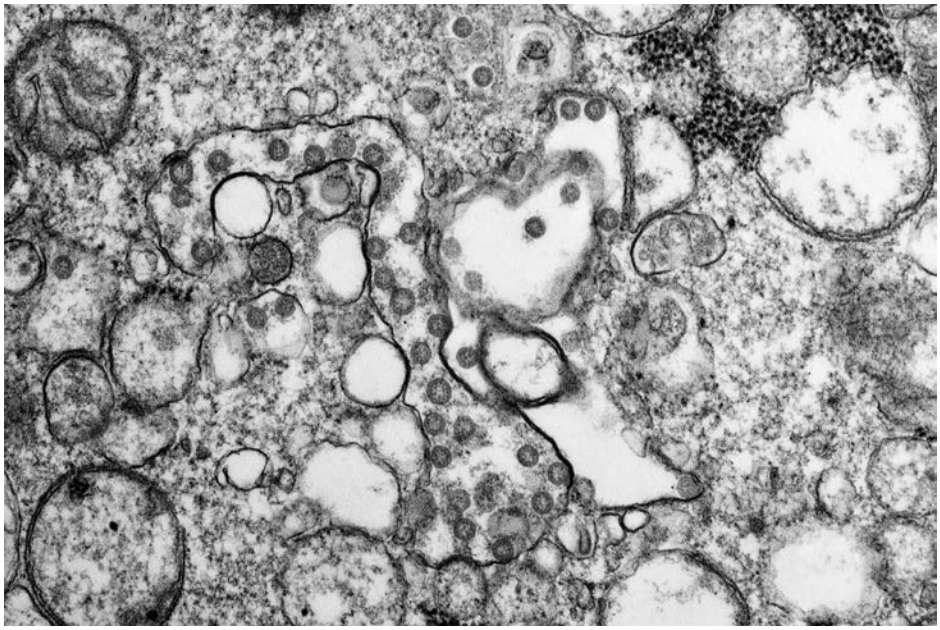

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Teresa Jiménez*

Keeping This Virus in Mind

Interview with Dr. Guillermo Ruiz Palacios[1]

Teresa Jiménez (TJ): Did the pandemic catch us by surprise?

Guillermo Ruíz Palacios (GRP): Yes, it did, because what happened was like when the boy cried wolf. When the influenza pandemic hit, we were partially prepared, and even though it was important, it didn't have the effects that the 1918 pandemic had, for example. When we saw that the consequences weren't as devastating as they could have been, both people like myself who work with this for a living, and the public health authorities neglected preparations, and programs that began at the start of this century, since 2002, were discontinued. I'd say we were prepared and we weren't, because we didn't think that we'd have a pandemic of the characteristics and magnitude of the one we're going through now.

TJ: Was this neglect, this pause in the fight against this kind of virus national or worldwide?

GRP: I think it was worldwide, but some countries never let their guard down, and those are the ones who have fared better. Yes, there was certain preparation after the N1H1 influenza crisis, which had important effects, but not the economic impact and, above all, the impact on health that the current COVID-19 pandemic is having.

TJ: And what about the so-called Spanish flu epidemic? What differences are there today, a century later? Are there commonalities?

GRP: Well, they have certain things in common. The 1918 influenza virus, the Spanish flu, was very similar to the one that emerged in 2009. This meant that the older population, people sixty-five and over, didn't have such a hard time of it because they had previous immunological history, and the hardest hit part of the population in 2009 was young adults, who had no immunological memory against it. For this group in particular, the effects were very serious indeed. That is, there were important differences. In 1918, the planet was in the throes of World War I and the population was highly concentrated, with

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overcrowding causing widespread transmission with no prior immunity. So, the consequences were devastating. In the 2009 pandemic, older people had prior immunity and the conditions weren't the same: there was no war and the transmission wasn't as quick. That is, environmental conditions were different, and that may also have played a part in its not having the impact it did on public health in 1918.

TJ: How do humans dialogue with viruses?

GRP: Some viruses are native to human beings: there are viromes and microbiomes, many viruses living in our bodies naturally. But other viruses are not natural to humans, like the coronaviruses. The latter are natural to rodents, and some particular groups are very specific to bats, and we are only occasional transitory hosts for them. Since these viruses evolve very quickly and constantly go through important mutations, they can adapt to humans in a certain way, infecting them easily and producing a different response than the one they cause in their natural hosts. And that's what makes a disease develop, making the transmission different and giving it very particular characteristics.

For example, this coronavirus, SARS-CoV-2, has very high transmission capabilities, and that's why it spread and mutated so quickly, compared to the other SARS-CoV-2 variants. A few small mutations were extremely important in making human beings one of the main receivers of the virus and making its transmission so implacable. Another example of this is happening now with the virus's mutations, the variants that have emerged in South Africa, in the United Kingdom, and in Brazil. These strains have changed and have caused these new waves of transmission and infection.[2]

TJ: Why do these mutations take place in such particular places? Brazil, South Africa, England: is there any specific reason?

GRP: We don't really know; at least I don't know why they may have happened in those particular places. I think it has a lot to do with the local controls in place, the capacity for propagation in the regions themselves, the rapid transmission, and the acquisition of immunity. Because these viruses mutate in the presence of people who are already immunized or partially immunized, above all in that group. That is what favors mutations; that we do know. But we still don't know what happened in these three groups in particular. Perhaps those populations already had a prior immunity shared with these viruses.

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TJ: Is there any evidence that we're generating a microbiome resistance?

GRP: Yes, definitely. This happens a lot with bacteria and the indiscriminate use of antibiotics; and it also happens with some viruses. HIV is the best example. It has a great capacity for mutation, and we often have to use new medications because people develop resistances. These resistances develop due to inappropriate use of antivirals, whether people stop taking them or because of prolonged usage. With continuous use, the virus develops mutations to respond to those specific antivirals. That hasn't happened so far with the coronavirus because very few antivirals are being used continually or for a long period in the general population. But with influenza, we have observed important resistances to some of the antivirals that were being used before.

TJ: You developed the protocol for the Cansino vaccine here in Mexico, and you've also participated in developing many other vaccines. Is there any difference between this one and the others?

GRP: Well, there are different vaccines, but they all work on the same principle. With a few exceptions, all the vaccines use a very specific protein of the virus; it's a protein whose job is to join the cellular receptors of the respiratory and intestinal epithelium. It's the S protein, called the "spike," and that's the common denominator. There's only a group of vaccines that uses the same system that's used for the flu vaccines, that uses a complete inactive virus. But the rest are recombinant vaccines that use the S protein, and there are different ways of producing that. But, at the end of the day, what we create are antibodies against that protein.

TJ: Can we know if the vaccine will generate herd immunity? Would that be the objective?

GRP: Well, that's what we expect will happen, because it's what happens with most vaccines and existing vaccination programs. We get to a point at which an important proportion of the population is immune and that slows the circulation of the viruses. And that means that, in a

certain way, the virus disappears from those populations. The best example is the smallpox virus, or what is happening now with polio. In some countries, above all in practically all of the Americas, infection from the polio virus has been controlled precisely due to herd immunity.

TJ: Moving on to other topics: in the past, many social problems were clear before, but now with the pandemic, they've become even more visible. These include the great social inequality among countries and among citizens of a single country; the terrible relationship we have with the environment; the ecological imbalances that we ourselves have also created and that have had an influence on the spread of this virus; and also, of course, the enormous deficiencies in the world's and every country's health systems. What lessons will the pandemic leave us?

GRP: In particular, this pandemic has changed the way we develop as a society, and it will have a very, very important impact. Hopefully, it'll be an impact that we can learn how to live differently from. This epidemic would not have happened if all the conditions of how we've been living hadn't come together. Globalization is real, and we're going to have to know how to handle it because, it was precisely the global dimension that made it possible for transmission to happen all over the world in such a short time. And specifically, this infection arose out of very local characteristics, out of the behavior of a specific society. I'm referring to the Chinese population, with its specific customs, with such a high demographic density, which encouraged a virus that was limited to a relatively isolated animal population to include the human race.

The so-called "wild" viruses live in areas with no contact with humans or only sporadic contact. The circle of life of these viruses is through small mammals. The virus transmits from a group of animals living in the wild, making certain populations a tasty dish for them. These animals, in fact, were from other sites in Asia and were concentrated in such very specific, very particular culinary markets in China. The virus passed on to humans and from there, it became a global problem. Right now, China is the center of the world; everything goes and comes from there; it's the world's most important trade center.

TJ: It's also a change in balance, isn't it? In ecological balance, the balance of power, balance in trade…

GRP: The other example is the 2009 influenza: all the flu outbreaks and pandemics have originated in Southern Asia for as long as we can remember. But 2009 was the first time, as far as we know, that a virus originated in the Americas. It was born exactly in the pork trade between Mexico and the United States, and its intermediary hosts were pigs. For a new human virus to be formed, it almost always has to go through this circuit. Normally, fowl are the natural reservoir; the intermediaries are pigs; and we humans are the end point. That's how new influenza viruses are generated. Once again, we're facing a unique situation, the consequence of the kind of life we have based on globalized trade.

TJ: How do you think we could act in a holistic way with nature, science, and society?

GRP: I think this has been a good lesson, particularly for our country, where science has never been given enough importance and impetus; it's never been considered an essential part of designing the country's general policies, particularly health policies, but also those for other sectors. In Mexico, and in general in Latin America, science is undervalued and very little known. People think it's something isolated, and they don't integrate it into their own activities for developing the country. And that's what I think has to change.

TJ: Do you think the world will be the same after this pandemic? What expectations can we have?

GRP: No, I definitely think not. Although once this virus is under control, the same thing may happen to us again, and we may forget, but I hope not. I think that that has to be one of the main reasons to keep in mind from now on, that our behavior in the last fifty years is leading us to our own destruction. And the fact that the virus can be controlled must be a lesson for thinking about how we're going to continue and how we're going to live for the next hundred years. VM

Notes

1 Dr. Ruiz Palacios graduated in medicine from the UNAM and is currently a researcher emeritus in medical sciences, as well as the director of the Salvador Zubirán National Institute of Medical Sciences and Nutrition Virology and Molecular Biology Laboratory. He has pursued an important career in gastrointestinal and respiratory infection research, as well as into dengue and zika. He pioneered the study of HIV/AIDS in Mexico and currently of SARS-COV-2, heading up the protocol for the application of the Cansino vaccine.
2 At the time of this interview, the Delta variant had not come on the scene yet. [Editor's Note.]