

Health Informatics, A Tool for Effective National Health Insurance Scheme (NHIS) Implementation: Case Study of Borno State, Nigeria

Article by Largema Bukar
Ph.D. Management student, Texila American University
E-mail: largems2@gmail.com

Abstract

Background: Health informatics in its simplest term is about getting the right information to the right person at the right time (National Health Services of America, 2015). It is a multidisciplinary field that uses health information technology (HIT) to improve health care especially in the health insurance industry via the combination of high quality, higher efficiency (spurring lower cost and thus greater availability), and new opportunities.

The specific objectives are to evaluate the level of awareness on health informatics to National Health Insurance Scheme in Nigeria; to find the challenges associated with application of health informatics by National Health Insurance Scheme; find the prospects of health informatics in National Health Insurance Scheme.

Methodology: the study uses primary source by administering a questionnaire to both the NHIS staff and enrollees /clients and about 200 completed and the returned the tool i.e. about 90% respond rate.

Some of the prospects includes assisting healthcare providers and system organize resources and records for decisions making and patient management; it tracks and keep patients records; it tracks of fund disbursement utilization and improve communication etc.

The challenges identified are, high cost of establishing the system; interconnected Health Informatics system requires leadership, organizational commitment, and multi-agency collaboration.

The finding recommends that government should fund for the establishment of the unit, trained professionals to handle the unit, sensitize the communities on the benefit.

Keywords: informatics, healthcare, evaluation, health insurance, technology.

Introduction

The introduction of information technology into the practice of health and medicine has been tumultuous for many reasons. Not only are new technologies expensive, but also physicians, nurses and other service providers are not adequately trained in using technology to generate or use information.

High quality health care provision depends on extensive and carefully planned information processing. Success of health information systems implementations does not only depend on the quality of hard- and software used but also on the quality of the operators of the health informatics, they need to be knowledgeable enough to be able to understand the needs and aspirations of user and decision makers.

Health informatics or application of information communication tools to health care has been touted as one of the possible means to improve the utility, access, safety and application of healthcare methods (Keepanasseril, 2011). (Murray, 2006) stated that informatics and information technology have the capability for being the stethoscope of the 21st century approach to care, in terms of its radical effect on care processes and its vital importance to delivering care.

Health informatics is applied to the area of nursing, clinical care, dentistry, pharmacy, public health, occupational therapy, physical therapy and (bio)medical research, and alternative medicine (called health care informatics, consumer health informatics, nursing informatics, clinical informatics, or biomedical informatics).

In its simplest term, health informatics is about getting the right information to the right person at the right time (National Health Services of America, 2015). It is a multidisciplinary field that uses health information technology (HIT) to improve health care especially in the health insurance industry via any

combination of higher quality, higher efficiency (spurring lower cost and thus greater availability), and new opportunities.

The disciplines involved include information science, computer science, social science, behavioral science, management science, and others. It deals with the resources, devices, and methods required optimizing acquisition, storage, retrieval, and use of information in health and biomedicine (Mettler & Raptis, 2012).

Health care informatics applications can be used to improve the quality of patient care, to increase productivity, and to provide access to knowledge (Mullner, & Chung, K 2006). Health informatics develops a sound understanding of healthcare and the role that information technology is playing in reshaping the industry and improving people's health is paramount, it is critical to the delivery of information to healthcare professionals so they can deliver the most appropriate care (NHS, 2015).

According to Oyelami, Okuboyejo, and Ebiye, (2013) the availability and utilization of information and communication technology for accessing health information by medical professionals revealed that medical professionals needed information continuously in the course of their clinical work. Clinical governance, care of patients and professional updating on the current medical practices were the main reasons for needing and seeking information. When the medical professionals needed clinical information, they turned to colleagues.

In Nigeria, in spite of the resource constraint, government seems committed to improving health care delivery in the country and the National health insurance scheme (NHIS) is one of the government efforts in this regard.

Insurance is defined by (Boateng 1981), "as a system whereby compensation can be paid for losses. All those people who are in a position to suffer a loss or losses and who participate in the scheme by contributing to it, have the right to claim from the fund, in the event insured against occurs. It is often referred to as the "pooling of risks". It is also important in the diagnosis, patient tracking and decision making regarding the patient and health service delivery in general.

Health informatics incorporates the following

1. The design and optimization of information system that support clinical practices, public health and research.
2. The modeling, organizing, standardizing, processing, analyzing, communicating and searching health and biomedical data
3. The understanding and optimizing the way in which biomedical data and information are used for decision making
4. The use of communication and computing technology to better educate health care providers and consumers.

The fast unfolding nature of the world and the burning desire to meet the health needs of population especially through health insurance with relative ease is always an issue in the health care industry. Execution of quality services to meet the health needs is achieved through evidence-based practices and this only comes out of proper health information management system.

However, knowledge and utilization of health informatics is paramount in catching up all the needed facets. This prompts the researcher to conduct this study on the prospect and challenges of Health Informatics to National Health Insurance Scheme in Nigeria.

Basically, the National health insurance scheme (NHIS) is aimed at providing the opportunities to achieve the following goals

1. to ensure that every Nigerian have access to health care services at an affordable cost
2. to protect families from the financial hardship of medical bills.
3. to limit the rise in cost of health care services
4. to distribute health care cost equitably among different income group.
5. to set and monitor standards of health care delivery services.
6. to eventually cover the whole nation, and for efficient health care services.
7. to establish health care system that adapts easily to local conditions and changing technology.

Objectives

The aim of this research work is to find out the prospects and challenges in the use of health informatics among implementers of National Health Insurance Scheme (NHIS) in Nigeria, case study of Borno state.

The specific objectives of the study include

1. To evaluate the level of awareness on health informatics to National Health Insurance Scheme in Nigeria
2. To assess the application of health informatics by National Health Insurance Scheme in Nigeria
3. To find the challenges associated with the application of health informatics by National Health Insurance Scheme
4. To find out the prospects of health informatics in National Health Insurance Scheme

Research questions

The major aimed of this work is to understand the prospect of health informatics in the operation of the scheme, its significance and problems and proffer solutions for a successful implementation in the Nigeria.

1. What is the level of awareness of Health informatics application by National Health Insurance Scheme?
2. What are the prospects of health informatics application by National Health insurance scheme?
3. What are the challenges associated with the application of health informatics by National Health Insurance Scheme?

Concept and significance of health informatics

Health informatics could be regarded as the signs that underline the academics investigation and practical application of computing and communication technology to health care, health education and biomedical research. (Dr. M. Kamba, 2015).

Health informatics (also called health care informatics, healthcare informatics, medical informatics, nursing informatics, clinical informatics, or biomedical informatics). It is a multidisciplinary field that uses health information technology (HIT) to improve health care via any combination of higher quality, higher efficiency (spurring lower cost and thus greater availability), and new opportunities. The disciplines involved include information science, computer science, social science, behavioral science, management science, and others. It deals with the resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine. Health informatics tools include amongst others computers, clinical guidelines, formal medical terminologies, and information and communication systems. It is applied to the areas of nursing, clinical care, dentistry, pharmacy, public health, occupational therapy, physical therapy and (bio)medical research, and alternative medicine too.

Informatics is the science of computer information systems. As an academic field it involves the practice of information processing, and the engineering of information systems. It studies the structure, algorithms, behavior, and interactions of natural and artificial systems which store, process, access, and communicate information. The field considers the interaction between humans and information systems alongside the construction of computer interfaces. It also develops its own conceptual and theoretical foundations and utilizes foundations developed in other fields. As such, the field of informatics has great breadth and encompasses many individual specializations including the more particular discipline of computing science. Since the advent of computers, individuals and organizations increasingly process information digitally. This has led to the study of informatics with computational, mathematical, biological, cognitive and social aspects, including study of the social impact of information technologies. However, it is important to note that Informatics as an academic field is not explicitly dependent upon technological aspects of information, while information technology is.

Material and methods

The methodology of the study which gave information on how the study was conducted. Research design, a descriptive cross-sectional research design was used in the study. Research design of this study uses the expose-facto design. This is because the study does not require experimentation in which manipulation and treatment of control groups is involved. This design was suitable for collection of data from a large population across the area. Thus, the information required for the study exists naturally without manipulation.

Study population, a sample size of 250 was used for the study. This is based on sample size selection chart by Isaac, Michael & Smith who reveals that for a population of 500 – 1000, a sample size of 250 is sufficient for generalization.

The study location was conducted in Borno state; the tool was administered to both the staff of National Health Insurance Scheme NHIS staff.

The population understudy was made up of the health professionals and personnel who are working under the scheme at both state office and health facilities. They are all included for accuracy and precision.

Research instruments, the researcher utilized closed-ended questionnaires as data collection instruments for the research. The instrument consists of three sections including socio-demographic characteristics of the respondents; section 2, level of awareness of Health informatics application; section 3, the prospects of health informatics; section 4, the challenges associated with the application of health informatics by National Health Insurance Scheme.

The scope of the study was the Borno State NHIS office staff, the office was responsible for the provision of insurance cover to about 4.5million residing in Borno. The variables used includes their understanding of the scheme, importance or role of health informatics, how can the health informatics be used in managing the huge number of clients etc.

Data analysis, descriptive statistics is used to analyze the data collected from the study. Measures of central tendency using frequency, percentage and mean is used in the analysis. The reason for the selection of this method is because the tool is fashion using the method.

Validity and reliability of the research instruments, the instruments were modified by a team of expert in the field after reviewing relevant literature. The instrument was found to be reliable with a Cronbach alpha of 0.96.

Ethical clearance was south from Planning department of SMOH with reference No: BO/SMOH/HREC/125/4/129 and with strict compliance with the stated guidelines on human subject research taking in cognizance of Helsinki declaration, Nuremberg code and Belmont report.

Results

The analysis presentation in this section are the results of the completed questionnaires distributed to the health care providers and out of the two hundred and sixty questionnaires distributed, after sorting, about two hundred completed questionnaires were found worthy, signifying 76.9% responses.

Relevant information's derived from the questionnaires was used in the analysis. In order to substantiate the information gathered from respondents, statistical devices were used for the analysis i.e. frequency distribution and percentages.

Table 1. Categories of the respondents

Respondent	Frequency	Percentage
NHIS Staff	20	10%
Health facility staff	30	15%
Clients or enrollees	115	57.5%
Others	35	17.5%
Total	200	100%

57.5% of the respondents are the NHIS enrollees, while 17.5% are other members of the society.

Table 2. To identify if the respondents is aware of health informatics

Respondent	Frequency	Percentage
Yes	45	22.5%
No	155	77.5%
Total	200	100%

77.5% of the respondents are not aware of health informatics

Table 3. What health informatics is all about?

Respondent	Frequency	Percentage
Health record keeping	100	50%
Providing information about the patient to the doctor	25	17%
Health management information	75	33%
Total	200	100%

33% says health informatics is all about health management information.

Table 4. To find the importance of health informatics to health care delivery

Respondent	Frequency	Percentage
Very important	25	17%
Important	50	33%
Not sure	135	50%
Total	200	100%

50% of the respondents are not sure of the importance of health informatics

Table 5. What are the prospects of health informatics by NHIS?

Response	Frequency	Percentage
All Nigerians will access to quality health care services	65	32.5%
Sharing of health information	50	25%
Improvement in quality of care	35	17.5%
Health emergencies can be handled quickly	25	12.5%
Not sure	25	12.5%
Total	200	100%

17.5% are of the view that the health informatics will help improve quality of care

Table 6. The challenges faced in the implementation of health informatics

Respondent	Frequency	Percentage
Inadequate knowledge	30	13%
Lack of equipment e.g. I.C.T.	35	17%
Inadequate government support	70	40%
Poor record taking and keeping	25	10%
Non-existence of the health informatics units	40	20%
Total	200	100%

40% of the respondents believed that the major challenge is inadequate government support

Discussion of findings

Improving the implementation effectiveness using the health informatics by the national health insurance scheme is an activity that will greatly enhance their performance.

Concerning the characteristics of the respondents in table 1, this survey reveals that, more than one third of the respondents (57.7% are those that have enrolled into the scheme or are clients reached while accessing health services at the facility levels, 10% and 15% are those that are officials of the scheme

or those that managed the scheme at the facility level. This indicates that because of the number of staff running the programme, they are mostly overwhelmed by the work that they hardly have time to use the computer, let a lot the use of health informatics to generate information for decision making.

The findings in the table 2 tries to find out whether the respondents are aware of health informatics. 30% said they are familiar with health informatics while 70% said no, they are not familiar with the health informatics. This indicates that health informatics is a new concept and therefore needs more publicity.

Table 3, seeks to find out what health informatics is all about. 50% of the respondents said it all about record keeping i.e. writing patients medical information as he attends health facility. 17% said it's about providing information about the patient to the doctor for treatment while 33% is about health management information. This shows the low level of knowledge about the significance of health informatics to the extent that they are comparing it with conventional record keeping or all those secretariat works. This shows that the NHIS staff and the client's needs to be educated on the importance and they be sensitized to provide the required information into the health informatics data based so as to help them effectively.

The 4th table seeks to know from the respondents the importance of health informatics to the health care delivery. 17% said it's very important, 33% said its important while 50% of the respondents are not sure of its importance to the health care delivery. This means few people know or understand the importance of health informatics to the health care delivery; therefore, there is the need for more education of the people on the importance of health informatics.

Table 5 seek to find what challenges faced in the implementation of the health informatics, majority of the respondents said it due to lack of government support and funding (40%). 20% said its due to lack of a functional unit designated as Health informatics units. 17% said its due to lack of ICT equipment. Other issues are lack of adequate knowledge of uses of the informatics. This means there is the need for government support and fund the full implementation of health informatics.

In table 6, the study revealed that majority of the respondent says they know what health insurance is. Their opinion is sought to find out what health insurance is all about. 37% of the respondents say that health insurance is about all Nigerians having access to quality health care services; 27% say it all about sharing of health care cost among the contributors of the scheme and 17% are of the opinion that health insurance is about insuring one's life with an insurance company and 10% say that they are not sure of what health insurance scheme is all about. This indicates that majority of the responded needs to be educated on the importance of health insurance scheme so as to enable understand the modus operandi and the benefits of the scheme towards the socio-economic development of their families and the country at large.

Summary

This research is conducted on the topic, Prospects and challenges of Health informatics to effective implementation of the National Health Insurance Scheme in Nigeria: Case of Borno state. Quite a number of factors have been identified which are responsible for the increase challenges of health informatics to the implementation of the national Health insurance Scheme in Nigeria, thus: Poor understanding on the relevance of health informatics on patient management especially by the National Health Insurance Scheme; Non utilization of the health informatics in the various health facilities across the country; Lack of establishment of the units in most of the health facilities; Lack of ICT equipment necessary for the full functioning of the unit; Inadequate professionals to support the unit in our various health facilities; Lack of training and re-training of the HMIS staff.

The prospect of Health Informatics applications potentially has effects on health care organizations, health care delivery and outcomes, therefore a Health Informatics application may not directly affect the medical condition of the patient – as drugs do – but it will generally have an indirect effect by assisting the care givers in their decisions and their patient management. IT is an intervention that can largely affect quality, efficiency, costs and outcome of health care.

The major challenges of health informatics in Nigeria are: The public health system faces many challenges in its efforts to produce useful, timely population health data; Federal, state, and local agencies maintain information systems for health surveillance.

Most of these systems were designed separately and often cannot share data, which limits the ability to communicate across systems. Health departments must adopt national data and technical standards; The cost of establishing and maintaining informatics technology is very expensive, particularly in light of shrinking public health budgets and expanding community needs; Consumers—policymakers and the public alike—are concerned about the impact of information technology on confidentiality and privacy and the need to assure secure systems that safeguard information and citizen privacy. Health departments must establish uniform policies and practices to assure confidentiality and security. It is generally known that the above problems cannot be solved without adequate finance and commitment by the government, Adequate fund made available for the establishment of the units in all health facilities running NHIS, educate the health workers and the general public on the relevance or importance of health informatics and application to the health care industry and the populace.

Similarly, relevant literatures were reviewed concerning the topics i.e. health informatics; definitions from various scholars, its evolution and developments, problems, challenges, significance and importance of health informatics to National Health Insurance Scheme in Nigeria.

Conclusion

It is a known fact that the Health Informatics is designed to improve patient's outcome and response to emergencies as well as electronic store request and inventory. However, its application to the present-day health care is at its rudimentary stage in almost all health facilities, especially the health facilities under the National Health Insurance Scheme in Nigeria.

This research work identified the expected problems as enunciated in the statement of problems, which includes; lack of understanding of the concept of health informatics, inadequate government support/ funding, lack of public awareness or education, lack of unit specifically designated as health informatics units; inadequate personnel /professionals to man the unit; lack of health care facilities willing to operationalize the system at all levels of health care delivery. At the end, various recommendations were proffered.

Recommendations

Based on the findings made the research has the following recommendations, thus:

The Health Informatics is fashioned out to provide timely, quality information about the patient or the health system for decision making. It also helps in timely response to emergencies and requests especially those that are life savings.it is the view of the above; the following recommendations if implemented will enhance the effective implementation of Health Informatics in the National Health Insurance Scheme and the achievement of the scheme's overall objectives

1. There is need for government to invest in the establishment of Health Informatics units fully equipped with all the ICT and inter-connectivity in all health facilities especially NHIS accredited health facilities across the country.
2. Qualified health informatics professionals should be engaged to operate the health informatics
3. The NHIS management should be sensitized on the advantages of health informatics to the success of the scheme
4. The general public should be educated on the importance and the need to provide adequate information to the health informatics unit on their health conditions

Finally, the researcher is of the candid belief that, if these recommendations are fully implemented to the core, it will eliminate double registration of enrollee or client, also enrollees and client will have easy access to health facilities across the country because of the establishment of the network via the health informatics portal and therefore, National Health Insurance Scheme implementation is going to be very effective in Nigeria.

References

- [1]. A. Friede, *at el*, Public health informatics: how information-age technology can strengthen public health, Annual Review of Public Health 16 (1995) 239–252.
- [2]. W.F. Bauer, Informatics and (et al) informatique, IEEE Annals of the History of Computing 18 (2) (1996).

- [3]. Dr. Manir Kamba, Lecture note on Health informatics, BUK, 2015.
- [4]. R. Koppel, *et al.*, Role of computerized physician order entry systems in facilitating medication errors, *JAMA* 293 (10) (2005) 1197–2003.
- [5]. B. Rotman, A. *et al.*, A randomized controlled trial of a computer-based physician workstation in an outpatient setting: implementation barriers to outcome evaluation, *J. Am. Med. Inform. Assoc.* 3 (5) (1996) 340–348.
- [6]. J. Ash, E. Coiera, M. Berg, some unintended consequences of information technology in health care: the nature of patient care information system-related errors, *J. Am. Med. Inform. Assoc.* 11 (2004) 104–112.
- [7]. Y.Y. Han, J.A. *et al.*, Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system, *Pediatrics* 116 (6) (2005) 1506–1512.
- [8]. E. Ammenwerth, N. Shaw, Bad health informatics can kill—is evaluation the answer? *Methods Inf. Med.* 44 (2005) 1–3.
- [9]. P. Beynon-Davies, M. Lloyd-Williams, when health information systems fail, *Top. Health Inf. Manage.* 20 (1) (1999) 66–79.
- [10]. R. Heeks, Health information systems: failure, success and improvisation, *Int. J. Med. Inform.* 75 (2) (2006) 125–137.