



Application of Sequencing Technology to Elucidate SARS-CoV-2 Introduction and Dispersion in Mozambique

COVIDSeq_NET

SARS-CoV-2 NGS Capacity Building in Mozambique to Identify SARS-CoV-2 Variants, Generate Information about Genetic Diversity and Spread within the Country

Duration

2021 – 2023

Budget

approx. 405,000 EUR

Partner countries

Mozambique

Challenges addressed by the project

Mozambique shares geographical borders with South Africa, the country bearing the highest burden of confirmed cases of COVID-19 in Africa. In addition, the geographical location and elongated shape of the country, with numerous neighbouring countries, make Mozambique vulnerable to the introduction of genetic variants of SARS-CoV-2 from a wide range of regions in Africa. Understanding the spatial distribution and transmission dynamics via the use of whole-genome epidemiology analyses of the virus, like it is being used in multiple other countries, is important for the generation of better public health policies and intervention strategies. However, limited resource settings such as Mozambique still lack infrastructure and trained personal for viral Next Generation Sequencing (NGS) and subsequent data analysis.

Objectives

The COVIDSeq_NET project has several aims for relevance in the country perspective:

- » Determination of the genetic diversity of SARS-CoV-2 since the beginning of the outbreak in Mozambique to provide a better understanding of the molecular epidemiology and genetic characterization of SARS-CoV-2 in Mozambique. This information will help authorities to better understand how the virus is spreading, identify the emergence of variants of concern and generate information about the genetic diversity and its dissemination.
- » Expand and use the NGS capacity at INS to establish the SARS-CoV-2 sequencing using an amplicon-based approach described by the ARTIC-NETWORK (<https://artic.network/ncov-2019>). Colleagues from Mozambique will be trained in all essential steps including laboratory procedures, but also data analysis.
- » The technology and knowledge acquired by this project will be of great use in future viral outbreaks in Mozambique.

Overview of activities

A better understanding on the epidemic diffusion, as well as temporal and geographical trends in transmission events of the virus will help in the generation of better public health policies improving current COVID-19 control and prevention measures established in the country and worldwide. As part of the long-term



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Lecture on sample and library preparation for SARS-CoV-2 sequencing. (Photo ©Leonardo de Araujo)



Implementation team during the first on-site training. (Photo ©Nalia Ismael)



Starting the iSeq100 sequencer with SARS-CoV-2 samples for whole viral genome sequencing. (Photo ©Nalia Ismael)

collaboration between the Instituto Nacional de Saúde (INS) and the Research Center Borstel Leibniz Lung Center (RCB), whole genome sequencing (WGS) of SARS-CoV-2 from different periods of the epidemic will be performed using NGS technology. For ongoing and future surveillance analyses, after the establishment of the sequencing technology and training and depending on local COVID-19 incidence, between 50 and 100 positive samples for SARS-CoV-2 will be sequenced per month and analysed in a timely manner from June/2021 to June/2022. Initially, NGS of SARS-CoV-2 samples will be performed at the RCB to get a first impression of the circulating variants. The NGS technology will be performed on the iSeq 100 platform. The corresponding analysis workflows have already been established at the RCB. However, the aim is to implement the NGS technology very quickly in the laboratory in Maputo, so that virus sequencing and subsequent data analysis can be carried out locally and be included in the country's epidemic plans. For this purpose, the local partners will be trained in the NGS technology and in the analysis of the generated sequence data to build local capacity for further challenges on the need of viral NGS. Building capacity and transferring knowledge for NGS will enhance scientific research information which might lead to local improvements in regard to SARS-CoV-2. The German and Mozambican partners want to use the current funding phase to jointly develop a plan for ongoing molecular surveillance of infectious diseases in Mozambique for the period after 2023.

Partner institutions

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