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Full Length Research

# Attitude and perceptions of Nigerian laboratory personnel towards integrated clinical samples referral network

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**An integrated specimen referral network is one strategy used for the optimization of the capacity of high throughput laboratory equipment, especially viral load assay and Tuberculosis (TB) diagnosis. Many countries, including Nigeria, have key-in into the Joint United Nations (UNAIDS) 90-90-90 strategy to end human immunodeficiency viruses (HIV) pandemic by the year 2030. The approach had now been dubbed '95-95-95 strategy' with an increase in the targets. This study aims to determine the attitude and perceptions of Medical Laboratory personnel working in the healthcare facilities where specimen referrals do take place and their effects. An online survey on paid Survey-Monkey™ platform and critical informants' interviews were conducted to gather data. Theory of Planned Behaviour provided the theoretical framework for the study. The data were analyzed using Nvivo software to produce the coding into six themes as follows: Availability of monetary payment to participants; Allowances; Incentives to staff involved; Motivation; More specimen collection and analysis; and Involvement in other personal activities. These attitudes and beliefs provide stiff opposition to the establishment and operationalization of an integrated specimen referral network to the benefits of the general population. Giving antidote to these beliefs and attitudes will avert the resistance from the staff of the laboratories that are engaged in specimen transportation. Findings can help policymakers to develop better programs and services that will strengthen the specimen referral network in Nigeria.**

**Keywords:** Humanitarian supply chain; Nigeria; Medical Laboratory; Optimized specimen referral; Logistics services providers; Attitude.

## INTRODUCTION

Studies by researchers have shown that sample referral network for clinical laboratory samples remains an impediment to effective healthcare services in some countries (Xiong et al., 2008; Faruna et al., 2019). In those studies, assessments of the country's supply chain management (SCM) of laboratory samples and test results showed the following:

- Smooth movement of samples from facilities that have no equipment to assay viral load and early infants' diagnosis for human immunodeficiency viruses (HIV) in children can maximize equipment utilization.
- It provides an efficient and effective service for patients.

One of the identified reasons for the failure of an integrated specimen referral is the attitude of personnel working in the laboratory where specimens are currently referred from to the testing laboratories. The laboratory personnel attitudes are ascribed to lack of knowledge, lack of governmental policy, the economic gain accruing to the staff involved in the transportation of the specimen. From philosophers, when the attitude of people to a thing is right, it is easier to manage the situation. This provided the underlining reason why urgent attention was required to study the lived experiences of the Nigerian Medical laboratory personnel who are involved in the handling of the current uncoordinated and disjointed clinical specimen referral program in Nigeria for HIV and TB programs. The study is meant to provide the belief and attitudinal disposition toward a productive and well-coordinated integrated specimen referral network program in Nigeria.

This study explores the attitudes and perceptions of the Nigerian medical laboratory personnel toward the operation of an integrated samples transfer network. The focus was mainly to survey Nigerian Medical Laboratory personnel (Medical Laboratory Scientists, Technicians and Assistants) who are involved in the business of clinical sample transfer and result collection back to the referring laboratories, who agreed to participate in this study under voluntary and anonymous conditions.

An online survey on paid Survey-Monkey™ platform and critical informants' interviews were conducted to gather data. Theory of Planned Behaviour provided the theoretical framework for the study. The data were analyzed using Nvivo software to produce the coding into six themes as follows: Availability of monetary payment to participants; Allowances; Incentives to staff involved; Motivation; More specimen collection and analysis; and Involvement in other personal activities.

These attitudes and beliefs provide stiff opposition to the establishment and operationalization of an integrated specimen referral network to the benefits of the general population. Giving antidote to these beliefs and attitudes will avert the resistance from the staff of the laboratories that are engaged in specimen transportation. One of the limitations was the inability to have a personal interview with all the 39 people that responded via Survey-Monkey™ platform for robust responses and generalization. There is a positive social change implication from this research. Further research is recommended to evaluate the attitude of the funders and implementing partners that provide the money for the specimen transportation to provide triangulation of ideas from their perspectives.

The outcome of the study is to help in the optimization of the laboratory equipment and achieve the third tranche of the United Nations against AIDS (UNAID) 90-90-90 strategy. Such that 90% of the people on treatment should attain viral load suppression as well as the intensification of Tuberculosis (TB) case detection and management (Sidibe et al., 2016). This study brings an implication of social change when contribution to the knowledge base for public health personnel and policymakers in this study is utilized for the operation of the National Integrated Specimen Transfer Network in Nigeria.

## LITERATURE REVIEW

### Researches regarding referral network for clinical laboratory samples

It was pointed out that network location models have been used extensively for siting public and private facilities (Melkote and Daskin, 2001). The investigation was carried out on a model that simultaneously optimizes facility locations and the design for an underlying transportation network but changing the network topology was more cost-effective than adding facilities to improve service levels. The sample referral network for clinical laboratory samples remains an impediment to effective healthcare services in some countries. In 2014, Dominican Republic Ministry of Health conducted a baseline study to identify the causes hindering timely diagnosis and treatment of HIV/AIDS and tuberculosis patients by looking at the supply chain management (SCM) of laboratory samples and the test results (George et al., 2014). The result

showed that awareness of supply chain management for clinical samples was deficient. The recommendation and lessons learned were that SCM is also needed for a referral network for clinical laboratory samples. Personnel that is involved in the preparation, reception must be trained on supply chain management and orientation provided to implement the best practices (George et al., 2014). Similarly, countries like Uganda tried to raise the uptake of early infant's diagnostics assay but were unsuccessful because of sample transportation challenges. Only 35% of the samples were what they could achieve. However, when they carried out a pilot study using a standardized specimen referral, 51% was achieved with a shorter time. The cost too, decreased by 62% and the turnaround time by 47% (Kiyaga et al., 2013). Haiti had a similar success story with CD4 specimen that increased from 27 facilities to 113 facilities benefiting from the services. The testing volume also increased to 76% resulting in more patients being placed on antiretroviral therapy, according to the findings (Louis et al., 2015).

Samples transfer network design is akin to the designing of a supply chain network (SCND) (Farahani et al., 2014) observed that SCND is the determining factor that affects cost and performance. Various decisions like the number, size, and location of facilities in the supply chain are critical to the supply chain network design. Other factors are tactical that involves distribution, transportation, and inventory management policies while some are operational just like fulfilling the customers' demand. Locations took into consideration the hub and spoke. In this case, the centers are the facilities where the clinical samples are investigated, and results of the investigations sent back to the spokes (the facilities where the samples are transported from, and results are returned).

In the same vein, Simchi-Levi et al., (2014) considered SCND as the primary and the most crucial step for decreasing or increasing the total costs, profit inclusive, of chains. Strategic, tactical, and operational decisions are involved in having an efficient supply chain network design. The conventional supply chain network design has an operational choice to fulfill customers' demands, pricing, and provide services. The tactical decisions are hinged on the amount of flow, transportation among the SC's facilities, transportation mode among the SC's facilities, inventory volume and type in SC's facilities, amount and type of purchase from contracted providers, and the information technology for knowledge management. Lastly, the strategic decisions are based on the number of SC's facilities, the location of SC's facilities, the capacity of SC's facilities, the quality of SC's facilities, the type of technology, number of contracted providers, and reserved capacity of contracted providers. These three decisions criteria are equally critical for an effective integrated clinical sample transfer network design. From the available researches, an assessment of the country's SCM of laboratory samples and test results showed that smooth movement of samples from facilities that have no equipment to assay viral load and early infants' diagnosis for HIV in children could maximize equipment utilization and provide efficient and effective samples for patients.

**Healthcare system strengthening in Nigeria**

According to an article on Nigeria in the Encyclopedia Britannica, Nigeria is the largest country in tropical West Africa and has an area of 923,770 sq. Km (Udo, Kirk-Greene, Ade-Ajayi, and Falola, n.d.). Nigeria's landmass is located between latitude $2^{O}$ 49' E and $13^{O}$ 52'N and between longitude $2^{O}$ 49'E and $14^{O}$ 37'E. Boundary to the East by Cameroun and the Chad Republic, bounded on the North is the Niger Republic, and the Benin Republic is to the West. The Delta of River Niger dominates the Southern axis. Regarding landmass, it is about the twelfth largest country in Africa, but the most populous country. Approximately about 180 million people, Nigeria has a diversity of tropical rainforest, Guinea Savanah to Sahel Savanah and from coastal swamps to semi-temperate highlands (Aikhuele, 2018).

The laboratory services are developed along with the 3- tier public health system and these are found at the primary, secondary, and tertiary levels. Besides these, there are National and sub-national Public Health Reference Laboratories, Research Laboratories, and Disease-Specific Reference Laboratories to provide services for complex and specialized tests. Both public and private sectors offer laboratory support at all levels of healthcare, both in rural and urban areas. The Medical Laboratory Council of Nigeria (MLSCN) is statutorily

responsible for regulating the practice of medical laboratory practice in Nigeria. The MLSCN expects that each laboratory should identify the scope, functions, and the capacity of the services offered by it and have an appropriate infrastructure with necessary biosafety measures in place.

Just like other aspects of the Nigerian healthcare system, the laboratory service has dispersed clinical and diagnostic laboratory capacity and capability. There are also limited linkages between existing in-country laboratory resources for clinical and diagnostic investigations. Unfortunately, available specialized laboratory resources are underutilized due to poor networking and difficult access for clients. Furthermore, there is limited service integration across disease areas because of vertical program planning, design, and implementation. Hence, the laboratory service requires system strengthening, by the government of Nigeria and international funding agencies like USA PEPFAR and GF programs actively support with funding and technical assistance.

The above is in line with the World Health Organization (WHO), which is interested in the strengthening of the healthcare system in all parts of the world. This is the reason why WHO launched the health system performance monitoring using system-wide approaches (Adam and de Savigny, 2012), proposing a new way of thinking and of working so that complexity of the challenges of the health system can be accommodated. A clear understanding of the system is relevant to solving the problem, which comprises of the building blocks that are made up of service delivery, health workforce, information, medical products, vaccines and technologies, financing and leadership with good governance (Bodenheimer et al., 2014). The operation of an active integrated specimen referral network cut across some of these blocks like service delivery, leadership, and proper management.

There is no standardized way for referral of clinical samples hitherto, and this had been identified as the cause of under-utilization of the capacity of high-tech laboratory equipment in the country. There are many models of sample referral systems in the country operated by stakeholders. The multiplicity has led to inefficiencies such as high cost, the long turnaround time for results, and the uneven proportion of workload on the existing laboratory capacity. In some instances, remote areas or hard to reach regions remain not covered in the scaling up efforts to test more clients. Incomplete data availability hampered previous attempts to map antiretroviral treatment (ART) site to polymerase chain reaction (PCR) labs. Similarly, wrong geocodes and non-availability of road network analysis were encountered challenges.

**The role of medical laboratory service in monitoring HIV/AIDS and TB patients**

According to writing in the WHO bulletin, it said, in the absence of diagnostics, medicine is blind and becomes a trial and error permutation (Ridderhof et al., 2007).For diagnosis of clients as HIV positive, it requires laboratory personnel to carry out the HIV screening and confirmation of HIV positive status before placement on the antiretroviral treatment (ART). The patient on ART should be monitored for the progress of the therapy through the CD4 test and viral load assay for the determination of the effectiveness of such treatment. Other monitoring tests are liver function tests parameters and kidney function tests as well as the full blood count parameters. This bolsters the Joint United Nations on AIDS (UNAIDS) strategy of the 90-90-90 where it stipulates that 90% of the population should know their HIV status, as well as 90% of those with a positive status, should be placed on ART. The final 90 is aimed at knowing that 90% of those on ART should have viral load suppression of fewer than 1000 copies per ml of the blood sample. The first and last 90s squarely rest on the shoulder of the laboratory community (UNAIDS, 2014).

It is a well-known fact that in detecting and monitoring HIV/AID and TB patients, robust laboratory services and systems are crucial for delivering timely and quality health services that are vital to reducing patients' attrition in the HIV treatment and prevention cascade. Supply chain management has been identified as one of the critical areas that require system strengthening for the medical laboratory to provide the essential services in detecting and monitoring of HIV/AIDS and TB patients (Alemnji et al., 2014). This is adequately captured by the series of stages from HIV diagnosis, linkage to, and retention in care, the commencement of antiretroviral treatment (ART), adherence, and viral load suppression that translates to a reduced

risk of death and HIV transmission as the pivot of HIV/AIDS programming pillars.

In designing the supply chain management for laboratory services for commodity management and samples management from referring facility to referral laboratory, the integrated specimen referral network becomes a useful tool to achieve the advantages of a functional supply chain management. The attitude and perception of Nigerian medical laboratory personnel are vital factors for the success or otherwise of an integrated specimen referral network as an attribute of logistics and supply chain management of laboratory components.

### The role of logistics management of healthcare commodities

In a study carried out, it is inferred that Health programs cannot succeed unless the supply chain delivers a reliable and continuous supply of health commodities to its customers with the aim of commodity security (Kumurya, 2015). The existence of commodity security can be attested to when every user can obtain and use essential health products whenever it is needed. In a similar vein, laboratory commodity security exists when every specimen can be analyzed with quality laboratory commodities whenever it is needed.

The logistics management of laboratory commodities is a complex one. However, it makes provision for the following outcomes:

- Ensures that laboratories can provide patients with appropriate, high-quality diagnostic services.
- To permit laboratory staff to carry out high-quality, reliable, effective, and efficient diagnostic services.
- To guarantee that healthcare staff (such as physicians) have continuous access to the laboratory services required to manage patient care, and to safeguard epidemiological studies that are necessary for disease outbreak and case contact analysis (Ridderhof et al., 2007).

In this study, authors partnered with major vital stakeholders in the laboratory services and funders to conduct an assessment, derive way forward and establish a robust clinical samples referral network system that the Nigeria government can use to ensure samples referral becomes effective at low cost and achieve a lean operation in samples referral for the country. Questionnaires and interviewing of crucial stakeholders yielded the desired data that were used for this research.

## RESEARCH METHODOLOGY

Phenomenological research connects with other qualitative research methods like ethnography, hermeneutics, and symbolic interaction, but the pure phenomenological analysis looks out for what to analyze instead of an explanation and begins typically without hypotheses or preconceived ideas (Katz, 2015). This is the mind of this study.

The hermeneutic phenomenological approach provided the terrain to explore the lived experiences of the Nigerian medical laboratory personnel towards the operationalization of NISRN. In hermeneutic phenomenology, an approach is recommended to the researcher to interpret the meanings found concerning phenomena (Sloan and Bowe, 2014). Often this approach suggests the analysis of text to discover these meanings that can allow for their interpretation. The primary interest of the exercise is to find out the real meaning to the experience shared by looking out for similar thematic areas. Scrutinize the data to gain further insight that can enable a full interpretation and understanding of the descriptive that phenomenology portends (Sloan and Bowe, 2014).

A theoretical framework was also used as the lens through which more could be achieved in carrying out this research. The theory of planned behaviour (TBP) was the theory of choice for this study. It provided a conceptual framework for systematically identifying the determinants of attitudinal behavior of Nigeria laboratory personnel. The theory of planned behavior as a conceptual framework was used to aid understanding and analysis of public attitudes to investigate the determinants of recycling behavior in Brixworth, UK (Barr et al., 2001). The findings suggested that recycling attitudes are the major contributor to recycling behavior.

Attitudes of laboratory personnel have been implicated in preventing the setting up of an integrated specimen referral network in Nigeria and that these attitudes are influenced firstly, by having

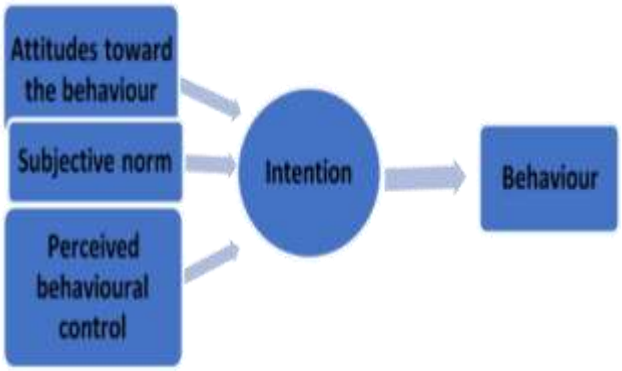


**Figure 1.** Illustration of Theory of Planned Behavior: Courtesy of Ajzen.

the appropriate opportunities, facilities and lack of knowledge to ISRN, and secondly by not being deterred by the issues relating to governance policies. The Theory of Planned Behaviour (TPB) as noted by the theory pioneer, provides such a theoretical framework (Figure 1) for this study (Ajzen, 1991).

The TPB provides a framework for systematically investigating the factors which influence behavioral choices. In 1992, further studies showed that TPB had been successfully applied in an area like the choice of leisure (Ajzen and Driver, 1992).

Similarly, others applied the study in driving violation (Parker et al., 1992), while in 1993, the use of TPB was demonstrated in an investment decision (East, 1993). TPB was also demonstrated in the study of dishonest actions and showed the evolution TPB was from the earlier Theory of Reasoned Action (TRA), which assumes that people behave rationally by considering the implications of their actions (Beck and Ajzen, 1991). The hypotheses are that the immediate determinant of behaviour is the intention of an individual to perform an action or not to perform that behaviour. The other two major factors influence this intention: firstly, an attitude which can be a favourable or unfavourable evaluation of performing the behaviour and secondly, the subjective norm which is the individual perception of social pressure to perform or to be deterred from the behaviour. The theory of planned behaviour has equally been used to explore environmental, behavioural, and intentions in a workplace setting (Greaves, 2013).

The constructs explained between 46% to 61% of the variance in employees' attitudes towards three environmental behaviours. The result provided an opportunity to develop an intervention, implications in the areas of theory, practice, and research for future engagement. The TRA agrees that most behaviours are under volition of the actor who either decides to perform or not to perform. The performance of many behaviours is constrained by the absence of an appropriate enabling environment and resources, which leads to the third factor of perceived behavioural control, as shown in Figure 1 (Liska, 1984).

TRA and TPB provide frameworks to guide research that can empirically identify factors on which intervention efforts should focus (Glanz et al., 2015). However, the selection of specific beliefs to change through interventions must be made carefully. This theory has provided the framework needed to identify the inhibitions and barriers to the operation of integrated specimen referral networks due to the attitudes of laboratory personnel and has enabled policymakers to introduce inclusive policies to ensure the smooth operation of ISRN for the benefit of the patients. This is succinctly captured that the TPB is still very much alive and has defied retirement wish, and it is not a theory of behaviour change. Instead, it is a theory to explain and predict people's intentions and behaviour (Ajzen, 2015). In designing effective interventions for behaviour change, TPB is a useful framework that comes in handy.

For this study, this theory helped to better portray NISRN as a program that is at the mercy of the attitude of laboratory personnel and other stakeholders towards its successful implementation in Nigeria, and that has not been adequately addressed due to lack of awareness of NISRN as well as poor services. The Nigerian government is still in the process of recognizing the integrated specimen referral network as a national program. Again, this theory helped to explain the underlying factors that have contributed to the attitudes and perceptions held by the Nigerian laboratory personnel toward the implementation of NISRN in Nigeria.

In a nutshell, the above brings hypotheses into view as summarized below:

- Attitude and perceptions of Medical Laboratory personnel can affect the operationalization of an integrated specimen referral

network in Nigeria as the Null hypothesis.

- Attitude and perceptions of Medical Laboratory personnel cannot jeopardize the operationalization of an integrated specimen referral network in Nigeria as the Alternative hypothesis.

The authors used the hermeneutic phenomenological approach to explore the lived experiences of the Nigerian medical laboratory personnel towards the operationalization of NISRN. The hermeneutic phenomenology approach is recommended to the researcher to interpret the meanings found concerning phenomena. Often this approach suggests the analysis of text to find these meanings and allow interpretation from the extracted themes.

**Research questions**

Two overarching questions were used in this hermeneutic phenomenological study to explore and understand the lived experience, attitudes, and perceptions of Nigerian medical laboratory personnel towards NISRN operation. These questions were:

- What are the attitudes of the Nigerian medical laboratory personnel towards the operation of the integrated specimen referral network within the hospital for HIV, TB, and Malaria clinical specimens?
- What are the experiences of Nigerian medical laboratory personnel in the operationalization of an integrated referral specimen for clinical laboratory specimen?

**Participant selection logic**

For this study, the researchers used purposeful sampling, precisely, maximum variation (heterogeneity) sampling. In heterogeneity (maximum variation sampling), Patton (2002) said it is a strategy for purposeful sampling to extricate the central themes that cut across many variations. This brought to fore the authors' ability to showcase individuals from various settings, their narratives, and their shared experiences with unique themes.

The participants of this study were drawn from healthcare facilities supported by eight Implementing Partners (IPs) in Nigeria that are currently receiving funds from the United States Agency for International Development (USAID), US-Centre for Disease Control and Prevention (US-CDC), and US-Department of Defense (DOD) HIV-AIDS program in Nigeria. The IPs were AIDS Prevention in Nigeria (APIN), Family Health International (FHI360), Management for Health Sciences (MSH), Centre for Integrated HIV Program (CIHP), Centre for Clinical Care and Clinical Research Nigeria (CCCRN), Friends in Global Health in Nigeria (FGHiN), Department of Defence-Nigeria Ministry of Defense (NMDOD), that support referral of specimen to various laboratory located in 27 PCR facilities in Nigeria.

**Data collection and analysis**

This study was conducted using the qualitative method to explore the attitudes and perceptions of Nigeria Medical Laboratory Personnel towards the operationalization of an integrated specimen referral network in Nigeria. Hermeneutics phenomenology was the approached used to collect data, interpret, and provide an explanation for their perceptions.

**Data collection**

Based upon the completion of research ethics courses set by the Nigeria National Ethics Research Committee and application to commence data collection, collection began in March 2018. An internet search for the different facilities and countries that have any form of specimen referral network in place for laboratory specimens began earlier than March. With the available information obtained via the Internet and other modes, payment was made for subscription to use Survey Monkey™ to host the questionnaires. After that, the survey link was sent to targeted participants that were identified through stakeholders' engagement meetings conducted in Abuja, Lagos, Port Harcourt, Calabar, Uyo, Enugu, Awka, Benin, Lafia, Makurdi, Gombe, Sokoto, and Jos. With the information gathered, the authors logged unto the Survey Monkey™ platform, entered all the email addresses to send out a link inviting them to take the online survey. Some of the email addresses reported failed deliveries and calls were put through to some people to get the right email addresses and resend. 39 out of 49 (79.6%) responded to the online invitation.

Furthermore, ten participants were engaged to have a one-on-one interview for this study. The

authors transcribed the open-ended conversations into Nvivo software for coding to come up with themes.

Data collection was within four months, with two formal interviews with the participants. The interview sessions lasted between 15-30 minutes in some cases, per the disposition of the respondents and their willingness. Telephone calls with the participants were made for further clarification. This was necessary to clarify some of the responses earlier provided. There was also member checking, which helped to ensure the reliability of the information they provided so that their views were adequately presented in the study.

Memos and journal were used during the interview in addition to the interview protocol. Both the memo and protocol provided the platform to record relevant information, duration of the conversation, places, dates, and times with a statement of gratitude. Additionally, the authors explained to the participants to sign the consent form as an agreement that permitted to interview them and obtain relevant information about their experiences in the operation of the specimen referral network. A semi-structured interview approach was used for this study — a total of 23 interview questions (Appendix A) to elicit information from the participants.

The data received via the Survey Monkey were downloaded and stored in the cloud Google Drive and pass-worded to avoid unauthorized access to the data and kept safe even if the computer that was used has an issue, even stolen or damaged by any reason. The transcribed interview records were also protected in the same manner. The authors kept memos of activities in a journal format to ensure information related to this study is always handy.

**Data analysis**

The data analysis was conducted in a stepwise order. The paid platform for the Survey Monkey has the features to aggregate all the collected data and summarize it for analysis. The outcome was exported in both Excel and CSV format from the portal for analysis. The interview sessions were also transcribed into a written format, and efforts were made to replicate the response in verbatim. This is in line with a recommendation that it is necessary to read and reread transcripts several times to become familiar with the content (Smith and Osborn, 2007). Subsequently, horizontalization of the texts of the interview followed, which is the process of listing the relevant quotes of the studied topic to arrive at what the participants are saying (Padilla-Díaz, 2015). This was done with the aid of Nnivo® 12 pro version software procured from QSR International. The software helped to identify the significant speeches about the experiences and narratives of the medical laboratory personnel working on specimen referral network. The statements were organized to help with analysis. This process of horizontalization was essential in understanding the detail of information provided by the participants. Words and phrases were assigned to ideas, concepts, and units of meaning that were embedded in the interview texts. This was necessary so that underlying experiences and perceptions of the participants could be identified to align with the idea of qualitative codes (Saldaña, 2015), as the essential elements of research story when clustered together according to similarity and regularity.

The coding patterns were plugged into two columns to identify patterns that appeared repetitive and similar to the right column, while the left column contains the texts of the interview, as suggested by other researchers (Liamputtong and Ezzy, 2005). Codes that are not similar were arranged separately. This eventually gives rise to themes that were developed to support the strong view and perceptions of the respondents. The hallmark of the coding produced the following identified themes.

Finally, appropriate quotes derived from the interview texts were placed to go along with the themes that were discovered. The identified themes were as follows:

1. Availability of monetary payment to participants
2. Allowances
3. Incentives to staff involve
4. Motivation
5. More specimen collection and analysis
6. Involvement in other personal activities.

The six themes were identified, providing answers to the two research questions that formed a fundamental part of this qualitative study.

**Table 1.** Respondent.

| S/N | Theme | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Availability of money | | Y | Y | Y | Y | Y | Y | Y | | |
| **2** | Allowance | | Y | Y | | | Y | | | | |
| **3** | Incentive to staff | | | | Y | | | Y | Y | | Y |
| **4** | Motivation | | | Y | Y | Y | | Y | Y | | |
| **5** | More specimen collection | Y | | | | | | Y | | | |
| **6** | Involvement in other activities | | Y | | Y | Y | | | Y | | |
| | Keys: Y: Response provided and quoted | | | | | | | | | | |

Furthermore, quotations from the interview transcripts are provided to buttress the themes that were identified. To maintain confidentiality, participants in this study were classified as 'R' (respondent) and assigned the numbers one to ten. The summary of the responses directly from respondents and quoted verbatim in the discussion section are provided in Table 1.

## DISCUSSION

### Theme One: Availability of monetary payment to participants

Most of the respondents believed that the availability of payment of money to participants for moving or transporting the samples from the collection sites to the PCR laboratories and collection of results back to the specimen collection site is one of the reasons why they prefer that specimen transportation be left in their hands. It is a known fact that because the implementing partners supporting the viral load, EID and TB specimens make money available to support operational cost, laboratory personnel have the perception that there is money available for them to benefit from by rendering the services of specimen transfer and returning of results. R2, R3, R4, R5, R6, R7 and R8 all have one thing in common in their response for the reason why they believe the laboratory personnel undertakes the transportation of specimens instead of being fully engaged with the task they are employed to carry out. Below are some of their words recorded in verbatim. R2 specifically said the reason was that *"they get extra money."* The second person, R3, mentioned that the reason for wanting specimen transportation to be done by the staff of the laboratory was *"as a result of the transportation allowance."* With the payment of transportation allowance which is always higher than the actual cost of vehicular movement, the extra money goes into their pockets. The next respondent, R4, said, *"financial sponsorship,"* provides the reason for involvement in specimen transportation, instead of concentrating on the duty of specimen analysis in the laboratory.

Similarly, R5 specifically indicated *"prompt remuneration"* as the purpose of his involvement in the specimen transportation. R6 spoke of *"extra money they make in the process of transportation"* as the morale booster to get involve in specimen transportation. Finally, in the words of R8, *"extra cash that goes in the process of transportation"* is the reason for carrying out specimen transportation in addition to the primary duty of specimen analysis in the laboratory.

There are various forms of theories on motivation, but the most popular one is that of Maslow on need hierarchy which is based on human needs from the lower to the higher-order and the specific form that these needs will take vary from one person to another (Sanjeev and Surya, 2016). One way that the personnel involved in the specimen found a way of

motivation to continue working in the unit despite the extended hours of work is the money received while transporting specimens from the collection sites to the testing laboratories.

Respondent 'R3' specifically said the reason being involved in the transportation of specimens is because of the *"financial motivation."* Respondent 'R4' said in his word *"Zeal for the work and most times the transportation stipend."* Similarly, 'R5' said, *"the extra pay was a motivation for wanting the specimen transportation"* by facility personnel to continue. Another respondent (R7) indicated that "the remuneration of a certain stipend paid" serves as a motivation for involvement. The response provided by 'R8' was also like the one provided by 'R7' when "the stipends paid for transportation, I think is good…)" was the answer to the question of motivational factor.

**Theme Two: Allowances**

Another constant word that kept coming up while interviewing the respondents was allowances. The online definition of allowance by Collins Dictionary (Collins, n.d.) stated that *"an allowance is money that is given to someone, usually regularly, to help them pay for the things that they need."* The civil servants in Nigeria are used to various form of allowances paid to them to supplement the basic salary which cannot cope with the inflation and cost of living in many cities of the country. Allowances available in the health sector are call duty, shift, annual leave, hazard, and miscellaneous in addition to the basic salary. However, all of these puts together do not match up to their expenditures; hence, whatever can be received as another allowance is happily welcomed and protected especially if it is not unlawful. Respondent (R2) stated that it was *"as a result of the transportation allowance"* that staff is eager to be involved in the transportation specimen from their collection sites to the testing sites. In the same vein, R3 informed that "allowance should be issued to the staff involved" which ensures continuous participation in the movement of the specimen in addition to their primary task of specimen analysis. R6 described "giving them transport allowance" is the main reason and finally, R6 explained that "probably extra allowance from the specimen movement" is the purpose of involvement.

**Theme Three: Incentive to staff that are involved**

The staff that works in the HIV programs at service delivery points in many instances put in more effort and level of effort more than those that work in other sections of the hospital. They are more exposed to hazards and risk of infection than other sections. It is in the light of this that staff of PCR laboratories look forward to any form of incentive to continue rendering services.

Specimen transportation is linked to an exchange of money which the staff considers as an incentive for the services rendered and to remain in that duty post. As for R7, *"the incentives they get"* provide the necessary drives that make them take part in specimen transportation from their collection centre to the testing PCR laboratories. As if he was echoing the answer gotten from R7, one of those interviewed R8 emphatically said "incentive that moving specimen provides" is the reason for continuing to work in the unit without seeking for redeployment to another department. In the words of R10, *the "monetary incentive"* provided by transporting the specimen is the main purpose of agreeing to transport specimen from their facility to the PCR laboratory. R4 mentioned that it *is "the incentive involves"* that keeps him in the activity of moving samples and going back to collect the result after the specimen has been analyzed.

**Theme Four: Motivation**

There are various forms of theories on motivation, but the most popular one is that of Maslow on need hierarchy which is based on human needs from the lower to the higher-order and the specific form that these needs will take vary from one person to another (Sanjeev and Surya, 2016). One way that the personnel involved in the specimen found a way of motivation to continue working in the unit despite the extended hours of work is the money received while transporting specimens from the collection sites to the testing laboratories.

Respondent 'R3' specifically said the reason being involved in the transportation of specimens is because of the *"financial motivation."* Respondent 'R4' said in his word *"Zeal for the work and most times the transportation stipend."* Similarly, 'R5' said, *"the extra pay was a motivation for wanting the*

*specimen transportation"* by facility personnel to continue. Another respondent (R7) indicated that "the remuneration of a certain stipend paid" serves as a motivation for involvement. The response provided by 'R8' was also like the one provided by 'R7' when "the stipends paid for transportation, I think is good…)" was the answer to the question of motivational factor.

**Theme Five: More specimen collection and analysis**

Specimen collection is the hallmark of the PCR laboratory operations. Nigeria had keyed into the UNAID strategy of 90-90-90 where 90% of the population should know their HIV status, 90% of people that tested positive should be placed on antiretroviral therapy, and 90% of those on ARV should have viral load separation. This is inclusive of HIV exposed babies (infants) should be tested for the evidence of viral infection or not as a way of monitoring the intervention of the Prevention of Mother to Child Transmission (PMTCT) program. The scenario above leads to efforts in making sure more eligible clients are tested for viral load. There are over 7,000 facilities in the country where such clients are accessing services but only 27 facilities in the country where viral load testing can be carried out. This is the reason why specimen referral activities receive lots of funding supports from donor agencies, especially PEPFAR and Global Fund. During the interaction with the respondents, the following statements came up about specimen collection and the results return to facilities. 'R1' said, *"it was to facilitate a more coordinated and transparent process of samples transportation and referrals."* 'R2' equally said it was because *"it enhances rapid response to sample pick up and results drop off."* Also, yet, 'R4' said*, "No, because, when samples are not handled properly, it brings about inconclusive results or false results*." Another respondent, 'R7' said that the reason for participation is that *"Lab staff is trained to collect and transport specimen, thus will ensure sample integrity always."* The words demonstrate the notion and perception reeled out by these respondents with the perception that it was the duty of the PCR laboratory to move specimens so that more specimens could be collected and analyzed.

**Theme Six: Involvement in other personal activities**

The staff that is involved in the movement of the specimen from the collection sites to the testing laboratories do have the luxury of leaving their primary duty in the laboratory to go collect the specimen, package them and move them to the destinations. During the time of this activity, other primary assignments are suspended for them to travel the distance needed for the specimen movements. When the exercise is being undertaken, the staff engage in other business apart from the specimen transportation to the testing laboratories. This can be deduced from the interviewees' answers to questions of "*Do staff use the opportunity offered by sample transportation to get involved in other personal activities?"* The first response from 'R2' was to *"visit friends and relatives and use the period to run other private businesses."* That was not the only reason, as 'R4' said: "*some use the opportunity to do banking transactions."* In another response from 'R5', it was noted that *"Yes, of course, they used that as an excuse to leave the Laboratory and they use it as an opportunity to close early."* To buttress the response from 'R2', another respondent 'R8' said: *"visit friends and/or family and to reach out to other privacy-related matters, carry out personal business when traveled while some staff capitalizes on it to visit other places."*

In sum, it was apparent that all the participants have had one motive or the other to be involved in the specimen referral activities. Based on these narratives, there are other personal interests involve in participating in the specimen movement from the collection sites to the testing laboratories.

**Other responses different from the above**

On the question of doing other errands apart from sample transportation and result collection, 'R1' said, "they only come to pick result when there are other things to do around PCR Lab thus increasing the turnaround time (TAT)." Meaning, it is when there is another activity to be carried out that the respondent comes to pick results or drop samples. It was also mentioned that "No because when samples are not handled properly, it brings about inconclusive results, or false results" and that was the reason why the staff

is involved in the sample transportation. 'R' has an opinion that they "know the kind of specimen being carried and how urgent the result is needed; they will facilitate the movements and also the process leading to effectiveness as fewer rejection rates were recorded."

**Highlights from the themes**

It is a general knowledge that PEPFAR supports the Nigeria government in the fight against HIV/AIDS pandemic with supplements from the Global Fund as well. PEPFAR 2018 report on "Partnering to Achieve HIV/AIDS Epidemic Control" showed a total PEPFAR Investment (FY 2004-2017) of $5,008,644,000 that ensured 81% of people on ART achieving viral suppression (Flanagan et al., 2018). To accomplish the report of the 81% viral suppression, the specimen of people on ART had to be analyzed for viral load. These specimens are transported from various collection facilities to the testing laboratories. PEPFAR has six implementing partners (APIN, IHVN, FHI360, CIHP, DOD-WRPN, CCFN) Global Fund has 1 (AHNI-GF project) through which supports are provided to the specimen collection sites and the PCR laboratories. Each of the implementing partners (IPs) has a memorandum of understanding (MoU) with the appropriate hospital management authority, and the staff is engaged in the transportation of specimens while being remunerated for this service. The various uncoordinated approach has been in place before the advent of the National Integrated Specimen Referral Network such as having the facility staff collect and transport the specimen, using courier services (UPS, DHL, FedEx). These methods have not been transparent and accountable. The staff has this knowledge that there is available money for them to use in the transportation of samples. This brought up the perception that it is their right to use the funds available to transport samples PEPFAR devoted some of the funds mentioned above to the activities of specimen referral. In loss aversion, it shows that people are more emotionally affected by losses than by gains, hence giving rise to loss aversion (Yechiam and Hochman, 2013). Taking away the responsibility of transportation of specimens is seen by most of the respondents as amounting to a loss of income, which brings to fore the loss aversion syndrome. Managing this perception when developing for operationalization integrated specimen referral network where professionally third-party logistics vendor will be contracted to leave out the staff to face the job sample analysis must be well-thought-out to avoid sabotaging the process.

All participants speak of allowances received from sample transportation as what they deserve to have. Allowances and benefits of healthcare workers in Nigeria like other African countries play a vital role in staff attrition or retention. Studies that examined the public-sector health workers in some African countries said that "the adequacy of incomes for health workers; the management of public-sector pay; and the fiscal and macroeconomic factors that impinge on pay policy for the public sector affect staff migration and retention." Worthy of note is the fact that health workers also commonly use other sources of income to supplement their regular pay (McCoy et al., 2008).

Nigeria being an offshoot of British colonial rule, are used to the positive effect of using incentive in the public service. The use of specific incentives to improve the efficiency of the public sector is an essential component of the UK Government's public service modernization agenda according to studies (Burgess and Ratto, 2003). In this instance, clear incentives are offered in the form of performance-related pay, which is commonly deployed. The civil service in Nigeria practices this scenario to some extent when remuneration above the stipulated contracts are offered to ensure the staff put extra hours after the official 8hours work duration. The medical laboratory personnel working in the facilities where specimens are collected for a referral or where the specimen are analyzed and deemed to be putting more hours than workers in other departments.

As noted by the respondents earlier in the words of R7 "the incentives they get" provide the necessary drives that make them take part in specimen transportation from their collection centre to the testing PCR laboratories and echoed by 'R8' "monetary incentive is the reason for moving specimen."

Explicit incentive contracts in the form of performance-related pay have always been more common in the private sector than in the public sector. The public health sector provides some types of incentives to their staff, mostly, at the end of the

year, especially during the yuletide period where bags of rice, vegetable oils are procured in bulk and share to staff as a kind of incentive.

Ensuring the optimal viral load and early infant diagnostic (EID) across health facilities in the country is a crucial strategy the government of Nigeria (GON) has embarked upon to provide high-quality diagnostic and treatment services throughout the health system for the benefit of its clients (HIV positive individual, infants and mothers). This also aimed at achieving the UNAIDS 90-90-90 initiative adopted by the PEPFAR-Nigeria Country Operational Plan (COP), Federal Ministry of Health (FMOH) and the Global Fund (GF) for the reduction of the scourge of HIV/AIDS through early diagnosis and viral load testing. A critical part of achieving this goal is ensuring the optimal operating capacity utilization of various diagnostics PCR equipment for viral load and EID diagnosis, ensure standardized and cost-efficient samples transportation and results' delivery model, reduce turnaround time (TAT) for results delivery, reduce patients' loss to follow up and ensure the availability of dried blood sample (DBS) kits and reagent. In the absence of a streamlined transportation system, each Implementing Partner devices a mean of achieving the movement of specimen from point to point to achieve the above target. This is mostly the reason for the involvement of staff personnel to transport samples.

One different theme that came out of the responses provided by the participants is the fact that the staff that transports the specimen from the collection sites to the testing laboratories do equally utilize the opportunity to carry out other personal activities at those locations. Responses directly received from the respondents are as follows: "visit friends and relatives and use the period to run other private businesses." It is common knowledge that staff working in some of the collection facilities need to visit the towns or cities where the specimens are to be analyzed mostly visit family and friends which is a private matter. The opportunities provided by the movement of the specimen are always utilized in running this private or personal activity.

## CONCLUSION AND RECOMMENDATION

Telephonic communication provided the medium used in engaging the participants during the interview sessions. The data that were gathered were analyzed to come up with the findings. These findings were discussed under six themes. Several interpretations of the results were discussed. We discussed the ways the findings of this study confirmed or did not confirm existing knowledge prevailing in the peer-reviewed literature and the concluding hypothesis.

### Availability of monetary payment to participants

The knowledge of available money that can be used by staff is an enabler of wrong attitudes and perceptions of an integrated specimen referral network system in Nigeria. Stopping the staff from transporting samples can be equated to a loss of money which psychologically will be resisted as people ordinarily abhor losing sources of income. Spreading this false narrative must be discouraged.

### Allowances

The monthly wage and income of health workers vary widely, whether between countries, by comparison with the cost of living, or between the public and the private sectors.

It is this terrain that the medical laboratory personnel involved in specimen referral operates. They see the money received when transporting the specimen as an allowance and income that supplements their traditional salary payments. This perception of compensation to be paid to them makes the staff involved in the transportation of specimen protective of this duty to ensure the allowance continues to come from transporting specimen. To stop them from carrying specimen and collecting this 'allowance' does not just require giving a fiat order for another group of people to take over. It will, therefore, require engagement and dialogue to sell the idea of why they must stop specimen transportation. This is bound to face stiff opposition, as doing so, will seem to be refusing them to continue enjoying this so-called 'allowance.'

### An incentive to staff that are involved

The payment allowances received during specimens' transportation are equated to incentive given to them to ensure they continue to work beyond the stipulated working hours. The laboratory personnel involved in

sample transportation has this perception of receiving money as an incentive for the kind of work they do. Therefore, for NiSRN to take over this system from them, it will require an extensive effort to convince them to support the National program on specimen transportation. Payment to staff for specimen transportation must be discouraged and provide them with other forms of incentive

**Motivation**

All the participants agreed that the payment receives for transportation of specimen is a motivation for them. There are two types of motivation: intrinsic motivation is the motivation to do something for its own sake, for the sheer enjoyment of a task. Extrinsic motivation is the motivation to do something to attain some external goal or meet some externally imposed constraint (Hennessey et al., 2015). Similarly, most employees need the motivation to feel good about their jobs and perform optimally (Ganta, 2014). Some employees are money motivated, while others find recognition and rewards personally motivating. This depicts that motivation levels within the workplace have a direct impact on employee productivity. It is therefore advisable not to use the payment for specimen transportation by staff as a motivational factor.

**Collection and analysis of more specimen**

The medical personnel involved believe and have the perception that they have the wherewithal to carry out this service more effectively, not minding the cost implication and maintaining the required best-practice standard set forth by the international body responsible for transportation of biohazard specimen. It becomes a matter of competition between the facility personnel and any other 'outsider' that comes to pick specimens from their facilities. It is therefore very pertinent to get the message straight to the facility staff that Third-Party Logistics are not in competition but to complement their efforts in achieving the 90-90-90 (Sidibé, Loures, & Samb, 2016).

**Involvement in other personal activities**

Instead of using their off-duty time for the visit; or use their money to do the travel for the visit, they capitalize on the specimen movement to engage in such visits to friends. That was not the only reason, as 'R4' said: "some use the opportunity to do banking runs." Some of the locations of the specimen collection do not have banking facilities like the cities where specimen analysis does take place. Specimen transportation, therefore, allows such people to engage in this private business of banking transactions. Since this occurred, the null hypothesis is accepted: that attitudes and perceptions of medical laboratory personnel can affect the operationalization of integrated clinical specimen referral network in Nigeria. Staff should separate private visits from official conduct.

**RECOMMENDATIONS**

There is a convincing need for the implementing partners, the funding agencies and the government of Nigeria's Ministry of Health to work collaboratively to provide resounding reasons why the medical laboratory personnel involved in the transportation of specimens in Nigeria to change their attitude and perceptions identified in the six themes above. It is necessary to carry along this set of stakeholders when planning for the harmonization and integration of specimen transportation into a sustainable system. The benefits of allowing the appointed vendors that have the requisite experience and technical knowledge to transport specimen in an integrated manner, carrying for various disease areas like TB, HIV, Malaria instead just one disease area is more cost-effective than the current uncoordinated referral system being practiced. The laboratory personnel must be educated to look beyond the surface gain of transportation allowance. They should avoid the opportunity to travel to meet friends and relations and monetary gain to see the bigger picture of making themselves available at the facilities to carry out the job description for which they have employed the risk of traveling on the road without insurance coverage in the event of any road mishap. By allowing and supporting the third-party logistics vendor to move specimens, they will be available to analyze more samples to meet the target of testing more specimens.

Ultimately, the cost of transporting specimen will

be lowered since it could then be done in an integrated manner. This will help in providing cost analysis for subsequent budgeting by the government. By establishing a government-backed referral system, in the event of an outbreak of diseases like Ebola, Monkey-pox, Lassa fever, and the likes, a referral system for specimen transportation would be available to provide a response in specimen movement to the testing laboratories even outside Nigeria. The issues raised by the respondents as the impetus for being involved in specimen transportation needs to be addressed by the employers. The staff must be adequately compensated for the number of hours they put as well as the extended hours that they work. All allowances, including call duties, hazard allowance, shift allowances, personal protective equipment allowances must be paid to enable the staff to be highly motivated to concentrate on their core mandate of specimen collection and analysis and avoid being involved in specimen transportation. The government must take the lead with funding agency supporting to develop standard operating procedures and guidelines for the operationalization of the specimen referral network in the country. The document must be given legal backing by passing through the bill of parliament to become a National Bill on Specimen Referral Network in the country. There is a positive social change expected from this study because the finding can assist policymakers in devising means of strengthening specimen referral network in Nigeria. This will avert the resistance that those working in the laboratories that are engaged in specimen transportation will put forward when specialized third-party vendors come to their facility to pick specimens and return results. Robust sensitization must be provided to those that were hitherto engaged in specimen transportation to stop seeing specimen transportation as a way of motivation, incentive, allowances and money-making ventures so that they can have positive dispositions toward integrated specimen referral network that would be established for the benefit of the entire country.

Additionally, the government must take ownership of the program and allow funding agencies and implementing partners to support the initiative rather than the other way around as it currently stands. The government must provide a policy document to back the initiative and entrench the system to have the buy-in of all the necessary stakeholders.

It is believed that an increase in the awareness about integrated specimen referral network with the federal and state governments in Nigeria as the propeller and propagator of this initiative can reduce the negative attitude of medical laboratory personnel that involved in the transportation of specimen from the collection site to testing laboratories. To achieve this goal, all stakeholders must be carried along and sensitized for their buy-in to prevent the frustration of this noble and novel idea in Nigeria.

Finally, it is recommended that future scholars in this area should use various approaches including qualitative, quantitative or mixed methods to explore the attitudes and lived experiences of Funding agencies (PEPFAR, Global Fund, Implementing Partners like FHI360, IHVN, APIN) who had funded the uncoordinated specimen referral through medical laboratory personnel to receive and analyze their perspectives and cost implications. That can provide more insights to the specimen referral network operated in Nigeria thus far beyond the contemplation of the integrated system for all specimen types.

Supply chain management of laboratory commodities in the healthcare set-up cannot be overemphasized because, without products, it is impossible to provide the services that the patients need and for the clinician to diagnose and monitor the treatment. Similarly, the logistics management of the clinical specimen has become a commodity of concern for the laboratorians. To this end, the logistics management of both reagents/consumables and the clinical samples have now taken a front row when discussing the management of healthcare commodities. In designing the supply chain management for laboratory services for commodity management and samples management from referring facility to referral laboratory, the integrated specimen referral network becomes a useful tool to achieve the advantages of a functional supply chain management. The attitude and perception of Nigerian medical laboratory personnel are vital factors for the success or otherwise of an integrated specimen referral network as an attribute of logistics and supply chain management of laboratory components.

The Nigerian government and the various

stakeholders should work collaboratively to provide quality logistics management of specimens which is the primary reason why the laboratory exists in the first place; without specimens for analysis, the existence of medical laboratory is inconsequential.

## Limitations of the study

One of the limitations that this study encountered was the inability to have a personal interview with the 39 people that responded via Survey-Monkey™ platform. It would have provided a more robust data for analysis along with their online responses. This could have a problem of generalization, however, to overcome that limitation, the 10 participants that agreed to be interviewed were conducted, and an open-ended-questions were used to elicit a thick, saturated data about their lived experiences. The Krejcie-Morgan theory of minimum sample size was fulfilled since 39 responded out of the envisaged 40 from the 27 PCR laboratories. The data were thoroughly analyzed, and six themes were identified as part of the findings of this study. It is the authors' opinion that the findings of this study can be generalized as reasons for attitudes of medical laboratory personnel involved in the transportation of clinical specimens from the collection site to the testing facilities in Nigeria.

Lastly, the limitation on bias was considered, and precaution was taken according to the advice and recommendation of other authors (Patton, 2002) that biases can be reduced when discussed mental cleansing is taken. Additionally, the bracketing technique was adopted and recorded any predispositions, biases, and preconceptions in a memo (Tufford and Newman, 2012). The memo that was taken during the interview helped to set aside any personal biases and focus on data gathered from the participants.

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## Conflicts of Interest

The authors declare no conflict of interest**.**

## Author Contributions

Dr. T. Faruna authored the entire manuscript that was submitted for review. Prof. D. Folinas supervised and provided comments, generating further insight, and paraphrased some sections.

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## Disclaimer

The findings and conclusions in this study are those of the authors and do not necessarily represent the official position of the USAID, the Implementing Partners or GHSC-PSM.

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## APPENDIX

Questionnaire on "Attitudes of Nigeria Medical Laboratory Personnel Towards Integrated Clinical Samples Referral Network."

1. Do you work in a medical laboratory or facility/organization related specimen referral network? Yes No
2. Do you take part or facilitate the transportation of specimens to the referral laboratory or hub centre? Yes No
3. Do you receive any form of monetary payment for taking part in the specimens referral? Yes No
4. Who provides the vehicle or motorcycle used for transportation? Commercial transportationPersonal transportation means
5. Apart from transportation costs, is there any other allowance paid to the people staff involved in the specimen referral? Yes No
6. Do the staff involve in specimen transportation work in the laboratory also? Yes No
7. What is the average number of hours the staff use to drop-off the specimen and picking up the result? 1hour 2hours 3hours 4hours >4hours
8. Are the staff insured for the travels for specimen drop-off and result pick-up? Yes No
9. How many staff work in your facility and how many participate in specimen movement?
10. Do you consider the money paid to staff for specimen movement as an incentive to work harder or be more committed to their duties?
11. Will you be demoralized or demotivated if no money is paid to you again? Yes No
12. Will more specimens be processed/collected if staff stop specimen transportation? Yes No
13. If the specimen transportation is no longer done by the staff of the facility, will they be happier to work more? Yes No
14. Do you think it is better to leave staff to continue to transport specimen? Yes No
15. If yes, why….
16. If no, why…….
17. Do staff participating in specimen movement look towards undertaking the exercise on the expected/agreed days? Yes No
18. What is the motivating factor for agreeing to transport specimen?
19. Do you think the attitude of medical laboratory personnel can affect the success of specimen referral network?
20. If the staff are stopped from transporting specimen, can this be any issue of concern to the authority?

The services rendered by the medical laboratory play a crucial role in quality health service delivery and, as part of the health system. It is expected that the medical laboratory responds in a balanced way to a population's needs. That bulletin enumerated the critical services of the medical laboratory as identified below. Confirmation of disease/identification and drug susceptibility testing; identification and management of adverse effects (such as, the monitoring of pharmaceutical toxicity); screening of 'at-risk' patients; disease surveillance; confirmation of medical intervention efficacy; quality assurance (such as, quality control specimens, proficiency testing); education and training of physicians, laboratory professionals and healthcare workers.