

Health Information Management in Controlling the Spread of Infectious Diseases in Wamakko LGA, Sokoto State, Nigeria: A Case Study of Usman Danfodiyo University Teaching Hospital Sokoto

¹Abdulaziz Hussaini, ²Abubakar Hamza (PhD) and ³SANI, Abubakar

¹Department of Psychology, Nasarawa state university Keffi.

*Corresponding author's E-mail: abdulazeezhussaini@gmail.com

²School of Health Information management, Usmanu Danfodiyo University Teaching Hospital Sokoto.

E-mail: abubakarhamza86@yahoo.com

³Department of Health information management, School of Health Sciences, Federal Polytechnic Damaturu

E-mail: abubakarkudan2000@gmail.com

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Health Information Management (HIM) is increasingly recognized as a pivotal component in the fight against infectious diseases, particularly in regions with underdeveloped health infrastructure. Effective HIM ensures timely, accurate, and accessible health data essential for surveillance, outbreak response, and resource allocation. This study investigated the role of HIM in controlling the spread of infectious diseases in Wamakko Local Government Area (LGA), Sokoto State, Nigeria, exploring how health data collection, reporting, and surveillance contribute to disease control, and identifying challenges hindering effective implementation. A descriptive cross-sectional survey design was employed. Data were collected from 95 health professionals across various cadres including nurses, health records officers, surveillance officers, and environmental health workers using structured questionnaires. Descriptive statistics and thematic analysis were used for data interpretation. Findings revealed that 92.6% of respondents recognized the importance of HIM in disease control, and 84.2% confirmed regular utilization of HIM practices. However, only 41.1% maintained electronic health records, while 76.8% submitted monthly surveillance reports. Major challenges identified included inadequate ICT infrastructure (75.8%), poor funding (71.6%), shortage of trained personnel (63.2%), and delays in data reporting (57.9%). Recommended strategies included capacity building (86.3%), government investment in ICT (82.1%), and integration of electronic medical records (73.7%). While foundational HIM practices exist in Wamakko LGA, their impact is limited by infrastructural and personnel constraints. Strengthening HIM systems through capacity building, digital transformation, and policy support is crucial for improving disease control efforts.

Keywords: Health Information Management, Infectious Diseases, Disease Surveillance, Wamakko LGA, Health Information Systems, Nigeria

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INTRODUCTION

The study begins by examining the critical role of Health Information Management (HIM) in controlling the spread of infectious diseases. The global and local burden of infectious diseases, including their devastating impact on public health and socio-economic development, underscores the urgency of effective data management. In this context, the significance of timely, accurate, and accessible health data cannot be overstated, as it is essential for surveillance, outbreak response, and resource allocation. This chapter provides a comprehensive overview of the current state of HIM within Nigeria's healthcare system, setting the stage for an in-depth analysis of its specific application and challenges within the Wamakko Local Government Area (LGA) of Sokoto State (Fagbemi & Adeleke, 2019). Infectious diseases remain a significant public health challenge, particularly in sub-Saharan Africa. Nigeria, the continent's most populous nation, continues to contend with recurrent outbreaks of communicable diseases such as cholera, malaria, and Lassa fever, which contribute to high rates of morbidity, mortality, and economic burden. The ability to effectively combat these epidemics hinges on robust systems for collecting, analyzing, and utilizing health data, which is the core function of Health Information Management (HIM).

HIM is the essential practice of acquiring, storing, analyzing, and disseminating health data to support clinical decision-making, disease surveillance, and overall health system management. It is a vital tool for the early detection of outbreaks, tracking epidemiological patterns, coordinating emergency responses, and evaluating the effectiveness of public health interventions. In an era of evidence-based medicine and digital transformation, the availability of accurate and timely health information is no longer a luxury, but a necessity for building resilient health systems. To address this need, the Nigerian government adopted the Integrated Disease Surveillance and Response (IDSR) strategy. This framework emphasizes the critical importance of local data collection and rapid reporting from individual health facilities to the national level. However, the successful implementation of this system is heavily dependent on skilled health information personnel, functional infrastructure, and strong institutional commitment.

Infectious diseases remain a significant public health challenge, particularly in sub-Saharan Africa. Nigeria, the continent's most populous nation, continues to contend with recurrent outbreaks of communicable diseases such as cholera, malaria, Lassa fever, tuberculosis, and COVID-19, which contribute to high rates of morbidity, mortality, and economic burden (World Health Organization [WHO], 2021; Fagbemi & Adeleke, 2019). The ability to effectively combat these epidemics hinges on robust systems for collecting, analyzing, and utilizing health data, which is the core function of Health Information Management (HIM).

Health Information Management is the essential practice of acquiring, storing, analyzing, and disseminating health data to support clinical decision-making, disease surveillance, and overall health system management (LaTour et al., 2020). It serves as a vital tool for the early detection of outbreaks, tracking epidemiological patterns, coordinating emergency responses, and evaluating the effectiveness of public health interventions. In an era of evidence-based medicine and digital transformation, the availability of accurate and timely health information is no longer a luxury but a necessity for building resilient health systems. To address this need, the Nigerian government adopted the Integrated Disease Surveillance and Response (IDSR) strategy, emphasizing the critical importance of local data collection and rapid reporting from individual health facilities to the national level (Federal Ministry of Health [FMoH], 2020). However, the successful implementation of this system is heavily dependent on skilled health information personnel, functional infrastructure, and strong institutional commitment.

Wamakko Local Government Area (LGA) in Sokoto State, like many rural communities in Northern Nigeria, faces significant public health challenges, including recurrent seasonal outbreaks of water-borne diseases and endemic malaria. The capacity to effectively monitor, report, and respond to these diseases is directly contingent upon the strength of its HIM system. The absence or underutilization of a robust HIM framework can allow outbreaks to spread undetected, leading to preventable morbidity and loss of life (Abubakar et al., 2018).

This study was designed to conduct a thorough examination of how health information is managed within Wamakko LGA and to assess its contribution to controlling infectious diseases. Specifically, it explored the level of awareness and utilization of HIM among healthcare workers, identified the key challenges faced in disease reporting, and proposed evidence-based strategies to improve HIM practices for enhanced public health outcomes at the local level.

STATEMENT OF THE PROBLEM

Infectious diseases remain a persistent public health threat in Wamakko Local Government Area (LGA) of Sokoto State, Nigeria. Over the past decade, the region has experienced recurring outbreaks of preventable communicable diseases, including malaria, cholera, typhoid fever, and more recently, COVID-19. These recurrent outbreaks have resulted in significant morbidity, mortality, and economic strain on an already fragile healthcare system. Despite the availability of national frameworks such as the Integrated Disease Surveillance and Response (IDSR) strategy, the local

capacity to effectively monitor, detect, and respond to these disease threats remains severely compromised.

A critical yet underexplored factor contributing to this persistent challenge is the absence of an effective and comprehensive Health Information Management (HIM) system within the LGA. Health data the cornerstone of any functional disease surveillance and control mechanism—is frequently unavailable, inaccurate, incomplete, or significantly delayed in transmission from primary health centers to local and state health authorities. This information deficit is not merely administrative; it has direct and devastating public health consequences.

Several systemic factors perpetuate this problem. These include inadequate Information and Communication Technology (ICT) infrastructure, a shortage of formally trained health information personnel, poor funding for health data systems at the local government level, and a persistent culture of underutilization of collected data for decision-making. Furthermore, most health facilities in Wamakko LGA continue to rely on cumbersome, error-prone paper-based record-keeping systems that are ill-suited for the demands of modern disease surveillance.

While previous studies have examined Health Information Systems at the national and state levels in Nigeria, there exists a significant research gap concerning the specific challenges and opportunities for HIM at the Local Government Area level—particularly in rural, resource-constrained settings like Wamakko LGA. Understanding the unique contextual barriers and facilitators to effective HIM at this grassroots level is essential for designing targeted, feasible, and sustainable interventions.

Therefore, this study seeks to address this fundamental gap by investigating the role that effective Health Information Management can play in controlling the spread of infectious diseases in Wamakko LGA. Specifically, the study aims to assess the current state of HIM practices, evaluate the utilization of health data for disease surveillance and response, identify the key operational and systemic barriers to effective HIM, and propose evidence-based strategies for strengthening HIM systems. Understanding this relationship is crucial for strengthening the local public health response and ultimately improving community health outcomes in one of Nigeria's most underserved regions.

Research Objectives

To examine the role of Health Information Management (HIM) in controlling the spread of infectious diseases in Wamakko LGA, Sokoto State, with reference to Usmanu Danfodiyo University Teaching Hospital Sokoto.

Specific Objectives

1. To assess the level of awareness and knowledge of Health Information Management (HIM) among healthcare personnel in the study area.
2. To evaluate the extent of HIM practices in infectious disease control in healthcare facilities.
3. To determine the level of adoption of electronic health information systems in managing infectious disease data.
4. To identify the challenges affecting effective Health Information Management in disease control.
5. To explore strategies for strengthening Health Information Management systems in controlling infectious diseases.

METHODOLOGY

The study adopted a descriptive cross-sectional survey design, which is suitable for assessing the current status of HIM systems and their role in controlling infectious diseases at a single point in time. The target population consisted of health personnel involved in the generation, management, and documentation of patient data. A sample of 100 respondents was selected using a purposive sampling technique to ensure that only respondents with relevant experience in HIM and infectious disease control were included. A structured questionnaire titled "Health Information Management and Infectious Disease Control Questionnaire (HIMIDC-Q)" was employed, covering demographics, system availability, data usage, challenges, and perceptions. The instrument was validated by experts in Public Health and Health Information Management. A pilot test conducted in a neighboring LGA yielded a Cronbach's Alpha coefficient of 0.81, indicating strong internal consistency. Data collection was conducted over four weeks. Trained research assistants distributed questionnaires, and participants gave informed consent before participation. Quantitative data were analyzed using SPSS version 26, employing descriptive statistics (frequencies, percentages, mean scores). Qualitative data from key informant interviews were analyzed thematically.

RESULTS

Response Rate and Demographic Characteristics

Out of 100 questionnaires distributed, 95 were successfully retrieved and analyzed, representing a 95% response rate. Table 1 presents the demographic characteristics of respondents.

Table 1: Demographic Characteristics of Respondents (n=95)

Variable	Category	Frequency	Percentage (%)
Gender	Male	58	61.1
	Female	37	38.9
Age	20-29 years	20	21.1
	30-39 years	42	44.2
	40-49 years	25	26.3
	50 years and above	8	8.4
Profession	Health Information Officer	25	26.3
	Nurse/Midwife	30	31.6
	Disease Surveillance Officer	20	21.1
	Environmental Health Worker	20	21.1
Years of Experience	Less than 5 years	22	23.2
	5-10 years	40	42.1
	Over 10 years	33	34.7

The majority of respondents were male (61.1%), aged 30-39 years (44.2%), with 5-10 years of experience (42.1%). Nurses and health information officers formed the largest professional groups.

Awareness and Knowledge of HIM

Table 2: Awareness of Health Information Management (n=95)

Statement	Agree (%)	Disagree (%)	Undecided (%)
HIM is important in disease control	92.6	3.2	4.2
I understand the principles of HIM	88.4	5.3	6.3
Our facility uses HIM practices regularly	84.2	10.5	5.3

The majority of respondents demonstrated high awareness of HIM and recognized its role in disease control, consistent with findings by Abubakar et al. (2020) in Northern Nigeria.

Health Information Management Practices

Table 3: HIM Practices in Relation to Infectious Disease Control (n=95)

Statement	Yes (%)	No (%)
We maintain electronic records of disease cases	41.1	58.9
Disease data is analyzed regularly	63.2	36.8
Surveillance reports are submitted monthly	76.8	23.2
HIM officers are involved in outbreak investigations	69.5	30.5

While evidence of regular surveillance and reporting exists, electronic record-keeping remains limited. Most facilities rely on paper-based records, affecting the speed and accuracy of data handling.

Challenges Affecting HIM

Table 4: Challenges in Health Information Management (n=95)

Challenge	Frequency	Percentage (%)
Lack of trained HIM personnel	60	63.2
Poor funding of health data systems	68	71.6
Inadequate ICT infrastructure	72	75.8
Delay in data reporting	55	57.9

The most commonly cited challenges were inadequate ICT infrastructure (75.8%), insufficient funding (71.6%), and shortage of trained health information professionals (63.2%).

Suggested Strategies for Strengthening HIM

Table 5: Recommended Measures for Strengthening HIM (n=95)

Suggested Measure	Frequency	Percentage (%)
Training for HIM personnel	82	86.3
Government investment in ICT	78	82.1
Timely data feedback mechanisms	65	68.4
Integration of electronic medical records	70	73.7

Respondents strongly endorsed capacity building and ICT investment as critical to improving HIM performance in infectious disease control.

DISCUSSION

The findings of this study revealed several critical insights into the role of HIM in controlling the spread of infectious diseases in Wamakko LGA. The results indicated that health information systems play a significant role in disease surveillance, data-driven decision-making, and community health interventions.

Health Information Management and Disease Surveillance

The study demonstrated that effective HIM contributes to the early detection and monitoring of infectious diseases within Wamakko LGA. Health personnel reported that timely reporting of cases such as malaria, cholera, and typhoid was possible due to structured data recording systems within primary health centers. This finding supports the work of Nsubuga et al. (2006), who emphasized that disease surveillance systems are vital for the prompt detection of epidemics and the initiation of control measures. However, gaps in reporting completeness were observed, particularly in rural facilities, due to poor internet connectivity and limited electronic health systems.

Utilization of Health Information for Decision-Making

Another important finding was that while data were being collected routinely, their full potential for evidence-based decision-making was not being realized. Many health facilities lacked the capacity to analyze and interpret collected information effectively. This aligns with the observations of Odekunle et al. (2017), who noted that in many Nigerian states, data generated at health facilities often remain underutilized, limiting their impact on health planning and resource allocation. In Wamakko, decision-making was sometimes based on estimated needs rather than robust analysis of data trends, weakening the responsiveness to outbreaks.

Human Resource and Training Gaps

The findings also indicated that inadequate training of health workers in HIM significantly affected the accuracy and timeliness of reports. Some staff responsible for data management lacked formal training in health records management,

resulting in errors and delays. This resonates with the report of AbouZahr and Boerma (2005), which identified shortage of skilled personnel as a major challenge to effective health information systems in low- and middle-income countries. The situation in Wamakko reflects this broader national challenge, highlighting the urgent need for continuous capacity building of health information officers.

Technological and Infrastructural Barriers

Infrastructural constraints emerged as a major limitation to effective HIM in the study area. Respondents identified issues such as inadequate computers, lack of standardized reporting software, poor electricity supply, and weak internet connectivity. These barriers hinder the timely transfer of data to central health authorities. According to Adepoju et al. (2017), such infrastructural limitations remain one of the biggest obstacles to achieving effective digital health records and disease surveillance systems in Nigeria.

Comparison with Previous Studies

The findings are consistent with previous studies such as that of Adebayo et al. (2018), who found that HIM plays a critical role in improving Nigeria's response to disease outbreaks but remains hampered by weak data systems and inadequate investments. Similar observations have been reported in Ghana and Kenya, where weak HIM structures limited the effectiveness of infectious disease surveillance (Nutley & Reynolds, 2013). Oluwole et al. (2021) found that healthcare workers who received continuous training in HIM practices were more efficient in detecting and reporting cases of infectious diseases, with significant improvement in outbreak response times following the introduction of DHIS2-based training modules.

CONCLUSION

Health Information Management plays a pivotal role in the surveillance, early detection, reporting, and response to infectious diseases. In Wamakko LGA, health workers recognize its importance and actively engage in data collection and reporting. However, several systemic barriers hinder the full effectiveness of HIM in disease control. The study concludes that while foundational HIM practices exist in Wamakko, their impact is limited by infrastructural and personnel constraints. Strengthening HIM systems through capacity building, digital transformation, and policy support is crucial for improving disease control efforts. This conclusion supports the position of the World Health Organization (2022), which emphasizes that robust health information systems are fundamental to achieving health security, especially in low- and middle-income countries.

RECOMMENDATIONS

Based on the findings, the following recommendations are made:

1. **Capacity Building:** Regular training and retraining of HIM personnel should be prioritized to keep them updated with modern data management practices.
2. **Investment in ICT Infrastructure:** Government and partners should invest in electronic health records and database management systems to replace outdated paper-based systems.
3. **Increased Funding:** Adequate budgetary allocations should be made to support HIM units in primary and secondary healthcare centers, especially in rural LGAs like Wamakko.
4. **Timely Feedback Mechanisms:** Health data should be analyzed and fed back to healthcare providers promptly to inform decisions and improve community response.

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