

## **BLS-2/BSL-3 Laboratory for Diagnosis of Pathogens on the Colombia-Ecuador Border Region: A Post-COVID Commitment to Public Health**

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**Abstract :** COVID-19 is a disruptive pandemic for the public health and economic system of whole countries, including Colombia. Nariño Department is the southwest of the country and draws attention to being on the border with Ecuador, constantly facing demographic transition affecting infections between countries. In Nariño, the early routine diagnosis of SARS-CoV-2, which can be handled at BSL-2, has affected the transmission dynamics of COVID-19. However, new emerging and re-emerging viruses with biological flexibility classified as a Risk Group 3 agent can take advantage of epidemiological opportunities, generating the need to increase clinical diagnosis, mainly in border regions between countries. The overall objective of this project was to assure the quality of the analytical process in the diagnosis of high biological risk pathogens in Nariño by building a laboratory that includes biosafety level (BSL)-2 and (BSL)-3 containment zones. The delimitation of zones was carried out according to the Verification Tool of the National Health Institute of Colombia and following the standard requirements for the competence of testing and calibration laboratories of the International Organization for Standardization. This is achieved by harmonization of methods and equipment for effective and durable diagnostics of the large-scale spread of highly pathogenic microorganisms, employing negative-pressure containment systems and UV Systems in accordance with a finely controlled electrical system and PCR systems as new diagnostic tools. That increases laboratory capacity. Protection in BSL-3 zones will separate the handling of potentially infectious aerosols within the laboratory from the community and the environment. It will also allow the handling and inactivation of samples with suspected pathogens and the extraction of molecular material from them, allowing research with pathogens with high risks, such as SARS-CoV-2, Influenza, and syncytial virus, and malaria, among others. The diagnosis of these pathogens will be articulated across the spectrum of basic, applied, and translational research that could receive about 60 daily samples. It is expected that this project will be articulated with the health policies of neighboring countries to increase research capacity.

**Keywords :** medical laboratory science, SARS-CoV-2, public health surveillance, Colombia

**Conference Title :** ICIPH 2022 : International Conference on Infection and Public Health

**Conference Location :** London, United Kingdom

**Conference Dates :** November 18-19, 2022