KNOWLEDGE, PRACTICES AND FACTORS INFLUENCING REPORTING OF NOTIFIABLE DISEASES AMONG HEALTH WORKERS IN TWO SELECTED RURAL AND URBAN LOCAL GOVERNMENT AREAS OF OYO STATE, NIGERIA

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A DISSERTATION IN DEPARTMENT OF EPIDEMIOLOGY AND MEDICAL STATISTICS,

SUBMITTED TO THE
FACULTY OF PUBLIC HEALTH, COLLEGE OF MEDICINE,

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

IN EPIDEMIOLOGY

of the

UNIVERSITY OF IBADAN

IBADAN, NIGERIA

MARCH, 2014

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CERTIFICATION

This is to certify that Oladeji Atilola Gbadamosi carried out this work in the Department of Epidemiology and Medical Statistics, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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DEDICATION

This dissertation is dedicated to the almighty God, who made the project possible from the onset to completion.

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ACKNOWLEDGEMENT

I hereby express my profound gratitude to my supervisor, Dr. M. D. Dairo for his guidance, patience and encouragement from the onset of this project to the completion. I also appreciate the contribution of Dr (Mrs) Adekunle, my maiden supervisor.

I appreciate encouragement and the contribution of the following Lecturers; Professor Afolabi Bamgboye, Dr. Akinola Fatiregun, Dr. Olufunmilayo Fawole and Dr. Adedokun (all in the Department of Epidemiology and Medical statistics , UCH, Ibadan. Also Dr. Ijidunola Kayode Titus (IKT), Dr. (Mrs.) Peju Esimai and Professor. Segun Faturoti (all in Department of Community and Social Medicine, OAU, Ile-Ife).Special words of appreciation to my lecturer and mentors; Professors A.R.K Adesunkanmi and O. Lawal.

I also express my deep gratitude to Dr. Azeez Aderemi (Directorate of Epidemiology, Federal Ministry of Health, Abuja FCT), Dr. M. O. Ogundeji, CEO, Primary Health Care and Health Management (PRIHAEMAC) Centre, Yemetu, Ibadan Oyo state.

The following colleagues were also appreciated. Dr. Tosin Onigbinde, Dr Oke, Dr. Dele Omidiran, Dr. Soji Isaac Ijidale, Dr Adebayo Olusegun and Mr. Femi Dipeolu.

Special appreciation to Dr. Bisi Ayoola, Oyo state Ministry of Health. Secretarial, Ibadan, Professor Antonette Ofili of Department of Community Medicine, University of Benin, Nigeria, Dr. (Mrs.) Olumide, Health Management, College of Medicine. Mrs. Ajuwon, Chief Librarian, Olatunde Odeku Medical Library, College of Medicine University of Ibadan.

The contribution and assistance of Mr. Nathaniel, Mr. Tony and Mrs. Yinka are appreciated.

The contribution of Prof Jesse Biodun Olegbayo was outstanding. I specially thank my Jewel of inestimable value, Oluseyi and our lovely children.

Above all I give all glory and honour to almighty God for giving me the patience, perseverance throughout the programme.

Oludeji Atilola OLABAMONI

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ABSTRACT

Reporting of notifiable diseases is essential for control and prevention of outbreak of diseases. In Nigeria, reporting of Notifiable Diseases by health workers has not been adequately documented. This study was conducted to assess health workers knowledge, practices, and factors influencing disease reporting in urban and rural communities in Oyo State, Nigeria.

A cross-sectional survey was carried out among the 210 health workers who were responsible for disease reporting at their health facilities. The 33 local government Areas (LGA) of Oyo State were stratified into rural and urban, out of which one rural (Afijio LGA) and one urban (Ibadan North LGA), were randomly selected. All the health facilities in Afijio (39) and Ibadan North (171) were included in the study. One respondent at each health facility (focal person) was then selected and interviewed. A semi-structured, self- administered questionnaire was used to obtain information on knowledge, practices, pattern and factors affecting reporting. The list of diseases included: immediate, routine, international and occupationally notifiable diseases. Knowledge was assessed on a scale of 50 points with score ≥30 as good. Data were analyzed using descriptive statistics, Chi square, t-test and linear regression.

Community Health Officers (30.1%), Nurses (26.0%) and Physicians (16.3%), constituted the majority of the respondents. Seventy-two percent (rural- 14.8% and urban- 57.1%) were aware of the existence of disease notification system while 26.5% knew the current strategy for reporting. Mean knowledge score for notifiable diseases among respondents was 27.6±8.4 with group means for rural and urban being 32.0±8.6 and 26.7±8.2 ($p<0.001$) respectively. About eleven percent (11.2%) of the respondents had good knowledge of the notifiable diseases. Majority (82.8%) of the respondents forwarded their routine health facilities reports to their respective LGA while 17.1% sent theirs to the Ministry of Health. Fifty-six percent of respondents sent reports through their staff while the rest had their facilities report collected by staff from State Ministry of Health and LGA. Main reasons for non-reporting included: lack of training on reporting (8.1.0%), absence of legal enforcement (58.0%), ignorance of reporting requirements (50.0%) lack of supervision (48.0%) and lack of reporting forms and telephone facilities

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(38.0%). Health workers that were aware of notification system were five times likely to comply with reporting than those that were not aware. (OR=5.0, 95% C.I = 1.5-17.5).

Reporting of notifiable diseases was poor among the health workers at the Local Government level in Oyo State. Lack of training on reporting, absence on legal enforcement and ignorance on reporting requirements were major influencing factors. Regular training, effective supervision and logistic support to all notifiable diseases reporting health workers are recommended.

Keywords: Notifiable diseases, health workers, reporting system.

Word count: 460

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LIST OF ABBREVIATIONS (ACRONYMS)

AFP	-	Acute Flaccid Paralysis
AFRO	-	World Health Organization Regional Office for African
AIDS	-	Acquired Immunodeficiency Syndrome
CHO	-	Community Health Officer
CHEW	-	Community Health Extension Workers
DSNO	-	Diseases Surveillance and Notification Officer
EEC	-	European Economic Countries
FGN	-	Federal Government of Nigeria
FMOH	-	Federal Ministry of Health
HIV	-	Human Immunodeficiency Virus
ISR	-	International Sanitary Regulations
IDSR	-	Integrated Disease Surveillance and Response
LGA	-	Local Government Area
MO	-	Medical Officer
MOH	-	Ministry of Health
ME	-	Monitoring and Evaluation
MRO	-	Medical Record Officer
STD	-	Sexually Transmitted Disease
STI	-	Sexually Transmitted Infection
SMOH	-	State Ministry of Health
SHMB	-	State Hospital Management Board

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UCH	-	University College Hospital
WHA	-	World Health Assembly
WHO	-	World Health Organization

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CHAPTER ONE

INTRODUCTION

Background information

Disease notification is the official reporting of cases of notifiable diseases to the appropriate designated authority (Oyediran, 1999). It is a system of constant monitoring of all aspects of occurrence, spread of diseases and use of information thus gathered for prevention and control. The number and types of notifiable diseases to be statutorily reported to the designated health authority in each country varies and it includes those under international health recommendations. They are also referred to as priority diseases because of their public health significance (Lucas and Gilles, 2003; WHO, 2000).

Globally, disease notification suffers a set back as diseases are generally under-reported. The extent and pattern to which this underreporting occurs varies. For example, in a study carried out by Dos Cmnpos and other researchers University physicians in 1991 in the United States of America showed that only 63% of reportable communicable diseases treated and documented at outpatient over a period of four months, were actually reported to the state local health department (Dos Campos, 1999). In 1994, a 5-year in-department report of situation analysis of notifiable diseases reporting in Nigeria between 1990-1994 by Nasidi and others showed that the rate of disease reporting had increased from 44% in 1990 to 74% in 1994. The same report showed that only nine out of thirty-six states of Federal Republic of Nigeria sent their complete report to the Federal Ministry of Health for documentation and necessary action (Nasidi, 1994).

Several factors had been documented as reasons for underreporting. Commonest are ignorance, lack of clarification on responsibilities and requirements on reporting as well as multiple reporting channels (Bawa, 2003; AbdoolKarim, 1996). A small proportion of underreporting can be explained by confusion of responsibilities of reporting patients with notifiable diseases among different health personnel involved in patients care. (Dos Campos, 1991)

In Nigeria, poor knowledge and ignorance of disease notification and surveillance system is partly responsible for the Yellow fever epidemics observed in many states of Nigeria in 1987 – 1990 (FMOH, 1999). The devastating effect of the yellow fever epidemic, which claimed more than a thousand of lives, led to the setting up of Usediran

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–led National Task force yellow fever disease control in 1990 (Oyewale, 2002). Also in Nigeria, disease notification had been observed to be weak and erratic with a lot of constraints and irregularities.

The earliest and the fairly well-established notification system was the disease surveillance and notification system (DSN) of 1990. The system recognized nine epidemic- prone notifinble diseases (DSN 001) and a list of other forty diseases which are of public health significance (DSN- 002) (Oyediran, 1999).

The Federal Ministry of Health of Nigeria, as a result of those constraints and irregularities of notification system on one hand and the WHO mandate to member states on another, introduced a new notification system; integrated disease surveillance and response system (IDSR) in May 2002 for all the states of Federation and Abuja Federal Capital territory. The development was also consequence upon mandate given by the World Health Organization African Regional Office to all member states in 2002 (WHO, 2002). Oyo state of Nigeria had commenced the new system since six years ago. The IDSR strategy had been further modified in 2010.

The responsibilities and requirements in reporting communicable diseases vary from one country to another among health workers in different countries. This include; (i) the nature of reporting requirements (ii) reporting sources e.g. physicians, laboratories and other health care providers (iii) method of reporting channels (mails, phone and (iv) definitions of case (Bawa, 2003). Physician plays a key role in communicable diseases reporting to the officially designated health authority. This should include illness either as a single case or epidemic form (Sobayo and Nwachukwu, 2005). In a study carried out in Benin, South Western Nigeria in 1999 among physicians in Government health institutions, Ofili, reported an abysmally low number of respondents (11.9%) who had good knowledge of disease notification (Ofili, 2003). In a similar local study carried out in Yobe State, northern Nigeria, among health workers in 2003, Bawa reported that only 38.2% of the respondents were aware of disease surveillance and notification system (Bawa, 2003). In that study, eighty five percent (85%) of the respondents who were aware of the reporting requirements listed lack of training among major factors affecting reporting.

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Hospital infection control officers and medical records officers in reporting in order to improve the process (Marrier, 1994).

Communicable diseases still remain one of the most common causes of death, disability and illness in Africa Region. Two of the three health released millennium development goals (Goals 4 and 6) address those diseases:

"Millennium development Goal '4': Reduction of childhood mortality of measles death being a major component and millennium development goal 6: combating HIV/AIDS, malaria, tuberculosis, and other diseases". The Big three: HIV/AIDS, malaria and tuberculosis; including epidemic-prone diseases, are important and pose a threat to human survival particularly in developing countries. It has been also observed that poor surveillance and notification system which had been attributed to inability to detect early warning sign of impending outbreak. It is one of the contributory factors to high morbidity and mortality (Abiose, 2009).

Effective disease notification and surveillance is germane to prevention and control of communicable diseases and epidemic in the communities. Attitude, knowledge and practice of health workers, saddled with this responsibility of reporting need be assessed especially in Oyo State where there is no such documented study since IDSR system became operational.

This study is therefore designed to assess knowledge, practice of notifiable diseases reporting as well as evaluating major factors influencing diseases reporting among health workers at the health facilities in two randomly selected local government areas of Oyo State of Nigeria. Findings of the survey will be disseminated to the Ministry of Health and all the 33 local government area councils in order to improve notifiable disease reporting and attempt to curb the frequency of disease outbreak.

1.2 Statement of the problem

In Nigeria, poor knowledge of disease notification and surveillance had been observed and documented several years back. This had led to the frequent disease outbreaks causing a lot of preventable deaths. Typical examples were the Yellow fever epidemic in Oju in Benue State and Ogbomoso in Oyo State during 1987 – 1990 Yellow fever epidemic (FMOH, 1996), and recent cases of cholera outbreaks in the country

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between 2009 and 2011 and Avian influenza incidents in the country that also led to preventable loss of lives among Nigerian populace.

Globally, disease notification suffers a set-back and underreporting is a major problem. In Nigeria prominent associated factors of underreporting are ignorance of reporting requirements and lack of clarity of reporting responsibilities. The physicians who play a key role in reporting are not an exception. The available documented studies revealed gross poor knowledge and non-reporting of physicians.

In addition, current reporting system i.e. The integrated disease surveillance and response system (IDSR) was mandated by World Health Organization in September, 1999 in Zimbabwe, in order to improve existing weakened surveillance infrastructural system (WHO, 2000). In Nigeria, IDSR came into force in May, 2002 by Federal Ministry of Health for the 36 States and Federal Capital Territory to implement. Oyo state of Nigeria implemented the IDSR about Six years ago. In many states of Nigeria that is currently practicing IDSR strategy, which include Oyo state, have no documented work on knowledge and reporting practice assessment of her health workers.

1.3 Justification for the study

Communicable diseases are the most common causes of death and illness in African Region and other developing countries of the World (WHO, 2002). In Nigeria, diseases such as Lassa Fever, Cerebrospinal Meningitis (CSM) and Measles continued to occur with increased frequency in epidemic proportion and produced highest case fatality rate. Some of the major causes of deaths are; Malaria, Diarrhea disease, Measles, pneumonia, (CSM), Tuberculosis, Cholera and Pertusis (National Technical Guidelines, 2000). Majority of these communicable diseases were implicated among prominent causes of under-five mortality in Nigeria. This causes include Malaria (24%), acute respiratory infection (20%), Diarrhea (16%), Measles (6%), HIV/AIDS (5%) and Neonatal causes (26%) (Grange, 2008). Many communicable diseases presents a serious threat to the well-being of Nigerians and some of the problems had been traced to ignorance and poor knowledge of disease reporting.

It has also been documented by many researchers in Nigeria that poor knowledge and ignorance of diseases notification process among health workers was partly

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responsible for many disease outbreaks (Oyediran, 1990). Ofili, (2002) and Bawa, (2003) in separate studies documented poor knowledge of notifiable diseases reporting among health workers.

Oyo State of Nigeria which was one of the states affected by yellow fever epidemic of 1987-1990 (Oghomoso ucn) and which had also been practicing the new reporting notification strategy (IDSR) has no known recent documented knowledge assessment study of her health workers. The IDSR reporting strategy, which was mandated by the World Health Organization (WHO) to her member states, was introduced and practiced in Oyo State since about six years ago. It was also part of the targeted objectives of the FMOH then that 60% of the state and local Governments Health workers must have been trained on IDSR strategy by 2010 (FMOH, 2008).

Effective disease notification and surveillance is germane to prevention and control of communicable diseases and epidemic in the communities. Attitude, knowledge and practices of health workers, saddled with the responsibilities of reporting, need be assessed.

In view of the public health significance of notifiable disease reporting in the prevention and detection of epidemic, especially in highly densely populated community like Oyo State, there is a need for this assessment on reporting practices.

1.4 Research questions

The Research questions are:

1. Is the knowledge of selected health workers in Oyo state on reporting notifiable diseases adequate?
2. What is the pattern of notifiable diseases reporting among health workers to the designated authorities.
3. What are the factors influencing effective notifiable diseases reporting in Oyo State.
4. Is there any comparison between rural and urban health workers knowledge.

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1.5 Aims and objectives of the study

1.5.1 General objective

To assess knowledge and practice of selected health workers from various health facilities in Oyo State on notifiable diseases reporting.

1.5.2 Specific objectives

1. To assess knowledge of health workers in selected rural and urban settings on notifiable diseases.
2. To document pattern of notifiable diseases reporting among health workers to the designated authorities.
3. To identify major factors influencing effective notifiable diseases reporting in Oyo State.

1.6 Hypotheses statement

1. There is no relationship between knowledge of selected Oyo State health workers and pattern of reporting notifiable diseases.
2. There is no relationship between practice of notifiable disease reporting to designated authorities and the place of selected health workers in Oyo State.

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CHAPTER TWO

2.0 LITERATURE REVIEW

Notifiable diseases are diseases in which by law cases must be reported to the appropriate health authority (Parks, 2002). Disease notification, an essential component of disease surveillance, is an indispensable public health practice in the control of spread of communicable diseases in the community. Disease notification is a source of surveillance data. It is the official reporting of specific diseases to the appropriate designated authorities (Oyediran, 1999). In every country, there is a list of certain communicable diseases, cases of which must be statutorily reported to a designated authority for prevention and control of epidemic. This is also known as priority diseases and it includes those under international recommendation. A specific number of such diseases are statutorily notifiable to the community physicians under the list recommended by the health authority that has such power (Mason, 1978).

2.1. Historical Background of infectious diseases and notification

Historically, notification of infectious diseases was the first health information sub-system to be established (Parks, 2002). In 1907, delegates from some European nations met in Rome and agreed that there was a need to coordinate and control epidemic-prone diseases. Subsequently, Office International d' Hygiene Publique was created. The office disseminated information in a monthly bulletin on the occurrence of selected diseases notably Cholera, Yellow-fever and Plague. In the succeeding years other diseases of public and international concern were added. The information was used to monitor the occurrence and progress of diseases under surveillance. Despite these coordination and monitoring, epidemics keep occurring and over thirty (30) new infectious diseases were reported by the World Health Organization in 1997. The earliest attempt to control spread of communicable diseases dated back to fourteen century when plague epidemic occurred in Venice in 1348 and later spread to Marseille in 1377. Isolation and quarantine were measures adopted by Venetian Republic authority to identify and exclude ships which had infected people on board (Dechlich 1994).

In the seventeen century, records of number and cases of death kept at the hall of Parish Clerks company which summarized data from London and adjoining parishes.

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The report which also includes extent of plaque in the capital was published in the weekly Bill of mortality morbidity report (WMMR) that was circulated to those that require it for action.

In 1662, John Graunt, conceptualized and quantified the pattern of diseases and related the numerical data in a population to the causes of the diseases. In 1741, Rhodes Island passed a bill requiring Caravan keepers to report contagious disease among their patrons. Two years later, the colony passed another law requiring reporting of Small Pox, Yellow Fever and Cholera. In 1833, Williams Farr, a medical statistician, who worked at the United Kingdom general office, developed data collection and interpretation for health action. He was adjudged the founder of modern concept of surveillance and first compiler of medical abstracts. Lamuel Shattuck published data in the United States of America National morbidity data collection on plaque, Small Pox and Yellow Fever. By 1925, all the states in the United States of America were reporting weekly to the US public Health Service. In 1907, Office International d Hygiene Publique was created and commenced information dissemination in which selected communicable diseases (Cholera, Plague, and Yellow Fever) were reported in the monthly bulletin (Thacker, 1993)

In 1950, Alexander Langmuir of United States of America promoted a new concept of monitoring diseases in the population. The department which monitors communicable diseases in the United States of America was changed to centre of disease control (CDC) some year. Subsequently due to further development on surveillance of communicable disease of international importance, an approval by the World Health Organization (WHO) Director General led to the creation of epidemiological unit of division of communicable disease at WHO headquarter in 1965. Disease notification and surveillance are interwined and often described together. Disease notification is a source of surveillance data.

In the middle of twelfth century, Alexander Langmuir described the concept of surveillance as a routine process of data collection, analyses and dissemination, watchfulness over the distribution and trends of incidence through a systematic collection, collation of morbidity and mortality report and other relevant data together with timely and regular dissemination to those that need to know. He further described

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surveillance as a branch of epidemiology that has developed into a discipline of its own in the last three decades. Its principles and methods have not been fully described hence reason for scarce literature review on the subject (Langmuir, 1994)

In 1968, in the World Health Assembly (WHA) Technical discussion, it was highlighted that the control and prevention of spread of disease was the principal objectives of surveillance. Diseases surveillance had been occupying a central position in disease control effort of man especially in the following areas: 1). Surveillance was used to determine areas of continued transmission and to focus spraying efforts in areas without malaria. However, surveillance data later showed re-emergence of malaria in many areas where there was control previously; 2). Surveillance serves as a compass (evidence-based action) for small pox eradication in the world. Small- pox had been eradicated with the notification and surveillance activity.

Principal Objectives of Disease Surveillance and Notification

Dechlich, 1994 described principal objectives and benefits of surveillance to include the following: 1). Describing the pattern of disease occurrence and to link with the public action through; a). Detecting acute changes in disease occurrence and distribution (epidemic); b). Identifying and quantifying trend and pattern of disease e.g. sexually transmitted diseases (STD); c). Observing changes in the agents, host and factors to assess the potential of occurrence example laboratory services e.g. influenza is a typical example; d). To detect changes in the health practice e.g. caesarean section; e). Disease investigation and control report of many notifiable diseases; f). Health services, practices, planning and eradication control measures e.g. measles's resurgence in the United States; g). The need for early recognition, new and re-surgence of infectious diseases has been illustrated by several recent outbreaks such as Ebola Virus in Zaire and Plague in India (Jacob, 1998).

Regulation and control of spread of notifiable diseases

International efforts to control spread of diseases were under certain World Health Organization (WHO)'s regulations. In 1948, measures were first reviewed, consolidated then adopted in 1951 as World Health Organization's Regulation articles no 2 as

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International sanitary regulations (ISR). These regulations covered the so called quarantinable diseases namely Plaque, Cholera, Yellow Fever, Small Pox, House Borne Typhoid and Relapsing Fever (WHO, 2000).

The International sanitary regulations was reviewed with certain diseases to be named international health regulations (IHR) articles 21(a) and (b) which include specific infectious diseases and conditions under international resources to control the spread of diseases (WHO annotated in 1969). The IHR 1969 narrowly focused on the government management and reporting of these three particular diseases (Cholera, Yellow Fever and Plaque). The IHR also requires disease reporting to WHO to help the world body with its global surveillance and advisory role. In recent year, there had been a number of disease outbreaks of international significance including most notably several Avian influenza incidence and in 2003, SARS.

The revised IHR was adopted at the World Health Assembly in May 2005 and entered into force on June 15, 2007. The World Health Organization (WHO) played an advisory role in monitoring and coordinating responses to these outbreaks. The regulations builds on WHO's experience that the most effective way of addressing public health threat of spreading of diseases is at their source in order to reduce their potential of spread. A requirement to rapidly assess and then notify WHO of events which might contributes a potential health emergence of international concern along with a flow chart (decision instrument) to assist countries make that statement. There is recognition that WHO may take into account information from un-officials as well as from official sources in forming its views about an emerging issue and that WHO may initiate investigations in conjunction with member states (United States Summary of Notifiable Diseases, 2007).

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Regulations and legal frameworks of infectious diseases notification

Public health laws expand to meet the need of the society. At present, there is a common recognition that public interest may in certain occasion justify a breach of confidentiality especially when the objective is to protect the public (Dechlich, 1994). Example is European economic countries (EEC) where medical profession in this country generally accepts the following exception from the principle of confidentiality:

When there is an overriding duty to the society.

When information is required by law.

When information is required for the purpose of research.

Of greater importance is the fact that certain measures of communicable diseases are impinging on the rights of individuals and also on patient, doctor- relationship. Statutorily, a number of diseases are notifiable by the local community physician to the health authority. Hence, there cannot be n binding confidentiality between doctor and patient. This statutory power goes further than this (Mason 1978). Carrier state of some communicable diseases is the most notoriously difficult to treat. Individual (Carrier) is perfectly well yet he is excreting pathogenic organisms. International health regulations (IHR) articles 21 (a) and (b) annotated edition were operating legal acts which were used to curb spread of diseases (WHO, 2002).

In Europe and Scotland, statutory powers to achieve control of communicable diseases were contained in Scotland acts 1897-1917. The coverage power was far and wide and far beyond ambit of individuals. There were also public health acts of infectious regulations 1908 (Mason, 1978). In India, there is Madras public health act (Parks, 2002) while in Nigeria, public health acts 1917, section 49 (1), 33, 28 (1) and 3 (13) are in place (Oyegbile, 1992).

The most important challenge to the control of the international spread of disease is the increased volume of air travel and traffic in large number of air passengers that could be infected or carrier of communicable diseases who get within how to another area. The extent and the spread of international travel facilitate exchanges of infections between areas of different levels of social and economic development and with varying environmental conditions. The surveillance of communicable diseases on an international or global scale is something more than the sum of national surveillance activities since it

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is concerned with the dynamics of the spread of the diseases from one country to another. Prompt and adequate reporting in the only prerequisite for the early recognition of the danger of spread of infection and taking necessary control measures (WHO, 2000).

Development and Organization of Notification and Surveillance System

Notification and surveillance of communicable diseases had undergone various developments and concepts over the years as a way of curtailing occurrence of epidemics. There are various national surveillance systems adopted by various countries with the World Health Organization (WHO) giving technical supports on control of spread of infectious diseases and conditions to its member states (WHO, 2000).

Before 1998, the Tanzania system consisting of National Health Information Management System (NHIMS). Tuberculosis/leprosy TBL, HIV/AIDS, Acute flaccid paralysis (AFP), surveillance for poliomyelitis, were those in existence. In Nigeria, a West African country, the earliest and the well-established surveillance and notification system was the disease surveillance and notification system (DSN 001 and 002). The system recognized epidemic- prone diseases which are nine items (DSN-001) also DSN 002 that has a list of forty (40) infectious diseases of public health significance. The DSN was the outcome of the task force recommendations of the yellow fever epidemic 1987 – 1990.

In 1891, in London, the statutory requirements for notification of certain infectious diseases first come into being. Cholera, Diphtheria, Small pox and Typhoid had to be reported by the head of the family or the Landlord to the local authority.

By 1899, this system of reporting spread to the rest of England and Wales in which the diseases statistics were collected by the Registrar-General Office. Thus was done along with birth, death and marriage data. The office was later known as the office of population census and surveys. Today, the main concern of the modern system is the speed in detecting possible outbreaks and accuracy of diagnosis is only secondary. In United Kingdom (UK), the statutory notification system for infectious diseases (NOIDS) 2010 – contains a list of 30 (thirty) notifiable diseases including leprosy. In 2002-2003 outbreaks, SAR was added as 31st in 1998, the World Health Assembly reviewed the global spread of infectious diseases and came out with a new recommendation.

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In 2000, World Health Organization African Regional Office offers a protocol for assessment of the infrastructure and logistics associated with recurrent outbreaks of infectious diseases in many developing countries (WHO, 2000). The system had been used to observe challenges in recurrent outbreak of epidemics occurring in developing countries. In Tanzania in 2000, the Ministry of Health introduced integrated disease surveillance and response system (IDSR).

In Nigeria and precisely May, 2002, the Federal Ministry of Health adopted the IDSR strategy and mandated all the thirty six (36) states and the Federal capital territory, Abuja to implement (FMOH, 2000). The integrated disease surveillance and response (IDSR) recognized three groups of infectious diseases or conditions – namely IDSR-001 consisting of five epidemic-prone diseases: Cholera, Measles, Cerebrospinal Meningitis, Viral Hemorrhaging Fever (Or Lasser Fever) and Yellow Fever. IDSR-002 consisting of 5 diseases targeted for elimination/eradication and IDSR-003 are other diseases of public health importance. This consists of diarrhea, dysentery, hepatitis, HIV/AIDS, malaria, onchocerciasis, pertusis, pneumonia, STD, tuberculosis, Buruli ulcer has been recently added. The goal of IDSR system was to improve local government area to detect and respond adequately to diseases and conditions that cause high rates of death and illness in the community. It also to provide a rational basis for decision making (WHO 2005). There are also specific occupational notifiable diseases.

In Nigeria, for instance, there is a list of eighteen (18) occupational notifiable diseases being recognized. They include lead poisoning, phosphorus poisoning, mercury poisoning, manganese poisoning, arsenic poisoning, aniline poisoning, carbon disulphide, benzene poisoning, chronic ulceration of the skin, dinthox, silicosis, pathological manifestation to radiation, toxic jaundice, toxic anaemia, tar, brich, bitumen, minerals oils and paraffin poisoning due to halogenased aliphatic hydrocarbon, compression air sickness, asbestosis (Azuru, 2003).

Reporting pattern of notifiable diseases

Notifiable diseases' reporting constitutes an integral part of public health practice and prevention of epidemics. The practising physician is the key to effective surveillance of infectious diseases that must ensure reporting to the appropriate health authority that

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has a broader perspective of illness in the community. Reporting may also come indirectly through hospital infection control practitioner and laboratory personnel. Documented efforts to improve communicable disease reporting suggested inclusion of laboratory personnel and utilization of standard case definitions at the health facilities. Marier, 1994, also suggested inclusion of medical record officers and hospital infections control practitioner in order to improve reporting (Marier, 1994).

The rates and pattern of communicable disease reporting varies among researchers in various communities and on different diseases. In a study carried out by Dos Campos and other researchers by University physicians in 1991 in the United States of America showed that only 63% of reportable communicable diseases treated and documented at outpatient over a period of four months, were actually reported to the state local health department (Dos Campos, 1991). In a related study by Royl Clearc in 1967 on physician attitudes toward reporting venereal diseases, survey, showed that the results observed two groups of physicians, those that faithfully report each case of venereal diseases they treated and those that do not report.

In 1994, a 5-year in-depth report of situation analysis of notifiable diseases reporting in Nigeria between 1990-1994 by Nasidi and others showed that rate of disease reporting had increased from 44% in 1990 to 74% in 1994. The same report showed that only nine (9) out of thirty six states of Nigeria sent their complete report to the Federal Ministry of Health for documentation and necessary action. In a study carried out by Ofili, in Benin city, Western part of Nigeria in 1999 among physicians in government hospitals, observed an abysmally low number (11.9%) of physicians that had good knowledge of disease notification (Ofili, 2003). Bawa, et.al., (2003) in a related study carried out in Yobe state, Northern part of Nigeria among health workers, found out that only thirty- eight (38.2%) of respondents were aware of disease surveillance system (Bawa, 2003).

In England and Wales, doctors have statutory duty to notify a "proper officer" to the local authority of suspected cases of certain infectious diseases. The list consists of thirty notifiable diseases including leprosy. The registered medical practitioner in England and Wales, have statutory duty to notify a "proper officer" to the local authority of suspected cases of certain infectious diseases. The registered medical practitioner

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(RMP) normally fill out a notification certificate immediately on diagnosing suspected notifiable diseases. This certificate is to be sent to the proper officer within three days or verbally within 24 hours if the case is considered urgent. Thereafter, the proper officer who are public health clinicians called consultants in communicable diseases control pass on to the entire notification to Health protection Agency (HPA) or health protection unit (HPU) (Beck, 1994)

In a study carried out in South Africa among physicians, Abdool Karim, Dilraj et al., (1996) reported overall poor knowledge of physicians on notifiable diseases. A similar study in Sri-Lankan revealed that only few of those that are aware of diseases notification knew their importance. In Northern Ireland study showed that despite varying experience, junior doctors in accident and emergency department which diseases were notifiable by statute. Another study conducted in large health district hospitals in Wales found that 82% of 176 hospital Doctors new legal obligation to notify these diseases. However, over a third of those surveyed did not know that food poisoning and tuberculosis were notifiable

Organization, structures, principles and methods of disease notification and surveillance

Thacker, 1993 described four systems of reporting namely:

Notifiable disease reporting

Laboratory-based surveillance

Hospital-based and

Population-based surveillance

Jean-Claude Desenclos et al. (1993) classified surveillance system as follows:

Mandatory notification: involves those diseases or conditions which must by law be reported to health authorities by physicians (on a named basis with patient anonymity or a prerecorded identifier)

Voluntary: There is legal obligation but physicians, laboratories and other agreed to notify on a collaboratory basis

Sample Based: A voluntary system for which data are obtained from a selected samples of doctors (sentinel physician) services such as STD clinics or laboratories for examples

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or a population that is evaluated regularly e.g. HIV/AIDS survey in Nigeria and Tanzania that are regularly carried out.

The Basic chains of events are:

Identification of sources of Data

Data collection and analysis

Data dissemination

Identification of sources of Data: These sources will depend on socio-economic condition (medical facilities and personnel and a number of specific diseases brought under surveillance at any given time)

In its simplest form, such structure or information would be a single disease to a complicated type which could involve network of medical monitoring unit seeking with a large number of communicable diseases. In most cases and countries, surveillance activities are based on structures lying between the two.

In 1968, the World Health Organization (WHO) published ten key sources of surveillance data which are regarded as the traditional sources: they include:

Mortality and morbidity data

Epidemic reporting

Case reporting

Epidemic field observation

Survey

Animal reservoir

Vector distribution studies

Demographic data

Environmental data

After 1968, other sources include Hospital and medical care statistics, General practitioner, public health laboratories reports, disease registrars, drug and biologic utilization, absenteeism from school health and general population studies and newspaper reports. Sources of data are usually based on in-patient and outpatient registrars including data like Age, Sex, Address, patient's nose, diagnostic treatment as well as outcome (Dechlicks, 1994).

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In Nigeria, the following nine (9) major sources of health data have been identified:

Health facilities

Primary Health Care department of local government

Ministry of Health

Federal Office of Statistics (FOS)

National Population Commission

Health Related ministry

United Nations

Multilateral agents

Religious organizations

Research institutions

Health facilities (private and public) are, however, very important sources of health data in Nigeria. Such facilities ranges from health post, health centres, specialists and teaching hospitals (Oyegbetu, 1992). Laboratory sources are important in isolating, identifying and confirming characteristics and reports of pathogens of National public health importance especially STD, HIV/AIDS, Poliomyelitis.

Data Collection: The collection of data is the most important. It is costly and difficult component of surveillance and notification system. The quality of surveillance system is only as good as the quality of data collected. This aspect of quality include sources of information, identifier, diseases covered, case definitions, variables collected, type of report (individual or summary), periodically of reporting (daily, weekly, monthly) analysis, dissemination and evaluation. They also include case definition, usefulness, sensitivity, completeness, timeliness, representativeness and acceptability. Usually a standardized country reports, summarizing the findings, were sent to the official representativeness for correction before disscimination. A major challenge in data collection and analysis in developing countries is the establishing of a denominator data in the target population. This is usually because regular and acceptable censuses are not taken. Uniformity and reliability of surveillance data are also ingredients of data collection. Case definitions are important in order to know or identify disease and improve sensitivity. The publication of case definitions to all participants is essential and

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is done in many developing world with technical assistance of the World Health Organization. Case definitions must be simple and understandable (F.M.O.H 1994)

Timeliness and completeness: This is the periods within which data are collected and submitted to the designated authority (timeliness). The specific numbers of data to be submitted to the authority within a particular stated period of time (completeness) are essential feature of a good notification system. There is unusual delay of notification data that lead to frequent outbreak in many African Countries. This delay of data submission could be in months and span between 3 months to 6 months. In 1992 for instance, Niger State in Nigeria was reported not to have sent report at all in the data collected on annual communicable diseases reports nationally. Incomplete reporting is also a commun feature in many developing countries. Factors which affect data collection and treatment, among others include, duration, ease of collection (such as clarity, simplicity, reporting requirements for only important information and exclusion of ambiguities (Nasidi.1994)

Feedback on report: Disseminating findings to those who primarily generated data is vital to the operation and success of surveillance

Regular training, provision of basic working tools/items to work with (calculator, telephones, facility, writing materials, reporting forms as well as regular stipend are mandatory to the success of notification system (F.M.O.H,1990)

Personnels: The number and the right type of personnel to handle surveillance data are in short supply in many developing countries. Also, where trained health data personnel are transferred, he or she is not taken to the appropriate place where the service could be effectively used. The consequence or outcome of such is lack of satisfaction, incomplete entries, and non-entries (F.M.O.H, 2002).

In rural areas, personnel shortage is more acute and supervision is less. There is also problems of reliability and validity of data. In terms of quality, urban health institutions produce better than rural areas (F.M.O.H, 2002)

Data Analysis: This is a very vital aspect of reporting. It begins at the health facility level. In the data analysis, health workers need to know how many cases occur, where and when cases occur, the affected population at risk and factors that contributed to the transmission of diseases. Analysis book need be kept and simple tables, graphs, spot

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maps of priority diseases need be displayed on the wall of health facility. Analysis is usually done in terms of time, place and persons.

Data Dissemination: The health authority should disseminate all relevant facts and conclusions oo collected data to those who submitted the basic data and to others who need to know (i.e. decision maker). The result should be published and distributed to local, regional health offices, health facilities and workers on a regular basis and at interval whose frequency depends on its particular needs. The distribution should extend nationally, to neigbouring countries and international agencies. This is because the spread of disease globally is usually via international borders. Feedback is vital to reporting of communicable disease. Feedback enables its testing against empirical experiences of health management team and the community. In Nigeria, one of the biggest obstacles to be overcome in putting an emergency preparedness system in place is the extreme long lag time before data passes from the periphery to the Central (Federal Ministry of Health, [FMoH], 2008). Health workers resent being treated mainly as data generators and concentrating on timeliness on reporting exclusively could lower morale of workers and impair the usefulness of the system for management at the lower levels. It has also been observed from a number of countries that the quality, comprehensiveness and timeliness of reporting increase markedly when data is perceived locality as needed for health services management. The emphasis here is to stress the promotion of the principles of use of data at the level at which it is geocrated. In Nigeria, for instance, the exchange of data among the three levels of governments should be encouraged (FMoH, 2008).

Information flow chart on integrated diseases surveillance and response

A standardized information pattern and gathered data is usually treated in a defined pattern in all surveillance systems and countries in order to achieve its objectives and goals. Information on priority diseases and collection are based on case definition of the diseases.

Sources of data which are usually based on in-patients, outpatient's registers include data like age, sex, address, patient's nos, diagnosis treatment as well as outcome. The form of action taken would also depend whether disease in question is epidemic-prone disease, those noted for eradication/elimination or of public health importance

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Epidemic-prone diseases are reported within 24 hours by the health workers and by the fastest means to the designated health authority. Thereafter, investigation and confirmation begins. Information on epidemic prone is reported weekly using reporting forms and is forwarded to the local government area (LGA) while other priority diseases are completed monthly and quarterly for tuberculosis and leprosy (National Health Survey, 2002). The point of collection of data/information is usually a health facility. Sample analysis is expected to be carried out at this level to keep the trend lines of priority diseases and also to know the thresholds for action. The collected forms are collected periodically at the LGA/province level (timeliness) to the epidemiological unit where a disease surveillance and notification officer (DSNO) carry out data analysis which is usually done in terms of time, place, persons, (age, sex) distribution pattern of the case as well as population at risk).

The flow chart is essentially both vertically and horizontally. Vertical in terms of flow higher to lower [and vice-versa] and horizontally in linkage to other units or departments that require information for programming, planning and action e.g. department of monitoring and evaluation unit sends copies to epidemiological, Research Statistics and Planning Units as well as other copies to health facilities that comes to LGA then to states. Feedback is sent to upper and lower levels of linkage of primary, secondary and tertiary levels.

In Nigeria, for instance, the Federal Ministry of Health guidelines requires that a medical officer in charge of general hospital within a local government area primary health care management committee should serve on hospital management boards in order to enhance the flow of information and promotion of functional integration between the two systems (FMOH 2002).

Principal usefulness of diseases notification and surveillance

Includes:

Detecting an impending epidemic and taking preventive/control measures, use of data for planning, evaluation and determining effectiveness of control programmes (Oyediran et al 1999). In Nigeria, Oyewole documented that there is a discrepancy between official

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notification reports and epidemiological investigation findings (Oyewale, 2002) Uses of notification include;

Monitoring programmes

Detection of infections

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CHAPTER THREE

METHODOLOGY

3.1 Description of study area

The study was carried out in Ibadan North and Afijio LGAs of Oyo State of Nigeria between February and May, 2010. Oyo State was created from former Western State of Nigeria. Ibadan is the capital city of Oyo State. Some of the major towns and cities are; Oyo, Ogbomoso, Iseyin, Kishi, Oke-iho, Saki, Eruwa, Lanlate, sepeteri, Iora, Awe, Ilero, Igbeti, Igboho, Afijio and Igbo-Ora. It has a landmass of 27, 247 km^2. It is bounded in the South by Ogun state, in the North by Kwara State, in the West by Ogun State and Republic of Benin and in the East by Osun State. Oyo State has a population of 5,591,589 (NPC, 2006 census). It is inhabited by the Yorubas and other ethinic groups: the Ibos, Hausas, Fulanis and foreigners.

About 65% of the population live and work in rural area. The main occupation is Agriculture and is responsible for about 70% of the revenue generation. However, the people of the state also engage in trading and mining.

The climate is equatorial, notably with dry and rainy seasons with relatively high humidity. The dry season last from November to March while the rainy season starts from April and ends in October. Average daily temperature ranges between 25° C (77°F) and 35° C (95°F) almost throughout the year. The climate in the State favours the cultivation of crops like Maize, Yam, Cassava, Millet, Rice, Plantain, Cacao tree, Palm trees and Cashew.

There are thirty-three (33) local government areas in Oyo State. They are categorized into three; rural, urban and semi-urban (Federal Office of Statistics, 1993). Twelve of the LGAs were in urban, twelve in rural and nine in semi-urban (Appendix 4). There are 1560 registered, complete and functioning health facilities (Oyo SMOH, 2007), in the state comprising of local, state and federal government owned health institutions as well as private hospitals. About half (786) of the health facilities are in the urban local government areas while the rest are in the rural communities. Health workers with the highest medical qualifications or senior in rank administer each of the health facility. Health workers include doctors, nurses, midwives, Pharmacists and pharmacy

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technicians, laboratory scientists and technicians, community health officers, community health extension workers, physiotherapists, medical record officers, nutritionists etc

In each local government area (33 LGAs) in the state, a health personnel is assigned the responsibility of coordination, collection and summarizing notification and surveillance data from all the health facilities. They are referred to as Disease Surveillance and Notification officers (DSNO). They also work in conjunction with other health assistants who coordinates the work at ward level (called local persons) covering specified number of health facilities in each LGA.

Reports of activities of local persons get to the monitoring and evaluation unit as well as epidemiological unit in each LGA and feedback reports are periodically sent to those who primarily generated the reports at the health facilities level. From the LGA, reports subsequently get to the State Ministry of Health (epidemiology, research, planning and statistics units from where further copies get to the Federal Ministry of Health Epidemiological Division (vertical feedback). Other units at the state level also receive copies of such data (Horizontal feedback). Collection, coordination, interpretation and appropriate action take place at the various levels. There are periodical feedback and action.

3.1.1 **Ibadan North Local Government Area:** It is an urban setting. It is heavily populated and covers a large espanse of land with area of about 132.5m² with a population of 316,612 (NPC, 2006). The LGA has 12 political wards with six (6) state owned health facilities, 11 primary health centres, maternity and 157 private health institutions. It also houses the premier University of Ibadan and apex hospital University College Hospital (UCH). The Polytechnic Ibadan and other institutions.

3.1.2 **Afijio Local Government Area:** Is one of the 33 LGAs and is rural. Jobele is the headquarter and the LGA covers land area of 685.585m² with estimated population of 136,461 (male 71,964, female 68,133 [NPC, 2006]. It is located in the South Eastern part of the state. It has ten (10) political wards with two state owned health centres, maternity centre and thirty-six private institutions.

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3.2 Study Population

The study population was focal persons or designated staff for disease reporting in selected registered health facilities in Ibadan North and Afijio local government areas of Oyo State.

3.2.1 Inclusion criteria: Health workers designated for disease reporting in the selected registered Health facilities in Oyo state directory.

3.2.2 Exclusion criteria: Health workers not responsible for disease reporting outside registered health facilities.

3.3 Study Design

The study is a cross-sectional in design

3.4 Sample Size Determination

The minimum sample size for this study was obtained by using the formula,

Sample size,

$n = Z^2 pq / d^2$

where n = the sample size required for the target population of health workers

Z = Percentage of point in 2-sided normal distribution and correspond to level of significance (alpha error) = 1.96

P_1 = proportion of health workers that are aware of disease surveillance and notification (DSN) process in the rural area

q = Proportion of health workers that are aware of DSN process in urban area

d = precision of the study, d=0.07

z = Percentage of point in 2 sided normal distribution and correspond to the level of significance (alpha error) = (1.96)

By substitution in the above sample size formula,

Yoke State study finding for health workers that are aware of disease notification was 38% i.e. p =0.38 q= 1-0.38

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Therefore, q =1-p, i.e. the proportion of the health workers that are aware of disease notification in urban area q =1- 0.38= 0.62.

Therefore, sample size =n

n= 1.96 x1.96 x0.38 x0.62/0.07x0.07

= 185.08

Adjustment for non-response

An adjustment for a minimum non- response among respondents is anticipated. A minimum of 10% of required sample size is estimated (n=185.08) which is approximately 19. Therefore, N= sample size required plus minimum non -response is 185.08 + 19 =205

3.5. Sampling Technique

A stratified random sampling procedure was used to select respondents for the study, thus:

Stage One: A sampling frame of the 33 LGAS of Oyo State Local Government Areas was Prepared and stratified into rural and urban areas. One rural one urban LGAs were randomly selected by simple balloting.

Stage Two: All the registered health facilities in the selected rural and urban LGAs were included in the study. A health worker responsible for disease reporting or designated staff in each health facility was interviewed.

3.6 Study Sites

The study sites are Ibadan North and Afijio Local Government Areas of Oyo State of Nigeria.

3.7 Data Collection Tool (Questionnaire)

A self-administered, semi-structured, questionnaire was used to collect data for the study. It was pre-tested in 10 health facilities in Lakelu LGA (non-participating LGA) in Oyo State and 10 health facilities each in Ayedire and Iwo LGAS in Osun State. The Questionnaire was developed from review of relevant literature (FMOH, 2002, WHO, 2003) and further reviewed by a senior epidemiologist and two colleagues. It included sections and variables (dependent and independent) on socio-demographic

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characteristics, knowledge, reporting practices and major influencing factors on disease reporting. Independent variables included; age, sex, marital status, ethnic group, occupation, year of experience and type of health facilities. Dependent variables included knowledge of awareness of surveillance and notification system, awareness of current notification system (IDSR), knowledge on the fifty-notifiable diseases, uses of surveillance and notification data, frequency, pattern and means of sending health facility reports to LGA/ MOH, assessment of knowledge on understanding of ten-selected notifiable diseases case definitions and major factors for non- reporting notifiable diseases. Most of the questions in the questionnaire were close-ended with few open-ended (see appendix 3).

3.8 Validity and Reliability of the Instrument

3.8.1 Validity. This is the ability of a test to measure what the researcher plan to measure. The instruments were pre-tested in Lagelu LGA in Oyo State. Observed ambiguities were corrected and a preliminary analysis was carried out before administering the questionnaire for the main study.

3.8.2 Reliability. This is repeatability, reproducibility and consistency of the information. Questionnaire was pre-tested to validate questions. Random samples of questionnaire were also checked for completeness, consistency and accuracy. A test-retest method was used on twenty (20) health workers in the two LGAs. The questionnnires were distributed to the twenty health workers in the two LGAs and collected same day. All the Questionnaires were well kept in a locked cupboard for the purpose of safety and retrieval for data cross checking.

3.9 Data Management and analysis

Supervisor and peer edited questionnaires and collected data were safely kept under lock and key. Information obtained from this study was kept in a pass worded computer.

Data were entered into computer software, Statistical Package for Social Sciences (SPSS – 16) for analysis. Statistical tests: Chi square test for testing associations on

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dependent variables. Results were analysed using frequency distributions for categorical variables and mean, median and standard deviation for quantitative variables.

3.9.1 Knowledge grading

Respondents' knowledge on notifiable diseases was assessed on three scales. The knowledge statement questions were outlined in questions 15th (contains eleven sub-questions), 16th (has twenty-one sub-questions) and 17th of the questionnaires (eighteen sub-questions) totaling 50 questions in all. Two marks was awarded for each correctly answered questions to make up 100%. Responses to questions with correct or appropriate option were scored two full marks while wrong or inappropriate response was scored 1 or 0 respectively. Respondents were graded as follows: ≥40 (very good), 39-30 (good), 29-20 (average) and <19 (poor), (b) For immediate notifiable diseases ≥ 9 (good), 8-6 (average), 5-3 (fair) and <2 (poor).

3.9.2 Dissemination of Results

The results of the study will be disseminated to the health administrators (permanent secretary and directors in the MOH) and policy makers of health in the state.

3.10 Ethical Approval

Ethical approval and official permission to carry out the study was sought from Oyo State Ministry of Health, Secretariat, Ibadan (Appendix 3). Respondents from health facilities were approached and well informed on the study. Copies of questionnaire with the attached informed consent (appendix 1) were distributed and collected.

3.11 Limitations of the study

The study excluded health workers such as Traditional Birth Attendants (TBA) and village health workers (VHW) whose operation is outside surveillance. These workers were not assessed.

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Non-response rate:

Some challenges met included: questionnaires that were not completely filled and very few were not returned. The bulk of questionnaires that were completely returned and well filled were those analysed which made up the total number attested to in the study.

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CHAPTER FOUR

RESULTS

The survey findings are presented as follow:

- The results of the survey on Health workers socio-demographic characteristics; Age, Gender, Marital status, Professional distribution and type of health facilities.
- Results of the assessment of health workers knowledge on notifiable diseases; (a) (i) Routine (ii) immediate (iii) traditional and (iv) occupationally- notifiable diseases (50-Notifiable diseases) (b) (11 - immediate notifiable diseases.
- The result of findings on reporting practices of notifiable diseases among rural and urban health workers to the designated health authorities.
- The results of findings of the identified major factors influencing notifiable disease reporting among rural and urban health workers.
- Comparisin of knowledge between rural and urban health workers.

Socio-demographic characteristics of the study population;

Table 4.1 shows distribution of age, marital status and type of ownership of health facilities of the study population. The total number of respondents studied was one hundred and ninety six (196) out of which 35.7% were between age 40-49years with mean age 41.0 years. Of this proportion, 84.3% were from Ibadan North LGA and 15.7% were in Afijio LGA. Majority (65.0%) of the respondents were females. Above three-quarter (79.6%) of the respondents had married prior to the time of study in which 128(82.1%) were from Ibadan North while 28 (17.9%) were from Afijio LGA. Majority 119(60.7%) of the respondents surveyed were from public health facilities of which 90(75.6%) of them were from Ibadan North LGA (Table 4.1). The three-top list of professionals who participated in the study were: Community Health Officers (38.7%), Nursing officers (32.7%) and Medical Officers (16.3%). Others included Medical Laboratory personnel (6.0%), Medical Record Officers (4.0%) and Physiotherapists (2.0%) (Figure 4.2).

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Table 4.1 Socio-demographic characteristics of study population (N=196)

Variables	Afijio LGA	Ibadan North	Total
Age in years	Freq. n (%)	Freq. n (%)	Freq. N(%)
20-29	3(12)	22(88)	25(100
30-39	9(15.3)	50(84.7)	59(100)
40-49	11(15.7)	59(84.3)	70(100)
>50 years	10(23.8)	32(76.2)	42(100)
Marital status			
Single	1(3.3)	29(96.7)	30(100)
Married	28(17.9)	128(82.1)	156(100)
Separated/Divorced	4(40.0)	6(60.0)	10(100)
Ownership of Health facilities			
Public	29(24.4)	90(75.6)	119(100)
Private	4(5.2)	73(94.8)	77(100)

N.B: Numbers of respondents in study represent a unit of health facility

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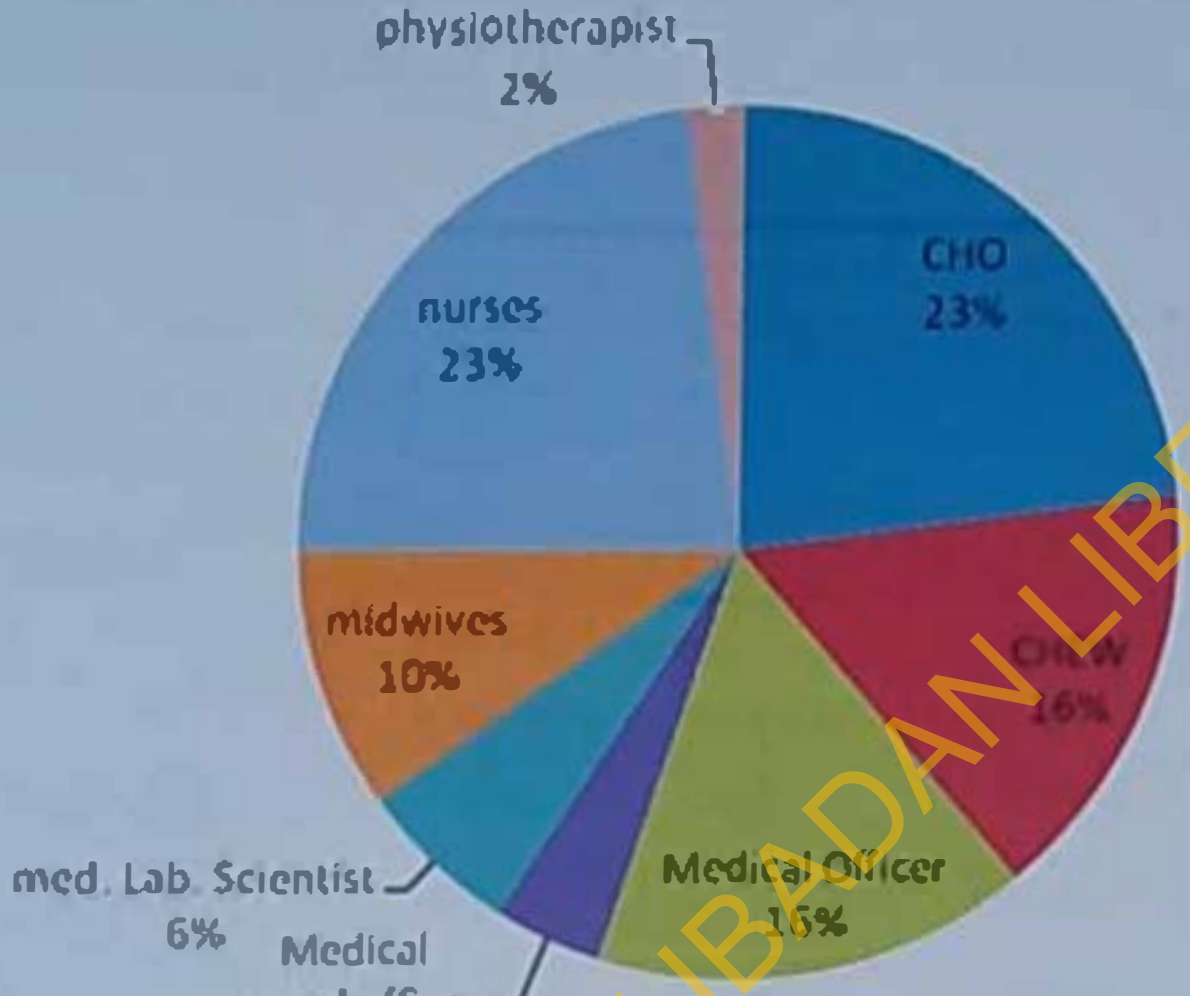

Figure 4.1: Respondents' professional job description

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4.2 Comparison of awareness of disease surveillance with study location of the Respondents

Table 4.2 shows result of knowledge of disease surveillance of health workers when computed with the study locations. Majority 141(71.9%) of the health workers were aware of the existence of disease surveillance of which (79.4%) were from Ibadan North LGA (urban).

Table 4.2 Comparison of awareness of disease surveillance with study location of the respondents

Study Location	Awareness of Disease Surveillance			Chi-square
	Yes	No	Total	
	Freq. (%)	Freq. (%)	Freq. (%)	
Ibadan North LGA	112(68.7)	51(31.3)	163(100)	$\chi^2 = 13.167$
Afijio LGA	29(87.9)	4(12.1)	33(100)	P-value = 0.001
Total	141(71.9)	55(28.1)	196(100)	

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Respondents' knowledge of current surveillance system

Table 4.3 shows the respondents knowledge of current reporting system. Less than half (26.5%) of the respondents confirmed that they were aware of the current disease reporting system (IDSR) of which 39.4% of them were from Afijio LGA and 60.6%% were from Ibadan North.

A considerable number of the study population (35.7%) were still using the old method of reporting (DSN) as the time of study (p=0.03).

N.B. Respondents' knowledge about current disease surveillance was scores based on the number of the respondents who declared their awareness and never aware.

Table 4.3 Health workers knowledge about different types of current disease surveillance

Study Location	Types of surveillance system				Chi-square
	DSN Freq. (%)	IDSR Freq. (%)	Don't know Freq. (%)	Total Freq. (%)	
Afijio LGA	14(42.4)	13(39.4)	6(18.2)	33(100.0)	χ^2 = 7.002
Ibadan North LGA	56(34.4)	39(60.6)	68(5.0)	163(100.0)	P-value = 0.03
Total	70(35.7)	52(26.5)	74(37.8)	196(100)	

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Level of knowledge of Health workers on the notifiable diseases

Table 4.4 shows the assessment of level of knowledge of health workers on the 50-notifiable diseases with study locations of respondents. Very few (11.2%) of the respondents in the study had good knowledge of notifiable diseases with higher number of Ibadan North LGA workers. Of those that were graded good knowledge, respondents from Ibadan North LGA had a higher value (Table 4.4 and chapter 3.9.1)

Table 4.4: Level of knowledge of health workers on the notifiable diseases

Location	Knowledge of notifiable diseases				
	Good Knowledge Freq. (%)	Average Knowledge Freq. (%)	Fair Knowledge Freq. (%)	Poor Knowledge Freq. (%)	Total (%)
Alijio LGA	8(24.2)	16(48.5)	8(24.2)	1(3.1)	33(100.0)
Ibadan North LGA	14(8.6)	75(46.0)	68(41.7)	6(3.7)	163(100.0)
Total	22(11.2)	91(46.4)	76(38.8)	7(3.6)	196(100)

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4.5 Knowledge of immediate notifiable diseases

Table 4.5 shows percentage distribution of health workers knowledge of immediate notifiable diseases. The five top from the list of notifiable diseases identified by the respondents were Poliomyelitis (Acute Flaccid Paralysis (83.1%), Cholera (73.0%), HIV/AIDS (59.7%), Cerebrospinalmeningitis (45.0%) and Yellow Fever (45.0%). Similarly, respondents from Ibadan North LGA could better identify each of the diseases in question than their counterparts from Afijio LGA (Table 4.5).

Table 4.5 Knowledge of immediate notifiable diseases

Immediate Notifiable Disease	Afijio LGA	Ibadan North LGA	Total	Relative
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Cholera	25(17.5)	118(82.5)	143(100)	73.0
Cerebrospinal Meningitis	19(21.3)	70(78.7)	89(100)	45.0
Yellow fever (lassa)	15(17.2)	72(82.8)	87(100)	45.0
Viral Haemorhaghic Fever	3(15.8)	16(84.2)	19(100)	9.7
Anthrax	4(26.7)	11(73.3)	15(100)	9.7
Rabics (Human)	2(28.6)	5(71.4)	7(100)	3.6
Plaque				
Typhoid	4(6.9)	54(93.1)	58(100)	7.7
Paratyphoid	2(13.3)	13(86.7)	15(100)	7.7
HIV/AIDS	26(22.2)	91(77.8)	117(100)	59.7
Acute Flacid (Poliomyelitis)	26(15.9)	138(84.1)	164(100)	83.1

Multiple responses

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Knowledge of health workers on immediate notifiable diseases and study population

Table 4.6. shows distribution of health workers on knowledge assessment of immediate notifiable diseases. Less than half of the respondents that took part in the study had good knowledge of the immediate notifiable diseases (40.8%) of which 66.7% of them were from Afijio LGA and 33.3% from Ibadan North LGA. Among the respondents that were graded (average and fair) in knowledge, 55.8% and 8.6% respectively, Ibadan North LGA worker had the higher value. With this result, it was shown that was association between knowledge of notifiable diseases and the location of the respondents. This depicts that urban dweller have better accessibility and adoption of innovation than rural dwellers which could be result of distance to information devices.

Table 4.6 **Relationship between knowledge of notifiable disease and the study population location**

Location	Knowledge				Chi-square
	Good Knowledge Freq. (%)	Average Knowledge Freq. (%)	Fair Knowledge Freq. (%)	Total Freq. (%)	
Afijio LGA	22(66.7)	11(33.3)	0(0.0)	33(100)	$\chi^2 = 11.23$
Ibadan North LGA	58(33.3)	91(55.8)	14(8.6)	163(100)	P-value = 0.002
Total	80(40.8)	102(52.0)	14(17.2)	196(100.0)	

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Knowledge of case definition for ten selected notifiable diseases

Figures 4.3 depicts outcome of knowledge assessment of respondents on the ten(10) selected notifiable discuses. The five top diseases on the list as identified and well understood notifiable diseases included, Malaria (84.2%), Cholera (79.6%), Measles (71.4%), Hepatitis (61.2%), Poliomyelitis(Acute Flaccid Paralysis) (52.0%), Neonatal Tetanus(48.9%). Others were Yellow fever (18.3%) Cerebrospinal meningitis (16.7%), Leprosy(16.3%) and Dracunculiasis (11.2%) (see figure 4.3)

Figure 4.3: Knowledge of case definitions for notifiable diseases

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Respondents' knowledge on use of surveillance data

Table 4.7 shows percentage distribution of health workers on the use of surveillance data. Most of the respondents that declared that they used the surveillance data were from Ibadan North and based on the items considered such as pattern of disease occurrence (84.7%), Record purpose (83.2%); Institute preventive measures (82.8%); Monitoring of control programme (82.5%), Notification to higher centre (82.3%) and Prevention of epidemic (82.0%) in that descending order. High response rate in both groups shows understanding in the use of notification data.

Table 4.7: Respondents knowledge on use of surveillance data

S/N	Purpose of notification and surveillance	Afijio LGA No&%	Ibadan North LGA No&%	Total No&%	X^2	p-value
1	Pattern of disease occurrence	24(15.3)	133(84.7)	157(100)	2.527	0.213
2	Institute preventive measures	27(17.2)	130(82.8)	157(100)	2.542	0.092
3	Prevention of epidemic	31(18.0)	141(82.0)	172(100)	1.521	0.468
4	Record Purpose	29(16.8)	144(83.2)	173(100)	5.061	0.002*
5	Notification to higher centre	31(17.7)	144(82.3)	175(100)	0.430	0.552
6	Monitoring of control programme	29(17.5)	135(82.5)	166(100)	11.805	0.003*

*Significant (<0.05)

Multiple Responses

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Pattern of forwarding health facilities reports to higher authority

Figure 4.3 shows pattern of reporting practice of notifiable diseases to the higher authority (LGA/MOH) by the respondents. Eighty-three percent (82.9%) reported directly to Local Government authority (epidemiology unit), eleven percent (11.6%) sent reports to the Ministry of Health while (5.4%) sent to others.

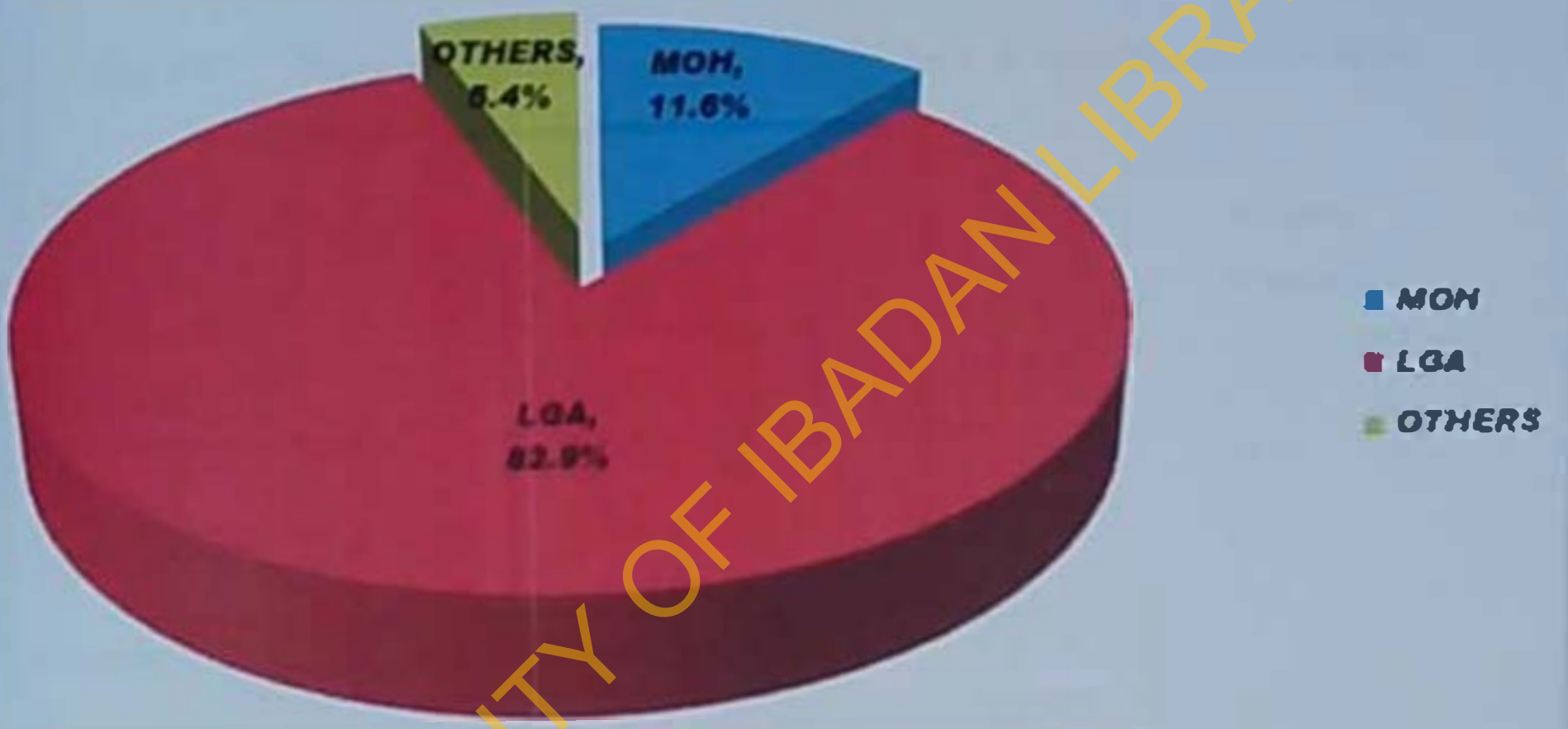

Figure 4.3: Pattern of forwarding health facilities reports to higher authority

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Reporting practices: (Continued)

Comparism of disease reporting pattern in the studied sites

Table 4.8 shows perentage distribution of respondents, frequency of reporting and study population. Fifty-three percent (53.7) of the respondents sent report on monthly basis with Afijio/Ibadan North relative frequency (19.1) to (80.9). Fourteen percent (14.3) of the respondents sent report on weekly basis with (52.0) to (48.0) Afijio/Ibadan North proportion. Twenty-two (22.0) percent of the study population did not send report at all to LGA/MOH. These respondents were in Ibadan North LGA (urban)

Table 4.8: Percentage distribution of health workers on reporting to LGA/MOH and study population

Frequency of reporting to LGA/ MOH	Study location		Total Freq. (%)	Relative Frequency
	Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)		
Weekly	13(52.0)	12(48.0)	25(100)	14.3
Monthly	18(19.1)	76(80.9)	94(100)	53.7
Quarterly	1(16.7)	5(83.3)	6(100)	3.4
6-Month	0(0)	2(100)	2(100)	1.3
Don't send	0(0)	39(100)	39(100)	22.3

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Means of sending report to LGA/MOH

Table 4.9 shows the means of sending health facility report to the LGA/MOH among study population. Sixty -five percent (65.0) of the study population sent their health facility report to the (LGA/MOH) periodically through their health facility staff while thirty-five percent (35.0) respondents had their report received or collected by the staff of LGA/MOH. The proportion of Afijio LGA to Ibadan North LGA respondents that sent their health facilities reports through their staff were (32.6) to (67.4) while respondents that had their reports collected by LGA/MOH staff were (6.3) to (93.8).

Table 4.9: Means of sending report to LGA/MOH

Means of sending report to LGA/MOH	Study location		Relative Frequency		
	Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)	Freq. (%)	χ^2	P-value
Report delivered by health facility	29(32.6)	60(67.4)	89(65.0)	12.08	0.001
Report received by staff LGA/MOH	3(6.3)	45(93.8)	48(35.0)	12.08	0.001

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Reporting of epidemic prone diseases by study location

Table 4.10 indicates percentage distribution of respondents that ever reported epidemic-prone notifiable diseases to their LGA/MOH. Twenty-four (24.0) percent of the study population ever reported epidemic-prone notifiable diseases to either LGA/MOH while a significant number (75.5) had not sent. (27.1) to (72.9) were the frequency percentages of Afijio LGA respondents to Ibadan North LGA that had sent report to LGA/MOH.

Table 4.10: Reporting of epidemic prone diseases by study location

Ever reported epidemic-prone diseases	Study location		Total		
	Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)	Freq. (%)	χ^2	P-value
Yes	13(27.1)	35(72.9)	48(24.5)	8.1002	0.017
No	20(13.5)	128(86.5)	148(75.5)		
Total	33(16.8)	163(83.2)	196(100)		

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Reporting of epidemic prone diseases by study location

Table 4.10: indicates percentage distribution of respondents that ever reported epidemic-prone notifiable diseases to their LGA/MOH. Twenty-four (24.0) percent of the study population ever- reported epidemic-prone notifiable diseases to either LGA/MOH while a significant number (75.5) had not sent. (27.1) to (72.9) were the frequency percentages of Afijio LGA respondents to Ibadan North LGA that had sent report to LGA/MOH.

Table 4.10: Reporting of epidemic prone diseases by study location

Ever reported epidemic-prone diseases	Study location		Total Freq. (%)	χ^2	P-value
	Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)			
Yes	13(27.1)	35(72.9)	48(24.5)	8.1002	0.017
No	20(13.5)	128(86.5)	148(75.5)		
Total	33(16.8)	163(83.2)	196(100)		

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Feedback report from LGA/MOH

Table 4.11: shows percentage distribution of respondents that ever received feedback from previous report sent LGA/MOH. Twenty-four percent of the respondents received feedback report from LGA/MOH. The percentages of respondents that had feedback report were (25.5%) to (74.5%) Afijio to Ibadan North LGAs. A significant number of respondents (76.0%) of the studied population had never received feedback report and majority (85.9) of this respondents were in Ibadan North LGA (Urban) P=0.017.

Table 4.11: Distribution of feedback report from LGA/MOH by study population

Ever received feedback report from LGA/MOH	Study location				
	Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)	Total Freq. (%)	χ^2	P-value
Yes	12(25.5)	35(74.5)	47(24.0)	8.100	0.017
No	21(14.1)	128(85.9)	149(76.0)		
Total	33(16.8)	163(83.2)	196(100)		

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Relationship between periods of dispatch of facility report to LGA/MOH and the Study population (Timeliness)

Table 4.12: indicates percentage distribution of time of sending monthly report of health facilities to LGA/MOH and the study population. Fifty percent (50.0) of the respondents sent their health facilities monthly report to LGA/MOH within the first week (seven days) of the following month while three percent (3.1) of the respondents sent report after another four weeks. Frequency percentage of respondents that sent report within the first week of the following month between Afijio LGA and Ibandan North LGA respondents were (8.4) to (81.6). Eighteen percent (18.0) of the respondents sent report to LGA/MOH between 1st and second week, (16.3) percent of the respondents between second and third week of the following month while twelve percent (12.0) sent report within third and fourth week. The proportion of Afijio LGA to Ibadan North LGA respondents were similar in all the above (1:7) except that report sent to LGA/MOH after a month was (1:2) P=0.004

Table 4.12: Relationship between periods of dispatch of facility report to LGA/MOH and the Study population (Timeliness)

Time of sending health facilities report to LGA/MOH in days	Study location: Afijio LGA Freq. (%)	Ibadan North LGA Freq. (%)	Total Freq. (%)	χ^2	p-value
<7days	18(18.4)	80(81.6)	98(50.0)		
7 – 14 days	6(16.7)	30(83.3)	36(18.4)		
15 – 21 days	4(12.5)	28(87.5)	32(16.3)		
22 – 28 days	3(12.5)	21(87.5)	24(12.2)		
>28 days	2(33.3)	4(66.7)	6(3.1)		
Total	33(16.8)	163(83.2)	196(100)	8.12	0.004

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Major factors for not reporting notifiable diseases

Table 4.13: shows percentage frequency distribution of major factors for non-reporting notifiable diseases and study population. Lack of training on notification and surveillance (84.0), lack of legal enforcement on health facilities and health workers (55.6) and ignorance of reporting requirement (50.0) were the principal three factors identified for non-reporting notifiable diseases by the respondents. Lack of supervision (48.5) of health workers and health facilities on reporting was followed by absence of reporting forms (38.6) and telephone number at the health facilities (38.3).

Table 4.13: Relationship between Respondents and distribution of major factors for non-reporting

S/N	Major factor for non-reporting notifiable diseases	Study location		Total Freq. (%)	χ^2	P-value
		Afijio LCA Freq. (%)	Ibadan North LCA Freq. (%)			
I	Lack of training on diseases notification and surveillence	22(12.2)	144(87.8)	164(84.0)	6.167	0.046
Ii	Lack of legal enforcement on health workers	17(15.6)	92(84.4)	109(55.6)	10.361	0.006
Iii	Ignorance of reporting requirements	16(16.3)	82(82.7)	98(50.0)	6.167	0.046
Iv	Lack of supervision on health facilities	20(21.1)	75(78.9)	95(48.5)	7.991	0.018
V	Lack of reporting forms	17(22.7)	58(77.3)	75(38.6)	5.789	0.055
Xi	Lack of telephone number	18(22.7)	57(77.3)	75(38.3)	5.612	0.053

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Summary of Results

The mean age of the respondents for the study was 41.0 ± 9.2 years. Majority (79.6%) were married at the study period and were from Ibadan North LGA. Community Health Officers, Nursing and Medical Officers dominated the professional group.

Majority (71.9%) were aware of existence of diseases surveillance of which (79.4%) were from Ibadan North LGA. Respondents' knowledge of current disease surveillance (IDSR) was poor as only 26.5% knew the current reporting system. Afijio LGA workers had a higher value (p= 0.03). Knowledge assessment scale was drawn to assess the knowledge of the respondents about notifiable diseases and those who scored ≥ 30 points was 11.2% which shows that there was shallow knowledge of notifiable diseases among the study population. Majority of the respondents forwarded their health facilities reports to LGA epidemiological units on monthly and quarterly basis. About two-third (65.5%) of the respondents sent reports though their facility staff. The time interval for collation and submission of returns was within seven days.

Major identified factors for not reporting notifiable diseases among the respondents included; lack of training on notification and surveillance (84.0%), lack of legal enforcement on health facilities and health workers (55.6%) and ignorance of reporting requirements (50.0%).

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CHAPTER FIVE
DISCUSSION

Previous studies on notifiable diseases reporting have addressed mainly physicians in reporting process on notifiable diseases (Olili, 2002; Al-laharam, 2000: Abdool Karim and Dilraj 1996). Only few studies examined causes of under reporting of notifiable diseases among health personnel. This study examined knowledge and reporting practices of notifiable diseases among physicians and other medical personnel in Oyo State and identified major factors militating against effective diseases reporting.

A strikingly high response rate (93.3%) was recorded among the health workers studied. This is remarkable when compared to findings in some available reviewed literature (Al-laharani, 2000; Bawa, 2003) that recorded lower rates, 71.0% and 25.0% respectively. This was possibly due to sufficient briefing of respondents on the objectives and benefits of the study and assurance of confidentiality. In addition, trained research assistants who were used to the terrain of the study area also contributed to high response rate.

Socio-demographic characteristics of the studied health workers

A sizeable number (35.7%) of the respondents were between 40-49 years. Married individuals predominated the study group (71.5%) with more female respondents (65.0%). The female preponderance was strikingly different from some reviewed studies in which there were male gender domination (Olili, 2002). Majority of the health facilities surveyed were public (60.7%) and were concentrated in Ibadan North LGA (75.6%). Health workers in public facilities, especially under local government area, were likely to have received some training and seminar/workshops and know importance of diseases reporting hence their favourable predisposition. (Fatiegun, 2009) reported that health facility by type could have direct impact with disease reporting. This he observed during assessment of DSNO on Measles reporting in Osun State in Nigeria (Fatiegun, 2009) Tan, 2009 documented the importance of role of private-partnership with disease reporting (Tao, 2009).

Community Health Officers (30.7%), Nurses and Midwives (33.6%) and Physicians (16.3%) constituted majority of the study population. The physicians, who

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play a significant role in disease reporting process, were relatively few in this study. This was similarly observed by Bawa, (2003) in Yobe State study where physicians were second to the list of professional group that participated (6.2%).

Level of awareness of disease surveillance among the health workers

There was a high level of awareness of disease surveillance among the health workers studied (71.0%) with higher percentage among Afijio LGA (87.9%). Similarly, this finding was higher than those observed among the health workers in the available reviewed local literature (38.3%) by Bawa, 2003 in Yobe study, Northern Nigeria (Bawa, 2003) and Ofili, (2003) with 67.0% among physicians in Benin City, South western, Nigeria.(Ofili,2003). However, only twenty-six percent (26.5%) of the health workers studied knew the current reporting system (i.e. integrated disease surveillance and response system; IDSR). This finding was also similar to that of Bawa. (2003) despite the difference in locations and time of study (38.0%) (Bawa, 2003). IDSR had been implemented by FMOH since May, 2002 for all the States in Nigeria. Ogo State commenced the implementation about six years ago. It was expected that the level of awareness would have been higher than what was obtained in this study.

Knowledge of notifiable diseases

The mean knowledge score on notifiable diseases examined was slightly above average of the total score with rural health workers having a higher value (Table 4.5). The health workers knowledge on immediate notifiable diseases was also low (Table 4.8). Afijio LGA health workers (rural) had a higher score than those in Ibadan North LGA ($p=0.001$). The reason for this was not clear and further assessment need be done. The response to identification of immediate notifiable diseases showed that Cholera, Poliomyelitis and HIV/AIDS were mostly known as immediate notifiable diseases by the health workers. Anthrax, Rabies (Human) and Plague were least recognized or known as immediate notifiable diseases. This was probably because the latter were not very common in this part of the world. Only eleven (11.2%, n: 22), a small number of the health workers studied, had a good knowledge of diseases examined. Of this proportion, a higher percentage of Afijio LGA workers that participated had good knowledge compared to Ibadan North LGA workers. This finding was similar to that finding by

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Ofili, (2002) among physicians in government hospitals in Benin City, Eastern Nigeria in 1999 in which 11.9% of the health workers (physicians) studied had good knowledge of notifiable diseases, using same checklist of notifiable diseases. Al-luharam, 2000 also documented low percentage of knowledge assessment among Syrian paediatricians studied in 2000.

Reporting Practices

Majority of the health workers 174 (82.9%) studied sent their routine health facility reports correctly to their local government area council (epidemiologic unit) for onward transmission to State and Federal levels (figure 4.3). This conforms with the conventional IDSR policy. This pattern was similarly documented by Bawa, (2003) in which 65.8% of the participants sent report to the local government area and less than 23.0% of the reports were sent to MOH. This was expected as treatment of such data, collection, analysis, interpretation and necessary action would be taken in turns at this level. The whole essence of IDSR strategy is ability to detect an upsurge or acute change in the threshold of epidemic-prone diseases at the local community level in order to institute control measures (WHO, FMOH, 2002).

Many of the health workers in this study that declared sending their routine health facility reports on monthly basis to their LGA and MOH (Table 4.9). The routine monthly reports were forwarded to LGA and MOH within first one week of the following month by about fifty percent of the study population. This was significant as a delay or failure to promptly send reports to LGA could be a potential risk of outbreak or an even epidemic. Only 24.5% of the health workers had ever reported epidemic prior to the study (Table 4.10). The same figure also had a feedback reports from the LGA from previous report sent to them. This was quite low as this is a motivation-driven indicator in reporting. Low feedback report was similarly documented by Bawa, (2003) and Al-laharam, (2000).

Health workers response to the use of surveillance data was appropriate as the results obtained generally indicated high level of understanding of the purpose/objective of the surveillance. However, the response to detection and prevention of epidemic, which was the principal purpose of surveillance, was low.

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Majority of the respondents indicated that designated staff at their health facility routinely forwarded reports to the LGA (65.0%). This pattern was similarly reported by Bawa, (2003) and Al-laharam, (2000) in which designated health facility staff primarily submitted their report to the designated authorities. It is obviously important that success of reporting depends on active participation of the individuals involved at this critical level.

Factors associated with not-reporting of notifiable diseases

Major identified factors for not reporting notifiable diseases as indicated by health workers were; lack of training on surveillance and notification (84.0%), lack of legal enforcement on health workers and health facilities (55.6%). Lack of training was similarly documented by Bawa, Ofili, and Al-laharam, (Bawa, 2003, Ofili, 2002 and Al-laharam, 2000) Absence of reporting forms at the health facilities constituted an hindrance to effective reporting. This was documented by Dauro, (2010) and Bawa, (2003). Ignorance of knowledge of telephone numbers of the designated authorities to contact, was similarly documented for not reporting by Bawa, (2003), Waldah, (2001) and Al-laharam, (2000).

Conclusion

Reporting of Notifiable diseases is an essential public health practice for the early detection and prevention of epidemic in the community. Globally, it has a lot of setback including underreporting, causes of which had not been properly documented. This study was conducted to examine knowledge, practices and major factors affecting notifiable diseases reporting among selected health workers from two LGAs, Afijio and Ibadan North, randomly selected from the 33 local government areas in Oyo State.

Results showed that respondents' knowledge of notifiable diseases was poor despite high level of awareness of notification process. The majority of the respondents studied sent their health facilities routine reports to the Local Government Area's (epidemiologic unit) which was appropriate.

Major identified factors influencing effective notifiable disease reporting among the health workers at the local government level were, Lack of training on notifiable

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disease process, ignorance on reporting requirements, lack of reporting forms, lack of legislation and supervision on health workers and health facilities.

Recommendations

The following measures are therefore, proffered toward a sustainable improvement on notifiable diseases reporting in Oyo State of Nigeria.

1. Regular sustainable training including workshops, seminars etc on notification and surveillance process. This must be mandatory for all relevant LGA health workers and private sector health workers in all registered health facilities by the local and state governments. Emphasis must be made on the key role of physicians, objectives and benefits of the notifiable diseases reporting and the consequences of neglect, delay or failure to report diseases.
2. Emphasis must be on supervision and monitoring of all LGAs health workers and health facilities in the state.
3. Copy of standard case definitions for priority diseases (guidelines for reportable notifiable diseases) and the telephone numbers of designated authorities to contact, both LGA and MOH, must be conspicuously displayed respectively at all registered health facilities.
4. Reporting forms, IDSR 001,002,003 and other relevant forms must be adequately and regularly be available at all registered health facilities. An agreeable and cost-effective strategy of producing reporting forms must be reached for forms to be available at health facilities.
5. A simple, regular mean of sending feedback report to the health facilities that generated the data, the primary generators of data by the LGA/MOH. This will be as a motivation and make the workers relevant to the system.

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APPENDIX ONE

INFORMED CONSENT FORM

My name is Dr. Oladeji Atilola Gbadamosi. I am a postgraduate student of field epidemiology in the Department of Medical Statistics and Environmental Health in the Faculty of Public Health, College of Medicine, University of Ibadan. I am carrying out a study on knowledge, attitudes and practice of Notifiable disease on health workers in Oyo State. The information you will supply would be used in the development of policies and strategies in the control of communicable disease in Oyo State specifically and Nigeria in general.

You are free to take part in the programme and you have the right to withdraw at any time you choose to. I will appreciate your help in responding to the study

Thank you.

Consent:

Now that the study has been explained to me and I fully understand the content of the study process, I will be willing to take part in the programme

.....

Signature/thumbprint of interviewer

.....

Signature of participant/date

.....

Signature/thumb of Witness/date

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APPENDIX TWO

QUESTIONNAIRE

My name is Dr. Oladeji Atilola Gbadamosi, I am a postgraduate student of field epidemiology in the department of Medical Statistics and Environmental Health (EMSEH), Faculty of Public Health, University of Ibadan, Nigeria.

This survey is to assess the awareness and experience of health workers in public and private health facilities in Oyo State on Notifiable Disease Reporting. It would also assist the policy makers in developing strategies and measure to improve reporting and ultimately in the formulation of preventive intervention and control programme.

Please help fill the questionnaire.
Do not write your names on the questionnaire. The information you give shall be treated with utmost confidentiality. Your participation is voluntary.

Thanks for your cooperation and participation.

Please indicate your response by making 'x' or ticking

On Knowledge' Attitudes and Practice of Notificable Disease Reporting among Health workers in Oyo State, Nigeria

SECTION A

1. Age: last birthday.....years
2. Sex:
   a. Male ☐
   b. Female ☐

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3. Marital Status

a. Single

b. Married

c. Separated

d. Divorced

e. Widowed

4. Profession (pls indicate)

5. Designation:.....

a. Medical doctor (general/specialist)

b. Dental surgeon

c. Staff nurse midwives

d. Staff nurse

e. Auxiliary

f. Physiotherapist

g. Community health officer scientist/technician

h. Medical record officer

i. Hospital infection control officer

j. Primary health care worker

k. Others (please specify)

6. Year of experience on present job as health workers:.....

7. Date of Appointment:.....

8. Type of your health facilities (indicate type)

a. Primary

b. Secondary

c. Tertiary

d. Private

e. Public

f. Others specify

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9. Indicate the local government area and headquarter to which your health facility belongs

a. LGA

b. Headquarter

SECTION B

Knowledge of Health Workers on Notification

10 Awareness of disease surveillance system: (Integrated disease surveillance and response (IDSR) or Disease surveillance and notification (IDSR) indicate

a. Yes

b. No

c. Don't know

11. If yes, in above, what does it means? .....

12 Which of the system is currently practiced in Oyo State: Tick appropriately by making 'x' in the correct box?

13 a. DSN

a. IDSR

b. Don't know

14 Which of the notifiable requires immediate notification? Tick appropriately Using the box in front of each

1.	Cholera	i. yes	ii. No.	iii. Don't know
2.	Acute flaccid paralysis	i. yes	ii. No.	iii. Don't know
	Cerebrospina meningitis	i. yes	ii. No	iii. Don't know
3.	Yellow fever (Lassa fever)	i. yes	ii. No	iii. Don't know
4.	Viral haemorrhaggic fever	i. yes	ii. No	iii. Don't know
5.	AIDS	i. yes	ii. No	iii. Don't know
6.	Anthrax	i. yes	ii. No.	iii. Don't know
7.	Rabies(Human)	i. yes	ii. No	iii. Don't know
8.	Smallpox	i. yes	ii. No	iii. Don't know
9.	Plague	i. yes	ii. No	iii. Don't know

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10. Typhoid & Paratyphoid i. yes ii. No. iii. Don't know

15. Of the list above, which of them is in epidemic-prone group i e IDSR-001?
List them out please .....

16. The following is a list of notifiable disease. Indicate those that are in the list of routine notifiable disease in Nigeria.

1.	Cholera	i. yes	ii. No.	iii. Don't know
2.	Measles	i. yes	ii. No.	iii. Don't know
2.	Cerebro spinal meningitis	i. yes	ii. No.	iii. Don't know
3.	Yellow fever (Lassa fever)	i. yes	ii. No.	iii. Don't know
4.	Viral haemorrhaggic fever	i. yes	ii. No.	iii. Don't know
5.	Poliomyelitis	i. yes	ii. No.	iii. Don't know
6.	Dracunculiasis	i. yes	ii. No.	iii. Don't know
7.	Leprosy	i. yes	ii. No.	iii. Don't know
8.	Neonatal tetanus	i. yes	ii. No.	iii. Don't know
9.	Lymphatic filariasis	i. yes	ii. No.	iii. Don't know
10	Pneumonia in child <5y	i. yes	ii. No.	iii. Don't know
11	Diarrhea in child <5y	i. yes	ii. No.	iii. Don't know
12	HIV/AIDS	i. yes	ii. No.	iii. Don't know
13	Malaria	i. yes	ii. No.	iii. Don't know
14	Onchocerciasis	i. yes	ii. No.	iii. Don't know
15	Sexual transmitted disease	i. yes	ii. No.	iii. Don't know
16	Tuberculosis	i. yes	ii. No.	iii. Don't know
17	Diarrhea with blood (dysentery)	i. yes	ii. No.	iii. Don't know
18	Pertusis	i. yes	ii. No.	iii. Don't know
19	Hepatitis B	i. yes	ii. No.	iii. Don't know
20	Plague	i. yes	ii. No.	iii. Don't know

17. The following is a list of occupational disease. Indicate which of them are notifiable occupational disease in Nigeria

1.	Lead Poisoning	i. yes	ii. No.	iii. Don't know

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2.	Phosphorus poisoning	i. yes	ii. No.	iii. Don't know
3.	Mercury poisoning	i. yes	ii. No.	iii. Don't know
4.	Manganese poisoning	i. yes	ii. No.	iii. Don't know
5.	Arsenic poisoning	i. yes	ii. No.	iii. Don't know
6.	Aniline poisoning	i. yes	ii. No.	iii. Don't know
7.	Carbon disulphide poisoning	i. yes	ii. No.	iii. Don't know
8.	Chroine ulceration o f the skin Benzene poisoning	i. yes	ii. No.	iii. Don't know
		i. yes	ii. No.	iii. Don't know
9.	Anthrax	i. yes	ii. No.	iii. Don't know
10.	Silicosis	i. yes	ii. No.	iii. Don't know
11.	Pathological Manifestation due to Radiation	i. yes	ii. No.	iii. Don't know
12.	Toxic jaundice	i. yes	ii. No.	iii. Don't know
13.	Toxic anaemica	i. yes	ii. No.	iii. Don't know
14.	Primary epithelimatous	i. yes	ii. No.	iii. Don't know
15.	Ulceration of the skin Poisoning due to Halogenated aliphatic	i. yes	ii. No.	iii. Don't know
16.	Hydrocarbon	i. yes	ii. No.	iii. Don't know
17.	Compression air sickness	i. yes	ii. No.	iii. Don't know
18.	Asbestosis	i. yes	ii. No.	iii. Don't know

CASE DEFINITION OF DISEASE

A standard case definition is a standard set of criteria used to describe if a person has a particular disease or a particular case can be considered for reporting. It could be clinical case definition if a clinic staff. (e.g Doctor/Staff nurse) is involved and surveillance case definition is used if a condition case fits the case definition issue for surveillance reporting.

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For the following listed disease, indicate your knowledge for case definition for each disease i.e. what symptoms or complaints by patients presenting at your health facility would indicate or point to the disease.

1. Cholera.....
2. Measles.....
3. Cerebro spinal meningitis.....
4. Yellow fever (Lassa fever).....
5. Hepatitis.....
6. Poliomyelitis.....
7. Drancuculiasis.....
8. Leprosy.....
9. Neonatal tetanus.....
10. Malaria.....

19. Do you believe or support use of case definition in reporting disease in Health facilities especially where there are no doctors

i. yes. ii. No iii. Don't know

20. State your reasons(s) for your choice in 19.....

.....

.....

LEDGE OF THE USES OF DISEASE SURVEILLANCE DAT AINFORMATION

21. Please indicate against any of the options you feel is correct

1. Pattern of disease occurrence in the community	a. yes.	b. No	c. Don't know
2. Institute preventive measure	a. yes.	b. No	c. Don't know
3. Prevent epidemics	a. yes.	b. No	c. Don't know
4. Record purpose	a. yes.	b. No	c. Don't know
5. Notification to higher authority	a. yes.	b. No	c. Don't know
6. Monitoring of control programmes for certain disease	a. yes	b. No	

7. Others (please specify).....

.....

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On epidemic-prone disease (IDSR 001) or those DSN (001)

22. Requires urgent notification a. yes b. No c. Don't know

23. Confirmation if laboratory is available a. yes b. No c. Don't know

24. On data form, it is easy to fill a. yes b. No c. Don't know

25. Do you consider filling of form time wasting? a. yes b. No c. Don't know

SECTION D

Perception, Practice regarding disease Notification

26. What is Epidemic? State in your own understanding please .....

.....

27. Have you ever reported an epidemic a. yes b. No c. Don't know

28. Please state the year and probable the month for the above .....

29. What is the frequency of forwarding routine reports at your health facilities to higher centre?

1. Weekly
2. Monthly
3. Quarterly
4. 6-monthly
5. Don't send
6. Others.....

30. What is the usual means of forwarding your report or return to higher level from your health facility? Tick the appropriate one

31. Delivered by Health facility staff

32. Received by staff from higher centre

33. Have you ever sent report on epidemic-prone disease before?

a. yes b. No. c. Don't know

34. Does your health facility send report on monthly routine basis?

a. yes b. No. c. Don't know

35. Timeliness: within what period of time (weeks) does your health facility submit your routine disease data from the last day of the month to the higher center i.e (LGA/MOH) .....

36. What do you understand by the term timeliness in reporting? Give an example

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On epidemic-prone disease (IDSR 001) or those DSN (001)

22. Requires urgent notification a. yes. b. No c. Don't know

23. Confirmation if laboratory is available a. yes b. No c. Don't know

24. On data form, it is easy to fill a. yes b. No c. Don't know

25. Do you consider filling of form time wasting? a. yes. b. No c. Don't know

SECTION D

Perception, Practice regarding disease Notification

26. What is Epidemic? State in your own understanding please .....

.....

27. Have you ever reported an epidemic a. yes. b. No c. Don't know

28. Please state the year and probable the month for the above.....

29. What is the frequency of forwarding routine reports at your health facilities to higher centre?

1. Weekly
2. Monthly
3. Quarterly
4. 6-monthly
5. Don't send
6. Others.....

30. What is the usual means of forwarding your report or return to higher level from your health facility? Tick the appropriate one

31. Delivered by Health facility staff

32. Received by staff from higher centre

33. Have you ever sent report on epidemic-prone disease before?

a. yes. b. No. c. Don't know

34. Does your health facility send report on monthly routine basis?

a. yes. b. No. c. Don't know

35. Timeliness: within what period of time (weeks) does your health facility submit your routine disease data from the last day of the month to the higher center i.e (LGA/MOH) .....

36. What do you understand by the term timeliness in reporting? Give an example

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37. What do you understand by the term completeness in reporting. Give an example.....

38. A regular interval training for all relevant health workers involved in communicable disease reporting will improve the control and prevention of disease outbreak. State your opinion on this statement using the options below

a. Strongly agree b. agree c. weekly agree d. disagree

e. Strongly disagree

What are the possible reasons for non-reporting or compliance with reporting requirements?

Please tick the appropriate option below

39. Did not know how to report notifiable disease	a. yes	b. No	c. Don't know
40. Did not know it was a reportable disease	a. yes.	b. No	c. Don't know
41. Reporting too time-consuming	a. yes	b. No	c. Don't know
42. Though case could be reported by somebody else e.g. microbiologist	a. yes.	b. No	c. Don't know
42 Lack of forms, on telephone of no of health facility or of authority to report to	a. yes.	b. No	c. Don't know
43 Lack of supervision	a. yes.	b. No	c. Don't know
44 lack of definite instruction or law	a. yes.	b. No	c. Don't know
45. Report violates doctor-patient relationship	a. yes.	b. No	c. Don't know
46. Patient's refuse permission to report	a. yes.	b. No	c. Don't know
47. Reportable Disease too Expensive	a. yes	b. No	c. Don't know
48. Patient may begin treatment	a. yes	b. No	c. Don't know
49. No treatment exist for certain disease			

50. Other reasons .....

51. To which higher centre does your health facilities send routine report?

1. LGA 2. MOH 3. Others

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SECTION E

Opinion/perception on inclusion/involvement of suggested health workers

Do you believe or expect that any of the following health personnel when involved in disease reporting would improve disease reporting system?

52. 1. Medical Laboratory technician a. yes. b. No c. Don't know
    2. Medical record officer a. yes. b. No c. Don't know
    3. Hospital infection control officer a. yes. b. No c. Don't know

53. State reasons for your choice for

    a. Medical laboratory scientist

Reason

1.....

Reason

2.....

Reason

3.....

54 Medical record officer

Reason

1.....

Reason

2.....

Reason

3.....

55 Hospital infection control officer

Reason

1.....

Reason

2.....

Reason

3.....

Thank you.

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APPENDIX THREE

Letter of Ethical Approval

TELEGRAMS ..... TELEPHONE .....

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5017, OYO STATE OF NIGERIA

Our Ref. No. AD 13/479/95

Date 10th December, 2009

The Principal Investigator
Department of Epidemiology, Medical Statistics
And Environmental Health,
University College Hospital Ibadan

Attention: Dr M O Gbadegoyi

Re: Oyo State Research Ethical Review Committee -OYSRERC)

In response to your letter requesting for ethical approval for the implementation of your Research Proposal titled Knowledge and practice of Epidemic-prone Notifiable diseases reporting among relevant health workers in Oyo State Nigeria

The Committee has noted your compliance with all ethical concerns. In the light of this, I am pleased to convey to you, the approval of the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

Please, note that the committee will monitor, closely, and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of the findings as this will help in policy making in the health sector

Wishing you all the best

Mr V.A. Adepoju
Director, Planning, Research & Statistics

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APPENDIX FOUR
MAP OF OYO STATE

Source: Oyo State Ministry of Health. 2007 Directory

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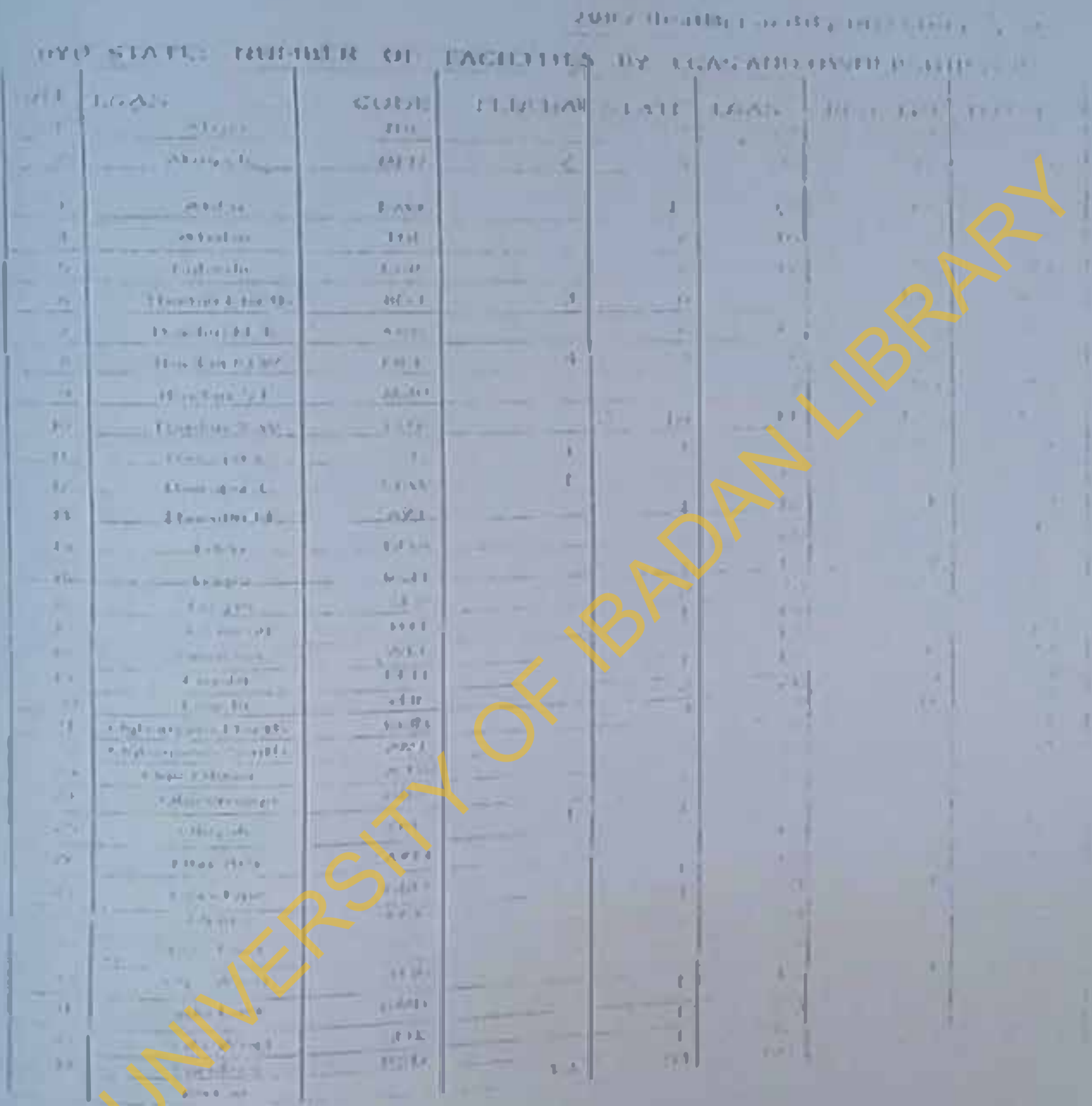
APPENDIX FIVE

List of 33 LGAs Oyo State



Source: Oyo State Ministry of Health. 2007 Directory

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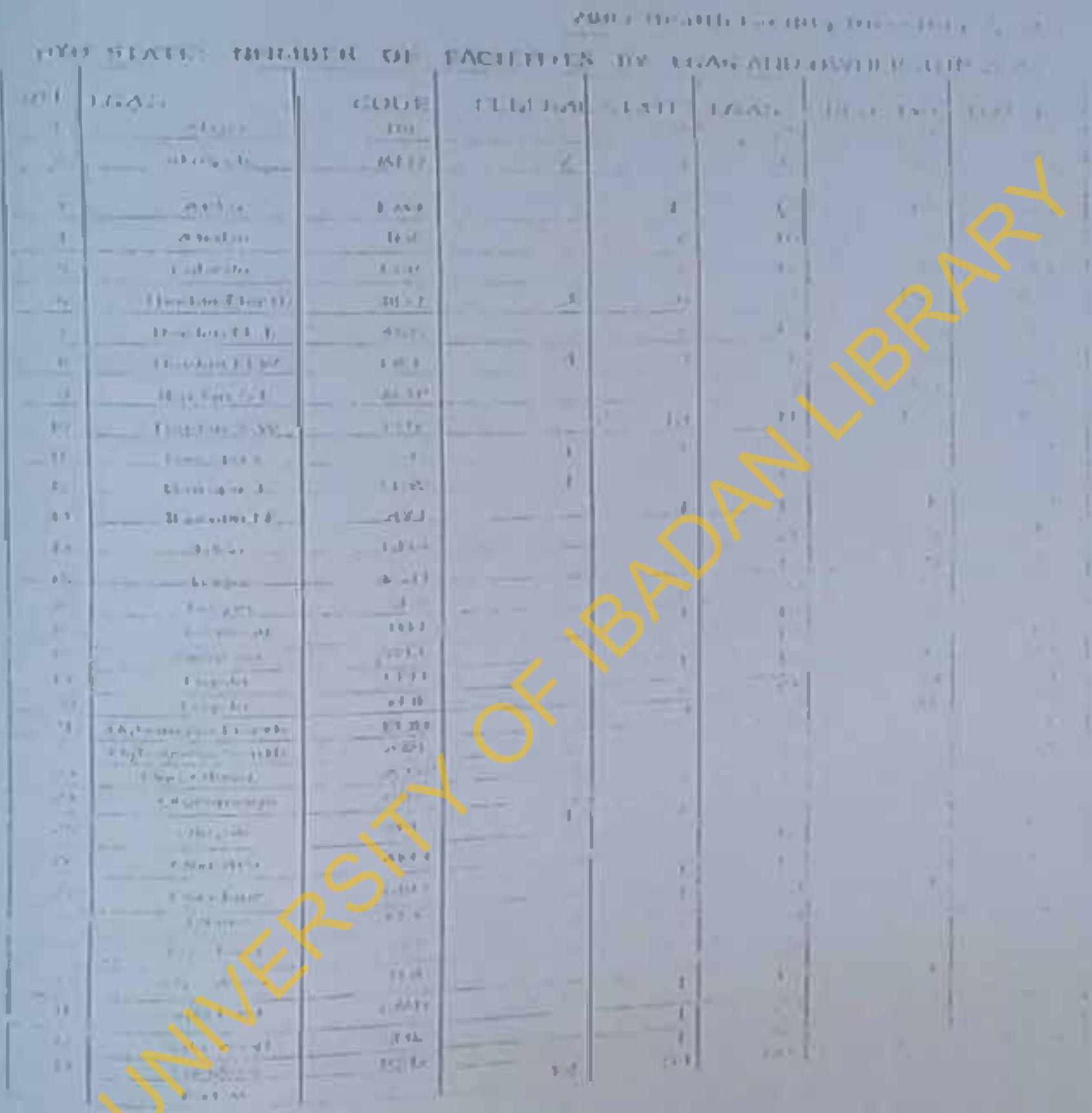
APPENDIX FIVE

List of 33 LGAs Oyo State



Source: Oyo State Ministry of Health. 2007 Directory

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APPENDIX SIX

CLASSIFICATION OF LOCAL GOVERNMENT AREAS OF OYO STATE INTO RURAL / URBAN / SEMI URBAN

SN	URBAN	WARDS
1	Atiba	10
2	Ibadan North	12
3	Ibadan North East	12
4	Ibadan South East	12
5	Ibadan South West	12
6	Ibadan North West	11
7	Iseyin	11
8	Ogbomosho North	12
9	Ogbomosh South	12
10	Oyo east	12
11	Oyo West	12
12	Saki West	11
SN	SEMI URBAN	WARDS
13	Akinyele	12
14	Egbeda	11
15	Ido	10
16	Ibarapa east	10
17	Iiesiwaju	10
18	Irepo	10

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19	Oluyole	10
20	Ona Ara	11
21	Lagelu	14
SN	RURAL	WARDS
22	Afijio	10
23	Atisbo	10
24	Ibarapa Central	10
25	Ibarapa North	10
26	Iwajowa	10
27	Kajola	11
28	Ogo Oluwa	10
29	Oorelope	10
30	Olorunsogo	10
31	Oriire	10
32	Sake – East	11
33	Surulere	10

Source: Federal of Statistics. Nigeria. (1993)

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APPENDIX SEVEN

List of notifiable diseases in Nigeria

List of Notifiable diseases

1. AIDS
2. Anthrax (human)
3. Brucellosis (human)
4. Cerebro-spinal meningitis C. S. M
5. Chicken pox
6. Cholera
7. Diarrhoea (simple without blood)
8. Diarrhoea with blood (dysentery)
9. Diphtheria
10. Dracunculosis
11. Filariasis
12. Food poisoning
13. Gonorrhoea
14. Hepatitis
15. Lassa Fever
16. Leprosy
17. Louse-borne typhus fever
18. Malaria
19. Measles
20. Onchocerciasis (River blindness)
21. Ophthalmia neonatorum
22. Pertussis (Whooping cough)
23. Plague
24. Pneumonia
25. Poliomyelitis
26. Rabies (human)
27. Schistosomiasis
28. Smallpox
29. Syphilis
30. Other sexually transmitted diseases (STI)
31. Tetanus (other)
32. Tetanus (neonatal)
33. Trachoma
34. Trypanosomiasis (sleeping sickness)
35. Tuberculosis
36. Typhoid and paratyphoid fevers
37. Viral influenza

List of emergency and immediate notifiable diseases

1. AIDS (Acquired Immune Deficiency syndrome)
2. Acute Flaccid Paralysis
3. Anthrax
4. Cerebro-spinal Meningitis (CSM)
5. Cholera
6. Lassa fever
7. Plague
8. Rabies (human)
9. Small pox
10. Typhoid and paratyphoid fevers
11. Yellow fever

Source: Standard Technical Guidelines Nigeria, 2008 edition page 209

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APPENDIX EIGHT

List of the 21 selected diseases (priority diseases)

Twenty one Selected Diseases
Epidemic-Prone Diseases
Cholera Measles Cerebro Spinal Meningitis Viral haemorrhagic fevers (e.g. Lossa fever) Yellow Fever
Diseases Targeted for Eradication and Elimination
Poliomyelitis Dracunculiasis Leprosy Neonatal tetanus Lymphatic filariasis
Other Diseases of Public Health Importance
Pneumonia in children less than 5 years of age Diarrhoea in children less than 5 years of age HIV/AIDS Malaria Onchocerciasis Sexually transmitted infections (STIs) Tuberculosis Diarrhoea with blood (dysentery) Pertussis Hepatitis B Plague

Source: National technical guideline for integrated disease surveillance and response, WHO Nigeria, May 2002 Ed. Pg. 15

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ANNEX 2 FMOH/WHO recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the LGA

FMOH/WHO recommends that health facilities use the following surveillance case definitions for reporting suspected cases of priority diseases and conditions to the LGA level. Please refer to the disease-specific guidelines in Section 8 for additional information about specific case definitions.

Epidemic-prone diseases	
Cholera	Any person 5 years of age or more who develops severe dehydration or dies from acute watery diarrhoea Any patient above the age of 2 years with acute watery diarrhoea in an area where there is an acute outbreak of cholera.
Measles	Any person with fever and maculopapular (non-vesicular) generalised rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles. A measles death is a death occurring within 30 days of onset of the rash.
Cerebro-spinal Meningitis	Any person with sudden onset of fever (>38.5°C rectal or 38.0°C axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal signs.
Viral hemorrhagic fevers (Lassa fever)	Any person with severe illness, fever, with or without sore throat and at least one of the following signs: bloody stools, vomiting blood, or unexplained bleeding from gums, nose, vagina, skin or eyes.
Yellow fever	Any person with sudden onset of high fever (>39°C rectal or 38°C axillary), followed by jaundice within two weeks of onset of first symptoms.
Diseases targeted for eradication and elimination	
Poliomyelitis	Any child less than 15 years of age with a sudden onset of paralysis (AFP) or a person of any age in whom the clinician suspects polio
Dracunculiasis	Any person with a history of skin lesion and emergence of Guinea worm within one year of the skin lesion
Leprosy	Any person with hypopigmented patches and loss of sensation over the patches (excluding patients released from treatment)
Neonatal tetanus	Any newborn with a normal ability to suck or cry during the first two days of life, and who, between 3 and 28 days of age, cannot suck normally, becomes stiff or has convulsions or both
Lymphatic filariasis	Any person in an endemic area with lymphoedema, elephantiasis or hydrocoele with or without microfilaria (W. bancrofti) in night blood sample

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Other diseases of public health importance	
Diarrhoea in children less than 5 years of age	***Diarrhoea with some dehydration:*** Any child less than 5 years of age with diarrhoea and two or more of the following – restless or irritable – sunken eyes – drinks eagerly, thirsty – skin pinch goes back slowly ***Diarrhoea with severe dehydration*** Anychild less than 5 years of age with diarrhoea and two or more of the following – lethargic or unconscious – sunken eyes – not able to drink or drinking poorly – skin pinch goes back very slowly
Diarrhoea with blood *(Shigella: dysentry)*	Any person with diarrhoea and visible blood in the stool
Pneumonia in children less than 5 years of age	***Pneumonia*** Any child aged 2 months up to 5 years of age with cough or difficult breathing and – breathing 50 breaths per minute or more in an infant 2 months up to 1 year – breathing 40 breaths or more per minute for a child aged 1 to 5 years ***Severe Pneumonia*** Any child age 2 months up to 5 years with cough or difficult breathing and with any general danger sign or chest indrawing or stridor in a calm child General danger signs are unable to drink or breast-feed, vomits everything, convulsions, lethargy or unconsciousness Infants less than 2 months with fast breathing 60 breaths per minute or more
AIDS	Any person with fever or diarrhoea of one-month duration or more, or loss of more than 10% body weight with positive HIV laboratory result

Source: National Technical Guidelines for integrated diseases surveillance and response (WHO / FMoH. 2002)

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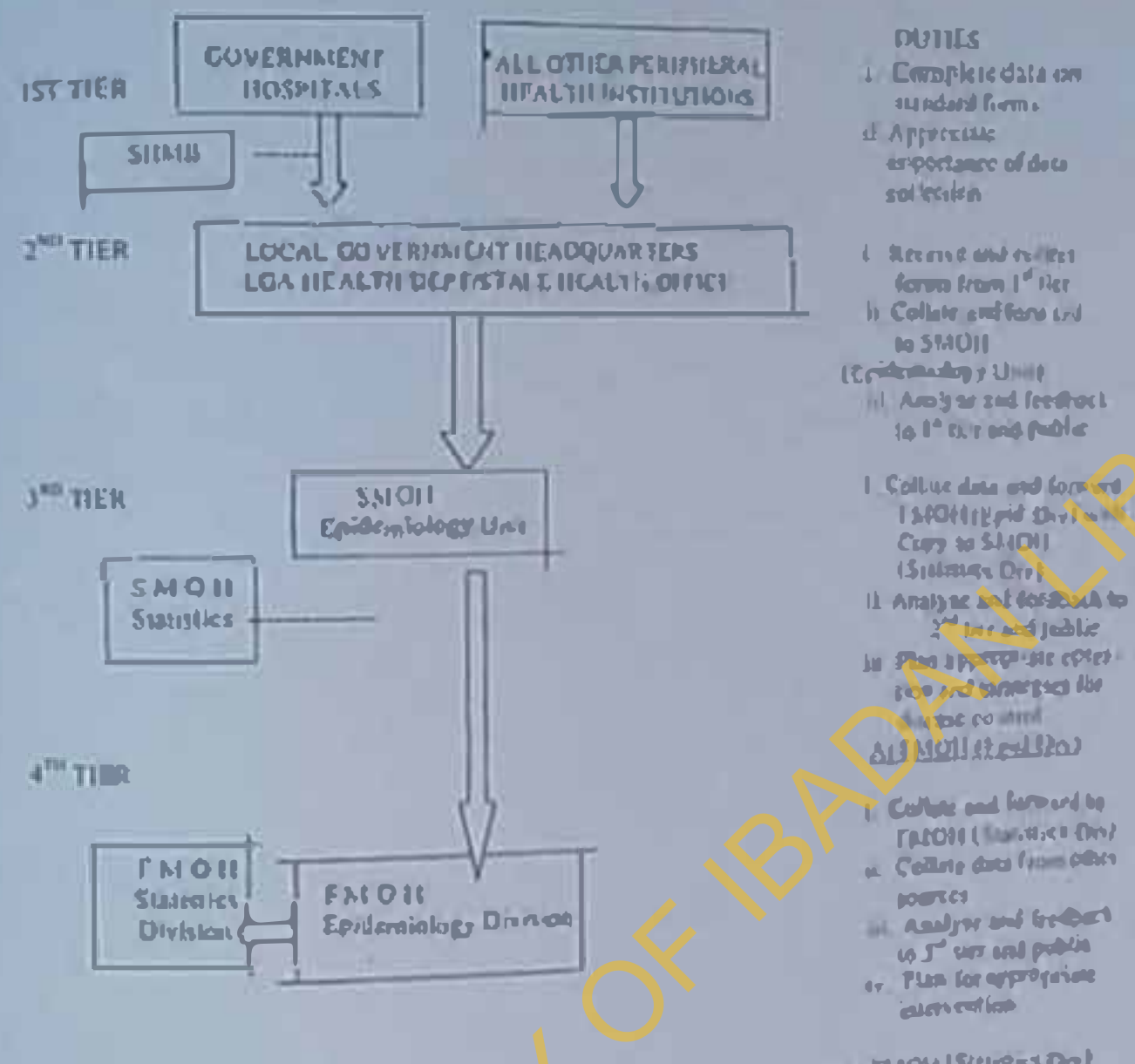
APPENDIX TEN

Flow of information chart on Integrated disease and surveillance response in Nigeria



KEY

Source: National Technical Guidelines WHO / FMOH, 2002

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APPENDIX ELEVEN

Reporting Forms 01

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Reporting Form 02

WEEKLY REPORTING OF NEW CASES OF EPIDEMIC PRONE DISEASES AND OTHER PUBLIC HEALTH PHENOMENA UNDER SURVEILLANCE

Year

Week number ___ From ___ To ___

Health Facility LGA State

LGA/State (with cases)	Cerebro-spinal Meningitis			Cholera			Viral Haemorrhagic fever (specify the fever)			Measles			Yellow fever			Other epidemic diseases not under surveillance (specify)		
	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths

Reporting Form 003

ROUTINE MONTHLY NOTIFICATION FORM IDSR 003

Health facility [ ] LGA [ ] (tick as appropriate) State [ ]

Name of HF/LGA/State

DISEASE	Cases/all patients			Cases/all patients				DEATHS			
	Less than 5yrs	5-14yrs	15yrs & above	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1 CSM											
2 Cholera											
3 Diarrhoea (Watery without blood)											
4 Diarrhoea (with blood)											
5 Dracunculiasis											
6 Hepatitis B											
7 HIV/AIDS											
8 Viral hemorrhagic fever (e.g. Lassa Fever)											
9 Leprosy											
10 Lymphatic Fearlasis											
11a) Malaria											
11b) Malaria (severe)											
11c) Malaria (Pregnant Women)											
12 Measles											
13 Pertussis											
14 Plague											
15 Pneumonia											
16 Poliomyelitis											
17 Stiff [illegible]											
17a) [illegible]											
17b) [illegible]											
17c) [illegible]											
17d) [illegible]											
18 [illegible]											
19 [illegible]											
20 [illegible]											
21 [illegible]											

Name of Reporting Officer Signature & date

Source: National Technical Guidelines for integrated diseases surveillance and response (WHO / FMoH, 2002)

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