



Tuberculosis in Nigeria

Rapid Assessment of Infectious Disease Surveillance and Reporting

September 2018



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ABSTRACT

Background: Effective infection control requires a functioning surveillance system. The Integrated Disease Surveillance and Response (IDSR) strategy was developed and adopted in 1998 for Africa as a comprehensive public health approach. Subsequently, Nigeria adopted the IDSR Technical Guidelines (2013), which defined operations and procedures for reporting priority diseases, including tuberculosis (TB).

Objective: The objective of the assessment was to investigate and report on the challenges of TB notification through the IDSR strategy.

Methods: This mixed-methods rapid assessment included a desk review, review of facility-level data, and qualitative interviews collected primarily through key informant interviews with purposively sampled managers and health workers at all levels of IDSR and TB program implementation.

Results: The assessment revealed that TB cases are being notified through the IDSR, but also through the national system, using different definitions and procedures and without integration of the data reported by each system. A major observation was that health facilities, especially private facilities, failed to comply with mandatory reporting of priority diseases. Additional challenges hampering effective implementation included inadequately trained human resources and poor infrastructure.

Conclusion: Improving the effectiveness of IDSR and TB reporting, and ensuring availability of strong data for decision making, requires improved education on IDSR, engagement of the private sector in surveillance, and strengthened systems for logistics and diagnosis.

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We express our profound gratitude for the efforts made by these groups. The success of the health information system, including disease surveillance, in Nigeria, especially in our core area of monitoring and evaluation, depends on everyone's collaboration, goodwill, and hard work to overcome the myriad challenges that must be confronted.

The continuance of positive attitudes will help the Federal Ministry of Health, through NCDC, to strengthen reporting of potential public health events of national and international concern by relying on early warning systems founded in national surveillance capacities. Nigeria is implementing integrated disease surveillance and response (IDSR) guidelines to improve the ability to detect, confirm, and respond to high-priority communicable and noncommunicable diseases, including tuberculosis. Regular notification of cases, with appropriate definition in the IDSR Technical Guidelines, could reduce or eliminate the impact of these infections.

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Cover: Girls in a rural setting in Nigeria. Photo: Stars Foundation, courtesy of Flickr Creative Commons.

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ABBREVIATIONS

| | |
|----------|---|
| AFB | acid-fast bacilli |
| AGMPN | Association of General Medical Practitioners of Nigeria |
| DHPRS | Department of Health Planning, Research and Statistics |
| DOT | directly observed treatment |
| DSNO | disease surveillance and notification officer |
| DST | drug-susceptibility testing |
| FCT | Federal Capital Territory |
| FMOH | Federal Ministry of Health |
| HMIS | health management information system |
| IDSR | integrated disease surveillance and response |
| IHR | International Health Regulations |
| INGO | international nongovernmental organization |
| LGA | local government area |
| MDR-TB | multi-drug-resistant tuberculosis |
| M&E | monitoring and evaluation |
| NCDC | Nigeria Centre for Disease Control |
| NTBLCP | National Tuberculosis and Leprosy Control Programme |
| PTB | pulmonary tuberculosis |
| SMOH | State Ministry of Health |
| TB | tuberculosis |
| TWG | technical working group |
| USAID | U.S. Agency for International Development |
| WHO | World Health Organization |
| WHO-AFRO | World Health Organization Regional Office for Africa |
| ZN | Ziehi Nielsen |

EXECUTIVE SUMMARY

Background

A country's ability to report public health events of potential national and international concern relies on early warning systems founded in national surveillance capacities. The integrated disease surveillance and response (IDSR) system, adopted by African member states in 1998, provides a framework for improving and strengthening the surveillance, response, and laboratory core capacities needed to implement the revised (2005) International Health Regulations (IHR).

The Nigerian Federal Ministry of Health (FMOH) adapted the World Health Organization (WHO) IDSR guidelines to implement defined structures and operations for effective IDSR interventions in Nigeria. The IDSR Technical Guidelines remain the core mechanism for implementing the Nigerian surveillance system from the community level to the health facility, local government, state, and national levels. These guidelines also identify 41 priority communicable and noncommunicable diseases and conditions (including tuberculosis [TB]) for integrated disease surveillance and response (WHO, 2010). However, the IDSR has not been used optimally to report cases of TB. Both policymakers and donor agencies, especially the U.S. Agency for International Development (USAID), desire to reduce the burden of TB in Nigeria; this provides an opportunity to strengthen the national IDSR system to improve reporting of TB case findings and notifications for all health facilities (public and private).

This rapid assessment examined how the IDSR system is currently fulfilling its core functions, particularly the current TB notification process within the IDSR by public and private health facilities. The findings will help to formulate recommendations for improving the generation and use of TB data from routine surveillance systems, with a view to enabling earlier diagnosis and treatment of presumptive cases.

Methods

The rapid assessment was conducted at the national level and in six states, one from each geopolitical zone (i.e., Anambra, Bauchi, Kano, Niger, Lagos, and Rivers, as well as the Federal Capital Territory), using qualitative data collection methods that included a desk review and 45 key informant interviews. The desk review consisted of examining TB data in the IDSR, reviewing documentation on IDSR, and TB surveillance, including tools, linkages between the IDSR system and the National Tuberculosis and Leprosy Control Programme (NTBLCP), and relevant assessment reports of the IDSR/surveillance systems. The key informant interviews consisted of in-depth interviews with stakeholders implementing the IDSR and the TB program at the national and state levels.

Key Findings

- Knowledge of the IDSR was limited, particularly in the private sector, and compliance with the standards prescribed in the technical guidance was weak due to non-availability of resources (including data collection tools and funding). However, the participants who had knowledge of IDSR knew the specific uses of the IDSR forms.
- TB data are available in the IDSR, but data quality (i.e., completeness, validity, reliability, and timeliness of reporting) needs to be addressed. The data in the IDSR are not disaggregated by managing authority; thus, it is difficult to know the reporting rates of public versus private facilities.
- The limited availability of TB diagnostic services was not unexpected, since GeneXpert and culture medium MGIT 960 are rarely available. Most private hospitals that provide TB services do not have the capacity for culture medium or rapid-test methods of TB diagnosis except TB X-ray. Some facilities are equipped to carry out basic lab tests, but for the more complex tests for communicable diseases, the samples collected are sent to labs in another town or state.
- The limited attention given to TB was partly due to a parallel TB surveillance program that lies outside the integrated approach envisaged by the founders of IDSR. This has detracted attention from IDSR and led to parallel reporting systems.
- Linkages between the TB data gathered for IDSR and the NTBLCP system were poor. For instance, the disease surveillance and notification officer (DSNO) and TB focal person do not exchange or coordinate the data collected from the parallel systems. It was evident that the data collection process differs for IDSR versus TB surveillance, which has implications for the quality of the data reported.
- Staff implementing the IDSR and TB surveillance often could not carry out their duties because of a paucity of funds. Consequently, they were unable to go into the field to collect data. Sometimes surveillance teams did not meet when they should. Projects were heavily dependent on donor funding, and the state government was not sufficiently supportive.
- Ignorance and misconception were reported as additional factors influencing disease surveillance in communities.
- The majority of private health facilities were reporting poorly to IDSR, with implications for data quality. Lack of resources, such as tools and staff, were among the reasons for not reporting. Because an estimated 60 percent of the Nigerian population prefers to visit private health facilities, this sector's non-use of IDSR for the 41 priority diseases described in the IDSR Technical Guidelines would have a large effect on the completeness of the IDSR data.
- TB case notification in Nigeria is very low. Weakness in recording and reporting by public facilities, and poor compliance with the IDSR framework among private health facility operators, may have contributed to the low number of cases of TB being reported through IDSR.
- Health service providers are not complying with the mandatory notification of TB cases. This is especially noticeable among privately owned health facilities. Facilities seldom received monitoring or supervision due to lack of resources.

Recommendations

1. **Integrate programs and share data to improve data collection:** It is important for the IDSR to generate quality data for evidence-based decisions—hence the need for the Nigeria Centre for Disease Control (NCDC) and NTBLCP to harmonize the differences in case definitions for presumptive TB and confirmed cases, either clinically diagnosed or bacteriologically confirmed. The NCDC and NTBLCP should implement collaborative data quality reviews to identify gaps and areas of intervention to improve the quality of the data from both systems.
2. **Engage the private sector:** Although health policy requires every health facility to participate in IDSR, private facilities are not complying. Involving private health facilities in disease surveillance will help bridge the 76 percent TB case detection gap in the country. Private providers must be trained on the IDSR process, and measures should be put in place to hold them accountable for noncompliance.
3. **Provide funding for disease surveillance:** National and state governments must budget for funds to assist donor-funded disease surveillance programs, so that surveillance staff can complete their assigned activities on time. The FMOH should also plan to make funds available to take over donor-funded projects when they come to an end.
4. NCDC should organize and facilitate a **monthly or quarterly collaborative meeting** to review TB notification data in the IDSR with participants drawn from NCDC, NTBLCP, Department of Health Planning, Research and Statistics (DHPRS); and WHO through the TB Monitoring and Evaluation (M&E) Technical Working Group (TWG). Monthly data meetings should take place at the local government area (LGA), state, and national levels. Laboratories should be included in the IDSR network to increase efficiency.
5. **Upgrade laboratory facilities:** The FMOH should ensure that every state has at least one laboratory that can perform complex tests for communicable diseases—ideally, the GeneXpert test for TB, which can provide accurate data in hours, as compared to the current system where diagnosis can take weeks. Rapid case detection will enhance the timeliness, reliability, and completeness of data reported, which in turn will improve notification. Laboratories should be included in discussions of TB case finding.
6. **Provide vehicles for sample transport:** Because samples often must be taken to labs in other towns or states, and samples require a controlled environment, vehicles should be made available to LGAs to facilitate rapid, safe transport.
7. **Strengthen training:** To improve reporting to IDSR, the FMOH and counterparts at the subnational level (states and LGAs) should provide facilities—especially private facilities—with IDSR reporting tools and mandatory training on IDSR. Training should include identifying a focal surveillance person at each facility.
8. **Upgrade forms and tools:** IDSR forms should be digitalized to enable NCDC receive real-time notification in the event of an outbreak. Digitalizing IDSR would also solve the problem of the unavailability of notification forms.
9. **Strengthen national support and coordinated oversight:** NCDC should be supported by the FMOH to provide oversight to states and LGAs in terms of training, drugs, logistics, etc.

International partners working in Nigeria can also provide a platform to train NCDC staff on how to handle disease outbreaks.

10. **Strengthen state compliance and supportive functions:** The actions of states and LGAs should enhance and complement the efforts of NCDC and other partners within the state. States should also implement the National Council on Health’s 12 key resolutions. In particular, states should (1) establish functional infection prevention committees, emergency operational centers, and isolation centers—each state prioritizing its particular public health challenges and building on appropriate partnership response to it—and (2) conduct campaigns to strengthen community health-seeking behaviors and improve surveillance.
11. **Strengthen zoonotic disease reporting:** NCDC should be supported to strengthen One Health by establishing countrywide laboratory networks with integrated components for zoonotic disease diagnosis and reporting.

Conclusions

This study confirmed that health facilities are reporting TB cases to the IDSR system poorly in Nigeria, posing a serious threat to early detection, quality treatment, and putting an end to the infection. Numerous factors contributed to poor reporting, including lack of knowledge, unavailability of reporting forms, insufficient lab support, lack of integration of the two systems that collect TB data in Nigeria, and lack of private-sector engagement. Improving disease reporting through the IDSR will require actions to address understanding of and compliance with the framework—including stakeholder education, infrastructure strengthening, and integration and data quality assurance in disease surveillance and reporting.

INTRODUCTION

Globally, increased travel and urbanization intensify the threat posed by emerging pandemics. This threat in turn increases the need for each country to develop the capacity for public health surveillance and response, particularly in developing countries (Debnath & Ponnaiah, 2017). The ability to report potential public health events of national and international concern relies on early warning systems founded in national surveillance capacities.

The WHO defines health surveillance as the ongoing, systematic collection, analysis, and interpretation of health data. Surveillance includes timely dissemination of the resulting information to policymakers, donors, program managers, and communities for action. Surveillance is also essential for planning, implementing, and evaluating public health practice. Disease surveillance systems provide information about disease manifestations and severity, etiological characteristics, space-time distributions, and the use and potency of treatments such as vaccines. An effective surveillance system includes data collection, analysis, dissemination, and response, and is characterized by simplicity, flexibility, sensitivity, timeliness, representativeness, and effective communication. A final, critical factor in determining the performance of infectious disease surveillance systems is demand for information by health policymakers and managers (Perry, et al., 2007).

In the 1990s, most African countries implemented vertical disease surveillance to respond to priority infectious diseases that were targeted for control and/or elimination. However, these vertical systems had numerous drawbacks. These included the high cost of maintaining various parallel systems; the inability of systems to fulfill the functions of surveillance and response; centralization; the inability to detect disease outbreaks in a timely manner; duplication of work due to lack of coordination among the different control and prevention programs; and excessive workloads among health personnel responsible for disease surveillance. Additional challenges emerged from social changes such as rapid urbanization and the increasing ease of travel, particularly by air, coupled with the incremental threat of emerging and re-emerging diseases of pandemic potential alongside endemic diseases such as HIV, hepatitis, and other diseases. The cost of implementing these vertical programs climbed sharply while most African economies either declined or remained stagnant (Jajosky & Groseclose, 2004).

The shortcomings associated with use of vertical systems eventually prompted the WHO Regional Office for Africa (WHO-AFRO) to develop a cost-effective, efficient disease surveillance and response strategy for African member countries (Kasolo, et al., 2013). This strategy, the Integrated Disease Surveillance and Response (IDSR) strategy, was adopted under resolution AFR/RC48/R2 by the WHO-AFRO member countries in September 1998, when WHO-AFRO met in Harare, Zimbabwe (WHO, 1998).

Nigeria is implementing the IDSR guidelines to improve the ability to detect, confirm, and respond to high-priority communicable and noncommunicable diseases. IDSR provides a framework for improving and strengthening the surveillance, response, and laboratory core capacities needed to implement the revised IHR (IHR, 2005). A major objective of the IDSR is to increase the availability of timely, high-quality, useful information to health providers and other stakeholders at the state and facility levels. This will enable health providers to gain an understanding of IDSR and the importance of surveillance-related data.

Purpose of the Assessment

An important facet of Nigeria's TB case notification is that it occurs through *two* systems: the IDSR, managed by the NCDC, which manages response to outbreaks of priority diseases, including TB; and the NTBLCP, which coordinates the response. Despite progress made by Nigeria's public and private sectors toward reducing TB as a public health threat, the country still contributes significantly to the global TB burden. WHO estimates that approximately 4 million cases are missed each year globally—not diagnosed, treated, or reported to national TB programs (WHO, 2016). Nigeria accounts for 15 percent (about half a million) of this global gap in TB case notification; in 2017, for instance, the NTBLCP reported that 302,096 out of 407,000 cases of TB went undetected. A central strategy for controlling the disease by the NTBLCP is early detection and appropriate treatment of those with active TB disease. Thus, case findings and notifications with appropriate treatment are paramount for stopping the spread of TB. The current reporting system relies significantly on facilities within the NTBLCP network. However, a high percentage of private health facilities that detect and treat TB cases are not part of this network, and thus are not reporting. Since more than two-thirds of health services are offered privately in Nigeria, obtaining data from this sector is vital to ensure accurate reporting and comprehensive treatment, including TB case detection and treatment.

The FMOH has used IDSR to complement the health management information system (HMIS) in reporting detected and/or confirmed priority infectious diseases to relevant authorities at the national and subnational level within the Ministry of Health. The data collection for disease surveillance is conducted primarily at the health facility level, mainly through paper-based information systems. Each facility collects information about suspected and confirmed priority infectious diseases on a paper-based tool. The tallied information from these tools is then sent to the DSNO at the primary healthcare unit of the LGA. The DSNO then shares the validated data with the Epidemiology Unit of the State Ministry of Health (SMOH). The Epidemiology Unit compiles the data from all the LGAs and validates, analyzes, and disseminates the reported surveillance numbers to other units or departments within the SMOH (e.g., Policy and Planning, Environmental Health, Health Promotion, and so on). The state sends the compiled data to the FMOH using the data flow prescribed in the IDSR Technical Guidelines. However, the facility-level information reported through the NTBLCP system is not shared or integrated with the IDSR system.

Thus, the IDSR has not been optimally used to report cases of TB in Nigeria. A key priority of the Federal Government of Nigeria and its national TB program, and for donor agencies—especially USAID—is to reduce the TB burden in Nigeria. This shared interest provides an opportunity to strengthen the national IDSR system to improve TB case finding and notification for all health facilities, both public and private.

This rapid assessment, conducted by MEASURE Evaluation in collaboration with NCDC, examined how the system is currently fulfilling its core functions, particularly focusing on the TB notification process within IDSR from public and private facilities. The findings will inform recommendations for improving the generation and use of TB data derived from routine surveillance systems, with a view to enabling earlier diagnosis and treatment of presumptive cases.

Objectives

The overall objective of this assessment was to consider how well the IDSR system in Nigeria is currently fulfilling its core functions, with an emphasis on TB surveillance and notification. Specific objectives were to:

- Assess the performance of the IDSR system across relevant aspects of its eight core functions
- Understand and detail the current TB notification process within IDSR from public and private health facilities
- Review and detail current processes for data linkages between the NCDC and the NTBLCP
- Identify gaps in the current notification and surveillance processes
- Recommend improvements to the IDSR system
- Recommend strategies to improve the generation and use of TB data derived from routine surveillance systems, thus enabling earlier diagnosis and treatment of suspected cases

METHODS

This rapid assessment used a mixed-methods approach, including a desk review, review of facility-level data, and qualitative interviews. The qualitative data were collected primarily through key informant interviews with purposively sampled managers and health workers at all levels of IDSR and TB program implementation. The sampling included staff from six states and Federal Capital Territory (FCT) who could describe how TB is being notified through the IDSR nationwide. The procedures for implementing the IDSR are standardized across all states and facilities (public or private) irrespective of their size, status, or location (urban or rural, health post or district hospital).

Study Setting

The assessment was implemented at the national level and in six states (the FCT and Anambra, Bauchi, Kano, Lagos, Niger, and Rivers States), one per geopolitical zone.

Desk Review

The desk review included TB data tools, routine TB surveillance data in NCDC, data linkage processes between the IDSR system, and TB databases being used by NTBLCP, as well as previous assessment reports of the IDSR/surveillance.

In-Depth Interviews

The 45 key informant interviews included IDSR and TB focal persons or designated staff at selected public and private health facilities (see Appendix A). The nine participants at the national level included an NCDC deputy director, an international nongovernmental organization (INGO) consultant, a research coordinator at NTBLCP, the IDSR data manager, the NTBLCP surveillance officer, the national M&E officer, and WHO staff.

The 36 state-level interviewees included state epidemiologists, the state TBLCP manager, LGA/DSNOs, in-charges from public and private health facilities, and in-charges from directly observed treatment (DOT) health facilities.

Facility-Level Data Review

TB data from 2013 to 2016 were extracted from the NCDC/IDSR, according to age of the patients and year of case reported. The analysis is presented in the Results section. A key limitation was lack of disaggregation of the data according to the type of facility and managing authority (public versus private).

Analysis

Qualitative data were transcribed and entered into MAXQDA software for qualitative analysis; also, all were read multiple times to identify critical responses and themes. Data were analyzed using the thematic analysis approach. The specific themes (based on the IDSR Technical Guidelines and assessment objectives) included understanding and knowledge of IDSR, community sensitization, the linkages between IDSR and TB programs, parallel disease surveillance violating the principles of IDSR, and weak private-sector involvement

in TB surveillance and management. These themes were then broken down into sub-themes. Quotes were grouped under these sub-themes to help clarify the assessment's findings according to its objectives. The analysis also captured each informant's perspective on the successes and challenges of the IDSR strategy.

Ethical Considerations

Ethical Clearance

A clearance letter from the chief executive officer/national coordinator of the NCDC was granted for this rapid assessment.

Confidentiality and Privacy

The data collection team conducted the interviews in locations that ensured privacy and maintained interviewees' anonymity. Researchers maintained confidentiality and the anonymity of respondents during coding, thus not using names or other ways of identifying the participants.

Consent

Consent was obtained from all participants by data collectors reading them the consent form, which explained the full extent of the survey, described the survey's objectives, and informed participants of their right to confidentiality and to withdraw from the study at any point during the assessment. Participants signed the consent form if they were willing to volunteer for the study.

RESULTS

Performance of the IDSR in Nigeria

The FMOH adapted the WHO IDSR guidelines in March 2013 to improve its ability to detect, confirm, and respond to high-priority communicable and noncommunicable diseases. In Nigeria, the IDSR is managed by the Nigeria Centre for Disease Control, or NCDC, and complements the HMIS in reporting detected priority notifiable infectious diseases to the relevant authorities within the FMOH and the SMOH (FMOH, 2013). Within the HMIS, there are indicators for priority notifiable infectious diseases, which are reported to the next level in the reporting chain immediately after they are detected/suspected and/or confirmed. The National Health Bill of 2014, the 2013 Technical Guidelines on IDSR in Nigeria (FMOH, 2013), and the IHR of 2005 (WHO, 2005) mandate notification of priority communicable and noncommunicable diseases and health events, including TB, to public health authorities in Nigeria.

The IDSR Technical Guidelines are the core component of the Nigerian surveillance system, applicable for implementation from the community level to the health facility, local government, state, and national levels. These guidelines identify 41 priority communicable and noncommunicable diseases and conditions for integrated disease surveillance and response (WHO, 2010). These include epidemic-prone diseases requiring immediate reporting, such as viral hemorrhagic fevers, cholera, suspected pandemic influenza, and meningococcal meningitis. Also included are diseases targeted for elimination or eradication (e.g., measles, poliovirus, and dracunculiasis) and endemic diseases that cause outbreaks among vulnerable populations, including malaria, TB, and HIV. The national IDSR strategy and guidelines define disease priorities, administrative processes, key actors, and nongovernmental partners. Both public- and private-sector facilities are expected to use the national IDSR framework to report priority diseases and unknown events in their catchment localities.

Disease surveillance data are collated into standardized reporting forms at the health facility level (weekly or monthly IDSR forms), based on the health facilities' registers. To improve early disease detection, there are trained community-based surveillance volunteers in some communities. According to the IDSR Technical Guidance, there are 10 immediately notifiable diseases and another 31 diseases that must be reported weekly and monthly, for a total of 41 reportable diseases and events in the IDSR system. Facilities use IDSR Form 001 for immediate case-based reporting for epidemic-prone diseases, while IDSR Forms 002 and 003 are used for reporting other diseases weekly, monthly, or quarterly, depending on when reporting is specified for each disease (see Appendices B–F). Each facility collects information on suspected cases, laboratory-confirmed cases, and deaths for each disease.

The IDSR in Nigeria has eight core functions: (1) identifying diseases, cases, and events; (2) reporting suspected cases, conditions, or events to the next level; (3) analyzing and interpreting findings; (4) investigating and confirming suspected cases, outbreaks, or events; (5) ensuring preparedness to respond to public health events; (6) responding to public health events; (7) evaluating and improving the system; and (8) communicating with and providing feedback to health workers and the community.

During interviews with key informants from federal, state, and facility levels, the themes relating to the performance of the IDSR in Nigeria emerged, as detailed in the following sections.

Understanding of IDSR

Knowledge about the IDSR is critical to the reporting of notifiable diseases. Proper understanding of IDSR, case definitions, and reporting methods enables quick and accurate identification and reporting of priority diseases to the right authorities and is essential preventing and controlling these diseases. The interviews with key informants showed wide variability in levels of knowledge about the IDSR. During the survey, responses to the question, “What do you understand by IDSR?” revealed **limited knowledge in some respondents**:

Some Ministry of Health people used to come but I can't really say what they came to collect.

—Private health facility focal person

I don't even know what IDSR is...

—Private health facility focal person

I'm just hearing that for the first time.

—Public health facility focal person

However, respondents who had in-depth knowledge of the IDSR knew the specific uses of Forms IDSR 001, IDSR 002, and IDSR 003:

We do it using the Form F001, IDSR 001, 002, and Form 002 and 003. We have immediate notification form, weekly reporting form, and the health facility epidemic prone disease reporting form is weekly.

—Public health facility focal person

You're talking of the integrated disease surveillance response? Trying to see how we coordinate so many of these communicable diseases in the environment and follow them up. That is my idea of what it is all about.

—Private health facility focal person

Availability of IDSR Tools

A strong, functional surveillance system is essential to informing public health decisions and actions—and the flow of surveillance data is an important component of the IDSR system. Poor data quality can affect the nature and impact of any response mounted during an outbreak. Thus, the availability or unavailability of the necessary tools (including IDSR Forms 001, 002, and 003) is a critical factor in the flow of data, and strengthening and maintaining IDSR performance depends on the availability of these and other tools. The results from this assessment indicated that **IDSR tools are not always available**.

It is to provide a lot of working materials. We are certified fully on IDSR. We know how to fill the forms, but sometimes, something can happen and there will be no forms to use.

—LGA DSNO

In my state, we most times run out of stock, so WHO usually comes to our assistance before the government...

—Senior surveillance officer

Respondents said that when forms or tools run low, they sometimes make photocopies, but this is not sustainable; staff cannot afford to make enough copies since most use their own money to pay for them. The unavailability of IDSR tools affects data collection, which in turn can have a serious impact on the quality and quantity of data reported.

I only wish that somebody funds surveillance. If there is funding for surveillance, then data tools will be available, and people can analyze accurate data daily and make sure that you pick [up] every little outbreak, because we often miss outbreaks most times because of wrong data. Sometimes people don't report because there are no tools.

—Senior surveillance officer

Occasionally, we also have inadequate data tools. [For] most of the data tools we get, we rely on the Federal Ministry of Health or partners to provide. For example, the IDSR 002 Form and 003. What we try to do in the interim is make photocopies, but these forms are supposed to be in triplicate, but when they make photocopies, they only make one. Then, when they send the copy they have to the LGA level, that means there is no record at the health facility level...

—Senior surveillance officer

Lack of Diagnostic Laboratories

One of the eight core functions of the IDSR system is to investigate and confirm suspected cases and outbreaks. The **absence of nearby diagnostic labs, or labs with sufficient diagnostic capacity**, affects facilities' ability to confirm the presence of disease. Participants' responses clearly showed the need to strengthen the capacity of laboratory facilities to increase health workers' ability to correctly diagnose any disease outbreak.

It depends on which diseases, but in general it is confirmed in the lab... for those diseases like cerebral spinal meningitis (CSM) we do the lumbar function, we do the rapid test, and we can do culture, but for things like Lassa fever we have to send to Lagos for confirmation.

—Senior surveillance officer

We have laboratory diagnosis but usually... those communicable diseases we don't have laboratory to test them.

—Public health facility focal person

We thought that by now, Niger State would have graduated to analyzing some of those things. Things like viral hemorrhagic fevers, we don't analyze them in the state. Measles and yellow fever are taken to Abuja. Then with the availability of rapid test kits, we get CSM done in the state and we take it to Lagos for

confirmation. We also have a rapid test kit for cholera. Although that is not available now but when there is an outbreak we make a request and WHO comes with support. Our labs that are suitably equipped are here to do the culture and sensitivity.

—Senior surveillance officer

The assessment uncovered several facets of weakness in laboratory support—including resources. Achieving disease control and prevention objectives requires the availability of **dedicated resources** to ensure that health officials can detect the targeted diseases, obtain laboratory confirmation of these diseases, and initiate action. The ability to collect specimens for laboratory analysis (and obtain quick results) is essential to enable immediate reporting of detected cases to designated local public health surveillance officers (LGA DSNOs) for investigation.

If you have suspected avian influenza, something to investigate, okay what are the apparatus or what are the equipments a surveillance officer should use to collect the sample even before the arrival of the director, because the director can be in the training somewhere. [The] state DSNO can be meeting somewhere and they have an immediate case to get that sample done, so sometimes the special laboratories are not actually defined [available] in a place. There is a challenge going to Irrua now [where a lab is located], and [in] FCT we have Nigerian Centre for Disease Control, the lab is just coming up at Gudu in a very [hard to locate] point. [It] is just now that we've started discovering the point.

—LGA DSNO

The logistics of **transport**—moving samples to a lab in another town or state—pose another challenge. If there is no diagnostic lab available, the specimen must be transported to the right location. Sometimes, these specimens have to be carried via public transport, which could expose other passengers to infectious diseases. Responses from interviewees suggested the need to find strategies to ensure safe, rapid sample transport.

You enter public transport, you buy a seat, you don't allow somebody to come closer to you, so sometimes it is a challenge.... So, the challenge is that they will be looking at you, "What is he carrying?" So, the Nigerian system is not up-to-date, so that question is supposed to be answered by Federal Ministry of Health that the whole local government should have a standby IDSR [response] vehicle.

—LGA DSNO

It's just now that WHO is even intervening by paying the logistics, the transport... WHO give you money to immediately rush for this. Is it by air, is it by road, it depends on how urgent.

—LGA DSNO

We have lab scientists as part of the Rapid Response Team of the state, so any disease that is epidemic prone, when it is reported, we will take sample. If it can be investigated in the Bauchi lab we do so, but if it can't, we will send it to a referral lab. Like for Lassa fever we sent to Yarawa in Edo state. I think it's only Lassa fever we have sent but for CSM and cholera we don't have to.

—Senior surveillance officer for Bauchi State

Donor Funding versus Government Funding

Inadequate staffing and operational resources and limited access to sustainable funds can also critically impede disease surveillance. Some respondents said that they could not carry out their duties because of inadequate funding:

I have to do collation in my office on the fourth, and sometimes most of them don't meet it [most of the facilities do not meet the deadline for when the report is expected to be collated]. Sometimes, they will complain of transport money to bring it to the office...

—LGA DSNO

When there is no money for people to go into the field, they sit in their offices, and most times the data you get is not a representative of what is in the field...

—Senior surveillance officer

Sometimes, respondents said, surveillance teams fail to meet because DSNOs do not have the money to bring the people together:

Because the caliber of people that will form the surveillance team, when you are bringing them together, you must provide something and for that you need money.

—LGA DSNO

Funding sustainability also poses challenges. Projects to improve disease surveillance are heavily dependent on donor funding. Because these projects will eventually end, respondents strongly suggested that the government allocate adequate funding for IDSR activities in the budget, so that progress made during projects is sustainable when the donors leave.

I think the government is better if they can help. For donor-funded projects, the contract will end. The government can work with the donors so that they can take over from them when the contract ends before another one comes up.

—Public health facility focal person

Government should give more funding. Government should take ownership of the notification system, and [provide] funding for development tools.

—INGO consultant

The state is not owning surveillance... Most times there is no funding for supportive supervision.

—Senior surveillance officer

Everything is a function of funding, and this funding can be provided for by the government at every level, it's just for us to make disease surveillance our business.

—Senior surveillance officer

Community Sensitization

Community knowledge and participation are essential to disease control. When a community's awareness level about disease outbreaks is high, those outbreaks that do occur are easy to contain. Therefore, surveillance officers and health staff use community sensitization (such as educational sessions and talks) to increase understanding and awareness about disease conditions—how to recognize them, how to prevent them, what to do when they occur, and what services are available—including for TB. Sensitization also encourages good health-seeking behaviors by community members—for example, seeking care quickly if symptoms of a disease occur. However, not all facilities conduct community sensitization, and interviewees said that communities do not always heed messages about seeking care.

What we do is just to create awareness. We teach the mothers how to identify issues that would cause them to come to the facility. This is a private setting, so we don't go out for health talks and all that.

—Private health facility focal person

Majority of this community are not educated, and if they have any illness, their first point of contact is the chemist. It is only when the chemist tries and fails that they come to the facility. If we can create awareness that the primary healthcare should be their first point of call.

—Public health facility focal person

Most people come very late. If there is early report to the facility the condition will be easily handled, but most people come, mostly at the tail end of the condition and by the time they come, the damage has been done. I believe there is insufficient awareness. Most people believe in local treatment.

—DOT facility focal person

Ignorance and misconception also influence disease surveillance in communities. For example, communities often are unaware that TB is a reportable—and treatable—disease, and they often view the symptoms of illness as stemming from other causes. When a community is educated to understand that a death from "mysterious" symptoms is not caused by witchcraft, they will not hesitate to report it.

When there is a disease entity, maybe death, occurring, they begin to think that it is witchcraft. If the informant thinks that it is witchcraft, he will think, the DSNO doesn't need to know about it...

—Senior surveillance officer

Let us increase our awareness for TB, because people don't know that TB services are available in their doorstep, TB service is free testing and treatment.

—State TB officer

Involvement of Professional Health Associations

Health professionals are fundamental to the delivery of smooth, efficient, effective, high-quality services. Their awareness of and involvement in disease surveillance are likely to influence the implementation of the IDSR system. Respondents believed that **organizations and associations for health professionals** could be involved in several ways—to help create awareness, train health workers, encourage correct laboratory practices, and encourage involvement of their members, who own the majority of private health facilities, in disease surveillance.

I think training is one of them. Also creating awareness too. The ones they train will also train others.

—Private health facility focal person

They can be involved by encouraging the laboratory practitioners to investigate and send out results as soon as possible... And also, to encourage the small labs that if they have cases like this to refer to the nearest big hospital.

—Private health facility focal person

The private health facilities are supposed to be involved in IDSR. Now what we did on our own part when we were reviewing guidelines was to involve the umbrella of association of private practitioners so that they can go to their members and talk to them.

—NCDC staff

TB Notification within the IDSR

TB cases are notified through both the IDSR and NTBLCP programs. All forms of TB, and cases clinically diagnosed or bacteriologically confirmed, are required to be notified in both systems. However, guidance differs in the two programs (see Table 1). In the IDSR, a presumptive TB case is notifiable in any patients with a cough lasting three weeks or more; in the NTBLCP guidelines, a presumptive TB case is notifiable in any patients with a cough lasting two weeks or more. Thus, **data in the two systems are not comparable.**

Table 1. Comparison of case definition between the IDSR and NTBLCP systems

| TB Cases by System of Notification | IDSR | NTBLCP |
|---|---|--|
| Presumptive (suspected) pulmonary tuberculosis (PTB) cases | Any person with a cough of three weeks or more. | Any person coughing for two weeks or more, with or without the following symptoms: weight loss, tiredness, fever, night sweats, chest pain, shortness of breath, loss of appetite, and coughing up blood |
| Confirmed TB cases | Smear-positive pulmonary TB: A suspected patient with (a) at least two sputum | A person is considered to have pulmonary TB if he or she is identified as having |

| TB Cases by System of Notification | IDSR | NTBLCP |
|------------------------------------|--|--|
| | <p>specimens positive for acid-fast bacilli (AFB), or (b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined</p> <p>Smear-negative PTB: A patient who fulfills all of the following criteria: (a) two sets taken at least two weeks apart of at least two sputum specimens negative for AFB on ;abnormalities consistent with PTB and a lack of clinical response despite one week of a broad spectrum by a physician to treat with a full course of anti-TB chemotherapy; or (b) a patient who fulfills all of the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and diarrhea), a decision by a physician to treat with a full course of anti-TB chemotherapy; or (c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result was positive.</p> | <p>symptoms suggestive of TB and/or an abnormal chest X-ray, and bacteriologically confirmed (smear-positive and/or culture- positive) <i>Mycobacterium tuberculosis</i></p> |

Both the IDSR and the NTCLPB collect TB data. Within the IDSR, information is collected on suspected TB cases, confirmed cases, and deaths using IDSR Form 003, on a monthly basis for multi-drug-resistant (MDR) TB and quarterly for drug susceptibility testing (DST). The data collected are disaggregated by age. A presumptive case is defined in the IDSR as any person with a cough lasting three weeks or more, and a confirmed case is a patient with smear-positive pulmonary TB (pulmonary TB), as shown in Table 1. The IDSR Technical Guidelines state that laboratory confirmations are conducted through a diagnostic test either by microscopy that indicates the presence of acid-fast bacilli (AFB), in Ziehi Nielsen (ZN) stained smears, and culture and identification of DST and MDR (FMOH, 2013).

However, because the NTBLCP guidelines define a presumptive TB case as any patient presenting with a cough lasting two weeks or more, case notification in the IDSR management information system will be lower than in the NTBLCP system. Thus, there is a need to **harmonize the case definitions** within the two systems, particularly the specifications on mandatory reporting for all health facilities in the IDSR.

In the IDSR, allied information from the reporting tools is then sent to DSNO at the Primary Health Care Department of each LGA. The DSNO then feeds the validated data to the Epidemiology Unit of the SMOH, which collates the LGA data and subsequently sends the collated data to the NCDC. The state's Epidemiology Unit conducts the data analysis and is expected to send feedback to health facilities. This process is intended to reduce the reporting burden in primary healthcare settings by making available essential information easily available to facilitate planning appropriate actions and strategies for disease control at the state and LGA levels.

Table 2 shows IDSR TB-data covering a four-year period from 2013 to 2016. It shows a reduction in TB cases notified through IDSR for all age groups except 0–28 days and 1–11 months, where case notifications increased slightly in 2014 compared with 2013. A similar pattern was observed for TB-related deaths reported in the IDSR. There were 117,674 cases of TB reported during those four years, with 474 deaths recorded. The data show that those ages 20–40 years are most often affected by TB.

Table 2. Annual notification of TB cases from January 2013 to December 2016, Nigeria

| Year | 0–28 days | | 1–11 months | | 12–59 months | | 5–9 years | | 10–19 years | | 20–40 years | | Over 40 years | |
|--------------|------------|-----------|-------------|-----------|--------------|-----------|-------------|-----------|---------------|-----------|---------------|------------|---------------|------------|
| | C | D | C | D | C | D | C | D | C | D | C | D | C | D |
| 2013 | 65 | 0 | 141 | 1 | 720 | 6 | 1260 | 7 | 5,208 | 16 | 17,120 | 57 | 13,671 | 68 |
| 2014 | 68 | 12 | 250 | 0 | 710 | 14 | 1346 | 4 | 3,754 | 8 | 12,098 | 46 | 9,750 | 49 |
| 2015 | 82 | 0 | 152 | 0 | 685 | 3 | 1117 | 2 | 2,916 | 9 | 9,344 | 20 | 7,934 | 23 |
| 2016 | 11 | 0 | 70 | 48 | 403 | 0 | 843 | 8 | 2,779 | 10 | 8,539 | 33 | 6,638 | 30 |
| Total | 226 | 12 | 613 | 49 | 2518 | 23 | 4566 | 21 | 14,657 | 43 | 47,101 | 156 | 37,993 | 170 |

Note: C=Cases; D=Deaths

Source: NCDC IDSR/TB data (2013–2016)

Linkages between the NCDC (IDSR) and the National TB Program

The IDSR platform aims to carry out disease surveillance activities using an integrated approach. This means that data on all important diseases will be collected, analyzed, interpreted, and reported in the same way, by the same people who normally submit routine report forms on health-related data.

That's where the whole country is going to now health-wise, integration. Integration is the way forward, if this can pick up at a point like you say 41 diseases at a point to know, it will serve the country better. We can always integrate our own wherever we can integrate our own reporting system into yours.

—State TB officer

The IDSR brings many surveillance activities together to ensure that priority diseases can be controlled and prevented more effectively. However, when different programs collect data on these diseases and do not report them through the same channels, the results will not be integrated. Respondents reported that there is a **huge discrepancy between the data collected for IDSR and data collected for NTBLCP**. Although TB is one of the diseases listed on IDSR Form 003, it is also collected separately (for the NTBLCP), by the TB focal person for TB response monitoring and evaluation. The DSNO manages the IDSR at the LGA level, while the TB focal person is responsible for the TB data collection and reporting to the LGA TB team. Due to the vertical system being used for data collection, the validation processes are separate. The DSNO and the TB focal person work in the same LGA, but the opportunity to synchronize the data is not being explored. This contributes to the poor quality of TB case finding in the IDSR and NTBLCP, and it results in parallel programming, which makes the numbers of TB cases unreliable.

The last annual surveillance meeting was a national disaster. Because almost all the states reported differently from what the national TB focal person was reporting. So, there has to be a way that the M&E or TB focal person can submit data, and it has to do with most of the parallel programming, how to get data to the state...

—Senior surveillance officer

I don't know how it happens that there is always a very huge discrepancy between the data that are collected from let's say primary healthcare agency and those that are collected from the TB program itself on TB. Why should there be [a] discrepancy? If, for example, the people from the primary healthcare are going to collect these data from the DOT facility, where will the discrepancy come from, when we too it is the same DOT that we go to collect these data from. But when it comes to presentation...

—State TB officer

That is a difficult matter because over time, we in the Epidemiology Unit have been crying about parallel programming. I try to go to the M&E person to get data to see what they have but you find out that what we have in IDSR has never rhymed with what they have. There is no linkage.

—Senior surveillance officer

But the main gap I think I find is this issue of parallel programming. I think it's crippling IDSR because you find out that malaria is doing their own thing somewhere, TB is there, HIV is there. You find out that almost all these diseases have their branches somewhere and that is how it trickles down to the local government level. At the local government level, the DSNO might not really get the accurate data and it is difficult to start doing data synchronization because most people are not aware that data is not their personal property.

—Senior surveillance officer

There are scant reports of any linkages between the IDSR's DSNO in a given location and the TB focal person. Most of the **TB data that are gathered are not validated in order to prevent duplication**; this, in turn, affects the processes of collation and analysis. Asked if he ever met with the TB focal person to compare data, one LGA DSNO answered succinctly, "No. Absolutely no." Responses from other interviewees made it clear that TB data are not collected in a standardized or coordinated manner.

We don't have any link, they do their own reporting and we do our own reporting.

—Senior surveillance officer

They collect the same data. The total positive they collect is the same. The only difference is that the TB focal person collects data on the negative cases.

—DOT facility focal person

We have noticed during our supervisions that there are some discrepancies in what happens from the part of DSNOs in the IDSR and what happens in the TB notification system, so we feel like the gap should be bridged.

—State TB officer

But we found out that for TB they have designated health facilities including the private health facilities that they also go to and have that information from there, they collect their own data from there which the DSNOs will not be able to since they don't even have the information on that.

—Senior surveillance officer

Because there is a TB focal person at the LGA level, he makes sure he collects all data for all cases for the facilities as well as the communities he has visited. But then for the DSNO he only collects data at the facility level. That will create a difference. So, if there was a validation meeting at the LGA level, he would have been able to get even the data at the community level. So, you find out that if you ask the TB/leprosy guy at the state level to give you data, there is a difference...

—Senior surveillance officer

Data collection processes differ for the IDSR and TB. While the IDSR collects *both* suspected and confirmed TB cases, the TB focal person only collects data on confirmed TB cases. According to one respondent, the data collection process for TB is more detailed than for the IDSR.

In TB control, it is one thing to detect a case, it is another to notify a case, because even if you detect a case, if you have not notified it that is equal to no detected case. So when you have a lot of patients who have been detected but have not been notified... So, working closely with the DSNO will help the supervisor in notifying that case to the program.

—State TB officer

The TB you know they run their program specially. They go to LGAs, they make supplies, and they follow it up and all that. But in IDSR all we do is go to health facilities, get the case note, and report whatever is seen.

—Senior surveillance officer

The assessment showed that both the IDSR and TB programs have established systems. However, because there is no linkage between the LGA DSNO officers and the LGA TB supervisor, **a significant amount of information on TB is lost**, and even when the information is collected, the two programs obtain different

data from the same area. The NCDC has tried to encourage linkages between the IDSR and other programs, but interviewees said that workers in the different programs are unwilling to share their data.

That linkage is not too strong there is this territorial thing... But somehow people just feel that you are coming to take the money that I am being given by partners, so I will not involve you or I will not let you know what I am doing.

—NCDC staff

The LGA DSNO and the TB leprosy coordinator should work together... When you are not communicating that's when you have problems, then you have different data going from the same area. —
NCDC staff

Personally, for the past 35 years working with TB, we have never used the IDSR data.

—INGO consultant

Gaps in TB Notification and Surveillance

Missing TB Cases

Despite significant progress in diagnosing and treating TB, a huge number of cases go unreported every year. **TB case notification in Nigeria is very low**, identifying an estimated one-quarter of cases or less. This may occur because of weakness in recording and reporting within public systems; non-existent or poor linkages with private practitioners, hospitals, laboratories, or services by nongovernmental organizations; or lack of knowledge about mandatory TB case notification among health service providers.

If we refer the case under the DOT unit, we follow up the case and if the case is positive, it is that health facility that will capture it, not us. We just put a suspected case, that is, only a case been suspected here not a confirmed case. So, will record it as a confirmed case there.

—Public health facility focal person

I think it is going to help us in giving us an idea of even the case burden we have and the case notification we have and then in TB program, there is what we say missing cases, those missing cases are cases that we are not able to detect... Currently even on the level of country, the case detection for TB is 24 percent, which means that there is a 76 percent gap in the case detection in the country and if you go to various states, the case notification is going between 24, 22, 21, 20 [percent], sometimes even between 18, 19 in some states.

—State TB officer

Weak Private Sector Involvement

In Nigeria, the private sector provides between two-thirds and three-fourths of healthcare services. For disease surveillance to be effective, *all* suspected cases must be identified, documented, and investigated to facilitate complete, timely case reporting and effective case management. Engaging the private health sector in TB surveillance is essential for reducing outbreaks and increasing data collation, especially in settings where the private sector is a major source of healthcare (including urban slums and rural areas). Nigeria's private health sector has not been adequately involved in disease surveillance and TB management, and **TB cases that pass through private hospitals are not captured** unless those hospitals refer them to a public facility.

In Port Harcourt it is only one private facility that is reporting IDSR 003, which we have over 100 private facilities, but it is only the public ones, even the public ones, the one like BMH, ... is not reporting.

—LGA DSNO

It has been proven that over 60 percent of our population will visit the private sector, and that includes TB. And you know that very few private sectors, particularly here in the North and my state here, are engaged in TB services with the state government simply because: (1) the private facilities are few, (2) I think there is not enough remuneration....”

—State TB officer

The assessment findings underscored the importance of involving private hospitals in disease surveillance, since over 60 percent of Nigeria's population prefers to visit private facilities. However, it has been difficult to get private hospitals involved in disease surveillance, and reportedly, these hospitals cannot afford the extra staff required to handle the data.

It is difficult to get the private health sector to participate in the disease surveillance, IDSR precisely. Most of them feel they don't have the staff to take care of the data. It is a problem because Nigeria is not data conscious, so most health facilities don't keep their data and when you approach them, they say you have to employ somebody, and it is difficult to do that kind of thing. There are very few that are reporting on IDSR, even though efforts are ongoing to sensitize them on the need to. So far that is what we have.

—Senior surveillance officer

Many patients come to private facilities, and some don't like to go to public facilities. By involving private facilities, you gain access to those patients and can get more records.

—Private health facility focal person

The private health facilities are supposed to be involved in IDSR. Now what we did on our own part when we were reviewing guidelines was to involve the umbrella association of private practitioners so that they can go to their members and talk to them.

—NCDC staff

We don't have the capacity to visit all health facilities... so it is only the health facilities that they visit that we get the information from. And a large number we don't collect from the private facilities. They do visit some, but a large number of our private facilities are missed.

—Senior surveillance officer

They treat but it is outside the national guideline. Like the place we went to yesterday, we were going there to see the possibility of services there. We got there, some two patients were already placed on treatment. They were buying loosed drugs. It is more expensive, and we find out that when they cannot pay for that period of time, they now send them back to us. We were able to talk to them and they have agreed to come for training. Since we are looking for the missing cases we have to go outside the private facilities.

—State TB officer

Respondents discussed several strategies to educate and involve private hospitals, such as attending their meetings and giving talks on infection prevention and control, the spread of disease, and recordkeeping and reporting. In addition, the government can base the annual license renewal of each facility on a percentage of weekly or monthly data the health facility or hospitals submitted at the end of the year.

Now we are discussing a plan that it is possible to tie the renewal of their license to a certain percentage of data they submit at the end of every year. If that can be done, it will go a long way in making sure that they report what they see. Because, believe it or not, more people visit the private clinics and we actually need them to be reporting.

—Senior surveillance officer

For now, there isn't much private sector involvement. In fact, that is one of the challenges or deficiencies in the data system for now... They have been in talks because we are trying to make disease reporting as a criterion for renewal of their license.

—Senior surveillance officer

What we do at the level of state is to ensure that all those facilities that are private are also captured and reporting to our database. And where they are health facilities where DSNOs are getting report, we ensure that our supervisors also go there to make sure they get the reports on time and they report to the state. So many private facilities are treating TB patients without notifying the national program ... I think working hand in hand with the DSNOs is going to really help in instituting the private just like in the public.

—State TB officer

DISCUSSION

The assessment findings showed that TB data are collected and made available by the IDSR. Though this assessment did not specifically examine data quality, the findings suggest that numerous factors have compromised the quality of IDSR data and data on TB generally. Overall, the assessment showed that case reporting for TB, specifically, is very low. One major factor is that TB data are collected through two systems that are not integrated. Another is that the IDSR has poor linkages with private practitioners (most do not contribute data to the disease notification process) and also with hospitals, laboratories, and nongovernmental organization services. Most IDSR data submitted come from public facilities; efforts to encourage private facilities to submit IDSR reports have been fruitless. The findings showed that a combination of significant weaknesses, many of them connected to the healthcare system, have challenged the IDSR's effectiveness:

- **Knowledge of the IDSR:** Among survey participants, especially those in the private health facilities, knowledge about the IDSR was limited. However, participants who did have knowledge of the IDSR knew the specific uses of the IDSR tools.
- **Lack of reporting tools:** Scarcity of IDSR tools, particularly at the private health facilities, comprised a key barrier to the effectiveness of IDSR implementation, according to various survey participants. This was likely due to funding shortages that impede production of sufficient copies and their transportation to the facilities. Though facility staff do take measures to address the shortage of copies—such as making photocopies of the reporting forms—these measures may be inadequate. For example, interviewees reported making single copies, while the forms are supposed to be in triplicate, and this affects the reporting process.
- **Laboratory capacity:** Some facilities are equipped to carry out basic laboratory tests, but for the more complex tests for communicable diseases, the samples collected are sent to other laboratories. The shortage of diagnostic laboratories that can carry out complex tests requires moving the samples to labs in other towns or states, which can present logistical challenges. In some cases, these specimens must be carried via public transport to Abuja or Lagos for confirmation. This causes delays, poses potential public health risks, and slows down the disease notification process, including TB notification.
- **Resource constraints** affected numerous facets of IDSR implementation. Interviewees said that compliance with the standard prescribed in the Technical Guidelines was weak due to scarcity of resources. The assessment also showed that staff implementing the IDSR and TB surveillance often could not carry out their duties—including collecting data in the field and even holding meetings—because of lack of funding. Additional challenges were that projects are heavily dependent on donor funding and that state governments are not supportive enough.
- **Ignorance and misconception** continued to influence disease surveillance at the community level. Interviewees mentioned that patients may attribute symptoms or deaths to witchcraft and often present for treatment at a late disease stage. Thus, poor health-seeking behaviors have negative effects on the quality and quantity of data collected for TB and other notifiable diseases within IDSR. Lack of knowledge was not limited to community members; providers also were uninformed about the mandate to report notifiable diseases. Respondents suggested that professional associations could play an important role in many aspects of surveillance—for example, conducting training and advocacy to increase stakeholders' engagement in disease surveillance.

- **Poor linkages** between the TB data gathered through the IDSR and the NTBLCP's information system, which operate in parallel. Although TB is one of the diseases listed in IDSR Form 003, it is also collected separately by the TB program, using a different diagnostic definition and different data collection processes. There are few linkages between the DSNO and the TB focal person. Most of the TB data gathered are not validated to prevent duplication, which in turn will affect the collation and analysis processes. Both the IDSR and TB programs have established notification systems for TB cases, but interaction between LGA DSNOs and the LGA TB supervisors responsible for TB program management remains uncoordinated with respect to the TB data management and sharing. Thus, the parallel systems are still being used, without harmonization of TB data—which is a strong contributor to the poor-quality data on TB cases. As a result, a large amount of information on TB is lost. NCDC has tried to encourage linkages between the IDSR and other programs, but workers in the different programs show an unwillingness to share their data.
- **Limited private sector reporting:** Since the majority of the Nigerian population prefers to visit private facilities, involving private facilities would improve the completeness of the reported data. However, this could pose challenges, since the facilities would need extra staff to carry out disease surveillance. FMOH officials are adopting strategies to engage the private sector, but more strategies will be needed.

RECOMMENDATIONS

1. **Integrate programs and share data to improve data collection:** It is important for the IDSR to generate quality data for evidence-based decisions, hence the need for NCDC and NTBLCP to harmonize the differences in case definitions for presumptive TB and confirmed cases, either clinically diagnosed or bacteriologically confirmed. The NCDC and NTBLCP should implement collaborative data quality reviews to identify gaps and areas of interventions to improve the quality of the data from both systems.
2. **Engage the private sector:** Although health policy requires every health facility to participate in IDSR, private facilities are not complying. Involving private health facilities in disease surveillance will help bridge the 76 percent TB case-detection gap in the country. Private providers must be trained on the IDSR process, and measures should be put in place to hold them accountable for noncompliance.
3. **Provide funding for disease surveillance:** National and state governments must budget for funds to assist donor-funded disease surveillance programs so that surveillance staff can complete their assigned activities on time. The FMOH should also plan to make funds available to take over donor-funded projects when they come to an end.
4. **NCDC should organize and facilitate a monthly or quarterly collaborative meeting** to review TB notification data in the IDSR with participants drawn from NCDC, NTBLCP, DHPRS, and WHO through the TB M&E-TWG. Monthly data meetings should take place at the LGA, state, and national levels. Laboratories should be included in the IDSR network to increase efficiency.
5. **Upgrade laboratory facilities:** The FMOH should ensure that every state has at least one laboratory that can perform complex tests for communicable diseases—ideally, the GeneXpert test for TB, which can provide accurate data in hours, as compared to the current system where diagnosis can take weeks. Rapid case detection will enhance the timeliness, reliability, and completeness of the data reported, which in turn will improve notification. Laboratories should be included in discussions of TB case finding.
6. **Provide vehicles for sample transport:** Because samples often must be taken to labs in other towns or states, and samples require a controlled environment, vehicles should be made available to LGAs to facilitate rapid, safe transport.
7. **Strengthen training:** To improve reporting to the IDSR, the FMOH and counterparts at the subnational level (states and LGAs) should provide facilities—especially private facilities—with IDSR reporting tools and mandatory training on the IDSR. Training should include identifying a focal surveillance person at each facility.
8. **Upgrade forms and tools:** IDSR forms should be digitized to enable NCDC to receive real-time notification in the event of an outbreak. Digitizing the IDSR would also solve the problem of unavailability of notification forms.

9. **Strengthen national support and coordinated oversight:** NCDC should be supported by the FMOH to provide oversight to states and LGAs, in terms of training, drugs, logistics, etc. International partners working in Nigeria can also provide a platform to train NCDC staff on how to handle disease outbreaks.
10. **Strengthen state compliance and supportive functions:** The actions of states and LGAs should enhance and complement the efforts of NCDC and other partners within the state. States should also implement the National Council on Health’s 12 key resolutions. In particular, states should (1) establish functional infection prevention committees, emergency operational centers, and isolation centers—each state prioritizing its particular public health challenges and building on appropriate partnership response to it—and (2) conduct campaigns to strengthen community health-seeking behaviors and improve surveillance.
11. **Strengthen zoonotic disease reporting:** NCDC should be supported to strengthen One Health by establishing countrywide laboratory networks with integrated components for zoonotic disease diagnosis and reporting.

Action Items

The results of this assessment point to implementation of specific immediate action items to begin improving TB surveillance and disease case finding generally. The FMOH, through the NCDC, should initiate policy directives to guide these actions.

The insights from this study suggest the need for specific actions:

- **Strengthen collaboration, coordination, and partnerships** among stakeholders, especially NCDC and NTBLCP, to improve TB case notification in the IDSR.
- **Emphasize data quality assurance** for both IDSR and NTBLCP databases, including TB case reporting, data flow, and data exchange among agencies.
- **Expand the network** of facilities reporting TB cases to NTBLCP.
- **Engage private health facilities**, particularly “private for-profit” agencies, through professional associations to educate them on the importance of the IDSR framework and technical guidelines.
- **Strengthen knowledge** and understanding of the IDSR framework among all providers, and develop a strategy to ensure compliance for TB and all the 41 priority diseases.
- **Develop alternative funding** sources to reduce dependency on donors and work toward sustainability.
- **Digitize the IDSR** to make it easier to deploy in the private sector.
- **Include laboratories** within the IDSR system to increase efficiency.

CONCLUSIONS

This study confirmed that health facilities are reporting TB cases to Nigeria's IDSR system very poorly, posing a serious threat to early detection, quality treatment, and ending the infection. Numerous problems—including dual TB reporting through two systems that are not integrated and non-reporting by the private sector—contribute to the poor reporting. The report details immediate and mid-term steps for improving program coordination and case finding to strengthen case finding and reduce the burden of TB in Nigeria.

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APPENDIX A: KEY INFORMANT INTERVIEW GUIDES

National Level (NCDC)

1. What are the roles of NCDC in the prevention, detection, and control of diseases of public health importance?
2. Describe how NCDC coordinates IDSR in Nigeria.
3. What roles does NCDC play in TB surveillance in Nigeria?
4. What linkages exist between NCDC and NTBLCP? How does this linkage support TB control in the states and national levels?
5. What similarities and differences exist in NCDC's roles in supporting disease identification/notification in public vs. private facilities?
6. How does NCDC ensure that disease outbreaks are prevented in Nigeria?
7. When disease outbreaks happen, how does NCDC support states to stem the outbreaks? (Please probe for feedback and communication mechanisms.)
8. Laboratory investigations are important in managing disease outbreaks. What does NCDC do to ensure a network of reference and specialized laboratories?
9. What gaps exist in the IDSR in Nigeria?
10. In your opinion, what can be done to improve the IDSR system?

National Level (NTBLCP)

1. What do you understand by IDSR (probe for understanding of IDSR Forms 002, 003)?
2. How does the IDSR support early TB case finding and proper case management?
3. How can TB identification and notification be integrated into the overall health system? (Probe about integration into NTBLCP.)
4. How would public-public-private partnerships improve TB surveillance in Nigeria?
5. What partnerships currently exist between NTBLCP and other national and international public health agencies? (Please probe specifically for linkage between NTBLCP and NCDC.)
6. What kinds of training do staff of NTBLCP receive on surveillance? (Please probe for training on the IDSR.)
7. What gaps exist in the IDSR in Nigeria? (Please probe specifically for gaps in TB identification and notification.)

8. In your opinion, what can be done to improve the IDSR system?
9. In your opinion, what can be done to improve the generation and use of TB data derived from routine surveillance systems?

State Epidemiologist/State-level Officials

1. What do you understand by IDSR? (Probe for understanding IDSR Forms 002, 003.)
2. Is there a disease surveillance committee set up in this state? (If yes, please probe for when it was set up, membership, and how often they meet.)
3. How are diseases confirmed in this state? (Please probe for laboratory diagnosis.) Also probe for confirmation of outbreaks in the state and NCDC support in disease outbreaks.)
4. How often do you receive IDSR data from the LGAs?
5. How often do you analyze the IDSR data you receive?
6. How is TB surveillance data captured in the IDSR data you receive?
7. What is the linkage between IDSR and TB identification and notification?
8. How promptly do you provide feedback to the LGA DSNOs?
9. What gaps exist in the IDSR in Nigeria? (Please probe specifically for gaps in TB identification and notification.)
10. In your opinion, what can be done to improve the IDSR system?
11. In your opinion, what can be done improve the generation and use of TB data derived from routine surveillance systems?

LGAs DSNOs/LGA-level Officials

1. What do you understand by IDSR? (Probe for understanding IDSR Forms 002, 003.)
2. Is there a disease surveillance committee set up this LGA? (If yes, please probe for when it was set up, membership, and how often they meet.)
3. How often do you collect data from facilities?
4. Do you routinely collect data on TB within the existing surveillance system?
5. To what extent do you analyze data collected to improve public health in your local government?
6. How long does it take to notify the state of any disease outbreaks?
7. How promptly do you receive feedback from the state during disease outbreaks?

8. What gaps exist in the IDSR in Nigeria? (Please probe specifically for gaps in TB identification and notification.)
9. In your opinion, what can be done to improve the IDSR system?
10. In your opinion, what can be done to improve the generation and use of TB data derived from routine surveillance systems?

Health Facilities (Public/Private)

1. What do you understand by IDSR? (Probe for understanding IDSR Forms 002, 003.)
2. What types of training do health facility staff receive on IDSR? (Please probe for frequency cadre of staff trained.)
3. How often do you provide IDSR data to the LGA?
4. How often do you provide TB data to the DNSOs in this LGA? (Probe particularly in DOTs centers.)
5. How are diseases confirmed in this facility? Please probe for laboratory diagnosis and effective case management using standardized management guidelines. Also probe for confirmation of outbreaks in their facility)
6. How often do you provide feedback to the communities?
7. What gaps exist in the IDSR-TB notification system?
8. In your opinion, what can be done to improve the generation and use of TB data derived from routine surveillance systems?
9. In what ways can the Association of General Medical Practitioners of Nigeria (AGMPN) improve disease surveillance? (Please probe for TB surveillance.)

Health Facility (DOT Centers)

1. What do you understand by IDSR?
2. How does TB surveillance affect the management of TB?
3. What linkages exist between DOT health facilities and DSNOs?
4. What are the different sources of TB case referrals to this facility? (Please probe for public vs. private sources.)
5. What gaps exist in the IDSR-TB notification system?
6. In your opinion, what can be done to improve the generation and use of TB data derived from routine surveillance systems?

APPENDIX B: IDSR Form 001A

Immediate/Case-based Surveillance Reporting Form IDSR 001A

| | | | | | |
|---|---------------------------------|--|---------|---|--|
| REPORTING HEALTH FACILITY | | REPORTING LGA | | REPORTING STATE | |
| IDENTIFICATION NUMBER | | | | IDSR 001A | |
| Immediate/ Case-based Reporting Form From Health Facility/Health Worker to LGA health team | | | | | |
| Cholera | Dracunculiasis (Guinea Worm) | Neonatal Tetanus | Measles | Meningitis | Influenza due to new subtype e.g H5N1 |
| | | | | | Viral Hemorrhagic Fever e.g. Lassa fever |
| | | | | | Yellow Fever |
| | | | | | Diahrroea with Blood /shigella (Under5 yrs) |
| | | | | | Others/specify* e.g. Dengue, SARS, Small pox, Plague, Anthrax etc |
| Date form received at SMOH or the national level: / / (Date/Month/Year) | | | | | |
| Name of Patient: | | | | | |
| Date of Birth (DOB): / / (Day/Month/Year) | | Age (If DOB unknown): | | Year | Month (if <12) |
| Sex: | | M=Male F=Female | | | |
| Patient's Address: | | Urban | Rural | | |
| Settlement/Village | | | | | |
| Ward | | LGA | | State: | |
| Exact residential address: | | If applicable or If the patient is neonate or child, please write full name of mother and father of the patient | | | |
| Date Seen at Health Facility: / / | | Date Health Facility notified LGA/: / / | | Date of Onset: / / | |
| Number of vaccine doses received: | | 9=unknown For cases of Measles, NT (TT in mother), Yellow Fever, and Meningitis (For Measles, TT, YF- by card & for Meningitis, by history) | | | |
| Date of last vaccination: / / | | (Measles, Neonatal Tetanus (TT in mother), Yellow Fever, and Meningitis only) | | | |
| Close contact with infected poultry | | 1=Yes 2 =No | | | |
| Close contact with suspected or confirmed case of | | 1= Yes 2 =No | | | |
| Associated with an outbreak? | | 1=Yes 2=No | | | |
| In/Out Patient | | 1=Inpatient | | 2=Outpatient | |
| Outcome | | 1=Alive | | 2=Dead | |
| | | | | 9=Unknown | |
| Final Classification of case | | 1=Confirmed | | 2=Probable | |
| | | | | 3=Discarded | |
| | | | | 4=Suspect | |
| Final Classification for Measles | | 1= Laboratory Confirmed | | 2= Confirmed by Epidemiological linkage | |
| | | | | 3=Clinical Compatible | |
| | | | | 4=Discard | |
| | | | | 5=Suspect with lab pending | |
| Person completing form Name: | | Address: | | Signature: | |
| Title: | | | | | |
| Date form sent to LGA/: / / (Day/Month/Year) | | Date Form Received at LGA: / / | | Signature | |

APPENDIX C: IDSR Form 001B

Lab Specimen Collection/Reporting Form (for Immediate Case-based Surveillance) IDSR 001B

If Lab Specimen Collected

| | | | | | |
|---|--------------------|--------------|----------------------|---------------|--|
| <i>For Health Facility: If lab specimen is collected, complete the following information and send a copy of this form to the lab with the specimen.</i> | | | | | |
| Date of specimen collection: ____/____/____ | | | | | |
| Type of specimen: | Stool | Blood | CSF | Other/specify | |
| Date specimen sent to lab: ____/____/____ | | | | | |
| ID Number: _____ | | | | | |
| <i>For the Lab: Complete this section and return the form to LGA/ health facility or clinician</i> | | | | | |
| Date lab received specimen: ____/____/____ | | | | | |
| Specimen Condition: | Adequate | Not adequate | | | |
| Disease/Condition: | | | | | |
| Type of Test: | | | | | |
| Result: | + = Positive | - = Negative | P = pending | | |
| Malaria | P. Falciparum | | | | |
| | P. Vivax | | | | |
| Cholera (culture) | | | | | |
| Cholera direct exam; specify the method used: _____ | | | | | |
| Meningitis: N meningitidis | Culture | | | | |
| | Latex | | | | |
| | Gram stain | | | | |
| Meningitis: S. pneumonia | Culture | | | | |
| | Latex | | | | |
| | Gram stain | | | | |
| Meningitis: H. influenza | Culture | | | | |
| | Latex | | | | |
| | Gram stain | | | | |
| Shigella dysenteriae | Culture | | | | |
| | Type | SD Type 1 | Other Shigella types | No Shigella | |
| Result: | + = Positive | - = Negative | I= Indeter. | P=Pending | |
| Viral Detection | Yellow fever (IgM) | | | | |
| | Measles (IgM) | | | | |
| | Rubella (IgM) | | | | |
| | RVF (IgM) | | | | |
| | Ebola (IgM) | | | | |
| | Lassa (Ig M) | | | | |
| | Marburg (IgM) | | | | |
| | A/H5N1 (RT-PCR) | | | | |
| Other lab test (specify) | Results: _____ | | | | |
| Date lab sent results to LGA/health facility: ____/____/____ | | | | | |
| Name of lab sending results: _____ | | | | | |
| Other pending results: _____ | | | | | |
| Name of lab technician sending the results: _____ Signature: _____ | | | | | |
| Date LGA/ receive lab results: ____/____/____ LGA: _____ | | | | | |
| Date lab results sent to health facility by LGA: ____/____/____ | | | | | |
| Date lab results received at the health facility: ____/____/____ | | | | | |

MEASURE Evaluation

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