

Here in Brazil, in the beginning-- just in the beginning of the pandemic, we were-- our lab was recognised as a International SARS-CoV-2 reference lab for Americas.

And in that beginning, we sought just us and the National surveillance network that we had in the past for influenza surveillance. Because when we start to do the surveillance, the National surveillance for SARS-CoV-2 here in Brazil, we keep the same structure of influenza surveillance. So all the 27 federal units, we have a central laboratory that receives samples from different municipalities of the state.

In this central laboratory, they do-- they perform the real-time PCR, the detection. And after, they send the samples for the National reference labs that, in that moment, in the beginning of pandemic, was like-- were three labs. One of them in Belém, in Pará, that is the Intitute Evandro Chagas, and the other one is Institute Adolfo Lutz, in São Paulo, and our laboratory here in Rio Janeiro.

But in this beginning, we saw that with the pandemic, we needed to improve. So we immediately identified inside Fiocruz other institutions that could help us in this genomic surveillance. So it was in this beginning that started the Fiocruz genomic network.

In that time, it was March 2020. I was in UK working with UCL genomics and with PGU [Pathogen Genomics Unit]. I was performing my post-doc with them there. And we were establishing the Nanopore sequencing in the platform using a in-house protocol that I had designed the primer-- the primers. And I sent this design that I designed there in UK to our group here in Brazil. So the first genomes that we produced using this protocol that in UCL genomics we did with Nanopore sequencing, and here in Brazil, the group performed with Illumina sequencing.

So on April, Fiocruz told me that "you need to return and continue your job here in Brazil" because we are in a pandemic. So I returned in that time, and we started to structure all-- and connect all these other labs and share the protocols.

So in that beginning, was really good to see how we could improve the amount of genomes that we were producing together using other groups also in the country. And last year, in the beginning of last year, we decided to improve the-- our protocols, so we changed the in-house protocol for a commercial protocol, and it helped us to produce more genomes in a shorter time. So the hands-on was shorter than when we used it with the in-house protocol. And it make us to produce more and more genomes.

And now, since the beginning of this year, all these 27 central labs that I mentioned to you in Brazil received Illumina machine also. And now we are in a phase that we are sharing this protocol with other groups in Brazil. We are training them here in our lab or in other labs of the network, and they are starting to produce genomes also. So we became really-- a really strong network to work together.

But of course, this network that I mentioned to you is related to the Brazilian ministry of health. But we have in Brazil also other important initiatives, like universities or other institutions that are doing also genome sequencing. And it helps also this amount of data that we have here in the country.

And if this, again, does show to connect with other things that I learned during the pandemic. Working together, we can improve and working better. So this is the message.

The one major learning lesson for Indian researchers during this pandemic was the participation in national mega-projects. So most of Indian researchers, including myself, were used to conducting PI [Principal investigator] driven research, addressing major questions in basic and applied biology. Although public health research requires quite a different approach.

So this was definitely a big learning experience for most of us. As part of the INSACOG network, we actually meet quite regularly. In fact, last year when we started, we were meeting every day, including the weekends. And then now, we meet once or twice every week.

So the network includes public health experts, sequencing experts, computational biology, structural biologists, virologists, immunologists, and people from other fields. And I don't think India has ever seen such an eclectic group of scientists and researchers coming together.

So I'm sure this will spawn further collaborative research for national health related issues in the country. The other important aspect of this work has been the building of infrastructure. So we have an enormous increase in technical and knowledge-based know how for tackling these kind of problems in the country. And this is definitely going to be of much of use in the future.

Well I mean, the experience during the SARS-CoV-2 pandemic was the fact that, especially for us in Africa, it opened up a room for collaboration. We saw extensive collaboration between-- within the continent. Some of us that had facility to sequence supported countries that didn't have facility to sequence.

We share protocols between our colleagues here and in South Africa and other African countries. We build capacity. We train a lot of African countries during the epidemic, because they could see the value in the training. And then also the value into sharing knowledge.

I think one thing that Africa-- that this pandemic showed was the fact that scientists can work together. Not only in Africa, but across the globe. You can see exactly what happened with GISAID. I mean, the pandemic showed that scientists when there are challenged, scientists can come together to address problems. And then COVID was a great example. And our science really has no border, and that people can actually come together to address problem where they have-- when they are faced-- where they're faced with challenges.