

# Monitoring pathogens of public health relevance

[00:00:00.000] My name is Josefina Campos I'm the director of the National Centre of Genomics and Bioinformatics Malbrán Institute in Argentina. We are the national reference lab for the Ministry of Health.

[00:00:11.761] So our main objective is to monitor pathogens of public health relevance among other non-transmissible diseases. I have been working on monitoring these pathogens for the past 15 years.

[00:00:24.691] One of the things we have to have in mind from the National Reference Lab is how the surveillance system is set up. What do we have in place and what do we mean that we have to have in mind the geography, which other reference lab we have across the country and how we want to monitor the dynamic of that particular disease when we need to think of new technologies like how genomics is merged in this surveillance system. This is one of the questions we need to ask.

[00:00:51.301] For example, in Argentina, all the national reference labs, for all the pathogens of public health importance has very well-established laboratory surveillance network. So how any technology can kick off?

[00:01:02.687] One of the things we can think of is where are the gaps in the surveillance and how we can fill those gaps. We have examples for example, when we study outbreaks where the technology we have in place was not enough to discriminate if the isolates were part of that outbreak. For example, cases of *Streptococcus pyogenes* in 2007 in Argentina.

[00:01:24.584] But we also want to do a continued monitoring of some other pathogens. For example, those are foodborne-associated outbreaks. In that case, we want to know what is circulating in the country and how these can be linked through the best technology we can have. In this case, genomics tends to be essential.

[00:01:43.978] That's how we start working with both set in Latin America and the Caribbean, not only in Argentina, but across the region to do the surveillance of foodborne and waterborne pathogens.

[00:01:53.071] We have many other examples, like, for example, the *Neisseria gonorrhoea* outbreak where we really need genomic surveillance to set up and identify two different clusters in the country in different provinces. This has had a direct impact in some policies that the Ministry of Health eventually take to prevent new outbreaks to come.

[00:02:15.385] One of our major outcomes in 2020 was to use this genomic infrastructure we set up in our institute to work to determine their resistance for TB isolates and with the national reference lab. This was because of we worked before on a specific project making a case study for this we also have a very well-known example of *Vibrio cholerae*. And when cholera kick off the 1990s, we could identify through genomics different lineages the pandemic and the non-pandemic. Even now we have pandemic cholera free in Argentina, we still monitor every cholera-suspected case with genomics to know if this is a pandemic or not. Why do we do that and why we don't use that the traditional techniques because even with the traditional techniques we can get up to *Vibrio cholerae* and also we can get to know if it's toxicogenic we don't know if it's a pandemic or not.

[00:03:12.317 ] And that has a direct impact on the response in public health. And we work with that with every National Reference Lab in the Institute to try to understand how new technologies can actually merge.

[00:03:24.329] Of course, it was essential during the COVID-19 pandemic, where we establish a completely new genomic response for the whole country, and that, of course, because of that geography, of the country and the amount of samples that we were receiving at the National Reference Lab, this was impossible to sustain. First of all, in our unit we have scaled up our genomic capacity. How? Getting new sequencers and doing automatic robots for the library, for example, but even with that, that was not enough for this genomics response.

[00:03:59.906] So we set up a new genomic network across the country where all the provinces have now all genomic capacity. But this is also a challenge is not only for creating the capacity across the country, but also to link this capacity with the extensive laboratory surveillance network well-established.

[00:04:19.509] We're still working with pathogens. This new technology is actually making a difference, and which ones have to be done locally, centrally or is not needed at all. This all has to do in how the public health response, we think for each particular pathogens of importance.