EDCTP Contract N⁰ RIA2020EF-2918

Rapid diagnostics for COVID-19: manufacturable in Africa to increase affordability, improve epidemic preparedness and strengthen local resilience

Deliverable report

Deliverable number	D8.2
WP no/title	8: Training and Capacity Building
Deliverable title	Training in design of AfriDx
Responsible partner	NMIMR
Dissemination level	PU
Due date	May, 2022
Actual submission date	4th July 2022

Delivery Type

R	Report	✓
DEM	Demonstrator, pilot, prototype, plan designs, new or revised health policies etc	
DEC	Websites, patents filing, press & media actions, etc	
OTHER	Other	

Dissemination Level

PU	Public	✓
RE	Restricted to a group specified by the consortium.	

Document Log

Version	Date	Author	Description of Change
1.0	March 2021	Kofi Bonney	
1.2	May 2022	Kofi Bonney	Proof read

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1. Status of the Deliverable

This project seeks to provide a reliable diagnostic system for COVID-19, using the PATHPOD system with RT-qPCR as the gold standard. The process requires the use of human samples, subsequently, ethical approval for this project was sought from the NMIMR Institutional Review Board (NMIMR-IRB) and KNUST/KATH committee for human research, ethics, and publication (CHRPE).

Clinical samples of suspected cases of COVID-19 are submitted from health facilities across the country and from individuals who walk in to know their COVID-19 status or for travel purposes. These clinical specimens are tested for confirmation or otherwise with the use of molecular tools (mainly RT-PCR). However, with the alternative provided by this project with the use of the PATHPOD system, there was the need for us to engage interested parties including all research assistants and technicians on the use of the device and the interpretation of results.

We sought to train new personnel who will be crucial not only to expand the test-handling capacity but also to train the next generation of analytical biologists in Ghana and increase the individual employability of the participants.

2. Summary of the results

During this two-day hands-on training course, NMIMR with assistance from KCCR and KNUST will teach up to ten participants how to test COVID-19 viral RNA and sera samples using both AfriDx (developed in WP3) devices. The training was to teach through practice and engage participants on how the devices are set-up, components including cartridges are loaded with samples and inserted, how it operates, interpretation of the colored lights on the device and interpretation of results. There was also a lecture and discussion sessions on infectious diseases and clinical specimen collection, handling, and storage of suspected cases of COVID-19.

3. Description of work performed and obtained results

The one-day training program covered didactic lecture sessions that presented the participants the opportunity to be part of the teaching process through discussions with

the facilitator on presented topics, general interactive lecture sessions and hands-on practicals.

The Opening

All eight participants (six research assistants and two technicians) were present on the day. After an official introduction on the objectives of the training, all were ushered to the diagnostic laboratory where the training session began.

The Presentation Session

1. Risk Assessment and Biosafety Lectures

Participants were given an insight into risk assessment and biosafety. Major highlighted points included, Risk Assessment Methodology and tools, Risk management systems, Biosafety levels, and Biosafety Management Programs. Mention was made of risk analysis, risk management processes, chain of infection and interventions.

2. Biosecurity and Good Laboratory Practices

We delve into biosecurity and personal protective equipment. The main topics for discussions included principles, basic concepts and components of lab biosecurity, biocontainment, epidemiological triad for disease, assessment and selection of appropriate laboratory PPE based on risk, techniques, and tips with practical demonstrations of PPEs.

3. Presentations on Good Laboratory Practices, Infectious diseases, and Sample Collection Procedures

The training session continued with presentation and discussion sessions on good laboratory practices (GLP), infectious diseases and sample collection and handling procedures. Main topics which were discussed included, the introduction, applications, and fundamental points in GLP, standard operating procedures, phases, and classification of infectious diseases, emerging and re-emerging infectious diseases, sample collection, handling and storage of COVID-19 suspected clinical samples.

4. Practical session on sample collection and PATHPOD Operation

Presentation on how to properly collect a quality clinical respiratory specimen was made after which the participants had a hands-on training session. During the didactic lecture, the participants were given a preview of sample types, kits management procedures and best practices in sample handling and transport.

Individual samples collected were used on the cartridges for the first time to gauge it's operation. Same samples were to be run on the routine testing systems (RT-PCR machines) to compare results. The participants were instructed on the following:

a) Setting up and plugging the device into the main power source
b) Preparing the cartridge to be loaded
c) Loading the cartridge with prepared samples
d) Inserting the loaded cartridge into the PATHPOD device
e) Starting the run and monitoring till completion
f) Interpretation of results

Results

There were few disparities (15%) with the results obtained from the PATHPOD device and the RT-PCR machine.

Conclusion

The training ended with recommendations and a planned schedule of the use of the device. However, the facilitator was to follow up with collaborators on the observed disparities in results and the possible troubleshooting procedures to deploy.

Some Photographs

Appendix I

1. Facilitator

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2. Coordinator

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3. Participants

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- Emmanuel Osei Kwarteng
- Deborah Pratt
- Joseph Abraham