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HINARI Usage Patterns and Trends in Nigerian Universities in Five Years (2010-2014)

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ABSTRACT

The digital divide is a global challenge. The Health Internet Network Access to Research Initiative (HINARI) is one of the most successful efforts aimed at bridging the digital divide in access to health information in developing countries. Despite the availability of this resource free of charge to not-for-profit institutions in developing countries, few studies are available that investigate its usage patterns and trend in Nigeria. Data for the study were obtained from HINARI server located in the WHO Library in Geneva. The data were the yearly log and statistics of usage of HINARI in universities in Nigeria from 2010 to 2014. The collected log data was analyzed using Microsoft Excel. Descriptive statistics including frequency counts, percentages and bar charts were used. More (68.0%) public than private (32.0%) universities in Nigeria are registered with HINARI. Of the registered institutions, (37.0%) are located in the South-West zone. A total of 201,110 user's accessed HINARI resources in universities in the six zones across the country during the five-year period. While universities in the South-West zone recorded the highest (63.4%) users, those in the North-East had the lowest (3.1%). The highest (97,229) number of HINARI users in Nigerian universities was recorded in 2012 while the lowest figure occurred in 2014. This study shows that HINARI was used in universities in all five geo-political zones in Nigeria however, usage trends revealed a sharp decline in 2014. Further studies are recommended to determine alternative sources used by students, researchers and healthcare providers to meet their information needs.

Keywords: HINARI, Research4Life, Usage patterns, Usage trends, Universities, Nigeria

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INTRODUCTION

For many years, access to the priced literature was a challenge to researchers, academics, health care providers, scientists, students and policy makers in resource constrained settings. Unlike their counterparts in wealthy nations, researchers from most developing countries, had limited access to high quality, up-to-date, relevant and reliable information from the published literature due to inadequate funding of libraries and lack ICT infrastructure including internet access. This challenge, termed as "digital divide" or "information gap" is used to describe the division between those who have access to ICTs and those who do not (Bridges.org, 2002). The digital divide reflects inequity that exists in access to ICTs between countries, within regions and among different social groupings within a country or between citizens of a country (Norris, 2001). The digital divide has also been defined as

"inequalities in access to the Internet, extent of use, knowledge of search strategies, quality of technical connections and social support, ability to evaluate the quality of information and diversity of uses" (Dimaggio and Hargittai, 2001).

During the past two decades, several initiatives aimed at bridging the digital divide in access to health information has been developed for resource poor settings. Among the most successful is the Health Internet Network Access to Research Initiative (HINARI) which the World Health Organisation (WHO) launched in 2002 (Aronson, 2004; Katikireddi, 2004). At inception, HINARI was an initiative between the WHO and six of the world's biomedical publishers namely Blackwell, Elsevier, John Wiley, Springer Verlag, Harcourt Worldwide STM Group, and Wolters Kluwer International Health and Science as well as partners including Yale University. The initiative is aimed at providing free or very low cost online

access to published research information to local, not-for-profit institutions in developing countries (Aronson, 2002). Dr Glo Harlem Brundtland, former Director-General of the WHO asserts that:

"the launch of HINARI sees the beginning of a new way to bridge the digital divide in health, and an important move by publishers in facilitating the flow of health information using the Internet" (Brundtland, 2002).

Up to 14,000 journals in (30 different languages), 46,000 e-books, and 100 other information resources are now available to health institutions in more than 100 countries and territories, benefiting thousands of health workers, researchers and students (HINARI, 2015a; WHO, 2011). Institutions in countries with a gross national income (GNI) per capita of less than \$1,250 (BAND 1) are given free access to the journals provided in the HINARI database (Villafuerte-Gálvez, Curioso, & Gayoso, 2007). However, institutions in countries with a GNI per capita between \$1,250 and \$3,000 (BAND 2) must pay a yearly fee of \$1,500 to access these journals (HINARI, 2015b).

HINARI is one of the core contents of the Health InterNetwork (HIN) Project launched in September 2000 by Mr. Kofi Annan, former United Nations Secretary General. The launch of HINARI in 2002 was a major breakthrough of the HIN Project. Initially, over 2000 electronic journals was made available free by the six publishers. Over a period of ten years, information resources accessible through HINARI have increased to include electronic books, databases, clinical practice guidelines, references sources and Evidence Based Medicine resources. Brundtland noted that the seed of a knowledge revolution lies in HINARI, as this resource will help developing countries improve skills, develop research and save more lives (WHO, 2003).

The HINARI, now known as 'Hinari Access to Research in Health Programme' has other sister programs including Access to Global Online Research in Agriculture (AGORA), Online Access to Research in the Environment (OARE), and Access to Research in Development and Innovation (ARDI) accessible at www.research4Life.org. All four programs are at present known and referred to as "Research4Life", a public-private partnership between over 200 international scientific publishers worldwide both commercial and nonprofit, the International Association of Scientific, Technical and Medical Publishers (STM), Cornell and Yale Universities in collaboration with four United Nations (UN) agencies namely WHO, Food and Agricultural Organization (FAO), United Nations Educational Program (UNEP), World Intellectual Property Organization (WIPO), and technology partner, Microsoft. Research4Life aims to help attain one of the six United Nation's (UN) Millennium Development Goals by 2015, namely reduction of the scientific knowledge gap between industrialized countries and the developing world.

In Nigeria, HINARI is the most popular component of the Research4Life programmes. Since its launch in 2002, several health institutions, governmental agencies and not-for-profit organizations have registered to access up-to-date, relevant and quality health information from HINARI. The availability of these resources free-of-charge on the Internet, have brought huge benefits to tertiary healthcare institutions and great relief to libraries in developing countries especially those in Nigeria

and other countries in sub-Saharan Africa. Despite their popularity, few empirical studies, (Ajuwon and Olorunsaye, 2013; Oduwole and Oyewumi, 2010) have investigated access and use of HINARI resources in Nigeria. These previous studies covered access and use of HINARI resources in health institutions in South-West Nigeria. There is a dearth of information on HINARI usage patterns and trends in universities in Nigeria. This study is meant to fill this knowledge gap. The main objective of this study is to investigate HINARI usage patterns and trends in Nigerian universities using processed log-in data.

MATERIALS AND METHODS

Setting: With a population of about 170 million, Nigeria is the largest country in Africa. It consists of 36 states and a Federal Capital Territory, Abuja. Nigeria is divided into six geopolitical zones namely South East, South-South, South West, North East, North Central and North West. There are different types of institutions in Nigeria that are eligible to register and access HINARI. These include government departments, universities, healthcare institutions and research institutes. As at 2015, a total of 141 universities are accredited by the National Universities Commission (Table 1). These consist of 61 private, 80 government owned universities, Federal (40) and State (40). This study covered Faculties, Schools, Centres, Institutes and Colleges of Medicine/Health Sciences in Nigerian universities, that are registered to use HINARI.

Table:1
Accredited universities in Nigeria

Items	No	%
No of universities (N=141)		
Federal	40	28.4
State	40	28.4
Private	61	43.2
Total	141	100.0

(NUC, 2015)

Method of Data Collection: Data for this study were obtained from the HINARI Team in WHO Library, Geneva, Switzerland. To obtain the HINARI usage statistics, logins are gathered from the proxy server logs which track the "events" that are relevant to the proxy sessions. The key event is a successful login- meaning that a correct username and password has been entered on the proxy login page and a proxy session is therefore established. The proxy logs are enormous, and are "parsed" by a hand-built programming script to count the number of these relevant "events" which are associated with any particular HINARI username. The resultant "counts" of logins for any day/time are inserted into a database, and the database is queried to determine how many logins exist in any single month. A report was then produced showing monthly login counts in sequence. The processed log files are returned in Microsoft Excel file format as usage statistics for each User Name (User Identification Number) representing institutions/organizations that are registered with HINARI.

The data collected was in Microsoft Word Excel, information contained include name of university, Faculty, Institute or Research Centre, location (city and country) and number of logins for registered institutions/universities.

Method of Data Analysis: The collected data was analyzed using Microsoft Excel. Descriptive statistics including frequency counts, percentages and bar charts were used for data analysis and presentation.

RESULTS

Profile of Registered Institutions and HINARI Users

The profile of institutions registered with HINARI is shown in Table 1. Of the 141 accredited universities in Nigeria, 97 are registered with HINARI. The majority (68.0%) are public universities owned by State and Federal government while 32.0% are private.

The distribution of users by region showed that the South-West had the majority (37.1%) followed by the South East (16.5%) and South-South (16.5%). The North-East had the least (3.1%) during the five-year period (Table 2).

HINARI Usage Trends in Institutions by Geo-political Zones

Trends in the usage of HINARI in institutions in the zones are shown in Table 3. Compared to other zones, South-West recorded the highest (63.4%) usage rate. In the South-West, Ibadan had the highest usage for all the years under review while Ile-Ife was second and Lagos, third. Ogun State University Ago-Iwoye, recorded highest (26.0%) usage rate in 2012 while Redemption university had low (10.0%) usage consistently for the entire five-year period (Figure 1).

Figure 2 reveals the trends in the use of HINARI in universities in South-South zone of Nigeria. HINARI usage

in universities in Port-Harcourt rose from 51.9% in 2010 to (65.6%) in 2014. Also, University of Uyo accessed HINARI resources more in 2011 (64.8%) and 2012 (59.2%) respectively. University of Benin and Ambrose Alli university both in Edo State, recorded low usage of HINARI resources during the five year period.

Table 2:
Profile of institutions registered with HINARI

No of registered institutions/universities Items	n=97	
	No	%
Federal	36	37.1
State	30	30.9
Private	31	32.0
No of the institutions by geo-political zones (n=97)		
SW	36	37.1
SE	16	16.5
SS	16	16.5
NC	15	15.5
NW	11	11.3
NE	3	3.1

Table 3:
Number of HINARI Users by Geo-political Zones in Nigeria (2010-2014)

Geo-political Zones	No	%
South-West	127,491	63.4
South-East	21, 736	10.8
South-South	20,236	10.1
North-West	16,320	8.1
North-Central	8,741	4.3
North-East	6,582	3.3
Total	201,110	100.0

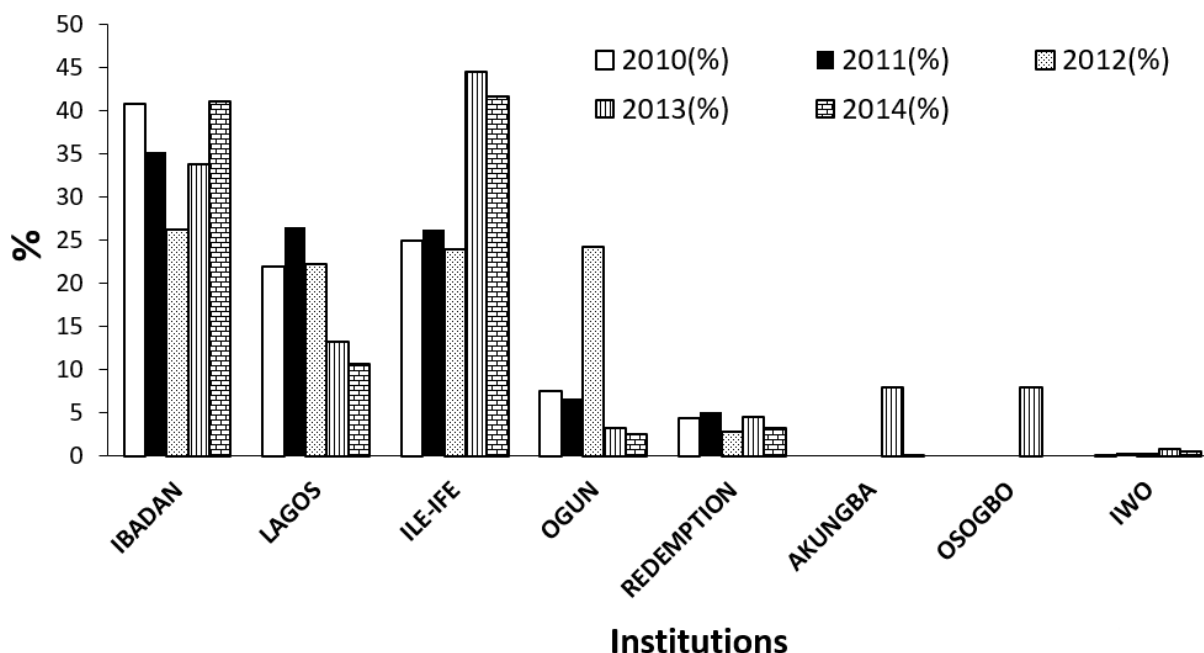


Figure 1:
HINARI Usage Trend in Institutions in the South-West Zone

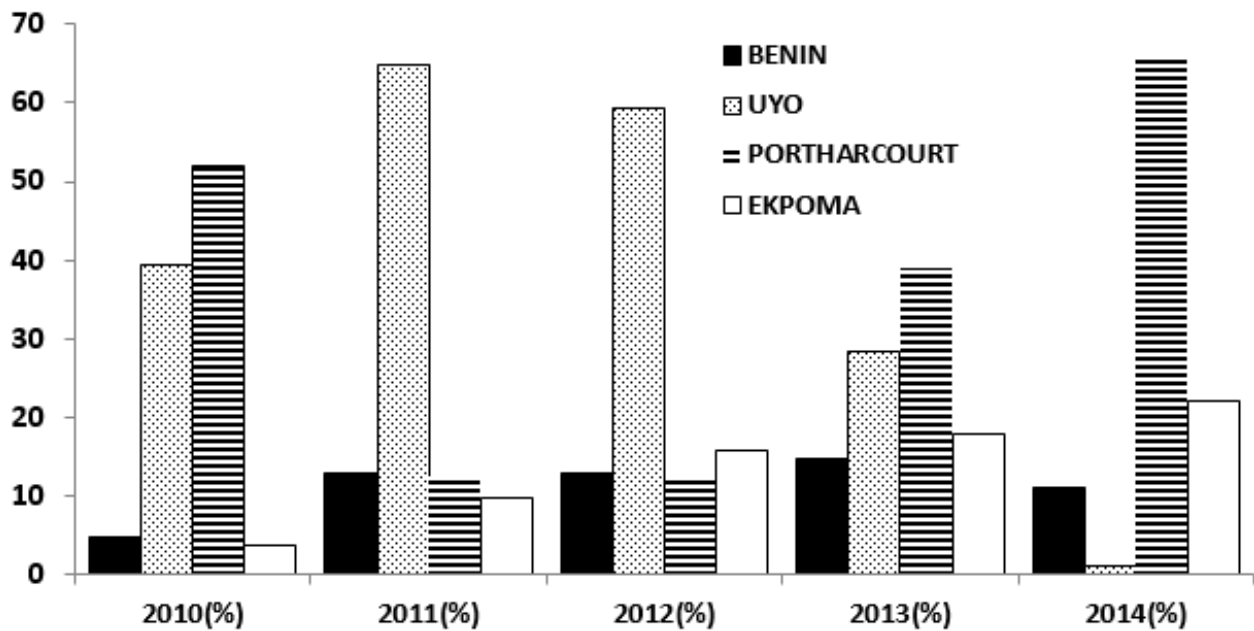


Figure 2:
Use of HINARI in institutions in South-South Zone

Trend in use of HINARI in the South-East zone show that Nnewi had the highest level of usage while Uturu had none (Fig. 4). Use of HINARI was high in Nnewi and Enugu than in Owerri, Onitsha, Abakiliki and Uturu. In Enugu, usage of HINARI rose from (20.0%) in 2010 and 2011 to (37.0%) in 2012 but dropped to (5.0%) in 2014. In Nnewi, there was an increase from 20.0% to 50.0% in 2013 and 95.0% in 2014. Onitsha and Abakiliki showed low usage during the five year period while Uturu did not record any trend in use of HINARI during the period.

Trends in the use of HINARI in universities in the North-West zone is shown in Figure 4. Usage of HINARI by institutions in Kaduna (%) 65.0% in 2010, rose to 72.0% in

2013 and dropped drastically to less than 5.0% in 2014. However, in Zaria, there was a tremendous increase (64.0%) in usage in 2014. Kano and Sokoto had low usage of less than 10.0% during the period under review.

Figure 5 shows trends in HINARI usage in universities in the North Central zone. Ilorin has high level of usage of HINARI during the five year period except for 2010. In 2014, HINARI usage level rose to (69.3%) while Jos recorded (30.7%).

Figure 6 shows HINARI usage in North East zone of Nigeria. University of Maiduguri consistently use HINARI more than university of Bauchi with 4.2% as the highest usage level recorded in 2010

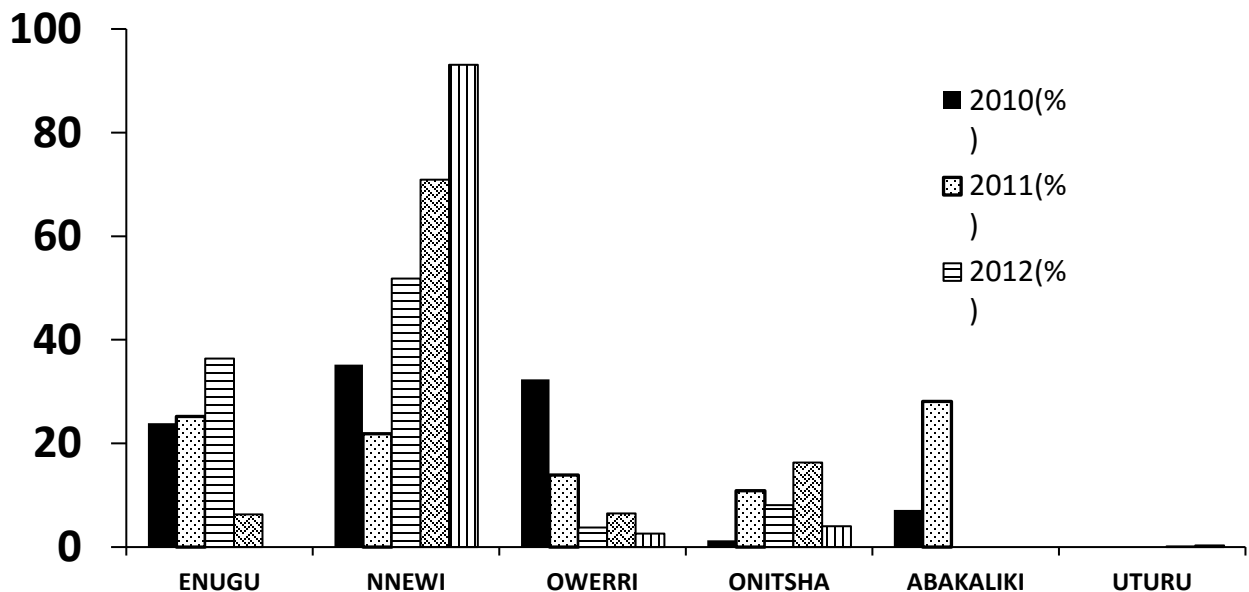


Figure 3:
Use of HINARI in Universities in South-East Zone

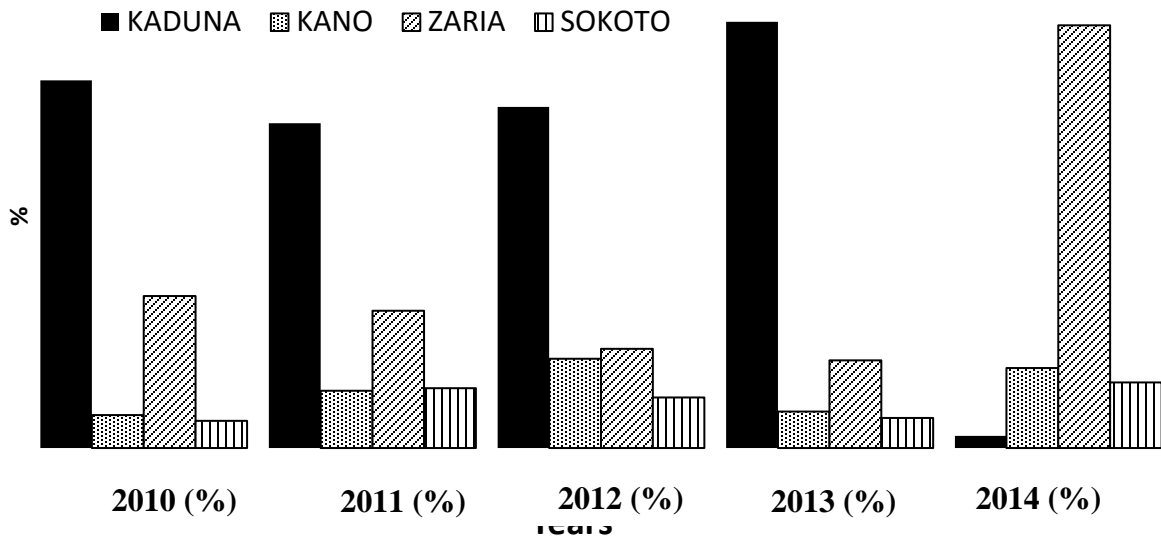


Figure 4:
Trends in the Use of HINARI Institutions in North West Zone

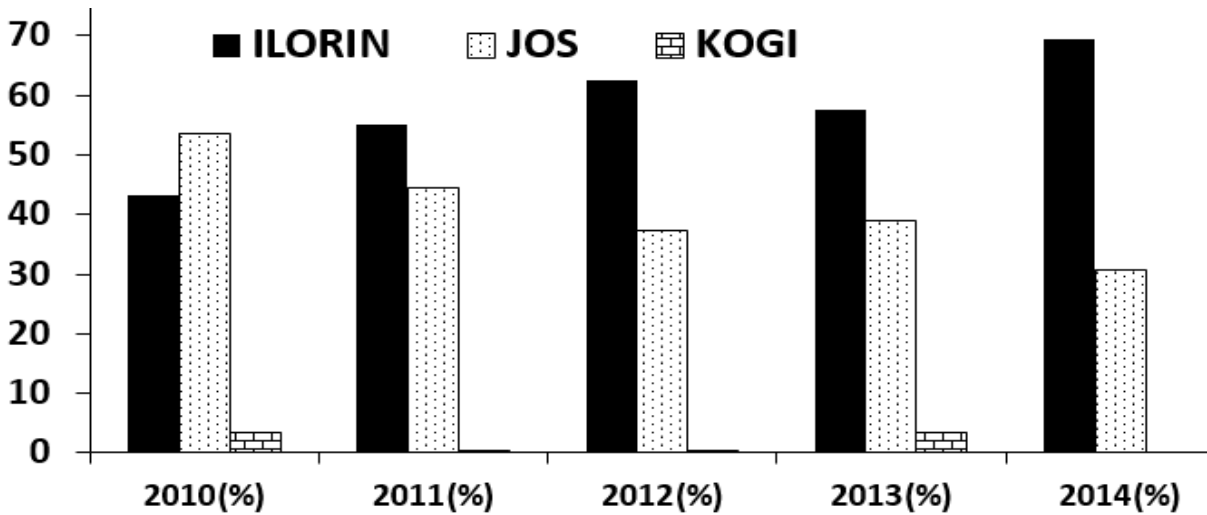


Figure 5:
Trends in Use of HINARI in Universities in North Central

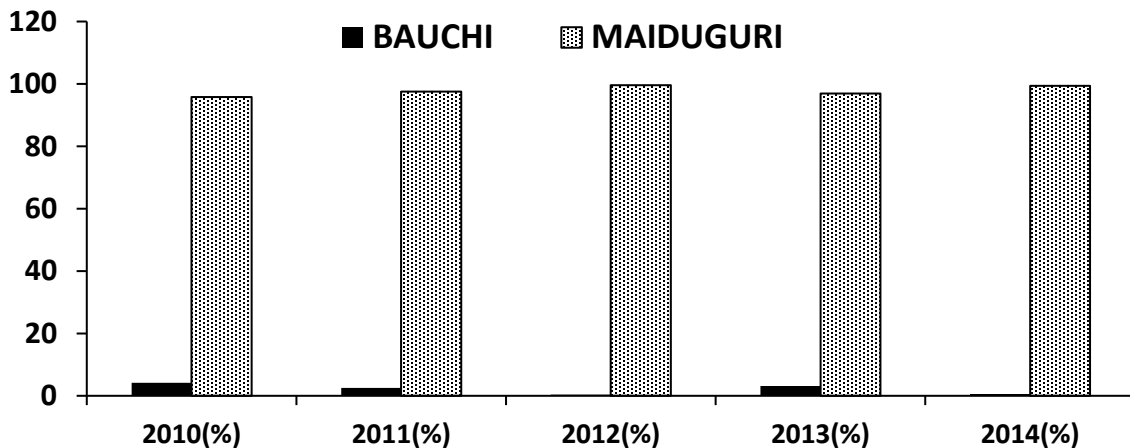


Figure 6:
Trends in Use of HINARI by Universities in the North East Region

DISCUSSION

To our knowledge, this is the first study that assessed HINARI usage trends in Nigerian universities with login data obtained from HINARI server in Geneva. This study revealed a preponderance of registered institutions and users in South-West zone of Nigeria. Thus, underscoring the significance of the data and their relevance in planning. The possible explanation is that there are higher educational academic institutions in the South-West including Nigerian Premier university, University of Ibadan, Nigeria. For example, the South-West has the highest number (36) of universities than other regions (NUC, 2015). On the other hand, use of HINARI was low in universities across all three Northern zones when compared to those in Southern zones.

A large majority of the institutions registered with HINARI are public (government owned). This is probably because government owned universities are underfunded (Ezekwesili, 2006; Famade, Omiyade, & Adebola, 2015; Idialu & Idialu, 2012; Okeke, 2015) leading to poor Information Technology (IT) infrastructure (Ahmed, 2011). As a result, more are registered with HINARI as well as other free information resources compared to private universities where financial provision is made for yearly subscription of both print and electronic resources for teaching, learning and research. Most universities and teaching hospitals owned by government are registered with HINARI.

Although use of HINARI is low across all the three Northern zones however, the North-East consistently lagged behind. This may probably be connected with the terrorist activities of Boko Haram that has made it impossible for schools including tertiary institutions to function normally (Awortu, 2015; Ohiwerei, 2014; Oladunjoye & Omemu, 2013). This became prominent during the years under study. People in the North-East zone are constantly being attacked and killed by terrorists through suicide bombings by members of the Islamic sect, Boko Haram thereby destabilizing the educational system and economy of North Eastern Nigeria (Babatunde, Uyanga, & Olarewaju, 2014; Chukwurah & Ogbeje, 2015).

Usage of HINARI picked up in 2012 but declined significantly in 2013 and drastically in 2014. This could be as a result of the decision made by some publishers to withdraw access to their contents in HINARI to some developing countries including Nigeria. This decision is said to be based on the initial agreement reached between WHO and the publishers that publishers have the right to withdraw from the initiative given the right reasons. The denial of access to contents in HINARI could possibly be responsible for the very low usage in 2014.

Although transactional log is a cheap way of obtaining significant amount of study data however, it is fraught with four limitations. First, using transactional log method of data collection (unobtrusive) for this study made it impossible to get demographic information concerning actual searchers of HINARI in the various universities in Nigeria. Such information could have helped to determine the characteristics of users. Second, it is difficult to get individual identities in transactional logs because more than one person may use a computer system. Since IP addresses typically represents a

"user" in a search log, it is not a precise presentation of a user or searcher therefore, getting individual identities of searchers was not possible. Third, a search log does not keep record of the reason(s) for the search and the purpose for which the searchers used the information obtained. For ethical reasons, the login data obtained from HINARI team does not include information that will enable comparison of HINARI usage by type of university. For example, comparison of usage between Federal and State universities and between public and private universities could have been useful.

Despite the limitations, the data shows HINARI usage trends in five years in institutions in Nigeria. The results also reveal decline in usage and underscore the need to develop alternative means of meeting the information needs of health care providers, students, researchers, and scientists in Nigeria. User Web search behavior cannot be established except through research therefore, further studies that will incorporate either qualitative or quantitative methods are needed to determine alternative means scientists and researchers are in Nigeria currently using HINARI to obtain quality, up-to-date and relevant scholarly materials to meet their information needs.

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