

Epidemic Response to SARS-CoV2

BACKGROUND

The Covid-19 pandemic has brought unprecedented challenges for Africa, with every country potentially at risk for unmitigated spread of SARS-CoV2. Like most health systems in the world, there is a significant risk for current levels of care to be overwhelmed by sheer volume of patients requiring intensive care and ventilatory support. In addition, health care workers are at risk of acquiring SARS-CoV2 and given limited infection control practices in many settings, there is also risk of nosocomial transmission of SARS-CoV2 among patients. A recent survey conducted by the African Academy of Sciences (AAS) found that the most important questions that Africans scientists, health care workers and public health officials should study included the **detailed epidemiology and transmission dynamics in African settings, as well as infection prevention and control for health care workers**. These are questions that are widely applicable across the continent, yet require local context and expertise in order to address in a timely and effective manner.

At the same time, pathogen genetic sequencing (PGS) has been increasingly used in wealthy countries to help respond to outbreaks of infectious diseases, from MDR bacteria to Ebola to Yellow fever, measles and polio. Already, PGS has been shown to be important in understanding the transmission dynamics and epidemiology of SARS-CoV2 in the US, Europe and China. **PGS has been used for contact tracing and outbreak size estimation based on phylodynamic analyses. Unfortunately, PGS is not in widespread use in Africa. A rapid introduction of PGS in Africa will help in the fight to control SARS-CoV2 over the next year, and prepare the continent for the next epidemic not yet identified.**

Over the past three years, the Africa CDC has begun to establish expertise in PGS and is developing a regional laboratory network that will eventually have advanced sequencing capacity at reference laboratories. Africa CDC has the mandate and vision to bring together African thought leaders in PGS in a coherent and sustainable peer network – A Pan-African Pathogen Sequencing Initiative. This challenge will support the parallel development of a cadre of scientists in academic and government laboratories who can contribute substantively to this initiative.

THE CHALLENGE

We invite proposals for the rapid establishment of PGS in African settings in order to respond to Covid-19 epidemics that address the following challenges:

1. Use PGS to understand the introduction, local spread and transmission dynamics of SARS-CoV2
2. Use PGS in public health field epidemiology response for SARS-CoV2, such as contact tracing
3. Use PGS in clinical settings to understand nosocomial transmission of SARS-CoV2 with the intention to protect HCW and patients

Interventions addressing more than one challenge (e.g. clinical and field epidemiology) are encouraged. In some geographies all three of these challenges exist simultaneously, at different times for different populations; in other geographies only one or two of these challenges predominate. Applications should clearly state which of these three challenges is being targeted

and provide clear rationale for why the intervention is likely to address the challenge. We are particularly interested in geographies with little or no access to PGS technology at present, but who have **functional and modern molecular microbiology labs and experience with PCR**.

Grant Funding Levels

We seek to make Seed Grants to generate proof of concept of novel interventions together with Validation Grants to generate further evidence of feasibility at a larger scale for existing interventions.

- **Seed Grants** of \$100-200K for up to 24 months: These grants are intended to provide start up equipment, supplies, software and training to support PGS.

What We Are Looking For:

All applications should:

- **Describe how their laboratory and staff can immediately put to use PGS technology at their site, including internet access, electrical capacity**

A few of the many options we will consider include (but are not limited to):

- Support for laboratory equipment, supplies and reagents needed for next generation pathogen genetic sequencing (PGS)
- Field supplies for sample collection, transportation, storage and preparation
- Lap-top or computer with appropriate software for the analysis; high speed internet access and cloud compute time, if not provided thru the Africa CDC lab network
- Support for salary for laboratory personnel
- Training specific for PGS technology or bioinformatics, either on-line or in person
- Travel to Africa CDC to support network development or to present findings at an international conference

We will not consider funding for projects that do not primarily respond to SARS-CoV2 public health response. We will highly preference funding for projects in national public health institutes or other public laboratories.

COLLABORATION WITH EXISTING FOUNDATION INVESTMENTS

This request for proposals seeks to create a network of individually funded projects that will benefit from and collaborate with the broader Africa Pathogen Genomics Initiative, which encompasses a new Pathogen Genomics Institute headquartered at the Africa CDC, a Pan-African PGS lab network, and large tech investments to give African scientists more direct end-to-end ownership of their PGS data. Recipients of these seed grants may also benefit from Africa-wide bioinformatics and PGS Data for Action trainings associated with the Africa Pathogen Genomics Initiative. We expect that PGS data on SARS-CoV2 will be shared immediately with local government health officials as well as uploaded to a standard repository for genetic data such as GISAID, NCBI or ENA. Such sharing is important for the public health response locally but also globally. In addition, it will be important to participate in the Public Health Alliance for Genetic Epidemiology (PHA4GE), a community-driven standards-setting organization located at the South Africa National Bioinformatics Institute in Cape Town.