外務省
Ministry of Foreign Affairs of Japan

EVALUATION OF JAPAN'S OFFICIAL DEVELOPMENT ASSISTANCE (ODA) TO THE NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH IN GHANA

Final Report

Presented to
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By

The International Centre for Evaluation and Development
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Abbreviations and Acronyms

CDC	Centre for Disease Control and Prevention
ICED	The International Centre for Evaluation and Development
JICA	Japan International Cooperation Agency
MOH	Ministry of Health
NMIMR	Noguchi Memorial Institute for Medical Research
ODA	Official Development Assistance
UG	University of Ghana
WHO	World Health Organization

EXECUTIVE SUMMARY

1.0 BACKGROUND

Ghana sits on the Atlantic Ocean and borders Togo, Cote d'Ivoire, and Burkina Faso. Its population is of about 29.6 million (2018). In the past two decades, Ghana has taken major strides toward democracy under a multi-party system, with its independent judiciary winning public trust. Ghana consistently ranks in the top three countries in Africa for freedom of speech and press freedom. Ghana's rapid growth was halted by the COVID-19 pandemic, the March 2020 lockdown, and a sharp decline in commodity exports. The economy had grown at an average of 7 percent in 2017-19, before experiencing a sharp contraction in the second and third quarters of 2020. The economic slowdown had a considerable impact on households. The poverty rate is estimated to have slightly increased from 25 percent in 2019 to 25.5 percent in 2020. Ghana's economy is projected to recover gradually over the medium term, thanks to commodity price growth and strong domestic demand. Ghana received $1 billion equivalent in the recent IMF SDRs allocation, part of which will go to support economic recovery. Growth is expected to average 5.1 percent yearly in 2021-23. After declining by 1.7 percent in 2020, real per capita GDP is projected to return to its pre-COVID-19 level in 2021. The public expenditure on health in Ghana corresponded to approximately 1.4 percent of the Gross Domestic Product (GDP) in 2019. In comparison to 2017, the spending increased by 0.29 percentage points. In that year, the domestic general government health expenditure covered 1.09 percent of the country's GDP.

1.0.1 IMPACT OF COVID-19

Ghana has also been affected by the pandemic and is listed as the fifth country in Africa with the highest reported number of coronavirus cases behind South Africa, Egypt, Nigeria, and Morocco. The first case of COVID-19 virus was recorded in Ghana on 12th March 2020. The cases were imported by two travellers from European countries Turkey and Norway. The country's difficulty to contain the recorded cases after few weeks led to an increase in the number of cases from 2 cases to 566 cases as of 12th April 2020. As the end of 31st May 2020, Ghana had recorded 7,881 coronavirus cases. However, a total of 43,094 cases have been recorded in Ghana with 40, 963 recoveries and 256 deaths.

1.0.2 NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH

Noguchi Memorial Institute for Medical Research (hereinafter referred to as "NMIMR") was established in 1979 by Japan's grant aid as a medical research center to perform research, conduct surveys and special examinations concerning specific health issues as well as to develop human resources for researchers. The research capacity has been improved as a result of Japan's grant aid and technical cooperation over the years, and it has grown to be an institute that can broadly and timely contribute to solve issues of infectious diseases in West Africa and the rest of

the world. In cooperation with international organizations, government agencies, NGOs and universities, the institute is currently working on nutrition issues, cancer research and vaccine development in addition to research on major infectious diseases such as HIV/AIDS, malaria, tuberculosis, and Neglected Tropical Diseases (NTDs). Concerning the outbreak of Ebola hemorrhagic fever, continuing since 2014, NMIMR has served and continues to serve as the only testing facility in the country.

To cope with the increase in demand for such specialized research and services in infectious diseases, the staff strength including research fellows has been expanded rapidly and is still growing at an annual average of 5%. Especially, the category of molecular biology is developing tremendously as the demand is increasing. The number of interns invited for research on infectious diseases is also on the rise. However, over the years, the capacity of the existing facilities has not been sufficient, coupled with deterioration of facilities and equipment, which has impacted negatively on the ability of the institute to deliver on their mandate. Under such situation, and to further improve NMIMR's capacity, the government of Japan granted four ODA projects to NMIMR between 2016 and 2020. Two of the projectsare being evaluated for this period and they are covered by this report.

The two (2) Projects covered under this thematic evaluation are.

i. ***FY 2016 Grant Assistance:*** "Constructing an advanced research centre for infectious diseases in the NMIMR" JPY2,285,000,000. This project aims to ensure efficient and safe research, as well as the provision of good teaching environment of the NMIMR to facilitate its leading role in tackling the ever-expanding research and training needs of Ghana and the West African sub-region to respond effectively to disease outbreaks.
ii. ***FY2018 Technical Cooperation:*** "Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola"

1.2 EVALUATION APPROACH

A mixed methods approach comprising quantitative and mostly qualitative methods was used to collect and analyse data from primary and secondary sources, to provide evidence-based information in line with the objectives of the evaluation. The data addressed the relevance, effectiveness and sustainability of the project and its deliverables. The evaluation was centered on the contribution the project had made in the areas of its mandate and within the program budget.

The analysis culminated in a synthesis of lessons learnt and recommendations to inform similar projects in the future. Desk reviews were conducted, project reports and documentation were critically examined, and verified through multiple personal interviews and focus group discussions. A web-survey was randomly sent to 17 of the 50 beneficiaries of the Third country training to assess the impact of the project on beneficiaries of the training program. Thirteen (**13**) out of Seventeen (**17**) participants representing seventy-six (**76**) percent completed the whole

questionnaires. Qualitative methods included analysis of information obtained from focus group discussions with the project stakeholders and project direct beneficiaries.

1.3 KEY FINDINGS

1.3.1 PROJECT RELEVANCE:

The Project for Advanced Research Centre for Infectious Diseases at NMIMR was approved to address shortage of space to operate research within a growing need for capacity building and research/testing activities in infectious diseases in recent years. This is in line with NMIMR's four functions: ***"High-level research and survey to deal with health issues***," "***Disease control***," "***Special examination and diagnosis***" and "***Development of human resources for researchers***."

The construction of the Centre positioned NMIMR with improved functionality to enable it to accelerate its contribution towards infectious disease control, health, and education. The Assistance Policy of the Government of Japan underpin this. ***In the health sector, while focusing on the reduction of mortality rate among mothers and infants, Japan is also focusing in infectious diseases on a continuous basis, which is consistent with the assistance policy.*** The Institute lauds Japan/JICA's assistance towards capacity building and improvement of the healthcare systems, and to prevent and manage various life-threatening diseases. The feedback from the third country training highlighted its relevance and timeliness in facilitating rapid response against the COVID-19 pandemic in West Africa. The positive lessons and rich experiences acquired by participants of the training positioned most of them to play very significant roles in the COVID-19 testing strategies of their respective countries.

1.3.2 PROJECT EFFECTIVENESS:

Both evaluated projects were found to be effective. Firstly, the Advanced Research Centre for Infectious Diseases at NMIMR was highly effective in achieving its main objectives, outcomes, and targets as set out in the contract. All the four indicator targets set for 2021 were exceeded.

The second evaluated project which was the third country training was effective. Following the emergence of Ebola in West Africa (2014-2016) and the recent global outbreak of COVID-19 pandemic which caused major losses of lives and socio-economic disruption globally, the third country training was essential to strengthen the preparedness and responsiveness of the health systems within the West African sub-region to such emergencies. With the occurrence of new waves of COVID-19 infections, the third country training was effective in enhancing laboratory skills for infectious diseases and biomedical research to contain the pandemic and prevent other emerging diseases in the country and the sub-region.

1.3.3 PROJECT EFFICIENCY:

Both evaluated projects were found to have been efficient. First, concerning the construction of the advanced research centre, the assessment focused on the project's overall effort in terms of management of resources committed taking into consideration the level and quality of

cooperation with partners. In terms of the management of resources, the total budget allocation including equipment totalling ***JPY2,285,000,000*** for constructing an advanced research centre for infectious diseases was utilized as planned. Counterpart contribution from the Government of Ghana was also provided to augment existing funding arrangement.

Similar evidence of efficiency was observed for the Third Country Training Course. Despite the challenges COVID-19 pandemic posed to the training program, the resources were managed, and the project conducted efficiently achieving all the targets within the budget allocated and the timeframe.

1.3.4 PROJECT IMPACT:

Currently, the Institute serves as the Reference centre for COVID -19 surveillance and diagnosis, as well as a WHO accredited laboratory for surveillance and diagnosis of poliomyelitis in the West Africa sub-region. It also provides middle-level manpower training for public and private health institutions across the country and in the sub-region and organises international trainings for partner institutions such as the WHO and CDC through the Institute Third-Country Training for West-African countries. The construction of the advanced research centre for infectious diseases made these developments possible and hence the two projects have demonstrable impact.

1.3.5 SUSTAINABILITY:

JICA projects and support have sustainability considerations inbuilt into their design. This project was designed to ensure sustainability by enhancing the capacity of the various actors to build linkages for effective knowledge management, and shared learning of best practices at all levels. Evidence of sustainability of the construction project is seen in the fact that members of the institute can secure additional funding through grant applications and therefore continue to maintain, add on, and keep on the capability building of both projects. The human resource built across the sub-region through the Training indicated the sustainable of the project.

1.4 LESSONS LEARNED

1. **Planning and designing Project in alignment with National Strategic Plan**

The two projects were in line with the national strategic plan which includes positioning the country to provide training and specialist services especially in the management of infectious diseases. Such high-level strategic alignment is believed to have played a key role in the success of the projects.

2. **Improving Project Design and Implementation**

The correct selection of relevant stakeholders and knowledge management is very key to improving the design of any Project. A well-planned inception phase produces a stronger implementation plan in which actions are clearer, more effectively prioritized, and interlinked, and motivation is stronger. This was demonstrated in the implementation of both projects.

3. **Improving Monitoring and Reporting**

It is necessary not only to implement assessment tools such as surveys at workshops or other events, but also to use them for monitoring and management purposes by drawing on the assessment results to inform decision-making and general progress reports. It was encouraging to therefore see that in the third country training, the evaluation and comments by participants were taken on board and used to shape the next year training.

4. **Robust Procurement System**

The procurement system through JICA is efficient and ensure that the Institute receives exactly the specifications agreed upon. Learning from this can enable the Institute to adapt such a procurement system for all other projects by other stakeholders.

5. Strong Involvement of the Government

JICA projects are channelled through the Government of Ghana. Close collaboration with Government agencies leads to smooth implementation of projects leading to the successful implementation of projects.

1.5 RECOMMENDATIONS

1. Maintenance:
    - There is the need for a specific budgetary allocation for maintenance of infrastructure and equipment. In future projects this could be factored into the project contract.
    - There is need to develop and implement a comprehensive maintenance schedule for the facility.

2. Operations:

- Operations and activities must be closely monitored and documented and must be evidenced by the production of an annual report to be shared with all stakeholders.

3. Re-structuring of the third country training

- The planners of the third country training should consider restructuring such that the participants are segregated based on specialty or interest. This will ensure that more time will be available for them to gain knowledge in the discipline relevant to their work.

- There is need to increase the time and resources allocated to practical aspects. of the training.
- Respondents indicated they derived most benefits from the trainings in Virology, and least benefits in Parasitology. Even though this is obvious from the COVID-19 pandemic, efforts could be made to focus more on Parasitology by participants within their countries.

1.6 Additional Needs Identified

- **Biobank:** With the increasing number of projects at the Institute and therefore volume of biological samples needing storage, there is an urgent need for a biobank facility. This will be very beneficial not for just the institute but for researchers across the country and sub-region.
- **Additional Space:** Even though the space provided allowed adequate testing for COVID-19, it was inadequate for the different projects in the department to also work at the same time during the peak of the pandemic.
- The space is also inadequate to meet the expanding needs of the department.
- **Maintenance Cost:** There is the need for funding to support equipment servicing and maintenance. There is need for training support on the maintenance of the facility and the equipment.

2.0 INTRODUCTION AND PROJECT BACKGROUND

2.1 INTRODUCTION

Ghana sits on the Atlantic Ocean and borders Togo, Cote d'Ivoire, and Burkina Faso. Its population is of about 29.6 million (2018). In the past two decades, Ghana has taken major strides toward democracy under a multi-party system, with its independent judiciary winning public trust. Ghana consistently ranks in the top three countries in Africa for freedom of speech and press freedom. Ghana's rapid growth was halted by the COVID-19 pandemic, the March 2020 lockdown, and a sharp decline in commodity exports. The economy had grown at an average of 7 percent in 2017-19, before experiencing a sharp contraction in the second and third quarters of 2020. The economic slowdown had a considerable impact on households. The poverty rate is estimated to have slightly increased from 25 percent in 2019 to 25.5 percent in 2020. Ghana's economy is projected to recover gradually over the medium term, thanks to commodity price growth and strong domestic demand. Ghana received $1 billion equivalent in the recent IMF SDRs allocation, part of which will go to support economic recovery. Growth is expected to average 5.1 percent yearly in 2021-23. After declining by 1.7 percent in 2020, real per capita GDP is projected to return to its pre-COVID-19 level in 2021. The public expenditure on health in Ghana corresponded to approximately 1.4 percent of the Gross Domestic Product (GDP) in 2019. In comparison to 2017, the spending increased by 0.29 percentage points. In that year, the domestic general government health expenditure covered 1.09 percent of the country's GDP.

2.1.1 IMPACT OF COVID-19

Ghana has also been affected by the COVID-19 pandemic and is listed as the fifth country in Africa with the highest reported number of coronavirus cases behind South Africa, Egypt, Nigeria, and Morocco. The first case of COVID-19 virus was recorded in Ghana on 12th March 2020. The cases were reportedly imported by two travellers from European countries Turkey and Norway. The country's difficulty to contain the recorded cases after few weeks led to an increase in the number of cases from two cases to 566 cases as of 12th April 2020. As the end of 6th April 2022, Ghana had recorded 161,014 confirmed cases and 1,445 confirmed deaths with only 43 New cases.

2.1.2 JAPAN GOVERNMENT ASSISTANCE TO GHANA

Japan and Ghana have long enjoyed amicable bilateral relationship. The friendship between the two countries is symbolized by the history of Dr Hideyo Noguchi, a well-respected Japanese medical researcher who travelled to Ghana in 1927 for yellow fever research, and popular Japanese chocolate products produced from Ghanaian cocoa beans. It is crucial to continuously support Ghana to maintain and develop an excellent bilateral relationship, and to further encourage peace and democracy in the country.

Basic Policy of Assistance: Promoting Dynamic Economic Growth that Benefits the People Widely as presented in the Government of Ghana (**GoG**)'s medium term development strategy (**2010-**

2013) aims to achieve "shared growth." Japan assists GoG in achieving this goal by continuing to encourage GoG's self-help efforts and sound macro-economic management while the Tokyo International Conference for African Development (**TICAD**) is prioritizing the following four areas: (1) Agriculture (rice cultivation in particular), (2) Infrastructure (electricity and transport in particular), (3) Health and Science/Mathematics Education, and (4) Capacity Development in Administrative and Financial Management.

With economic development driven by abundant natural resources, stable and democratic governance, as well as well-established public safety in Ghana, there has been a momentum in private sector to start Build Operate and Transfer (**BOT**) and natural resource related businesses in recent years. Japanese companies have expressed interests in this regard; therefore, Japan actively seeks for opportunities to cooperate with private initiatives. In this connection, to achieve higher value addition and strengthened competitiveness of Ghanaian products, Japan provides assistance aiming at quality/productivity improvement and necessary human resource development to small and medium enterprises fully utilizing the Japanese expertise in quality management and development of small and medium enterprises. In light of the fact that Ghana aims to achieve "shared growth," Japanese assistance emphasizes reducing various disparities within Ghana. In addition, Japan intends to better coordinate its assistance with other development partners particularly in the health sector to achieve better development results.

2.1.3 NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH

Noguchi Memorial Institute for Medical Research (hereinafter referred to as "NMIMR") was established in 1979 by Japan's grant aid as a medical research centre to perform research, conduct surveys and special examinations concerning specific health issues as well as to develop human resources for researchers. The research capacity has been improved because of Japan's grant aid and technical cooperation over the years, and it has grown to be an institute that can broadly and timely contribute to solve issues of infectious diseases in West Africa and the rest of the world. In cooperation with international organizations, government agencies, NGOs and universities, the institute is currently working on nutrition issues, cancer research and vaccine development in addition to research on major infectious diseases such as HIV/AIDS, malaria, tuberculosis, and Neglected Tropical Diseases (**NTD**). Concerning the outbreak of Ebola haemorrhagic fever, continuing since 2014, NMIMR has been diagnosing many suspicious cases as the only inspection institute in the country.

In order to cope with the increase in demand for such specialized research and services in infectious diseases, the staff strength including research fellows has been expanded rapidly and is still growing at an annual average of 5%. Especially, the category of molecular biology is developing tremendously as the demand is increasing. The number of interns invited for research on infectious diseases has also been on the rise. However, over the years, the capacity of the existing facilities was not sufficient, coupled with deterioration of facilities and equipment, and this impacted negatively on the ability of the institute to deliver on their mandate. Under such situation, to further improve NMIMR's capacity, the government of Japan granted four ODS

projects to NMIMR between 2016 to 2020. Two of the projects are being evaluated for this period and they are covered by this report.

2.2 PROJECT DESCRIPTION

The two (**2**) Projects covered under this thematic evaluation are.

i. **FY 2016 Grant Assistance**: "Constructing an advanced research centre for infectious diseases in the NMIMR" JPY2,285,000,000. This project aims to ensure efficient and safe research, as well as the provision of good teaching environment for the NMIMR to facilitate its leading role in tackling the ever-expanding research and training needs of Ghana and the West African sub-region to respond effectively to disease outbreaks.

ii. **FY2018 Technical Cooperation**: "Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola"

2.2.1 NOGUCHI ADVANCED RESEARCH CENTRE FOR INFECTIOUS DISEASES

The Government of Japan in 2016 approved a Grant Aid in support of the construction of an Advanced Research Centre for Infectious Diseases at the Noguchi Memorial Institute for Medical Research (NMIMR), College of Health Sciences University of Ghana, Legon. The grant, which was up to two billion, two hundred and eighty-five million Japanese Yen (JPY2,285,000,000) was for the construction of the building and supply of equipment.

The decision to establish the Advanced Research Laboratories for Infectious Disease at NMIMR was promoted by the standing of the Institute as a leading biomedical research Institute. The Noguchi Advanced Laboratory was to ensure more efficient and safe research as well as the provision of good teaching environment for training the next generation of scientists. The grant was to position the Institute to play its role as a regional reference biomedical research institute for West Africa. The Institute will also increase its role in tackling the ever-expanding research and training needs of the country and the West African sub-region and to respond effectively to disease outbreaks including highly pathogenic agents such as Ebola virus, HIV/AIDS, H1N1 Pandemic Flu, LASSA fever, Yellow Fever, among others.

The establishment of the Noguchi Advanced Research Laboratories was to strengthen the NMIMR to providing technical knowledge for state-of-the-art detection of dangerous pathogens and diagnosis of the diseases that they cause during major epidemic.

The Project was also intended to play a leading role in tackling the ever-expanding research and training needs of the country, as well as the West African sub-region and to respond effectively to disease outbreaks, including highly pathogenic agents such as Ebola Hemorrhagic Fever Virus at NMIMR.

The goal was to enable NMIMR to contribute broadly to infectious diseases control in Africa and to improve the functions to deal with issues on health and education.

The Project aimed at solving the issues of the health and educational sectors in Ghana and the rest of the world by reinforcing the functions of NMIMR. NMIMR plays a leading role in research, disease control, examination and diagnosis concerning different issues of infectious diseases, which is benefitting Ghana's entire population of thirty point eight (30.8) million, according to the 2021 Population and Housing Census Report. The institute is also functioning in the development of anti-AIDS drugs and malaria vaccine, diagnosis of Ebola virus disease inside and outside the country, WHO Emerging and Dangerous Pathogens Laboratory Network and is also the regional reference laboratories for polio and Buruli ulcer, which means that establishing the Project would contribute to measures against the health issues in the West African sub-region and the rest of the world

2.2.2 THIRD COUNTRY TRAINING COURSE ON ENHANCING LABORATORY SKILLS FOR INFECTIOUS DISEASES IN WEST AFRICAN COUNTRIES FOR POST EBOLA

The "Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola" was established to provide an intensive and hands-on training program in modern laboratory technology at the UG-NMIMR, to improve the skills of Laboratory technicians in selected countries in West Africa. The overall aim is to build regional capacity for public health emergencies across West Africa. At the end of the course, the participants were expected to have acquired.

1) New skills that will improve the quality of diagnosis and treatment at medical institutions or Laboratories where they work.

2) Techniques to prevent infections at the medical institutions or laboratories where they work.

3) Network to share reliable techniques among the technologists at laboratory or department

It is expected that the quality of diagnosis, treatment, and prevention of infections at medical institutions or laboratories of the participating countries is improved by sharing reliable techniques among the technologists at the laboratory or Department.

The countries to be benefited were Ghana, Liberia, Sierra Leone, Nigeria, Benin, Burkina Faso, Cote d'Ivoire, Guinea, Togo.

This report outlines and describes the results of the final thematic evaluation of the two (**2**) Japan ODS projects to Noguchi Memorial Institute for Medical Research (**NMIMR**) between 2016 and 2020 implemented by Japan International Cooperation Agency's (**JICA**).

3.0 EVALUATION PURPOSE, OBJECTIVES AND APPROACH

3.1 EVALUATION PURPOSE

The evaluation will seek to determine how well Japan's assistance for NMIMR achieved the outcomes planned, how they were achieved and under what conditions. The evaluation will also attempt to analyse how Japan's assistance for NMIMR contributed to Ghana's response to COVID-19. This report is a compilation of data collected through key informant interviews (**KIIs**); in-depth interviews; focus group discussions **(FGDs**), administration of a questionnaire, and review of relevant documents.

Specifically, the final evaluation sought to achieve the following specific objectives:

- To assess the design, implementation, and achievements of the project.
- To assess the management of the project by the project implementers.
- To assess the completed activities and how they contribute to the objectives of the project.
- To document the lessons learnt in terms of project approach, structure, and implementation.
- To provide recommendations to the project partners and donors for future actions.

3.2 EVALUATION SCOPE

The Evaluation sought to determine how well Japan's assistance to Noguchi Memorial Institute for Medical Research (**NMIMR**) achieved the planned outcomes, and under what conditions.

The evaluation also analysed how Japan's assistance for NMIMR contributed to Ghana's response to the COVID-19 pandemic. This was to guide and inform not only Japan's future ODA projects but also the international society by identifying key lessons learnt and emerging good practices.

The final evaluation of the project was based on the need to review and evaluate its implementation through accurate verification of the attainment of the objectives and whether the means used to attain them fell within the project scope. This implied that a comparison of the outcomes against the objectives and expected accomplishments was essential.

The Evaluation was conducted from ***January 2022 to March 2022***.

3.3 EVALUATION CRITERIA

The evaluation assessed the project's performance and provided recommendations for the future. The evaluation was in line with the Ministry of Foreign Affairs standards and assessed performance across six (**6**) key areas:

• ***Relevance*** (*validity with project implementation*): How appropriate was the project plan and logical approach.

- ***Effectiveness*** (*achieving targeted organizational objectives*): How effective was the intervention in terms of achieving the expected accomplishments and the overall objective?

• ***Efficiency (****maximizing resources, cost, and duration*): How efficient was the overall effort in terms of management of resources committed, and what was the level and quality of cooperation with partners in the implementation of the project?

• ***Impact*** (*achieving development impact*): What were the outcomes of the project and how has it contributed to the advancement of health and development?

- **Sustainability (***social, environment, risk, operation, and maintenance***):** What are the potentials and options for future sustainability, scalability, and replicability?
- ***Lesson learned and best practices:*** What knowledge was generated in the project that has the potential to improve future actions?

4.0 EVALUATION APPROACH AND METHODOLOGY

4.1 EVALUATION APPROACH

The evaluation team, with guidance from the Terms of Reference, designed an evaluation that was appropriate, feasible, and provided credible and defensible evidence. The team placed a high value on ensuring that the process as well as the findings were useful to and actionable by users and stakeholders.

An inclusive, utilization focused, and adult learning approach was applied to ensure ownership and accountability of all relevant stakeholders from the start to the finish of the evaluation.

A mixed methods approach comprising of quantitative and mostly qualitative methods was used to collect and analyze data from primary and secondary sources, to provide evidence-based information in line with objectives of the evaluation. The data addressed the relevance, effectiveness and sustainability of the projects and the deliverables. The evaluation was centered on the contributions made by the projects in their mandate areas, and within the program budget.

Desk reviews were conducted, project reports and documentation were critically examined, and verified through facility site visit, multiple personal interviews and focus group discussions. The evaluators also used web-survey to assess the impact of the project on the individuals who benefited from the training program. A simple random sample of 17 participants were selected from the 50 beneficiaries of the training program. Thirteen (**13**) out of Seventeen (**17**) participants representing seventy-six (**76**) percent completed the whole questionnaires. Qualitative methods included analysis of information obtained from discussions with the project stakeholders, and the project direct beneficiaries. The analysis used “before and after” comparison that culminated in a synthesis of lessons learnt and recommendations to inform similar projects in the future.

While the evaluation team sought to obtain quantitative and objectively verifiable information where possible, it is important to note that several findings were based on perceptions and were therefore subjective in nature. Semi-structured interviews were used to provide a unique insight into the processes of the project implementation and achievement of results.

4.2 METHODOLOGY FOR DATA COLLECTION

The evaluation utilized primary and secondary data. Primary data was collected from interviews and interactions with the target groups, qualitative in-person, and telephone key informant interviews, focus group sessions, and direct observations using a check list during site visit.

Web-based surveys were deployed to other beneficiaries of the Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola.

The evaluation team developed Interview Guides for the qualitative and quantitative data collection and shared them with the team as attached as ***Appendix 3-4***.

The secondary data included quantitative and qualitative data derived from the documents reviewed and the data directly provided by Ministry of Foreign Affairs of Japan and Noguchi Memorial Institute for Medical Research.

4.3 PRIMARY DATA SOURCES

This phase of the evaluation encompassed engagement of relevant stakeholders (as indicated in the terms of reference) involved in the implementation of the project. Key informant interviews with selected NNIMR and MOFA-JICA staff was the central data collection method utilised.

An Inception meeting was held with selected Stakeholders on ***10th February 2022. A meeting with the Director of*** NMIMR was also held on ***14th February 2022.*** The evaluation team met the project management team, key directors, officers, and team members for in-person discussions of the Project performance key indicators, achievement, and accomplishments to date. The key informant interviews with different target groups were based on different sets of questions, attached as ***Appendix 3-4***, with separate data collection tools developed for each group.

A visit to inspect the facilities and equipment at the newly constructed project building was done on 9th March 2022 during which the evaluation team had discussions with the facility manager and other relevant stakeholders. A checklist was used to assess the state of the equipment as per the project contract and the current state of the building and equipment. See Annex 3 **(1.3**).

The focus of the inception meeting with the MOFA-JICA team was to assess the depth of the Japan Government's strategic assistance to Ghana, and the future directions for sustainability. Furthermore, it was intended to expound on how JICA and other Japan ODA assistance to Ghana's MOH could better align their strategies with planned national level health and education strategies to enhance synergy, complementarity, and value addition and what some of the best practices in the country were, that could ensure greater impact for health and the control of diseases. This meeting was held on the **25th of February *2022.***

A web-based survey was also conducted for selected beneficiaries that participated in the Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola.

4.4 SECONDARY DATA SOURCES

The evaluation team assessed whether project activities were implemented as planned, and whether the expected outputs, outcomes, and impacts (**results**) have been achieved as intended. In other words, the review of existing project documents enabled the consultant to assess actual results as documented in the project's reports against planned results as documented in the project proposal and Logical Framework Matrix (**LFM**). It also enabled the consultant to assess the conditions of project beneficiaries at the start of the project interventions (**before**) as documented in the project's baseline report and compared it to the actual results at the end of the project (**afte**r) as indicated in the reports.

Project documents reviewed included the Ghana JICA Portfolio, Preparatory Survey Report on The Project for The Construction of Advanced Research Center for Infectious Diseases at Noguchi Memorial Institute for Medical Research in The Republic of Ghana, and three (**3**) course reports on the Third Country Training/ In-Country Training Program in Republic of Ghana.
Factors contributing to the achievement or otherwise of results were assessed and documented. Shortcomings encountered and lessons learned in the implementation were considered at every stage.

4.5 DATA ANALYSIS METHODS

The data collected from both administrative and field assessment were collated, analysed, and documented in a final report, and shared with main stakeholders Project. The key process in data analysis for this evaluation was triangulation of data from a variety of sources. The findings from the document review were used to design data collection instruments for the key informants from the Noguchi Memorial Institute for Medical Research and JICA. Key Informants were interviewed to uncover and document notable change stories among project beneficiaries. Information on project's implementation challenges and lessons were also gathered at this stage. The response rate from the web-based surveys was 76% and the findings are presented using descriptive statistics of frequencies and percentages.

The report encompassed executive summary, key findings of the evaluation; lessons learned and recommendations, among others.

4.6 RISK AND LIMITATION

Subjectivity and Semi-Structured Interviews: The semi-structured approach to the interviews created the opportunity to explore specific issues in depth. This increased flexibility but may also have introduced more interviewer subjectivity. The online survey also used a simple random

sample of beneficiaries of the Third country course and hence missed some participants. The evaluation team sought to mitigate these by carefully evaluating the available data through triangulation.

5.0 FINDINGS OF THE EVALUATION

Evaluation findings have been discussed under five (5) headings. Section 5.1, 5.2, 5.3, 5.4 and 5.5. These headings are project relevance, project effectiveness, projects efficiency, project impact, and sustainability, respectively.

5.1 PROJECT RELEVANCE

The Noguchi Memorial Institute for Medical Research (NMIMR), College of Health Sciences, University of Ghana, is leading biomedical research institute and a reference laboratory in West Africa. The institute is a Centre for Excellence for Research, Diseases Surveillance and Prevention in Ghana and the West African subregion, and it plays a critical role in advancing global health security. The Institute is recognized as a referral laboratory on polio and Buruli ulcer by the World Health Organization (WHO) and certified as the only diagnostic institute for Ebola haemorrhagic fever virus in the country, providing diagnostics for many suspected cases in the country as well as neighbouring countries in the ongoing Ebola epidemic.

From 1979 to 1990, about eighty (80%) of the Institute's funding was from Japan support but over time Japan reduced funding and the institute now sources a lot of external funding. Through the support of the people of Japan, the Institute is a leader in global medical research and plays a pivotal role at improving the health and wellbeing of Ghanaians through focused and relevant quality biomedical research, human resource development and support of national public health activities.

The assessment of the relevance dimension aimed at analysing how the project was aligned with NNIMR's overall mandate, whether its objectives met the needs of JICA's mission and strategy, and whether its proposed goals, objectives and intended activities were relevant to JICA's objectives.

5.1.1 CONSTRUCTION OF THE ADVANCED RESEARCH CENTRE

The project for advanced research centre for infectious diseases at Noguchi memorial institute for medical research was approved to address shortage of space to operate advanced research and build capacity in infectious diseases. This is in line with NMIMR's four functions:

1) High-level research and survey to deal with health issues,
2) Disease control,
3) Special examination and diagnosis,
4) Development of human resources for researchers.

The Construction of the Advanced Research Centre has enabled NMIMR to contribute to advanced level of infectious diseases research to help with surveillance and control in Africa and beyond. This is in line with the Assistance Policy of the Government of Japan. In the Country Assistance Program for Ghana, Japan prioritizes four issues: i. Agriculture, ii. Economic infrastructure (electric power, transportation), iii. Health and education of science and mathematics, and iv. Capacity development of government administration and financial management. ***In the health sector, while focusing on the reduction of mortality rate among mothers and infants, Japan is also focusing in infectious diseases on a continuous basis, which is consistent with the assistance policy.***

All documents reviewed, and the interviews conducted indicated that this project has been very relevant and will continue to be so even in the post pandemic phase. It offers the space and equipment needed for carrying out research at advanced level in the country and the sub-region. With the centre, opportunity to source more grants based on existing infrastructure has increased

COVID-19 RESPONSE

The relevance of this project was demonstrated clearly in the level of involvement the institute had in the response to the COVID-19 pandemic. This centre was the main place for the testing of samples for the Ghana health services. The Institute supported GoG by introducing 'poling' of samples to be able to test the increased number of samples. A total of 483, 228 samples were tested by rRT PCR between February 2020 and September 2021. Within the peak period of the pandemic, thus between February and December 2020, 350,579 samples were tested constituting 52% of the total samples tested in the country.

Majority of the samples were received between April (90,556) and July (65,423) in 2020, while January (23,686) and February (22,894) recorded the highest samples in 2021.

Of the 483,228 samples tested, 54,963 were positive representing 11.4%. The highest positivity rate of 32% was recorded in November 2020 and declined to 4.8% in May until the emergence of the delta variant in June when the positivity rate rose again in July (18.6%) and August (17.6%) 2021 when the delta variant emerged.

INFECTIOUS DISEASE CONTROL

The table below outlines the progress of work being undertaken at NMIMR focusing on the statuses in relation to infectious disease control activities being undertaken, and the beneficiaries.

	2016 Status	2021/2022 Status	Total number of Beneficiaries
Development of anti-AIDs Drug	NA	On-going	West Africa Sub-Regions
Development of Malaria Vaccine	NA	On-going	West Africa Sub-Region
Diagnosis of Ebola Virus diseases inside and outside Ghana	NA	0	West Africa Sub-Region
Regional Reference Lab for Polio and Buruli Ulcer (Number of Tests)	NA	4,704	4,704
Ebola Hamorrhagic Fever	NA	300	300
Avian Influenza	NA	403	4,032
MERS	NA	0	0
COVID-19	NA	52,322	52,322

QUALITATIVE EFFECT

The centre has enabled the Institute to have more space and resources to train the next generation of scientists and researchers in infectious diseases. The relevance of this is seen in the human resource gaps which exist in the country and sub-region. Access to advanced facilities and expertise for training has been a challenge and thus the centre helps to fill this gap.

The following qualitative effects were observed during the evaluation:

1. Improvement of research quality conducted by Virology, Bacteriology, and Immunology departments at NMIMR

    a) Increased Lab spaces,
    b) State of the Art Equipment,
    c) Dedicated Lab for Molecular research,

d) Cold storage to enhance cold chain and proper storage of research materials and supplies,
e) Provision of adequate space and equipment for the processing of COVID-19 samples for the nation during the pandemic, and
f) Support for the ongoing surveillance and research work in the department.

2. Increase in safety levels at the new BSL-3 Laboratory

    a) High and efficient filtrations system,
    b) More advanced BSL-3 Labs ensures safety,
    c) Built-in autoclave system for proper disinfection of direct waste from the BSL-3,
    d) CCTV monitoring of Lab activities,
    e) The new BSL-3 provides safety environment for researchers to process and manipulate pathogen three viruses as well as diagnose level 4 pathogens i.e., Ebola virus.

3. Increase in efficiency and accuracy of research in the molecular biology common laboratory

    a) Unidirectional flow reduces/prevents contaminations,
    b) Dedicated workspaces for each activity promote efficiency,
    c) Provision of high-quality equipment ensures accuracy,
    d) Continuous training of staff on the use of facility enhances efficiency and accuracy,
    e) The space and equipment are adequate and allow several people to work at the same time to achieve the required results.

INTERNATIONAL RECOGNITION

NMIMR is internationally recognized and accepted by WHO as an accredited medical research institution that trains students from 8 Africa countries. The role being played by Japan/JICA in capacity building and the improvement of the healthcare systems, to prevent and manage various life-threatening diseases is highly appreciated by the Institute.

5.1.2 THIRD COUNTRY TRAINING PROJECT

The relevance of the construction of the advance research centre is linked also with the project on Third country training. The second and third trainings were carried out in the new centre with more space and resources available to the trainees.

The feedback from the third country training that highlighted the relevance and timeliness of the training programme on the response against the COVID-19 pandemic in West Africa cannot be underestimated. The positive lessons and rich experiences acquired by participants of the

training made most of them play a significant role in the COVID-19 testing strategy of their respective countries.

Past participants of the Third Country Training Course from Nigeria, Sierra Leone and Liberia have been able to conduct risk and needs assessment in their various countries, improved processes, and workflows, enhanced external quality assurance, and taught their colleagues and other personnel, thereby ensuring adequate knowledge transfer.

The human resource built for the region from this project makes it very relevant. The content of the training modules was rated as part of this evaluation by the participants to be very relevant in building the requisite knowledge and skills as far as infectious disease research is concerned. The scope was appropriate, and the calibre of the trainers also ensured that this training was relevant. In the final training report (2021), participants scored the relevance of the training as 92.8%.

5.1.3 SUMMARY OF RELEVANCE OF NOGUCHI MEMORIAL INSTITUTE OF MEDICAL RESEARCH

1) The Advanced Research Laboratory (ARL) facility is the main Reference centre for COVID -19 surveillance and diagnosis

2) Regional World Health Organisation (**WHO**) accredited laboratory for surveillance and diagnosis of poliomyelitis in the sub-region.

3) Provider of middle-level manpower training for public and private health institutions across the country and in the West Africa sub-region and organises international training for partner institutions such as the World Health Organisation (**WHO**) and Africa Centre for Disease Control and Prevention (**CDC**).

4) Reference and confirmatory HIV laboratory in the country and the National HIV Drug Resistance Monitoring Centre that supports the monitoring of anti-retroviral therapy for HIV/AIDS.

5) A training centre for several doctors and researchers around the African continent in the detection of rotaviruses.

6) West African Centre for International Parasite Control (**WACIPAC**) that conducts training for programme managers from selected West African countries in the management of bilharzia and other intestinal worms.

7) National central laboratory for confirmation of multidrug resistant (**MDR**) and extensively drug resistant (**XDR**) TB.

8) National Influenza Centre which supports the WHO's Global Influenza Surveillance and Response System (**GISRS**) with influenza virus isolates for annual vaccine development

5.2 PROJECT EFFECTIVENESS

Effectiveness of Results assesses 1) the degree of achievement of the initial goals, and 2) the degree of effectiveness in comparison with the input.

5.2.1 CONSTRUCTION OF THE ADVANCE RESEARCH CENTRE

The project was highly effective in achieving its main objectives, outcomes, and targets. It was able to reach most of its output targets on an aggregate level. **Table 1** gives a summary of the Quantitative analysis Direct Results to the Program effectiveness.

Indicator 1: Increase Total number of interns within the three departments (**Virology, Bacteriology, Immunology**)

To develop human resources for researchers, NMIMR accepts undergraduate and graduate students in the faculty of medicine, health sciences and applied sciences as interns from within and outside the country. The total number of interns increased from one hundred and twenty (**120**) persons to five hundred and fourteen (**514**) in 2021 with the establishment of Advanced Research Centre for Infectious Diseases and procurement of advanced research equipment.

Indicator 2: Increase the percentage of foreign student interns as a centre of counter measures against infectious diseases in the West African sub-region, interns from foreign countries are expected to use the facility. The percentage of foreign student interns increased from ten (**10**) percent to eleven-point four (**11.4**) percent as of 2021.

Table 1: Indicator Tracking for the Construction of the Advanced Research Centre for Infectious Diseases in the NMIMR

			2018		2019		2020		2021	
			Completion							
Outcome Indicators	**Unit**	**2014 Baseline**	**Cumulative Target**	**Cumulative Actual**	**Cumulative Target**	**Cumulative Actual**	**Cumulative Target**	**Cumulative Actual**	**Cumulative Target**	**Cumulative Actual**
Total number of interns within the three departments (Virology, Bacteriology, Immunology)	Person	103.7 persons	120	164	125	278	130	381	135	514
The percentage of foreign student interns	%	9.3%	10%	9.3%	10.5 %	9.55%	11%	10.9 %	12%	11.4%
Total number of research projects at	Number	31 projects	32	46	34	82	35	96	36	107

the three departments (Virology, Bacteriology, Immunology)										
Number of times people have accessed BSL-3 Laboratory per year	Person	1,005 times	1080 times	N/A	1200 times	1329 Times	1287 times	3808 times	1,307 times	6411 times

Source: Field Survey March 2022

Indicator 3: Increase the total number of research projects at the three departments (Virology, Bacteriology, Immunology)

The total number of research projects of the three (**3**) departments transferred to Advanced Research Center for Infectious Diseases increased from thirty-two (**32**) projects to one hundred and seven (**107**) projects through reinforcement of the research functions and appropriate use of new equipment.

Indicator 4: Number of times people have accessed BSL-3 Laboratory per year as the number of users accessed BSL-3 Laboratory was linked with all the four functions of NMIMR, users increased from **1,080** times to **6411** times.

FACILITY UTILIZATION ACHIEVEMENT

In the assessment of the utilization level of the facility constructed, the following achievements were recorded. Apart from PHD studentships, all the targets were either achieved or exceeded as displayed below.

Description	Original Planned and targets	Achieved after completion	2021/22 Status
Number of Departments	3	3	3
Number of Staff	198	250	250
PHD	20	10	10
Research Fellow	15	24	24
Post- Graduates	13	14	14
Interns	50	54	54

Table 2 also gives the summary of the scores from the grading of the soft component planned achievement as a direct effect of the project

Expected Achievements of the Soft Component (Direct Effects)

At the end of Soft Component phase, the following six items shall be achieved as direct effect.

1. Understanding the BSL-3 Laboratory Facility System
2. Mastering the Operation of BSL-3 Laboratory Facility System
3. Maintenance Management of BSL-3 Laboratory Facility System
4. Understanding the Summary of Biosafety
5. Acquiring Skills for the Formaldehyde Fumigation
6. Acquiring Skills for the HEPA Filter Replacement

Type of Training	Check Items	Grade Level (A - E)
Understanding Laboratory Facility System	Ability to understand the structure and flow of facility system.	B
	Ability to understand the function of facility system.	B
	Ability to understand the specifications applicable to BSL-2&3 Lab	B
	Ability to understand the meaning of monitor and warning displays	B
Operation of Laboratory Facility System	Ability to conduct automatic-, systematic-, backup operations of facility system.	A
	Ability to switch operation of facility system to cope with emergency and failures	A
	Ability to determine facility systems required	B
	Ability to determine facility system's required temperature, pressure, differential pressure, flow ratio.	A
	Ability to operate monitor and warning panels	A
Maintenance Management of Laboratory Facility System	Ability to conduct maintenance management.	B
	Ability to put together manuals and other documents.	B
	Ability to keep records of maintenance management documents.	B
	Ability to develop a maintenance management plan	B
Understanding the Summary of Bio Safety	Having a basic knowledge of microbiology.	C
	Ability to understand biohazard measure for laboratory	B
Acquisition of Formaldehyde Fumigation Skills	Ability to understand fundamentals of sterilization.	A
	Ability to acquire practical skills for formaldehyde fumigation	A
Acquisition of HEPA Filter Replacement Skills	Having a basic knowledge of HEPA filter function.	A
	Ability to acquire skills for HEPA filter replacement	B

Grade Levels

Level A: Superior knowledge or appropriate operation and maintenance is possible

Level B: Some knowledge or tentative operation and maintenance is possible

Level C: Little knowledge or partial operation and maintenance is possible

Level D: Poor knowledge or operation and maintenance is not possible

Level E: No experience and no knowledge

There has been an Increase in Efficiency and Accuracy of Research in the Molecular Biology Common Laboratory. The new Advanced Research Centre for Infectious Diseases is fitted with a common molecular biology laboratory to prevent contamination and share advanced equipment among the three (**3**) departments leading to improved efficiency and accuracy of research.

5.2.2 THIRD COUNTRY TRAINING PROJECT

Following the emergence of Ebola in West Africa (**2014-2016**) and the recent global outbreak of COVID-19 pandemic which caused major loss of life and socio-economic disruption globally, the third country training was essential to strengthen the preparedness and responsiveness of the health systems within the West African sub-region. With the occurrence of new waves of COVID-19 infections, the third country training focused on enhancing laboratory skills for infectious diseases and biomedical research to contain the pandemic and prevent other emerging diseases in the future.

The targets set for the training were:

- First Course - 12 Participants from four countries
- Second Course - 15 Participants from 9 countries
- Third Course - 15 Participants from nine countries

Actual Achievement

- First Course - 12 Participants from four countries
- Second Course - 15 Participants from 9 countries
- Third Course - 15 Participants from Nine countries

		2018		2019		2020	
		Cumulative Target	Cumulative Actual	Cumulative Target	Cumulative Actual	Cumulative Target	Cumulative Actual
Outcome Indicators	Unit						
Total Number of Participants attending Third World Training	Person	12	12	15	15	15	15

FIELD VISITS

Second Course

29th January (Parasitology) - Tomefa

Participants gained knowledge in identifying the vectors associated with schistosomiasis.

Participants also gained practical experience in the right timing for sample collection, quantity to be collected, when to examine and the methods for examination.

19th February (Bacteriology) - Amasaman Municipal Hospital

Participants gained insight into patient recruitment, sample collection, preparation, and transportation.

4th March 2020 (Virology) - Influenza surveillance site at Shai Osu-Doku District Hospital, Dodowa.

Participants gained insight into how ILI and SARI cases are identified using case definitions, sampling of patients, completing case investigation forms, sample packaging, shipment, and reporting to the NIC laboratory at Noguchi Institute.

4th March 2020 (Virology) - Polio Environmental Surveillance site at Akosombo VRA area

Participants gained insights into characteristics of an ES site, the criteria for selection of ES sites, list of items required for ES sample collection and observed the steps during sampling from the environment for Polio and other Enterovirus detection using the grab method

Third Course

10th January (Parasitology) – Tomefa

Participants gained knowledge in identifying the vectors associated with schistosomiasis

Participants also gained practical experience in the right timing for sample collection, quantity to be collected, when to examine and the methods for examination.

6th February (Bacteriology) - Amasaman Municipal Hospital

Participants gained insight into patient recruitment, sample collection, preparation, and transportation.

28th February (Virology) – HIV/ART Clinic Eastern Regional Hospital, Koforidua

Participants gained insight into how HIV/ART clinics are run, and patient data is managed.

28th February (Virology) – Swampy area in Koforidua

Participants observed how sampling is done from the environment for Enterovirus detection

Curriculum Development

First Course

The curriculum was developed by facilitators from the three Departments and led by their heads namely, Dr. Samuel Dadzie, Department of Parasitology, Prof. Kwasi Addo, Department of Bacteriology and Prof. William Ampofo, Department of Virology. The course applied 3 methods of implementation:

1) Classroom-based lectures,

2) Practice in laboratories, and

3) Applied field study which was carried out on 10th January (Parasitology), 6th February (Bacteriology) and 28th February (Virology) 2019.

Second Course

The curriculum was developed by facilitators from the Departments of Parasitology, Bacteriology and Virology and led by their heads namely, Dr. Samuel K. Dadzie, (Department of Parasitology), Prof. Kennedy Kwasi Addo, (Department of Bacteriology) and Prof. William Kwabena Ampofo, (Department of Virology).

The course applied 3 methods of implementation:

1) Classroom-based lectures,

2) Practice in laboratories, and

3) Applied field studies. The field studies at this course were carried out on 29th January (Parasitology), 19th February (Bacteriology) and 4th March (Virology) 2020.

Third Course

The curriculum was developed by facilitators from the Departments of Parasitology, Bacteriology and Virology led by the Heads of Department; Dr. Samuel K. Dadzie, (Department of Parasitology), Prof. Kennedy Kwasi Addo, (Department of Bacteriology) and Dr. John Kofi Odoom, (Department of Virology).

The course content was modified to allow for training on only currently relevant infections. More time was given to Virology due to the COVID-19 pandemic.

The course applied 2 methods of implementation:

1) Classroom-based lectures, and

2) Practice in laboratories (Hands-on)

These project effectiveness indicators and performance despite the challenges brought onboard by the COVID-19 pandemic demonstrates the effectiveness of this project. In the final training report (2021), participants scored the effectiveness of the training in knowledge acquisition as 90.0% and for practical skills acquisition as 93.3%.

5.3 PROJECT EFFICIENCY

The assessment focused on the project overall effort in terms of management of resources committed. The level and quality of cooperation with partners were also taken into consideration. One factor which was seen as resulting in the efficiency of both projects was the fact that well trained project managers were attached to the projects to see to the implementation. They worked with the coordinators from the institute to ensure effective planning of procurement and others which would impact the efficiency of the projects.

5.3.1 CONSTRUCTION OF THE ADVANCE RESEARCH CENTRE

In terms of the management of resources, the total budget allocation including equipment totalling ***JPY2,285,000,000*** was utilized as planned. No additional financial resources had to be requested to complete the project. The construction works according to all documents reviewed and discussions with the facility management, was undertaken based on agreed specifications. The equipment as agreed within the contract was supplied with the specifications required (Annex 3). Counterpart contribution from the Government of Ghana

was also provided to augment the existing funding arrangement. All evidence also points to the fact that the building and the facilities in it are all being used for the intended purposes.

5.3.2 THIRD COUNTRY TRAINING PROJECT

The selected participants all participated fully in the training as seen from the training reports for all three sessions. The curriculum was fully followed and delivered as planned to include the practical sessions despite some challenges with getting all needed reagents for some aspects. As per the pre and post evaluation as seen in the training reports, there was evidence of acquisition of knowledge and skills by participants in all disciplines covered in the training. In the final training report (2021), participants scored the efficiency in covering the course content as 89.3%.

5.4 PROJECT IMPACT

5.4.1 CONSTRUCTION OF THE ADVANCED RESEARCH CENTRE

The Advanced Research Centre for Infectious Diseases was established to play a leading role in tackling the ever-expanding research and training needs of the country as well as the West African sub-region and to respond effectively to disease outbreaks, including highly pathogenic agents such as Ebola Hemorrhagic Fever Virus at NMIMR. The Project aimed at solving the issues of the health and educational sectors in Ghana and the rest of the world by reinforcing the functions of NMIMR.

As shown in **Table 1** above, this building has had impact on the number of people trained, the number of projects the institute has been able to secure and currently running, and very importantly the number of COVID-19 tests done during the pandemic.

In support of diagnosis of COVID-19 infections, the institute assisted the Government of Ghana Ministry of Health, West Africa Countries, and the Africa CDC in the following:

a. As at September 2021 Ghana had diagnosed over 400 ,000 individuals by rtPCR, and the Institute carried out diagnosis in about 52% of the total cases reported in Ghana.
b. The Institute supported and received samples from the whole country during the peak of the transmission.
c. 42 laboratories in Ghana were trained at the institute including the Ghana National Reference Laboratories undertaking COVID-19 diagnosis in Ghana – 12- two Technicians/Lab for diagnosis KCCR-KNUST and the National Public Health Reference Lab were trained on sequencing.
d. 120 kits/devices were evaluated as a support to the Food and Drug Authority and were approved and being used for diagnosis in the country.
e. There is current collaboration with the Africa CDC in sequencing SARS-CoV-2 variants for Togo, Benin, Sierra Leone, and Liberia.
f. 13 technical staff from 7 ECOWAS countries Technical Staff were trained on the sequencing of SARS-CoV-2

In addition, this facility has enabled the Institute to increase the coverage for yellow fever and poliomyelitis surveillance across the country and to the sub region. This has been possible because of the additional BLS-3 lab facility and other equipment obtained as part of the construction project. Below is a summary of results in relation to the impact indicators.

Impact Indicators

Total number of research projects conducted at NMIMR	101	115	115
Increase in Research Project Overhead	GHC 2,074,00	GHC4, 250,000.00	GHC 4, 250,000.00
Number of diseases that NMIMR is recognized as a national/regional reference centre	5 diseases	5 diseases	6 diseases

On -Going Research work with Total Number of Beneficiaries

	2021/2022 Status	Total number of Beneficiaries
Development of anti-AIDs Drug	On-going	West Africa Sub-Region
Development of Malaria Vaccine	On-going	West Africa Sub-Region
Diagnosis of Ebola Virus diseases inside and outside Ghana	0	0
Regional Reference Lab for Polio and Buruli Ulcer	4704	4704
Ebola Hamorrhagic Fever	300	300
Avian Influenza	403	4032
MERS	0	0
COVID-19	52,322	52,322

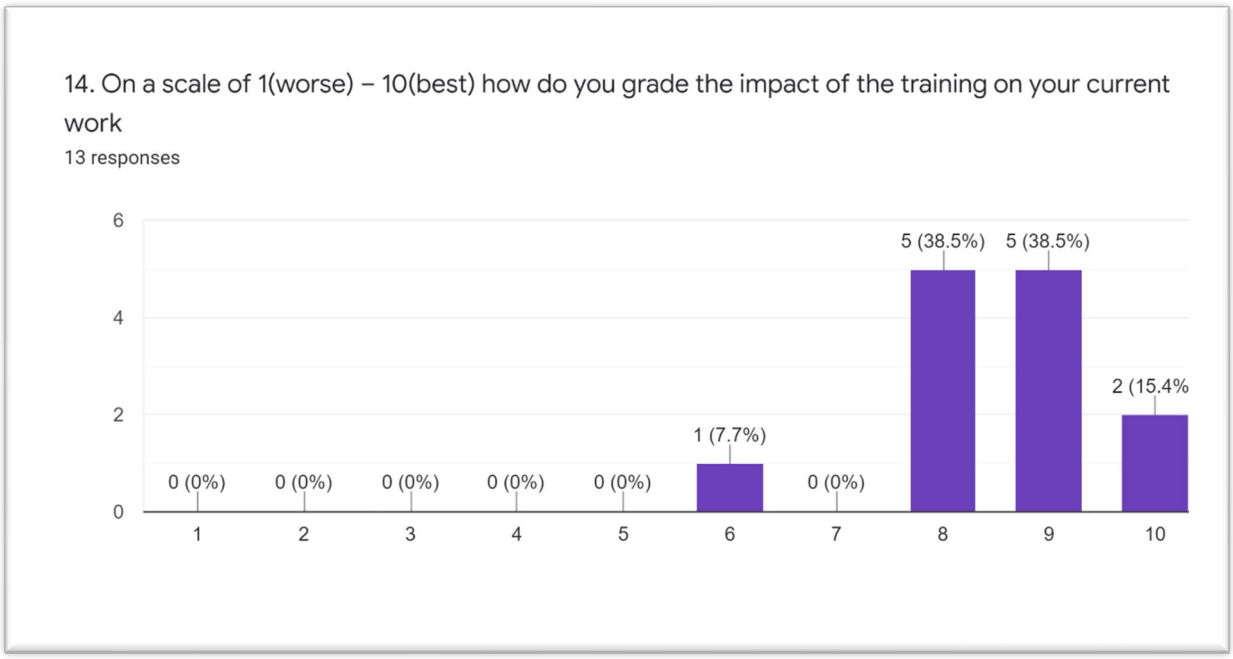
5.4.2 THIRD COUNTRY TRAINING PROJECT

A total of 42 participants from 9 countries (***Ghana, Nigeria, Benin, Togo, Serra Leone, Guinea, Liberia, and Cote d'Ivoire***) have benefited from the 3 batches of the third country trainings. The trainings demonstrate the impact in human resource capacity building beyond Ghana. The post training impact evaluation one at the end of the training sections have given some insight on

the benefits to the participants. Details of the survey conducted can be found at ***Annex 6***. A few examples of impact stores are:

- *"The third country training helped me to work with great ease especially in the area of RNA extraction up to the launch of RT PCR and analysis of PCR results"*
- *"As head of logistics, I have drawn an inventory equipment based on experiences with Noguchi to develop a futuristic laboratory including biobank and NGS MiSeg (Illumina)"*
- *"Based on experiences from the training, I have been able to effectively ensure sample reception in the lab and played key role in the RNA extraction process"*

From the web-based survey administered to randomly selected participants, over 92.7% indicated that the training impacted positively on their current work. The responses signified that the expectations of participants were met. **Figure 1** shows a pictorial view of respondents' responses as they graded the impact of the training on their current work schedules.



On the impact of the training on their country, the participants listed the following about how they have utilized the training to beneficiaries their country.

Briefly, describe how this training has been utilized to benefit your country?

The responses below are presented exactly as provided by respondence

- I am part of my country's team of COVID-19 response since reached my country.
- It has helped our bacteriology bench in bacterial identification and antibiotic sensitivity testing.

- I observed and enjoyed the practical organization of the parasitology laboratory, which edified me. It gave me another way of looking at the lab which I was able to apply especially during the peak of the COVID-19
- Helping others with the QMS systems.
- When I returned in Burkina Faso, I was immediately selected for COVID-19 diagnostic activities. And I also trained my colleagues on some techniques we learned at NMIMR. The next step, I would like to introduce environment surveillance of Poliovirus in my country.
- This training made me to see new techniques that I can only see on paper in my country and as such help me to make recommendations for those techniques to be brought in my country. With the bacteriology and parasitology knowledges I acquired during the training. I'm now able to apply most of the skills I learnt during the training session
- The JICA 3rd Country post-Ebola training augmented my molecular skills which enabled me to participate in SAR-COV-2 testing as a frontline health worker during the COVID-19 pandemic in Ghana.
- With the help of this training, I was able to work with my colleague in the fight against COVID-19. I have been involved in the fight against COVID-19 and other diseases of public health concern, now I am giving technical support to the Liberia National Reference Laboratory my previous place of work and other major labs in the country in fighting diseases of public health concern.
- The training is why I am part of the core team of Molecular infectious Disease team in my Country
- After the training I have developed more interest in Infectious disease epidemiology
- Share the knowledge and train my colleagues about bacteriology gym and parasitology curriculum that we had learned
- Knowledge and skills gained in this training especially in Virology has been directly used to capacitate me in carrying out daily diagnosis of suspected COVID-19 samples using RT-PCR

5.5 SUSTAINABILITY

5.5.1 CONSTRUCTION OF THE ADVANCE RESEARCH CENTRE

The evidence for the sustainability of this construction project was seen in the fact that a facility manager has been appointed who has the responsibility to monitor and ensure that the facility is used as expected, equipment is maintained per schedule and necessary repairs are undertaken. The other is demonstrated through the standard operating procedures (**SOPs**) which were seen in the various laboratories to ensure appropriate usage

and routine maintenance of the equipment. These have been posted on the walls and are therefore available to all. This was verified during this evaluation process. During the site visit, it was also found that through efforts of the Institute and Ghana government, additional steps have been taken to ensure stable power supply to the building and equipment as steps towards sustainability. Finally, the faculty has been able to secure more external funding through grant applications, and these projects have offered opportunity to have funding for maintenance and even replacement of equipment as needed.

5.5.2 THIRD COUNTRY TRAINING PROJECT

The training of the professionals to gain advanced level knowledge and skills is a sustainability indicator since these beneficiaries are then able to support their facilities and train others to the extent possible. It was evident that, the trainers are in touch with the trainees, and they support them in any possible way professionally. The training materials in terms of the presentations and other resources have all been made available to the participants and can therefore be used to conduct their own trainings.

6.0 Lessons Learned and Recommendations

6.1 LESSONS LEARNED

1 Planning and designing Project in alignment with National Strategic Plan

The two projects were in line with the national strategic plan which includes positioning the country to provide training and specialist services especially in the management of infectious diseases. Such high-level strategic alignment is believed to have played a key role in the success of the projects.

2 Improving Project Design and Implementation

The correct selection of relevant stakeholders and knowledge management is very key to improving the design of any Project. A well-planned inception phase produces a stronger implementation plan in which actions are clearer, more effectively prioritized, and interlinked, and motivation is stronger. This was demonstrated in the implementation of both projects.

3 Improving Monitoring and Reporting

It is necessary not only to implement assessment tools such as surveys at workshops or other events, but also to use them for monitoring and management purposes by drawing on the assessment results to inform decision-making and general progress reports. It was encouraging to therefore see that in the third country training, the evaluation and comments by participants were taken on board and used to shape the next year training.

4 Robust Procurement System

The procurement system through JICA is efficient and ensure that the Institute receives exactly the specifications agreed upon. Learning from this can enable the Institute to adapt such a procurement system for all other projects by other stakeholders.

5 Strong Involvement of the Government

JICA projects are channelled through the Government of Ghana. Close collaboration with Government agencies leads to smooth implementation of projects leading to the successful implementation of projects.

Other lessons learned from participants of each course are outlined below:

- **Biobank:** With the increasing number of projects at the Institute and therefore volume of biological samples needing storage, there is an urgent need for a biobank facility. This will be very beneficial not for just the institute but for researchers across the country and sub-region.

- **Additional Space:** Even though the space provided allowed adequate testing for COVID-19, it was inadequate for the different projects in the department to also work at the same time during the peak of the pandemic.

  The space is also inadequate to meet the expanding needs of the department.

- **Maintenance Cost:** There is the need for funding to support equipment servicing and maintenance. There is need for training support on the maintenance of the facility and the equipment.

First Course

- Lack of adequate time for practical session in Parasitology
- Training concentrated on English speaking countries
- Area of specialization of participants was not considered in laboratory group work.
- More facilitators needed in the lab
- Actual network building after the course

Second Course

- Lack of adequate time for practical session in Parasitology
- Women should be more encouraged to join the course
- Area of specialization of participants was not considered in laboratory group work
- Need a fund trip during weekends. The cost can be paid by participants per diem

Third Course

- Lack of adequate time for practical session in Parasitology and Bacteriology
- Nine countries invited (French speakers included)
- 15 participants were selected for the second and the third training. This was to be maintained
- Women should be more encouraged to join the course.
- Area of specialization of participants was not considered in laboratory group work.
- Need a fund trip during weekends. The cost can be paid by participants per diem.

6.2 RECOMMENDATIONS

1. **Maintenance:**

- There is the need for a specific budgetary allocation for maintenance of infrastructure and equipment. In future projects this could be factored into the project contract.

- There is need to develop and implement a comprehensive maintenance schedule for the facility.

2. Operations:

- Operations and activities must be closely monitored and documented and must be evidenced by the production of an annual report to be shared with all stakeholders.

3. Re-structuring of the third country training

- The planners of the third country training should consider restructuring such that the participants are segregated based on specialty or interest. This will ensure that more time will be available for them to gain knowledge in the discipline relevant to their work.

- There is need to increase the time and resources allocated to practical aspects. of the training.

Other Additional need identified are.

- With the increasing number of projects at the Institute and therefore volume of biological samples needing storage, there is an urgent need for a biobank facility. This will be very beneficial not for just the institute but for researchers across the country and sub-region.
- Respondents indicated they derived most benefits from the trainings in Virology, and least benefits in Parasitology. Even though this is obvious from the COVID-19 pandemic, efforts could be made to focus more on Parasitology by participants within their countries.
- Even though the space provided allowed adequate testing for COVID-19, it was inadequate for the different projects in the department to also work at the same time during the peak of the pandemic.
- The space is also inadequate to meet the expanding needs of the department.
- There is the need for funding to support equipment servicing and maintenance.
- There is need for training support on the maintenance of the facility and the equipment.
- The companies that won the bid in supplying the equipment could provide sales support.

7.0 ANNEX

7.1 ANNEX 1: OBJECTIVE VERIFIABLE INDICATORS FOR THE CONSTRUCTION OF THE ADVANCED RESEARCH CENTRE FOR INFECTIOUS DISEASES IN THE NMIMR

Goal: **To enable NMIMR to contribute broadly to infectious diseases control in Africa and to improve the functions to deal with issues on health and education.**

Objective: **The Project is to play a leading role in tackling the ever-expanding research and training needs of the country as well as the West African sub-region and to respond effectively to disease outbreaks, including highly pathogenic agents such as Ebola Hemorrhagic Fever Virus at NMIMR.**

Expected accomplishments	Indicators of achievement	Main Partners	Main Accomplishment Outcome and Impact	Relevance and Sustainability
Against this backdrop, the Project for Advanced Research Center for Infectious Diseases at Noguchi Memorial Institute for Medical Research (hereinafter referred to as "the Project") will be built as additional laboratories and enhance NMIMR of education and research/testing activities. 1) Construction of the Project **The requirements of the Project were for nine departments, but three departments (Virology, Bacteriology, and Immunology) are targeted at the**	• Total number of interns within the three departments (Virology, Bacteriology, Immunology) • The percentage of foreign student interns • Total number of research projects at the three	Ministry of Foreign Affairs Government of Ghana	• Total number of research projects conducted at NMIMR • Increase in Research Project Overhead • Number of diseases that NMIMR is recognized as a national/regional reference center	The Project aims to strengthen the countermeasure of infectious diseases in the West African district which respond to health and educational issues by building an advance research facility and equipping NMIMR with necessary research equipment.

improvement of a necessary research environment in addition to a growing volume of research. Because of Advanced Research Center for Infectious Diseases at Noguchi Memorial Institute for Medical Research will be constructed as specializing of research and training on pathogenic agents which are feared to outbreak in and out of the country in the future. 2) Construction of the New BSL-3 Laboratories **With an increasing advancement in research activities, it is currently difficult to perform research and experimental activities in the existing BSL-3 laboratory, which has space limitation and aging. Therefore, the construction of new BSL-3 Laboratories will be included in the Project.** 3) Provision of Molecular Biology Laboratory **The Common Molecular Biology laboratory (PCR laboratory) will be provided to make full and practical use of**	departments (Virology, Bacteriology, Immunology) • Number of times people have accessed BSL-3 Laboratory per year			

the same equipment owned by the targeted three departments. 4) Equipment Planning **The necessary equipment will be planned to conduct experiments and research in NMIMR for the BSL-3 Laboratories, Virology, Bacteriology and Immunology departments and other relevant rooms.** 5) Soft Component **To manage and maintain the BSL-3 facility properly, building service workers departments and experimental at the biosafety and building service technology will be strengthened. While providing training in which they will use real equipment at the site, hands-on training will also be conducted for fumigation and technology to HEPA (exchange high efficiency particulate air) filters.**				

7.2 ANNEX 2: LIST OF PERSONS CONTACTED

NO	NAME OF PARTICIPANT	DEPARTMENT/DESIGNATION
1	Prof. Dorothy Yeboah-Manu	Director/ Bacteriology
2	Dr. Michael F. Ofori	Immunology/ HoD
3	Dr. John Kofi Odoom	Virology / HoD
4	Dr. Charles Quaye	Parasitology/ Fellow
5	Dr. Gloria Joy Mensah	Bacteriology/ Fellow
6	Mr. Jacob Arthur-Quarm	Virology / Facility Manager
7	Ms. Pamela Nai	ORS/ Administrative Assistant
8	Ms. Afia A. Boakye	Administration/ /Assistant Registrar
9	Dr. Anthony Ablordey	Bacteriology/HoD
10	Dr. Evelyn Yayra Bonney	Virology/Fellow
11	Ms. Maki Ozawa	JICA/Senior Representative in charge of Programs
12	Mr. Takuya Shizume	JICA/ Representative in charge of Health Programs

7.3 ANNEX 3: INTERVIEW GUIDE FOR INCEPTION MEETING

Thematic Evaluation of Japan Grant Assistance Noguchi Memorial Institute for Medical Research in Ghana

Inception Meeting

Wednesday 9th February 2022

10am

Evaluation Aim

The evaluation seeks to determine how well Japan's assistance for Noguchi Memorial Institute for Medical Research (NMIMR) achieved the outcomes planned, how they were achieved and under what conditions.

The evaluation will also attempt to analyse how Japan's assistance for NMIMR contributed to Ghana's response to COVID-19. This information can inform not only Japan's future ODA projects but also the international society by identifying lessons learnt and emerging good practices

Evaluation Users

The primary evaluation user is Ministry of Foreign Affairs of Japan (MOFA), the Embassy of Japan in Ghana and other stakeholders that are relevant to the project including NMIMR.

The Scope and Focus of the Evaluation

We understand that there are currently four (4) Japan ODS projects to NMIMR between 2016 – 2020 but his evaluation will focus on two of them. The two (2) projects include.

1. FY 2016 Grant Assistance: "Constructing an advanced research centre for infectious diseases in the NMIMR" JPY2,285,000,000. This project aims to ensure efficient and safe research as well as the provision of good teaching environment of the NMIMR to play a leading role in tackling the ever-expanding research and training needs of Ghana and the West African sub-region to respond effectively to disease outbreaks.

2. FY2018 Technical Cooperation: "Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola"

Focus of the Inception Meeting

Seeking to understand the following key general issues.

1. What has been the main contribution of the Japan Grant Assistance to NMIMR' s mission, objective, and strategic directions
2. What has been the main contribution of to the priorities of individual Units within NMIMR?
3. To what extent does the JAPAN GRANT ASSISTANCE address an identified need in NMIMR? How well does the JAPAN GRANT ASSISTANCE align with your NMIMR priorities?
4. How did JAPAN GRANT ASSISTANCE design compare to regular programs implemented by NMIMR in the same sector and for the same target population?
5. Are objectives and design of JAPAN GRANT ASSISTANCE still relevant for potential future direction of the NMIMR?
6. What are the main JAPAN GRANT ASSISTANCE activities that units in NMIMR have been able to implement and have they contributed to NMIMR priorities?
7. What are the types of beneficiaries that JAPAN GRANT ASSISTANCE activities were expected to reach?
8. Who are the main partners that have carried JAPAN GRANT ASSISTANCE activities with and in what countries?
9. What are the managers and program officers experience over the application(s) process for JAPAN GRANT ASSISTANCE funds?
10. What are the managers and program officers experience during the project implementation?
11. What have been the main programmatic achievements and challenges to date?
12. Did the program achieve its intended outputs/outcomes/objectives? Were there any important unintended outcomes, either positive or negative?
13. What were the main reasons that determined whether intended outcomes were or were not achieved, and whether there were positive or negative unintended outcomes?
14. How sustainable are the outcomes of the JAPAN'S GOVERNMENT ASSISTANCE?
15. What are the main factors that affect, either positively or negatively, the sustainability of JAPAN GRANT ASSISTANCE outcomes?
16. What exit strategies were incorporated into JAPAN GRANT ASSISTANCE design? Were such strategies implemented and to what extent did they contribute to sustainability
17. How would you describe your experience with the administrative arrangements put in place for accessing and using Japan Grant Assistance?
18. Do JAPAN GRANT ASSISTANCE management arrangements have any advantages or disadvantages as compared to the regular budget or bilateral arrangements? Please explain.
19. Have Grant allocated been disbursed in a timely fashion? What are the challenges in funds allocation and disbursement?

20. Has your NMIMR been able to utilize all fund allocated and disbursed to you during the period of JAPAN'S GOVERNMENT ASSISTANCE?
21. Are there any extraordinary reporting requirements under the grants as compared to standard BP reporting requirements or for bilateral agreements? Please explain.
22. To what degree do new iterations of programs build on evidence of performance from internal Monitoring systems?
23. To what extent is it used to scale up innovations and successful projects?
24. In your opinion, has NMIMR used results of past evaluations and studies to improve itself? If so, how?
25. How do you assess NMIMR' s ability to build on successes/tackle problem areas?
26. Are there any lessons that can be identified in your experience with JAPAN'S GOVERNMENT ASSISTANCE?
27. Do you have any recommendations for the future operation of the JAPAN GRANT ASSISTANCE?

7.4 ANNEX 4 - STATUS OF EQUIPMENT SUPPLIED

Department/ Laboratory	No.	Name of Equipment	Status at Inception	Current Status (In use, out of use)
A.BSL-III Laboratory (Common equipment for Virology, Bacteriology, and Immunology	1	Autoclave pass through type	Functional	In Use
	2	Biosafety Cabinet	Functional	In Use
	3	Pass box	Functional	In Use
	4	Sink with decontamination tank	Functional	In Use
	5	Formaldehyde decontamination unit	Functional	In Use
	6	Formaldehyde decontamination unit	Functional	In Use
	7	Biosafety type autoclave	Functional	In Use
	8	Deep Freezer (-80^{0}C)	Functional	In Use
	9	Freezer (-20^{0}C)	Functional	In Use
	10	Medical refrigerator	Functional	In Use
	11	Refrigerated centrifuge	Functional	In Use
	12	Refrigerated centrifuge	Functional	In Use
	13	Refrigerated microcentrifuge	Functional	In Use
	14	Inverted Microscope	Functional	In Use
	15	CO2 incubator	Functional	In Use
	16	Incubator (37^{0}C)	Functional	In Use
	17	Shaking water bath	Functional	In Use
B. Virology Laboratory	1	Potable pH meter	Functional	In Use
	2	Electronic balance	Functional	In Use

	3	Autoclave	Functional	In Use
	4	Deep freezer (-80^{0}C)	Functional	In Use
	5	Binocular microscope	Functional	In Use
	6	Refrigerated centrifuge(15/50ml)	Functional	In Use
	7	CO2 Incubator	Functional	In Use
	8	Incubator (37^{0}C)	Functional	In Use
	9	Inverted microscope	Functional	In Use
	10	Biosafety cabinet(B)	Functional	In Use
	11	Water bath	Functional	In Use
	12	***Microcentrifuge***	***Functional***	In Use
	13	Vortex mixer	Functional	In Use
	14	Elisa System	Functional	In Use
B. Virology Laboratory	15	Centrifuge (15/50ml)	Functional	In Use
	16	Refrigerated microcentrifuge	Functional	In Use
	17	Real Time PCR	Functional	In Use
	18	Nanodrop	Functional	In Use
	19	Medical Refrigerator	Functional	In Use
	20	Freezer (-20^{0}C)	Functional	In Use
	21	Clean Bench	Functional	In Use
	22	Freezer (-30^{0}C)	Functional	In Use
	23	Refrigerator/freezer	Functional	In Use
	24	Refrigerated centrifuge (32 tubes)	Functional	In Use

	25	Shaker	Functional	In Use
	26	Ice maker	Functional	In Use
	27	Vacuum Dryer	Functional	In Use
	28	Fluorescent microscope	Functional	In Use
	29	Magnetic stirrer	Functional	In Use
	30	Shaking water bath	Functional	In Use
	31	Microwave oven	Functional	In Use
	32	Ultracentrifuge	Functional	In Use
	33	Flow Cytometry	Functional	In Use
	34	Immunoassay serological analyzer	Functional	In Use
	35	Fully automated nucleic material	Functional	In Use
C. Bacteriology Laboratory	1	Blood culture system	Functional	In Use
	2	Autoclave	Functional	In Use
	3	C02 Incubator	Functional	In Use
	4	Refrigerated Centrifuge (15/50ml)	Functional	In Use
	5	Biosafety Cabinet	Functional	In Use
	6	Refrigerated microcentrifuge	Functional	In Use
	7	Electronic balance	Functional	In Use
	8	Electronic balance	Functional	In Use
	9	Electronic balance	Functional	In Use
	10	Colony counter	Functional	In Use
	11	Incubator (37^0C)	Functional	In Use

	12	Incubator (22^0C)	Functional	In Use
	13	Incubator (44^0C)	Functional	In Use
	14	Medical refrigerator	Functional	In Use
	15	Water bath	Functional	In Use
	16	Centrifuge (15/50ml)	Functional	In Use
	17	Shaker incubator	Functional	In Use
	18	Clean bench	Functional	In Use
	19	Vortex mixer	Functional	In Use
	20	Freezer (-20^0C)	Functional	In Use
	21	Deep Freezer (-80^0C)	Functional	In Use
	22	Sonicator	Functional	In Use
	23	Desicator	Functional	In Use
	24	Stomacher	Functional	In Use
	25	Ice maker	Functional	In Use
	26	Drying hot oven	Functional	In Use
	27	Binocular microscope	Functional	In Use
	28	Digital coagulator	Functional	In Use
	29	Twin Incubator	Functional	In Use
	30	Fluorescent microscope	Functional	In Use
	31	Fume Extractor	Functional	In Use

D. Immunology Laboratory	1	Binocular microscope	Functional	In Use
	2	Hotplate magnetic stirrer	Functional	In Use
	3	Electronic balance	Functional	In Use
	4	Centrifuge (15/50ml)	Functional	In Use
	5	Refrigerated centrifuge (15/50ml)	Functional	In Use
	6	Biosafety cabinet	Functional	In Use
	7	Elisa system	Functional	In Use
	8	Fume extractor	Functional	In Use
	9	Medical refrigerator	Functional	In Use
	10	Refrigerator/freezer	Functional	In Use
	11	EliSpot reader	Functional	In Use
	12	Clean bench	Functional	In Use
	13	Plate shaker	Functional	In Use
	14	Vortex mixer	Functional	In Use
	15	Flow cytometry	Functional	In Use
	16	Autoclave	Functional	In Use
	17	Shaking water bath	Functional	In Use
	18	Microcentrifuge	Functional	In Use
	19	pH meter	Functional	In Use
	20	Inverted microscope	Functional	In Use
	21	Fluorescent microscope	Functional	In Use
	22	Freezer (-20^{0}C)	Functional	In Use

	23	Freezer (-30^{0}C)	Functional	In Use
	24	Freezer (-80^{0}C)	Functional	In Use
	25	Dissecting microscope	Functional	In Use
	26	Cell counter	Functional	In Use
	27	Refrigerated microcentrifuge	Functional	In Use
	28	Water bath	Functional	In Use
	29	Micropipette	Functional	In Use
	30	Sonicator	Functional	In Use
	31	Chemical cabinet	Functional	In Use
	32	Ultrasonic cleaner	Functional	In Use
	33	Nitrogen tank	Functional	In Use
E. Clinical Pathology	1	Gas chromatography mass spectrometry	Functional	In Use
F. Molecular Laboratory (Pre-PCR Lab)	1	Medical Refrigerator	Functional	In Use
	2	Freezer (-20^{0}C)	Functional	In Use
	3	Refrigerated microcentrifuge	Functional	In Use
	4	Vortex mixer	Functional	In Use
	5	Timer	Functional	In Use
	6	PCR workstation	Functional	In Use
	7	Micropipette	Functional	In Use
	8	Laminar flow Biosafety Cabinet	Functional	In Use
(PCR Lab)	1	Thermo Cycler	Functional	In Use

	2	Real -Time PCR	Functional	In Use
	3	Medical Refrigerator	Functional	In Use
	4	Micropipette	Functional	In Use
	5	Laminar Flow Biosafety Cabinet	Functional	In Use
(Post PCR)	1	Medical Refrigerator	Functional	In Use
	2	Freezer –(20^0C)	Functional	In Use
	3	Gel Imaging Systems	Functional	In Use
	4	Computer with network connection	Functional	In Use
	5	Electrophoresis apparatus	Functional	In Use
	6	Voltex Mixer	Functional	In Use
	7	Laminar flow biosafety Cabinet	Functional	In Use
	8	Refrigerated microcentrifuge	Functional	In Use
Sample Preparation	1	Sample homogenizer	Functional	In Use
	2	Medical Refrigerator	Functional	In Use
	3	Freezer (-20^0C)	Functional	In Use
	4	Water bath	Functional	In Use
	5	Heat block	Functional	In Use
	6	Laminar flow biosafety Cabinet	Functional	In Use
Sequencing (Common Usage)	1	DNA Sequencer (Next generation)	Functional	In Use
Washing room (Common Usage)	1	Drying hot oven	Functional	In Use
	2	Drying hot oven	Functional	In Use

	3	Water distiller	Functional	In Use
	4	Washing machine	Functional	In Use
	5	Drying machine	Functional	In Use
	6	Automatic pipette washer	Functional	In Use

7.5 ANNEX 4: KEY LEADING QUESTIONS FOR THE MEETING WITH JICA - NMIMR EVALUATION

Section 1: DETERMINE JICA'S ROLE IN ADDRESSING THE BARRIERS TO HEALTH AND INFECTIOUS DISEASES IN GAHAN AND WEST AFRICA

1. In order the address these barriers JICA is addressing, we would like to understand the focus of JICA programs in JICA and other West Africa Countries:
2. How would you rate the relevance and additionality of the actual interventions that JICA program has done to the needs of Health sector in the country? (Rating 1-5 for reach of relevance and additionality and qualitative feedback)

3. Are there other barriers/interventions that JICA should focus on? (Please specify)

   _____

Section 2: ASSESS POTENTIAL PARTNERSHIPS AND BEST PRACTICES

4. How would you rate the overall effectiveness of JICA assistance to NMIMR to date (rating of 1-5 and qualitative feedback)?
5. How would you rate the overall sustainability of' JICA assistance to NMIMR 's impact (or program's impact in making systemic change in eco-system) (rating of 1-5 and qualitative feedback)?
6. If you are aware of particularly successful JICA interventions or particularly unsuccessful ones, that NMIMR can learn from, please briefly explain the case and why.
7. What kind of partnerships would the JICA be interested in making to increase access to better health for citizens of Ghana and other West Africa Countries?
8. What types of contributions/investments would the JICA interested in making in such partnerships?

Section 3: UNDERSTAND JAPAN GOVERNMENT ODA POLICIES

9. How can JICA and other JAPAN development actors better align their strategies with planned national level HEALTH strategies to enhance synergy, complementarity, and value addition?
10. What are some of the best practices in the country that have ensured greater impact for women in BETTER HEALTH?

Section 4: UNDERSTAND THE CONSTRAINTS AND INTERVENTIONS FOR JAPAN ODA TO NMIMR

11. What are some of the critical barriers for JAPAN ODA TO NMIMR?
12. What are the current investments, if any, made by JAPAN ODA TO NMIMR to address these barriers?
13. What is the role of JICA and other development actors in addressing these barriers? Where are there gaps in JICA interventions in the country?
14. How would you rate the overall relevance and additionality of JAPAN ODA to the needs of HEALTH AND EDUCATION sector in the country? (Rating 1-5 for reach of relevance and additionality and qualitative feedback)

Section 5: Non-government stakeholders (e.g., other donors)

15. In your collaborated with NMIMR, please describe your experience. What did NMIMR do well and what CAN THEY improve?

16. How would you rate NMIMR's approach in building collaborative working relationship with other organizations in the space?

7.6 ANNEX 5: POST TRAINING EVALUATION

The International Centre for Evaluation and Evaluation has been awarded contract to evaluate the Japan Government Assistance programs for Noguchi Memorial Institute for Medical Research.

The Evaluation Team is assessing the “Third Country Training Course on Enhancing Laboratory Skills for Infectious Diseases in West African Countries for Post Ebola" and seeks your assistance in completing this form.

1. Title:
    - Ms.
    - Mrs.
    - Mr.
    - Dr.
    - Other (specify)
2. Highest level of education
    - BSc
    - Masters
    - MPhil
    - PhD
    - Other (specify)
3. Current Place of Employment:
4. Department:
5. Rank/level/position:
6. Nationality:
7. Country of Residence/Employment:
8. What year of training were you part of?
    - 2018
    - 2019
    - 2020

Grade based on the following scale the items below (Scale: 5=Excellent, 4=Very Good, 3=Good, 2=Satisfactory, 1=Poor)

9. Organisation of the training
    - Application and admission process
    - Pre-workshop information pack
    - Secretarial support for travelling and other logistical support
10. Content of the training Curriculum
    - The foundation courses
    - Bacteriology
    - Parasitology
    - Virology

11. The delivery of the course content by facilitators
    - The foundation courses
    - Bacteriology
    - Parasitology
    - Virology
12. Practical aspects of the training
    - Bacteriology
    - Parasitology
    - Virology
13. On a scale of 1(worse) – 10(best) how do you grade the overall training
14. On a scale of 1(worse) – 10(best) how do you grade the impact of the training on your current work
15. Which aspect of the curriculum have you found most useful to your current work?
    - Bacteriology
    - Parasitology
    - Virology
16. Which aspect of the curriculum have you found least useful to your current work?
    - Bacteriology
    - Parasitology
    - Virology
17. Will you recommend this training to other colleagues?
    - Yes
    - No
    - Maybe
18. Briefly, describe how this training has been utilized to benefit your country?

19. Any recommendations on how to improve this training?

7.7 THIRD COUNTRY TRAINING ON THE FIGHT AGAINST COVID-19

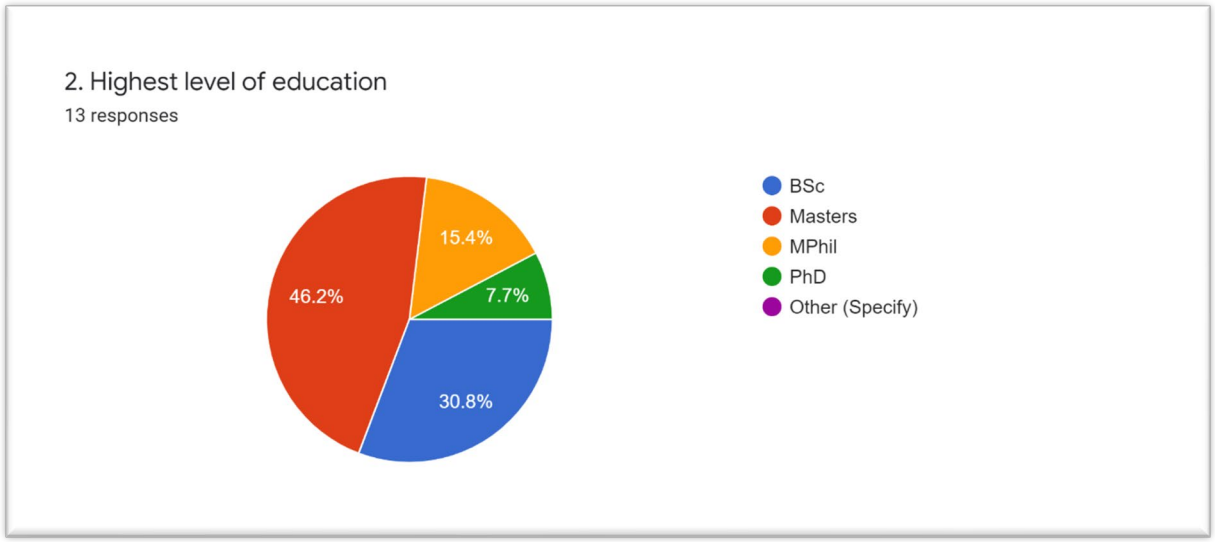
NAME	COUNTRY	INSTITUTION/ DEPARTMENT	INVOLVEMENT IN COVID RELATED ACTIVITIES	SKILLS/KNOWLEDGE APPLICATION DURING COVID-19
Badji Atakpa-Bem Bassabi	Togo	National Institute of Hygiene (INH) in Lomé. /Serology Laboratory	• Reception of suspected Covid-19 samples. • Decontamination. • Inactivation of the virus. • Extraction of genetic material for real-time PCR. • Programming and initiation of genetic amplification on thermal cyclers. • Analysis of real-time PCR results and reporting of results.	The third country training helped me to work with great ease especially in the area of RNA extraction up to the launch of RT PCR and analysis of PCR results.
Romeric Deguenon	Benin	Academic Hospital of Suru-Lere district, Cotonou/ Medical Biology Laboratory (Medical Biologist)	• In my setting we do not have virology but with the pandemic of COVID-19, I participated in sample collection (using RDTs) and delivery of the samples to the reference lab for processing. • Aside covid-19 related testing, I am also deeply involved in parasitology, serology, bacteriology, hematology, and Biochemistry related laboratory work	I have applied the knowledge gained on using PCR to be fast in our diagnostic works at the laboratory especially in this covid-19 pandemic
Bandaogo Ousseni	Burkina Faso	Centre MURAZ, Bobo-Dioulasso/Virology Lab (Laboratory Manager)	• Sample collection • Standards assessment of imported RDTs • Other areas of involvement are laboratory work on Polio virus and food safety	I applied knowledge and skilled acquired during sample collection and lab work for assessment of newly imported RDTs (rapid tests).

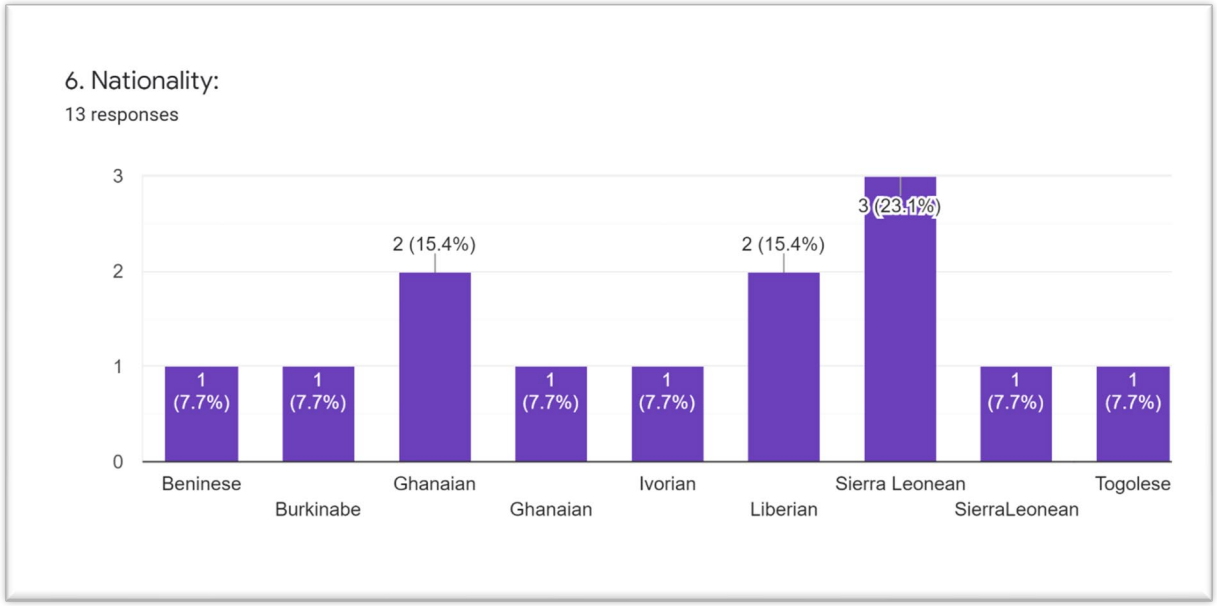
				As head of logistics, I have drawn an inventory equipment based on experiences with Noguchi to develop a futuristic laboratory including biobank and NGS MiSeg (Illumina) However, when our equipment is installed, we would like to call for help for any lab (NMIMR) to welcome three biologists for training in sequencing.
Irene Amedzro	Ghana	Zonal Public Health Laboratory, Western Region-Sekondi/Laboratory	I participate in sample collection, storage as well as testing (Pooling, Extraction and Mastermix/PCR. This is done in collaboration with the Veterinary services Laboratory in TAKORADI (which is a BSL3 lab) to test for COVID -19	During the 3rd Country training we were taken through RNA extraction as well as PCR testing. This has given me a better understanding of what the extraction team does even though I am not part of the team. My work with the PCR team is quite easy because of the knowledge and experience I gained from facilitators and scientists at Noguchi. I am better able to explain the principle behind what we do to my colleagues.
Michel Agbla	Benin	Ministry of Health-National Public Health laboratory, Benin (Biologist Engineer)	Key activities involved include: • Sample reception and treatment from field teams • RNA extraction • Data management	From experiences from the training, I have been able to effectively ensure sample reception in the lab and played key role in the RNA extraction process. Sometimes,

Samira B. Alim Sesay	Sierra Leone	Connaught Government Hospital, Freetown/ Medical Laboratory Scientist	Following my country's first confirmed case of the COVID 19 outbreak, I worked with the Technical Working Group at the Emergency Operations Center for the preparedness of our laboratories in response to the coronavirus in Sierra Leone I was recently posted to support the Laboratory Response Team for robust Sample Reception, Detection, Testing and Data analysis/Management.	The knowledge and skills acquired during the rigorous training on RNA extraction as well as PCR testing has helped me understood the processes and now makes my work in covid-19 activities much easier to implement.
Christopher Chukwu	Nigeria	Nigeria Centre for Disease Control/National Reference Laboratory (Medical Laboratory Scientist)	Involved public health laboratory testing especially on enteric pathogens such as influenza and recently on Covid- 19 sample collection	I am actively responding to the covid-19 pandemic in the area of core laboratory testing using PCR. I am also part of the laboratory setup and optimization team across Nigeria in other to increase testing capacity.
Abodji Essofa Oubote	Togo	National Institute of Hygiene/Department of Bacteriology (Senior lab Technician)	The main tasks are inactivation and RNA extraction, master mix preparation and sample addition, amplification, and data analysis.	My country set-up an inflatable P3 laboratory to increase our capacity in terms of number of samples tested. This laboratory is located at the airport and exclusively devoted to travelers. I and my colleague (Badji Atakpa-Bem Bassabi) have been tasked to manage the P3 lab. Thanks to the knowledge that we received during NMIMR training.

				We are preparing to train of our colleagues in management of this P3 lab based on the knowledge and skills we acquired.

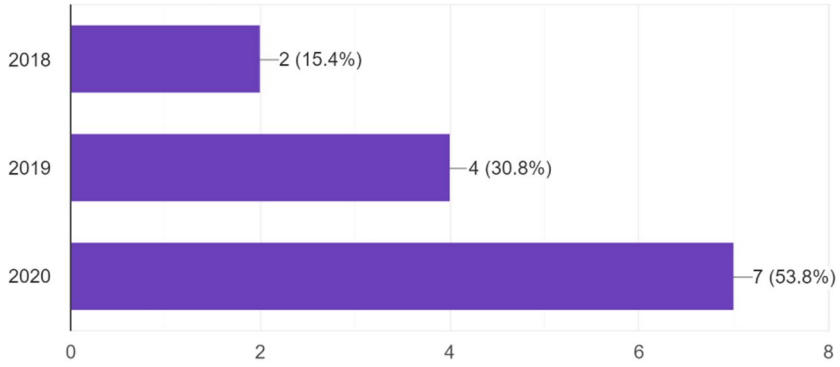
7.8 WEB BASED SURVEY RESPONSES





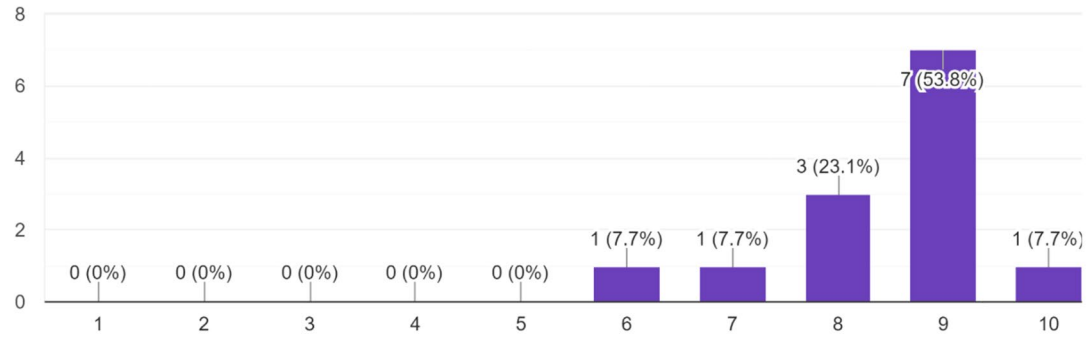
8. What year of training were you part of:

13 responses



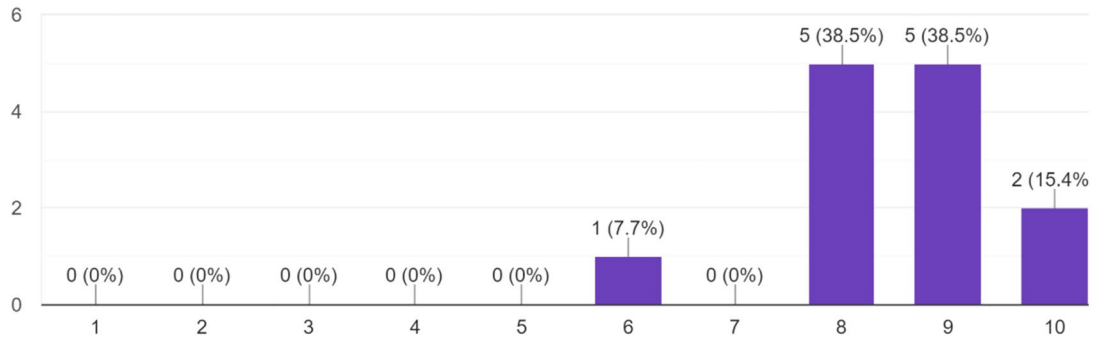
13. On a scale of 1(worse) – 10(best) how do you grade the overall training

13 responses



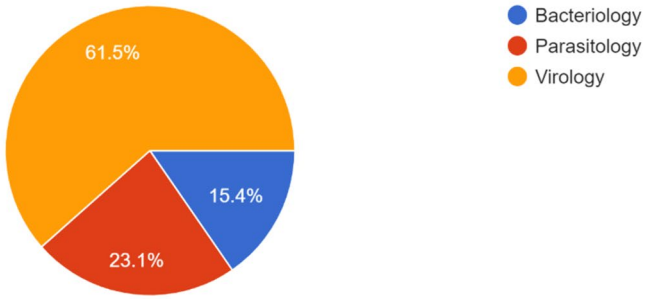
14. On a scale of 1(worse) – 10(best) how do you grade the impact of the training on your current work

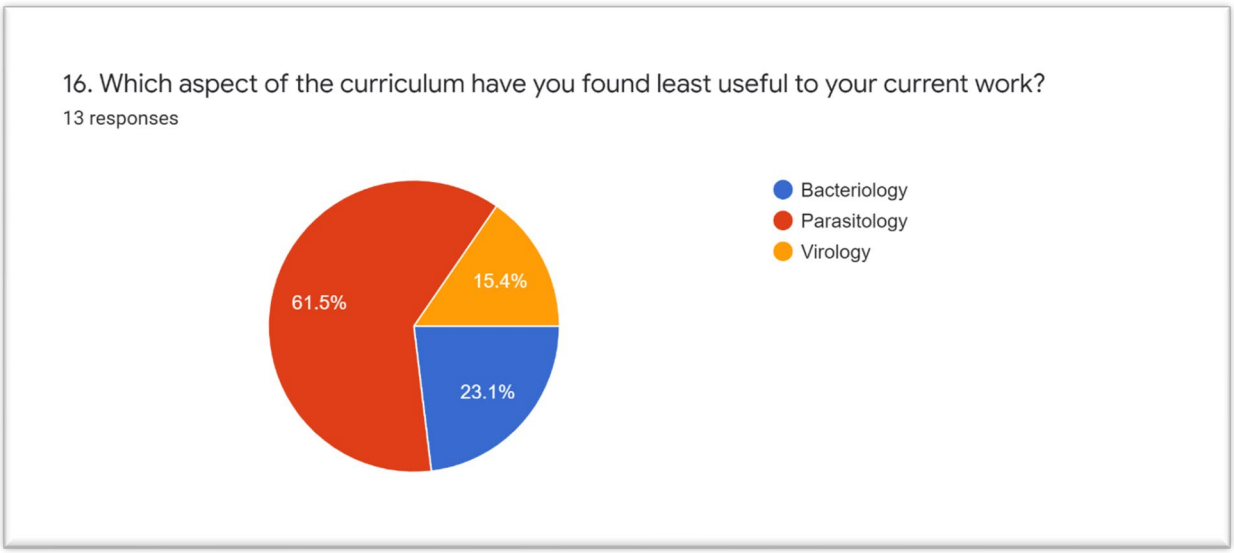
13 responses

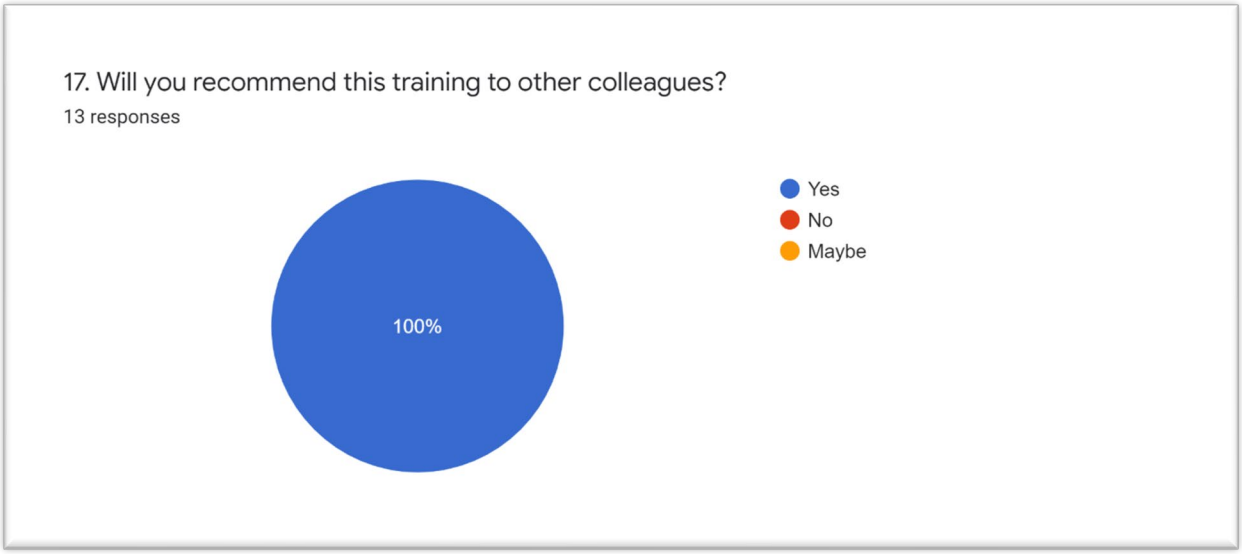


15. Which aspect of the curriculum have you found most useful to your current work?

13 responses







18. Briefly, describe how this training has been utilized to benefit your country? (Responses presented without modification

- COVID 19
- I am part of my country's team of COVID-19 response since reached my country.
- It has helped our bacteriology bench in bacterial identification and antibiotic sensitivity testing.

- I observed and enjoyed the practical organization of the parasitology laboratory, which edified me. It gave me another way of looking at the lab which I was able to apply especially during the peak of the COVID.
- Helping others with the QMS systems.
- When I returned in Burkina Faso, I was immediately selected for CoViD-19 diagnostic activities. And I also trained my colleagues on some techniques we learned at NMIMR. The next step, I would like to introduce environment surveillance of Poliovirus in my country.
- This training made me to see new techniques that I can only see on paper in my country and as such help me to make recommendations for those techniques to be brought in my country. With the bacteriology and parasitology knowledges I acquired during the training I am now able to apply most of the skills I learnt during the training session
- The JICA 3rd Country post-Ebola training augmented my molecular skills which enabled me to participate in SAR-COV-2 testing as a frontline health worker during the COVID-19 pandemic in Ghana.
- With the help of this training, I was able to work with my colleague in the fight against covid-19. I have been involved in the fight against covid-19 and other diseases of public health concern, now I am giving technical support to the Liberia National Reference Laboratory my previous place of work and other major labs in the country in fighting diseases of public health concern.
- The training is why I am part of the core team of Molecular infectious Disease team in my Country
- After the training I have developed more interest in Infectious disease epidemiology
- Share the knowledge and train my colleagues about bacteriology gym and parasitology curriculum that we had learned
- Knowledge and skills gained in this training especially in Virology has been directly used to capacitate me in carrying out daily diagnosis of suspected COVID-19 samples using RT-PCR