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Perspective

Testing for SARS-CoV-2 at the core of voluntary collective isolation: Lessons from the indigenous populations living in the Amazon region in Ecuador

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ABSTRACT

Voluntary collective isolation has been proposed to be the best response to COVID-19 for indigenous populations. While the potential value of voluntary collective isolation is appealing, the feasibility of this approach needs empirical evidence to support it as the best response to protect indigenous communities from COVID-19. This paper describes our experience during SARS-CoV-2 surveillance among Waorani communities in the Ecuadorian Amazonian region, from June to September 2020. We found that self-isolation strategies failed to contain the spread of SARS-CoV-2 from main urban areas to remote and isolated comunities.

Introduction

Ecuador is one of the eight countries sharing the Amazon forest, where more than 1 million indigenous people from more than 400 ethnic groups reside. The COVID-19 health crisis caught indigenous populations in this region off guard and the lack of immediate response by state governments exposed the poor existing health services in rural sectors, which has also been described for indigenous communities in Mexico (de Leo'n-Marti'nez et al., 2020).

Although COVID-19 outbreaks have been described for different countries in the Amazon basin, no massive surveillance testing has been carried out for Amazonian indigenous communities (Ramirez et al., 2020). This paper describes the experience of COVID-19 surveillance within remote indigenous communities in the Ecuadorian Amazon region.

Nasopharyngeal swabs were collected for SARS-CoV-2 diagnosis by RT-PCR (Freire-Paspuel et al., 2020a; Freire-Paspuel et al., 2020b; Freire-Paspuel and Garcia-Bereguiain, 2020a; Freire-Paspuel et al., 2020c; Freire-Paspuel and Garcia-Bereguiain, 2020b; Freire-Paspuel et al., 2020d; Freire-Paspuel and Garcia-Bereguiain, 2021). All of the staff from the research team attending the communities were tested for SARS-CoV-2 by RT-PCR 24 h before travelling. The required personal protective equipment was always used while working with the communities. Moreover, samples from each community were taken immediately upon arrival, so transmission from scientific staff to communities could be ruled out.

On a first visit to several recently contacted Waorani communities in June 2020, three of five remote and self-isolated communities included in the mass sampling brigades remained SARS-CoV-2-free, while the infection rates reached up to 90% in the remainder. Forty-one of 119 (34.4%) clan members tested positive for SARS-CoV2, while at least five COVID-19-related deaths were

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reported. We found that some members of these communities had recently travelled from urban and suburban areas where COVID-19 cases were found by the Ministry of Public Health (MoH), although contact tracing and proper notification was delayed for some of the most remote areas, causing massive contagion without any awareness. Therefore, the delay in access to testing may have resulted in the decision to voluntarily isolate, adopted by different indigenous communities, to be too late and ineffective (Kaplan et al., 2020). Before the communities were aware of the COVID-19 outbreak, they were still celebrating their traditional festivities like drinking saliva-fermented *chicha* beer from a sharing pot, which is a high-risk practice for bacterial or viral cross-infections (Freire et al., 2016).

After the first intervention within the communities, they received their viral status within 4 days of the samples being collected and the community leaders began to take preventive measures such as encouraging facemask wearing, individual and community isolation, and claiming their legal rights due to the evident abandonment.

Surprisingly, a few weeks later, on the second visit in September 2020, only two of the smaller same Waorani communities remained SARS-CoV2-free, the attack rates was still as high as 85% in some of them, and 34 of 69 (49.3%) individuals tested positive for SARS-CoV2. The SARS-CoV2 prevalence had increased by almost 15% since the first visit. There was also strikingly lower enrolment in voluntary testing among the communities, which was either due to fear or lack of interest, according to the opinion of community leaders.

This experience of Waorani people from the Amazon region in Ecuador challenges the hypothesis that voluntary collective isolation ia an effective control and prevention strategy for COVID-19 (Freire-Paspuel et al., 2020c), and highlights the need for intense surveillance programs to fight the spread of SARS-CoV2 among highly vulnerable indigenous communities, as previously proposedfor Mexican indigenous people (de Leo'n-Marti'nez et al., 2020).

Ethical approval and consent to participate

Written consent was obtained from all individuals included in the surveillance. The study was approved by the Bioethics Commission from Universidad de Las Américas.

Consent for publication

Not applicable.

Availability of supporting data

Not applicable.

Competing interests

The authors declare no conflict of interest.

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Authors' contributions

All authors contributed to data collection, analysis and writing of the manuscript.

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References

de Leo'n-Marti'nez Lorena Di'az, de la Sierra-de la Vega Luz, Palacios-Rami'rez Andre's, Rodriguez-Aguilar Maribel, Flores-Rami'rez Rogelio. Critical review of social, environmental and health risk factors in the Mexican indigenous population and their capacity to respond to the COVID-19. Sci Total Environ 2020;139357.

Freire AL, Zapata S, Mosquera J, Mejia ML, Trueba G. Bacteria associated with human saliva are major microbial components of Ecuadorian indigenous beers (chicha). Peer J 2016;4:e1962.

Freire-Paspuel Byron, Garcia-Bereguiain Miguel Angel. Analytical sensitivity and clinical performance of a triplex RT-qPCR assay using CDC N1, N2 and RP targets for SARS-CoV-2 diagnosis. Int J Infect Dis 2020a;25:, doi:http://dx.doi.org/10.1016/j.ijid.2020.10.047 S1201-9712(20)32250-32255.

Freire-Paspuel Byron, Garcia-Bereguiain Miguel Angel. Poor sensitivity of "Accu-Power SARS-CoV-2 real time RT-PCR kit (Bioneer, South Korea)". Virol J 2020b;17(1):178, doi:http://dx.doi.org/10.1186/s12985-020-01445-4.

Freire-Paspuel Byron, Garcia-Bereguiain Miguel Angel. Low clinical performance of "Isopollo COVID19 detection kit" (Monitor, South Korea) for RT-LAMP SARS-CoV-2 diagnosis: a call for action against low quality products for developing countries". Int J Infect Dis 2021;(January), doi:http://dx.doi.org/10.1016/j.ijid.2020.12.088 S1201-9712(21)00017-5. Online ahead of print.

Freire-Paspuel Byron, Vega-Mariño Patricio, Velez Alberto, Castillo Paulina, Cruz Marilyn, Garcia-Bereguiain Miguel Angel. Evaluation of nCoV-QS (MiCo BioMed) for RT-qPCR detection of SARS-CoV-2 from nasopharyngeal samples using CDC FDA EUA qPCR kit as a gold standard: an example of the need of validation studies. J Clin Virol 2020a;128:104454, doi:http://dx.doi.org/10.1016/j.jcv.2020.104454.

Freire-Paspuel Byron, Vega-Mariño Patricio, Velez Alberto, Castillo Paulina, Cruz Marilyn, Garcia-Bereguiain Miguel Angel. Sample pooling of RNA extracts to speed up SARS-CoV-2 diagnosis using CDC FDA EUA RT-qPCR kit. Virus Res 2020b;290:198173.

Freire-Paspuel B, Vega-Mariño P, Velez A, Cruz M, Perez F, Garcia-Bereguiain MA. Analytical and clinical comparison of Viasure (CerTest Biotec) and 2019-nCoV CDC (IDT) RT-qPCR kits for SARS-CoV2 diagnosis. Virology 2020c;553:154–6, doi:http://dx.doi.org/10.1016/j.virol.2020.10.010.

Freire-Paspuel B, Vega-Mariño P, Velez A, Castillo P, Masaquiza C, Cedeño-Vega R, et al. "One Health" inspired SARS-CoV-2 surveillance: the Galapagos Islands experience. One Health 2020d;100185:, doi:http://dx.doi.org/10.1016/j.onehlt.2020.100185.

Kaplan HS, Trumble BC, Stieglitz J, Mamany RM, Cayuba MG, Moye LM, et al. Voluntary collective isolation as a best response to COVID-19 for indigenous populations? A case study and protocol from the Bolivian Amazon. Lancet 2020;395(10238):P1727–34.

Ramirez JD, Sordillo EM, Gotuzzo E, Zavaleta C, Caplivski D, Navarro JC, et al. SARS-CoV-2 in the Amazon region: a harbinger of doom for Amerindians. PLoS Negl Trop Dis 2020;14(10)e0008686, doi:http://dx.doi.org/10.1371/journal.pntd.0008686.