting on a mask, 2) maintaining your 1.8 m distance, 3) not congregating in parties, markets, or other types of gatherings, and 4) being very seclusive. It is hard but it is the only way to help yourself, your family, and your community,” explains Dr. Piedra.

### **Measures for a Safe Reopening of the Economy**

Dr. Hotez says that “you need to have a good assessment of the situation, if possible, by using epidemiological models developed for COVID-19.” He then adds that “the most extensive modeling that is available is called the IHME (Institute for Health Metrics and Evaluation) model that is housed at the University of Washington. During the interview, Dr. Hoteze checked for data from Bolivia, but unfortunately, he found no report.”

“IHME's COVID-19 projections were developed in response to requests from the University of Washington School of Medicine and other U.S. hospital systems and state governments working to determine when COVID-19 would overwhelm their ability to care for patients. The forecasts show demand for hospital services, including the availability of ventilators, general hospital beds, and ICU beds, as well as daily and cumulative deaths due to COVID-19.” (source: [IHME](#))

Dr. Hotez adds: “I do not see how you can open up an economy without assessing the situation. The problem is that when you get back to work, how do you know if your colleague is not an asymptomatic carrier. This is a big

issue because 20-50% of people with COVID-19 have no symptoms. He then emphasizes once more the recommendations from the CDC, to “1) wear masks in the workplace, 2) try to maintain social distance while at work, 3) hand washing, and 4) avoid large gatherings.”

“Anything you can do for contact tracing as well. *Contact tracing* is very critical for someone who tests positive to let the public health system identify their contacts. This has a snowball effect because if you are not testing, you can’t do contact tracing”, he adds.

The role of contact tracers to prevent the spread of COVID-19 is key. In addition to contact identification, contact tracers provide patients, and their contacts, with vital information on how to isolate themselves and how to monitor their symptoms. They check with patients, and their contacts regularly to follow their recovery or to make recommendations for further evaluation at a hospital, if needed (source: [CDC](#)).

New York city recently announced the largest hire of contact tracers (source: [Wall Street Journal](#)). Johns Hopkins University recently launched a free [online course](#) to train new contract tracers. To this end Dr. Hotez added that “perhaps Bolivia could implement what is called Syndromic Surveillance using an app-based system. There is a system out by Kinsa. It would be worth contacting them,” he says.

In simple terms, [syndromic surveillance](#) uses methods to detect infected individuals before a confirmed diagnosis. It is based on tracking the patterns of behavior, symptoms (for example temperature), or laboratory results of ill individuals using various data sources.

The health tech company Kinsa developed an internet-connected smart thermometer coupled to a mobile app (shown in the image). It collects data on symptoms in real-time allowing to predict outbreaks of a disease and planning for resource allocation (source: [CNBC](#)).

In addition, several contact tracing apps for COVID-19 have been developed and are used around the world, but some users are concerned about their privacy and hacking attempts (source: [BBC News](#)).

The best approach to reopening a country is to rely on guidelines developed by public health experts. News outlets reported recently that the United Kingdom government advised its citizens to walk or bike to work in order to allow social distancing in public transport. This as a part of strategy for easing restriction post lockdown (sources: [Reuters](#), [NBC News](#)).

### **Projected Timeline for the Development of a Vaccine for the New Coronavirus**

Many research teams around the world are racing to develop a vaccine. Dr. Le and collaborators reported in [Nature Reviews Drug Discovery](#) that “as of 8 April 2020, the global COVID-19 vaccine research and development landscape includes 115 vaccine candidates.”

However, the process involves several steps. “It starts with designing a vaccine based on the proteins of the virus, the new coronavirus has >20 proteins, some may be better targets than others. Once a vaccine is produced, it is tested in at least two animal models for *safety* and *efficacy* before it can be tested in a small group of human volunteers. If that works, the vaccine is tested in larger human trials. It’s fraught with failures at many levels, and we are probably still a year away,” explains Dr. Schenkel.

A team of researchers at Colorado State University (CSU) is investigating alternative approaches to speed up the vaccine development process. By testing a genetically modified strain of the probiotic *Lactobacillus acidophilus*, they hope to activate an immune response and prevent entry of the virus into host cells. If successful, this vaccine could be delivered orally (source: [CSU News](#)).

“Some vaccines from SARS-CoV1 have been tested against the new coronavirus (SARS-CoV-2) and are already in the first human trials,” Dr. Schenkel says.

Dr. Piedra adds: “Everything is different right now. The average time to develop a vaccine is 14 years. Some vaccines can be developed faster and when this happens, it is between 5 to 8 years. We must demonstrate that a vaccine is safe, and in this case our knowledge of this new virus is still limited. I do not anticipate a vaccine in at least 3 years because once a vaccine is developed, it has to be produced in billions of doses, and this also takes time.”

“Bolivia is already dealing with other diseases on top of COVID-19. Our team is working on developing a low-cost, global health vaccine accessible to nations like Bolivia. However, we can’t put your hopes in a vaccine for this year. Unfortunately, cities in South America are going to have to learn to deal with this crisis without a vaccine. *Social distancing* and masks are all we have,” explains Dr. Hotez.

Despite current advances, it could take from several months to years before a vaccine for the new coronavirus is widely available to the population.

### **Is there scientific evidence supporting immunity against the new coronavirus?**

On April 24, 2020, the WHO warned about the lack of “enough evidence about the effectiveness of antibody-mediated immunity to guarantee the accuracy of an “immunity passport” or “risk-free certificate.” People who assume that they are immune to a second infection because they have received a positive test result may ignore public health advice. The use of such certificates may therefore increase the risks of continued transmission”

Dr. David Dowdy and Dr. Gypsyamber D’Souza, both epidemiologists at John Hopkins University, issued a warning for [early herd immunity against COVID-19](#) in a recent publication. They indicate that “Controlled voluntary infection, like the chickenpox parties of the 1980s” is risky because “COVID-19 is 100 times more lethal than the chickenpox”. People trying to purposely infect themselves “not only be substantially increasing their own chance of dying in the next month, they would also be putting their families and friends at risk.”

“This is very unclear” says Dr. Pullen. “For sure we can use an antibody test to see whether someone already had an infection however what’s unknown is the durability of that response if exposed to the virus again. In other words, you probably have protection, but how effective and how long that protection lasts are big unknowns.”

“There is emerging evidence from some of the initial cases (in different regions around the world) regarding mutations in the virus as it propagated. Some of these mutations are concerning, for example, mutations changing proteins on the outside of the virus (seen in a small patient cohort in China) could have great implications on the durability of immune memory and traditional vaccine efficacy,” he says.

“A recent study using samples in Arizona, U.S., later in the pandemic, has brought some optimism. The Arizona State University scientists suggest that the mutation they see could herald a weakening of the virus or the anti-viral immune response. It remains to be seen if this mutation is widespread, or what the functional consequences may be,” he adds.

### **Testing of New Drugs and Repurposing of Drugs to Treat COVID-19**

A recent publication states that “High-quality evidence showing the effectiveness of treatments for COVID-19 is scarce, but over 400 studies are now registered in [ClinicalTrials.gov](#) testing a range of therapies” (source: [The Lancet](#)).

As of today, the CDC and the WHO state that in spite of rampant speculation “there are no drugs or other therapeutics presently approved by the U.S. FDA to prevent or treat COVID-19.” A list of common [misconceptions and myths about COVID-19 treatments](#) can be found in the WHO website in Spanish.

“Solidarity” is an international clinical trial that is testing treatments for COVID-19 that was initiated by the WHO and partners. Currently, more than 100 countries are participating in the solidarity trial to help find effective therapeutics for COVID-19. The main idea is that conducting one single randomized trial will help facilitate the worldwide comparison of otherwise unproven treatments (source: [WHO](#)).

Standard clinical trials, which must be conducted in order to make a new treatment or drug available for massive use in humans, take years to design and conduct, and involve different phases. For instance, “Phase I trials test whether the treatment is safe. If determined acceptably safe, phase II trials recruit a larger cohort to test the efficacy of the drug against the condition. If successful, phase III recruits even larger cohorts (thousands or more) to test the effectiveness of the treatment in a more relevant clinical setting. Clinical trials will have inclusion and exclusion criteria, and it’s important, when possible, to make sure that clinical trials are randomized, and include controls to reduce bias,” explains Dr. Pullen.

“A lot of attention initially focused on a well-known anti-malarial drug, to treat COVID-19 but the fact is that the data are just too limited at this point. Additionally, there are potentially dangerous side effects,” he says. He then suggests reading a recent [article](#) in this regard.”

Dr. Piedra adds that “Repurposing a drug that is already on the market for a disease it was intended for is also another safety issue because the dose will not be the same and the unknown effects of that new dose without testing can be dangerous.”

Along these lines, Dr. Hotez says “We do not have any drugs that have been developed for one purpose that we know works for COVID-19. There was some initial optimism about some drugs used for treatment of malaria. However, no further data have shown that these are going to work for COVID-19; so far there is no scientific evidence. Even some antiviral drugs are showing conflicting results.”

“Recently, an [antiviral drug](#) has gained momentum for reducing the duration of COVID-19 symptoms from initial clinical trials. One concern I have is the effect of using it as a prophylactic to prevent disease, creating a potential for resistance. This hypothesis was [tested](#) for Middle East Respiratory Syndrome (MERS), with evidence that coronaviruses might not develop resistance. However, resistance to this antiviral drug has been observed for other viruses. This is something that needs to be carefully examined,” Dr. Pullen notes.

“I do think that drugs will become available but right now I don’t think there are any we can recommend yet,” Dr. Hotez says.

The WHO advises that until there is enough evidence, unproven treatments should not be recommended to patients with COVID-19 and *people should not self-medicate*.

### **COVID-19 Convalescent Plasma**

Among the many therapies under consideration for treatment of COVID-19 is convalescent plasma. “In the 1930s, this approach was widely used to treat a range of infectious diseases, such as scarlet fever and pneumococcal pneumonia; however, its use had declined by the middle of the 20th century as a result of the development of antimicrobial drugs.” (source: [The Lancet](#)).

Dr. Pullen explains that “someone who very recently recovered from the new coronavirus (SARS-CoV-2) has specific antibodies circulating in their blood. To date, there are no controlled trial data released using this approach, but anecdotal reports are optimistic. The [FDA](#) is interested in getting some controlled trial data on this.” On May 1, 2020, the FDA issued [guidelines](#) for healthcare providers and investigators for the use of convalescent plasma.

“There is motivation to try something similar to the [intravenous immunoglobulin \(IVIG\) infusion therapy](#), where you take antibodies from multiple recovered donors and pool them to enhance anti-viral protection, and this has the added benefit of not needing to match blood types. I’d stay tuned for details, especially since the IVIG infusion therapy has been a viable option for numerous immunological conditions and is a decades-old approach,” he adds.

Dr. Hotez suggests that “Bolivia could test the convalescent plasma therapy. This is an old approach that seems to have worked with SARS-CoV-1. Hospitals, the Blood Bank, the transfusion services could arrange this therapy even with minimal resources. [Dr. Arturo Casadevall](#) at Johns Hopkins University has been providing instructions to some Latin American countries, helping translate [protocols in Spanish](#) on how to do this. You could save lives with this approach.”

“More and more U.S. hospitals are starting to use COVID-19 convalescent plasma. Denver has treated several patients successfully so far, and Fort Collins hospitals have started using this as well” says Dr. Moore.

### **Recommendations for Bolivia**

Dr. Hotez expresses concerns for Bolivia regarding the situation seen in New York City, U.S. and Guayaquil, Ecuador. “We don’t want to see this happen in South America. So, for Bolivia, a country restricted in resources and where crowding occurs in major cities, there should be a health surveillance mechanism in place.” The first part of a health control mechanism he adds, is *social distancing*.

“Bolivia could work closely with the Pan American Health Organization ([PAHO](#)) and the WHO to make certain that if an emergence occurs in some parts of the country, especially in urban areas, there is a mechanism in place for health control,” he says.

“We do not know how extensive this infection will be in South America. We do not know if it will get worse as you move into the winter. The hardest days ahead for Bolivians may come in the next weeks and months as you move into June, July, and August. This is what I am fearful of, so the key is to have situation awareness. And if you do see an increase in COVID-19, *social distancing* is going to be imperative,” he concludes.

### **The Path Forward**

When asked *what would she say to skeptics who think that the media have overblown this whole situation with the new coronavirus when there are other problems in the world that warrant more attention?*

[Dr. Lynn Zechiedrich](#), a Professor of Molecular Virology and Microbiology at Baylor College of Medicine replied: “What people worry about depends on their unique perspective. Everyone looks at the same scene only from their own viewpoint.”

“We should all listen to and understand when someone feels that what they are going through is “more important” than COVID-19. At the same time, we must also pay attention to trusted sources.”

“The problem with COVID-19, relative to all the other things to worry about in the world, is that all of us are susceptible, every single person on earth. No one has an antibody to a virus they have never before been exposed to. So the risk is very great. And we’re still figuring it out.”

“What sets COVID-19 apart from other things that kill or harm people, like heart disease, flu, or contaminated drinking water is that we know what to expect from those other things.”

“Until we have a vaccine for SARS-CoV-2, or at least an effective treatment for people with COVID-19, it’s a big problem, and one that rises to the top when you take the perspective of the entire planet!”

*For people who live in constant fear of getting infected with the new coronavirus or who are losing hope:*

“COVID-19 is one of many diseases that threaten our mortality and well-being. We need to live each day to the fullest that we can. Stay informed and make smart decisions like wearing masks and learning as much as we can to prevent spread to others. As physicians and health care providers, we need to stay as current as we can on new treatments and ways of treating our patients if they get sick,” says Dr. Moore.

“Fear is constant in life,” Dr. Zechiedrich says. “I tell myself there’s no point in worrying about what I cannot control. So, I just keep doing my job and doing my best. There’s hope for a vaccine, for limiting the spread, and from knowledge of so many wonderful people, such as the doctors and researchers. I choose to trust them and to continue to do what I can do to protect myself and my family and loved ones. Because that is what I can do.”

Dr. Hotez says: “We are learning more about this virus every day. Eventually, we will have treatments and vaccines, but it won’t happen overnight. There are doctors and scientists like me who have worked in South America and Central America for many years. We love the people there and we feel a kinship, so I think every day on how we can get our vaccine to this part of the world; that’s why I’m trying to raise awareness about South America.”

### **Sites of Interest Recommended by the Interviewees:**

American Academy of Family Physicians  
<https://www.aafp.org/home.html>

American Academy of Pediatrics  
<https://shop.aap.org/>

American College of Emergency Physicians



<https://www.acep.org/>

The Preprint Server for Biology (bioRxiv)

<https://www.biorxiv.org/>

Centros para el Control y Prevención de Enfermedades

<https://www.cdc.gov/spanish/index.html>

Colorado Medical Society

<https://www.cms.org/>

Infectious Disease Society of America

<https://www.idsociety.org/>

Journal of the American Medical Association (JAMA) Network

<https://jamanetwork.com/>

Journal of the American Association of Nurse Practitioners

<https://journals.lww.com/jaanp/pages/aboutthejournal.aspx>

The Preprint Services for Health Sciences (medRxiv)

<https://www.medrxiv.org/>

New England Journal of Medicine

<https://www.nejm.org/>

Organización Mundial de la Salud

<https://www.who.int/es>

Organización Pan Americana de la Salud

<https://www.paho.org/es>

The Lancet

<https://www.thelancet.com/>

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