

Primary Health Care Innovation in Nigeria – Desk Research Report

by the Pro-Poor Growth and Promotion of Employment in Nigeria Programme-
SEDIN

Author:

Margherita Trestini, Prototipi, Lagos, December 2022



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1. Acronyms

CesTII	Centre for Innovation Indicators
CHAI	Clinton Health Access Initiative
CHEW	Community Health Extension Worker
DOI	Diffusion of Innovation
EPI	Expanded Programme on Immunisation
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
LGA	Local Government Authority
MDCN	Medical and Dental Council of Nigeria
MDGs	Millennium Development Goals
NACETEM	National Centre for Technology Management
NARD	Nigerian Association of Resident Doctors
OECD	Organisation for Economic Co-operation and Development
PHC	Primary Health Care
PRIMASYS	Primary Health Care Systems
WHO	World Health Organisation

2. Executive Summary

This desk research report represents the first stage of the “Research on Business Opportunities in the Nigerian Primary Health Care Sector” aiming at identifying:

- Relevant stakeholders in the primary health sector in Nigeria;
- Level of awareness and adoption of business/digital solutions;
- Level of digital/business skills at the primary health care level;
- Driving forces for changes which may foster the adoption of innovative business and/ or digital solutions in the primary health sector in Nigeria;
- Restraining forces, the obstacles to change which can prevent new business and/or digital solutions to be adopted;
- Existing solutions or emerging solutions and gaps to be filled;
- Risks and foreseeable challenges in the support to the selected sector in general and regarding the political environment, stakeholders involved and possibly distortion of markets;
- Possible roles of SEDIN to facilitate an increase in income of actors and/ or promote employment creation;
- Other development partners/ donors supporting the primary health sector from a business perspective and their areas of interventions

The Desk Research provides the description of the actor structure in the innovation system in the Nigerian Primary Healthcare Facilities, aka Primary Health Care Centres (PHCs). This report serves as a basis for the Primary Research areas which will be conducted in early 2023, for further investigation. The results of the Primary Research will inform the next phases of the project (i.e. innovators hackathon, awareness campaign and matchmaking of innovators and health care providers etc.).

Our initial analysis of the Nigerian PHC system has indicated that the country lacks adequate health personnel. In addition, the state of the PHC facilities is wanting. Whereas it is assumed that deploying technology might help the matter and fill in the gap in order for the country to meet its Millennium Development Goals (MDGs). However, there is a need to ask ourselves, what technology is already on the ground and how has it helped.

In addition, identify infrastructure on the ground to support innovative ideas and if any innovation will get the relevant acceptance from stakeholders. The stakeholders, in this case, include the health authorities both at the Federal and State levels, the healthcare players such as the doctors, nurses and clinical officers, academics, civil society organizations, and other elite opinion formers as well as the recipients, in this case, the patients and the general public at large.

Where technology has been used, there has been improvement in primary healthcare delivery. Technological innovation can be used to advance PHC in Nigeria on different fronts.

For example:

- In training
- Patient Management and Monitoring
- Disease Surveillance
- In reaching remote patients
- In delivering essentials such as drugs

As we speak the country has limited health worker capacity

In terms of capacity development, the country lacks capacity in terms of human resources as well as lack of efficient and effective learning environment. The lack of learning and other capacity-building measures is highly affected by the lack of enough healthcare personnel, resulting in the few already in place being overworked and hence lacking time and energy to learn and improve their skills. Furthermore, those who work in the country's rural areas are disadvantaged compared to their urban peers. This is because the rural areas lack basic infrastructure including electricity.

Research carried out based on the Clinton Health Access Initiative (CHAI) indicated that *“Conventional training approaches that are often classroom-based, didactic, costly, and infrequent lead to service disruptions at points of delivery when they do occur.”*

In addition, the CHAI study, which was carried out in Kano State, also established that limited health worker capacity and ineffective learning environment hindered optimal service delivery across primary health care (PHC) facilities in area of the study. To tackle the above-named challenges and create an optimal learning environment with the objective of supporting effectively upscaling health workers, the Clinton Health Access Initiative (CHAI) came up with peer-led learning (PLL). This 2016 initiative was a low-cost, non-disruptive capacity-building approach that had the objective of closing the health worker knowledge and skill gap.

“The majority of health workers in PHC facilities across all the states are community health extension workers (CHEWs). Doctors, nurses and midwives are more available in non-PHC health care centres”

- The primary level of care is rather dominated by CHEWs and junior CHEWs, who make

- up about 36.8% of all care providers at the PHC level.
- There is no available data on the proportion of informal providers, and practitioners of traditional, complementary and alternative medicine, out of the total healthcare workforce
- Furthermore, studies have shown that health workers perceive rural life as difficult and lack the desire to work in PHCs located in rural communities. Reasons include:
 - lack of basic amenities that characterize rural areas;
 - poor personnel and equipment,
 - leading to difficult working conditions and dissatisfaction;
 - lack of electricity and water in the facilities, leading to poor quality of care and performance;
 - an inadequate supply of drugs, which is a considerable constraint to service delivery
 - separation from families is another significant challenge for health workers who have to leave their families and social responsibilities to work in rural areas.
- These factors have a negative impact on job satisfaction, staff performance and health service delivery, and consequently, lead to high staff turnover.

3. About Nigeria

Nigeria or formally the Federal Republic of Nigeria is a large country in West Africa. It occupies an area of 923,769 square kilometres (356,669 sq. mi).

The country is sandwiched between the Sahel in its north and the Atlantic Ocean's Gulf of Guinea in its south. In addition, it is bordered by Benin to the west, Cameroon to the east, Niger and Chad to the north while the Atlantic Ocean lies to its south.

This Africa's most populous nation sits in the tropics, lying between the latitudes of 4° 1' and 13° 9' N and longitudes 2° 2' and 14° 30'. Besides being the most populous country in Africa, it is the world's 7th most populous, with a population of 177 155 754 and a population growth rate of 2.47% per annum.

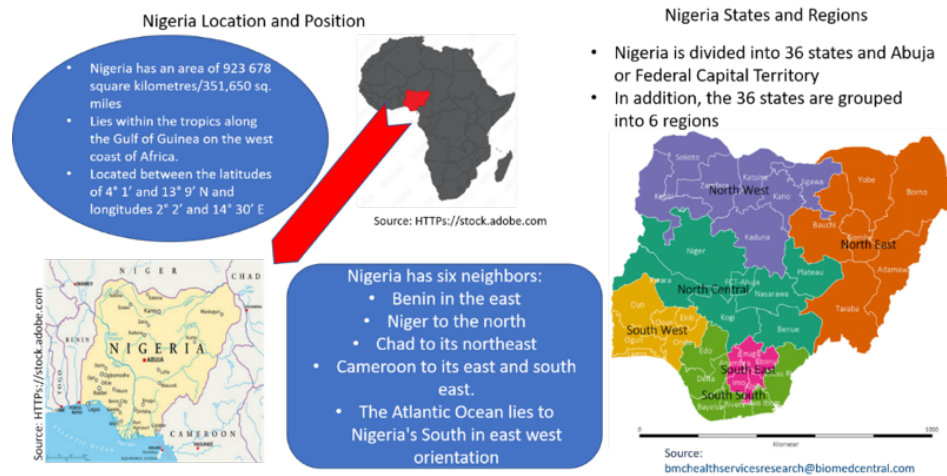
Additionally, Nigeria's population is predominantly young, with about 45% aged under 15 years and 20% under 5 years, while women of childbearing age (15–49 years) account for about 22% of the total population.

Nigeria is the largest economy in Africa and with a gross domestic product (GDP) per capita of US\$ 1,091 and an income or wealth inequality (Gini coefficient) of 43.7. However, Nigeria is still ranked among the poorest countries in the world. In addition, about 70% of the population lives below US\$ 1 per day.

Furthermore, about 52.2% of the country's population lives in rural areas where poverty is more prevalent, thus limiting access to adequate nutrition, quality health care and other basic social services.

Health-wise, the country is not doing well with recent assessments have shown that the maternal mortality ratio is 576 per 100,000 live births, the under-5 mortality rate is 128 per 1,000 live births, the infant mortality rate is 69 per 1,000 live births and life expectancy is 52.62 years. Below is a picture quickly summarizing the geography of Nigeria.

Figure 1 Nigeria States and Regions



4. The State of Primary Health Care (PHC) in Nigeria

The healthcare system is largely public-sector driven, with substantial private-sector involvement in service provision.

Secondary- and tertiary-level health facilities are mostly found in urban areas, whereas rural areas are predominantly served by primary health care (PHC) facilities.

There is a shortage of PHC facilities in all states in the country. The situation is more pronounced in rural areas. Furthermore, many PHC facilities lack basic necessities and are hardly efficient.

Health policy-making and national healthcare priority setting are the responsibility of the Federal Government.

Nigeria ranks 187 out of 191 countries in health system efficiency with respect to health expenditure per capita.

- Under-5 mortality rate: 128/1,000 live births
- Infant mortality rate: 69/1,000 live births
- Maternal mortality ratio: 576/100,000 live births
- Antenatal care attendance and delivery by skilled health providers: 61% and 38% respectively
- Fully vaccinated children: 25%
- No vaccination: 21%

Nigeria has one of the world's highest rates of all-cause mortality for children aged under 5 years, with health service utilization for the treatment of acute respiratory infections at 35% and diarrhoea at 29%.

Nigeria accounts for one-quarter of all malaria cases in Africa and has an HIV prevalence of 3.1% (2012 estimate).¹

According to the World Health Organization report: Primary Health Care Systems (PRIMASYS); a case study from Nigeria (2017), the following are some of the factors that greatly affect the Primary health care system in the country

- High population growth places a major strain on the resources available for health care.

1 Sources: World Health Organization (WHO)

- More young population implies a need for increased provision of child and adolescent services.
- Very high total dependency ratio implies a need for more government funding for primary health.

A relatively lower literacy rate in women implies a need to communicate medical advice and adverse health outcomes using non-written methods of communication.

How Nigerian Primary Health Care is structured

The Primary Health Care (PHC), is the lowest level and the entry point to health care services. Furthermore, PHC is the foundation of the National Health System. PHC is made of:

- The health posts and clinics,
- Health Centres and Comprehensive Health Centres

It is important to note that the PHC provides basic primary care services such as:

- Promotive, preventive
- Curative and rehabilitative services.

In terms of Management Local Government Authorities (LGAs) own and fund PHC facilities. In addition, the LGAs have overall responsibility for this level of care. Furthermore, the Ward Health System, which takes on the political ward as the functional unit for PHC service delivery, was adopted as a suitable strategy for addressing the numerous challenges and accelerating progress in the attainment of the Millennium Development Goals. The LGA health departments are primarily responsible for managing primary care facilities. Each level of government identifies its health priorities and pursues them with minimal intervention from the other levels (13).

In addition to the efforts of the LGAs, PHC services have been jointly managed by the state ministries of health, ministries of local government affairs, the Local Government Service Commission, the Civil Service Commission, the Ministry of Budget and Planning, state hospitals management boards, faith-based organizations, nongovernmental organizations, zonal and state offices of the National Primary Health Care Development Agency, the Federal Ministry of Health.

According to the 2018 report “Distribution of health facilities in Nigeria: Implications and Options for Universal Health Coverage”²: Nigeria’s healthcare facilities are owned as follows:

- Public sector 67%
- Private sector 33%

To come up with the right representation, we adopted a table from “*An Overview of the Health System in Nigeria and the contributions and role of faith-based health providers in the overall health system. March 2021 Christian Connections for International Health*”.

Ownership Category	Primary	%	Secondary	Tertiary	Total
MOH/Public facilities	28,448	82	1,232	105	29,785
Christian Health Facilities	432	1	194	15	641
Islamic Health Facilities	5,795	17	4,354	46	10,195
National Total	34,672		5,780	166	40,621

² Source: International Journal of Health Planning and Management

Source: Triangulated from several sources including Nigerian Health Facility Register FMOH (2019)

In terms of the actual service delivery, the private/ faith-based health care system contributes to over 65%¹ of health services delivery despite owning only 27% of health facilities in Nigeria. This is mainly because 89% of the private/FBO facilities are located in rural and hard-to-reach communities where 70% of the Nigerian population resides according to the 2006 Nigerian Census.

Some history about Nigeria's Primary Health Care System

To improve Primary Health Care, in the August of 1987, the Nigeria Federal Government launched the Primary Health Care plan (PHC). This plan had the following major 9 objectives:

- Improve collection and monitoring of health data
- Improve personnel development in the healthcare
- Ensure the provision of essential drug availability
- Improve immunization programs
- Promote treatment of epidemic diseases
- Improve food supply and nutrition
- Improve material and child care, and family planning
- Educate people on prevailing health problems and the methods of preventing and controlling them.

According to Ibrahim Babangida, the country's president at the time, PHC was intended to be the cornerstone of health policy. In addition, its introduction was intended to affect the entire national population. In the government's eyes, PHC looked like a silver bullet that would allow:

- acceleration of the health care personnel development;
- improvement of collection and monitoring of health data;
- ensure availability of essential drugs in all areas of the country;
- implementation of an Expanded Programme on Immunisation (EPI);
- improved nutrition throughout the country;
- promotion of health awareness;
- development of a national family health program;
- widespread promotion of oral rehydration therapy for the treatment of diarrheal disease in infants and children.

At its launch, the PHC Implementation was intended to take place mainly through the collaboration between the Ministry of Health and participating LGAs, which received direct grants from the Federal Government.

Based on this desk research analysis, this health care plan has not achieved the desired result mainly due to a lack of infrastructural, personnel deficit, lack of adequate financing from the government and finally poor public health management. As such, innovative technology in the Nigerian PHC would help in mitigating some of the challenges mentioned above.

How the PHC is structured and how innovation flows from one level to the other

When it comes to health, each state has a ministry of health. In addition, each LGA has a health department.

The population served by the LGA health department is administratively determined by the state and local government population. Following the general administrative structure of the country, the health system in Nigeria follows the same three-tier structure; federal, state and LGA. Each tier has substantial autonomy and exercises considerable authority in the allocation

and utilization of its resources. Please note that the National Health Policy and the National Health Bill, ascribe roles and responsibilities to each level.

According to the 2017 report, Primary Health Care Systems (PRIMASYS): A case study from Nigeria by Professor B.S.C. Uzochukwu Institute of Public Health, College of Medicine, University of Nigeria, Enugu Campus on behalf of WHO, Alliance for Health Policy and Systems Research, in collaboration with the Bill & Melinda Gates Foundation

“In practice, however, the roles and responsibilities of the three tiers of government are not clearly defined by the National Constitution or the National Health Policy. The existence of several comparatively better-funded parastatals and single-disease vertical programmes further adds to the fragmentation”

There is push and pull on the number of doctors practising in Nigeria with the government insisting that there is an adequate number of doctors with the Nigerian Medical Association (NMA) disputing the claim, saying that only about 30,000 are currently practising in Nigeria. This translates to a ratio of 1 doctor for every 4000 – 5,000 Nigerians. This is way down from the WHO recommendation of 1: 600.

“At the moment we have heard complaints of doctors who are now leaving the system but there are actually enough doctors in the system in the country because we are producing up to 2,000 or 3,000 doctors every year in the country, and the number leaving is less than 1,000. It is just that the employment process needs to be smoothened.” October 2022, Nigeria’s Minister of Health, Dr. Osagie Ehanire.

The NMA insisted that just about 30,000 medical doctors were currently practising in Nigeria. The country has trained about and registered 80,000 doctors since the 1960s according to the Medical and Dental Council of Nigeria (MDCN). However, many of the trained doctors leave the country for greener pastures abroad.

According to the Daily Trust report³ published the country is facing a doctors’ brain drain in the health sector. This in turn has led to a shortage of manpower/ Consequently those remaining undergo burnout.

“In fact, FMC Owo is on strike over manpower shortage. The remaining doctors are now overworking to cater to the teeming patients and they are breaking down frequently as a result of that,” President of the Nigerian Association of Resident Doctors (NARD), Dr. Godiya Ishaya.

According to the NMA, Nigeria lost over 9,000 medical doctors to the United Kingdom, Canada and the United States of America between 2016 and 2018. The association said the loss left Nigeria with only 4.7 per cent of its specialists to service the health care needs of the population, adding that this does not paint the country. In addition, as much as the government insisted that there were enough fresh doctors, those who left were the experienced ones:

“I am a consultant haematologist of 15 years standing, if I leave today, will I be replaced with a fresh graduate?” President of NMA, Dr Uche Ojinmah.

The blunt of this brain drain affected the PHCs:

“If there were enough doctors in the country, primary health care centres in the country would not have been empty of doctors” President of NMA, Dr Uche Ojinmah.

The sentiments of the NMA president are supported by Dr. Godiya Ishaya, the President of the Nigerian Association of Resident Doctors (NARD) *“...there is no way Nigeria will have enough*

³ Mon, 29 Aug 2022; <https://dailytrust.com/brain-drain-nigerias-doctor-patient-ratio-now-1-to-5000>

medical doctors even if the whole doctors that have registered with MDCN in the country since its inception were practising.” President of NARD, Dr. Godiya Ishaya

“...the manpower shortage from a brain drain for instance led to the shutting down of the Federal Medical Centre, Owo, Ondo State last Friday” President of NARD, Dr. Godiya Ishaya.

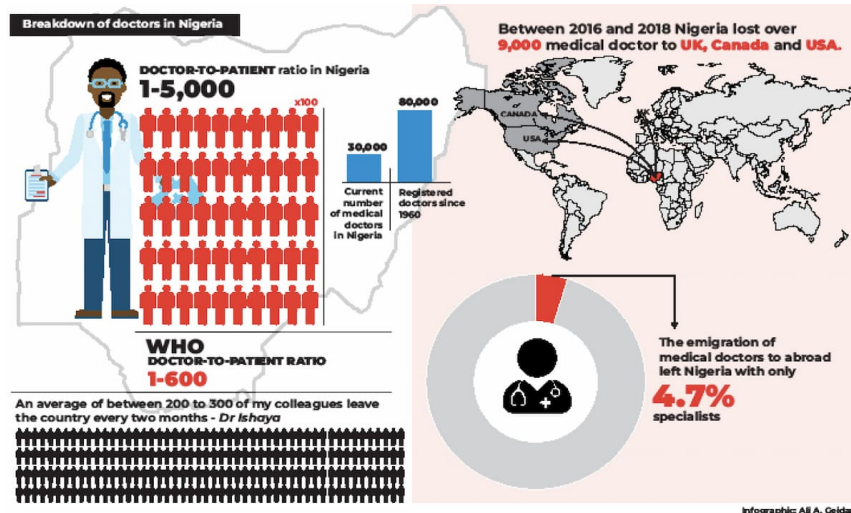


Figure 2 <https://dailytrust.com/brain-drain-nigerias-doctor-patient-ratio-now-1-to-5000>

The brain drain is caused by:

- Dilapidated state of the economy
- Poor remuneration
- Inadequate health infrastructure/equipment
- Highly volatile security situation

“The link between the dilapidated state of the economy; poor remuneration, inadequate health infrastructure/equipment, and highly volatile security situation are also factors forcing doctors to emigrate.” The immediate National President of the Medical and Dental Consultants Association of Nigeria (MDCAN), Prof. Ken Ozoilo.

“The current security challenges in Nigeria threaten the very fabric of our existence and should be a cause for concern for all well-meaning Nigerians. The current brain drain that has increased exponentially in recent times is also partly fueled by the need to flee this insecurity.” The immediate National President of the Medical and Dental Consultants Association of Nigeria (MDCAN), Prof. Ken Ozoilo.

In addition, the doctors get a better deal when they migrate:

“My association observed that while these countries (where doctors are migrating) have put in place measures to recover their health systems, including boosting personnel by luring our members with lucrative conditions of service, the Nigerian government has not put in place every serious measure to retain this highly skilled manpower.” The immediate National President of the Medical and Dental Consultants Association of Nigeria (MDCAN), Prof. Ken Ozoilo.

In this regard, doctors and other health workers go to strike demanding burnout, payment of hazard allowance, and outstanding Medical Residency Training Fund. The strike is demanded by the Nigerian Association of Resident Doctors (NARD) and threatens industrial action.

Important points to note about PHC in Nigeria

One key factor to remember is that Nigeria is the most populous nation and due to its large population, the country ranks low in healthcare workers to population ratio as indicated below:

*“The doctors and nurses who remain are reluctant to relocate to remote areas, including forest locations, where communication with other regions is poor and amenities for health professionals and their families are lacking. So, the inequitable geographical distribution of healthcare professionals is compounded by a concentration of medical professionals in urban areas. While access to medical personnel may be readily available in cities, rural dwellers often have to travel considerable distances in order to obtain”.*⁴

Other points to ponder about PHC in Nigeria

- The COVID-19 pandemic and its economic consequences have led Nigeria back into an economic crisis.
- Nigeria's economy, based on data from the National Bureau of Statistics, experienced a decline in GDP of -1.92% in 2020 after a low growth in the gross domestic product (GDP) of 2.27% in 2019.
- The pandemic has shown certain gaps in the health sector, which from a business angle can also be seen as opportunities for investment and can be one of the growth areas helping the country back into an economic growth cycle.
- The health sector is a large field and certainly, there is a big role for government investment on all levels, but there equally are business opportunities spread from rural to urban areas and from micro to macro investments.

Therefore

- Among the many challenges facing Nigeria's health system is an acute shortage of competent healthcare providers. As a result of inadequate infrastructure locally and poor compensation packages, a sizeable number of physicians, nurses and other health professionals migrate to developed countries in search of fulfilling and lucrative positions.
- Nigeria is a major health-staff-exporting nation, accounting for 22% of nurses who emigrated out of Africa between April 2000 and March 2006;⁷ however, the true extent of this migration is masked by under-reporting. Whatever the extent, this has resulted in acute shortages of health staff in Nigerian health facilities, which has drastically reduced access to local health care.

5. Diffusion of Innovation in Nigeria

The Adoption Theory and how it relates to Nigeria PHC

In 1962, E.M. Rogers developed the Diffusion of Innovation (DOI) Theory. As much as it is one of the oldest social science theories, it is still used widely to help analyze how innovations start

⁴ Attraction and retention of qualified health workers to rural areas in Nigeria: a case study of four LGAs in Ogun State, Nigeria: by OM Ebuehi, PC Campbell Department of Community Health & Primary Care, College of Medicine, University of Lagos, Lagos, Nigeria, that was published 10 February 2011

and gains momentum, diffuse and wane out through a social system. This theory is therefore critical in determining the way people adopts new idea, behaviour and even a product. In this case, the term adoption is the use of something different or behaving differently from what the person or social system used to do before. In this regard, we are analyzing the use of new innovation or change of behaviour among Nigeria's PHC players.

How does the target group perceive new ideas, behaviours or new innovations and what level of different innovations are in the country? From E.M. Rogers theory, we already know that adoption does not take place simultaneously. Therefore, there is a need to analyze the different innovations and their levels of adoption across Nigeria PHC. Furthermore, following the DOI theory, researchers over the years have people who adopt new innovation follows five stages (five established adopter categories), with people at each stage differing in characteristics. Below are the five established adopter categories:

1. Innovators

These adapters are the first to try an innovation. Characteristics:

- Adventurous
- Venturesome
- Interested in new ideas
- Very willing to take risks,
- Are often the first to develop new ideas

2. Early Adopters

This group is made up of opinion leaders. Characteristics:

- They enjoy leadership roles
- They embrace change opportunities
- They are already aware of the need to change
- They are very comfortable adopting new ideas

Key point to note: Strategies to appeal to this population includes how-to manuals and information sheets on implementation. They are more than the innovators in a population, only constituting 13.5% of the population.

Our question therefore, is: Who are the Early Adopters in the Nigeria PHC system and where are they, and which innovations have they been involved in?

3. Early Majority

This is the first largest mainstream group of people but not leaders. They adopt the innovation before the average person does. Characteristics:

- They are easily convinced compared to the average person
- Usually need to see evidence that the innovation works before they are willing to adopt it

Key point to note: Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness. They form a substantial group and constitute 34% of the population

Our question therefore, is: In the Nigeria PHC system which innovations can we use to

showcase and convince the early majority to adopt

4. Late Majority

Unlike the previous type of adopters, these are very sceptical of change and only adopt an innovation after the early majority have done it. Characteristics:

- Sceptical to change
- Need evidence of innovation efficacy to form the early majority

Key point to note: Strategies to appeal to this population includes information on how many other people have tried the innovation and have adopted it successfully. They form a substantial group and constitute 34% of the population.

Our question therefore, is: In the Nigeria PHC system what innovations in the Nigeria PHC have the early majority adopted ways of communicating this information to the late majority?

5. Laggards

This is the last group of people to adopt a new idea. Characteristics:

- Very conservative
- Bound by tradition
- Very sceptical to change
- Hardest to convince

Key point to note: Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups. They form a substantial group and constitute 16% of the population.

Our question therefore, is: In the Nigeria PHC system, do we need to use resources to convince them or do we get another innovation and start the process again? In addition, when innovation becomes the norm, the laggards will have to adopt it.

The figure below clearly depicts the adopter categories.

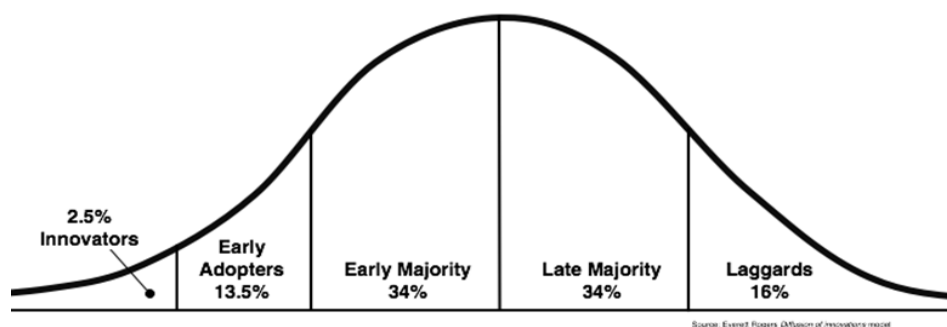


Figure 3 Innovation Adopters Curve⁵

It is important to note that for the innovation adoption to be complete on either individual or social system, five factors must come to play. These factors are:

- Awareness of the innovation
- Decision to either accept or reject

⁵ <http://blog.leanmonitor.com/early-adopters-allies-launching-product>

- Test or the Initial use of the innovation
- Continued use of the innovation

Each of the above-mentioned factors plays a different extent in different five established adopter categories. In this regard during our primary research process, using the already adopted and known innovation in the Nigeria PHC system, we will measure:

- Relative Advantage - The degree to which an innovation is seen as better than the idea, program, or product it replaces.
- Compatibility - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
- Complexity - How difficult the innovation is to understand and/or use.
- Trialability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.
- Observability - The extent to which the innovation provides tangible results.

With the above feedback, we will be able to identify gaps in the market and areas where investment is feasible and rewarding to investors while improving the delivery of service to PHC patients.

6. E-health and M-health

One of the things we have noticed during our desk research is the use of terminologies. We have encountered words such as digital health, ehealth and mhealth used interchangeably. We therefore, decided to start with understanding if the words mean the same thing and below is our understanding of the terms:

Basically, the use of “e” is associated with the use of electronic documentation as opposed to paper. For example, in e-mail e-signature. This is different from the use of the prefix “m” before the word health. The use of term “m” is intended to mean the use of a mobile phone as opposed to the term “e” which denotes the term electronic, where the device can be a laptop, desktop or mobile.

- Therefore, mhealth is a subgroup of ehealth. In addition, ehealth intends to remove the use of paper and Face to Face interaction. What this means is that a health worker and a patient can interact without meeting physically. It is important to note that ehealth is quickly being replaced by mhealth. This is because mobile phones are becoming cheaper in addition to having more features and becoming smart. A computer, whether laptop or desktop also requires a higher level of skill to use compared to a mobile phone. In this regard, it is better to invest in mhealth as opposed to ehealth.
- mhealth will more traction since it ties closely with the growing mobile money. This way it is easier to pay for services using the same device without having to switch from device to device or methods.

Adoption of mhealth in Nigeria:

Despite heavy investment, mobile health as a solution to many challenges facing the developing country's PHC system has not picked up as anticipated. This is according to Grace Kenny et al in their report “A Ground-Up Approach to mHealth in Nigeria: A Study of Primary

Healthcare Workers' Attitude to mHealth Adoption". These 2017 findings, were presented at the CENTERIS - International Conference on Enterprise Information Systems / ProjMAN - International Conference on Project Management / HCist - International Conference on Health and Social Care Information Systems and Technologies, CENTERIS / ProjMAN / HCist 2017, 8-10 November 2017, Barcelona, Spain.

In this report, the authors lament and we quote:

"Despite the increased investment from Non-Government Organisations (NGOs), governments, and other funding bodies, in conjunction with and the reported benefits associated with mHealth, the number of mobile health (mHealth) solutions operating in developing countries remains extremely low."

According to Grace Kenny and others, there are several reasons for the low adoption and development of mhealth which includes resistance among the end users as well as the stakeholders

"There are many possible reasons for the low levels of mHealth; from resistance among end users and stakeholders to failure to adequately communicate the aims and benefits of mobile health solutions. Furthermore, it is argued that there exists a limited body of empirical mHealth research in the context of developing countries."

The authors recommend that there is a need to capture the end users' first impressions when they are introduced to the mhealth for the first time.

"It is therefore imperative that we capture the first impressions end users perceive when initially introduced to mHealth projects. This is important to explore as research suggests that early impressions formulated by various end users impact their attitude towards the adoption of technology"

According to the A Ground-Up Approach to mHealth in Nigeria: A Study of Primary Healthcare Workers' Attitude to mHealth Adoption report, ICT development can be perceived as relevant on two levels: Macro and Micro. In addition, it is even in how the innovation will solve or help the users achieve their goals:

"Perceived relevance is a concept that can be subdivided into two categories. The relevance of ICT development within a healthcare context can be viewed from a macro and micro perspective⁶. The former refers to the extent to which users of Information Technology (IT) (in this case, a mobile health application) will solve problems or help users realise their actual goals" Grace Kenny et al in the report".

"E" terms are quickly being replaced with "m-health" terms as consumers and providers turn to mobile devices for management and monitoring. Near real-time communication, techniques include the use of multimedia mechanisms and applications that work on iPhones, iPads, and laptops. If these devices are used as medical devices, Food and Drug Administration (FDA) oversight and regulatory requirements may apply. In July 2011, the FDA published draft guidance related to mobile medical applications,¹⁰ and in July 2012 the Food and Drug Administration Safety and Innovation Act was signed into law.

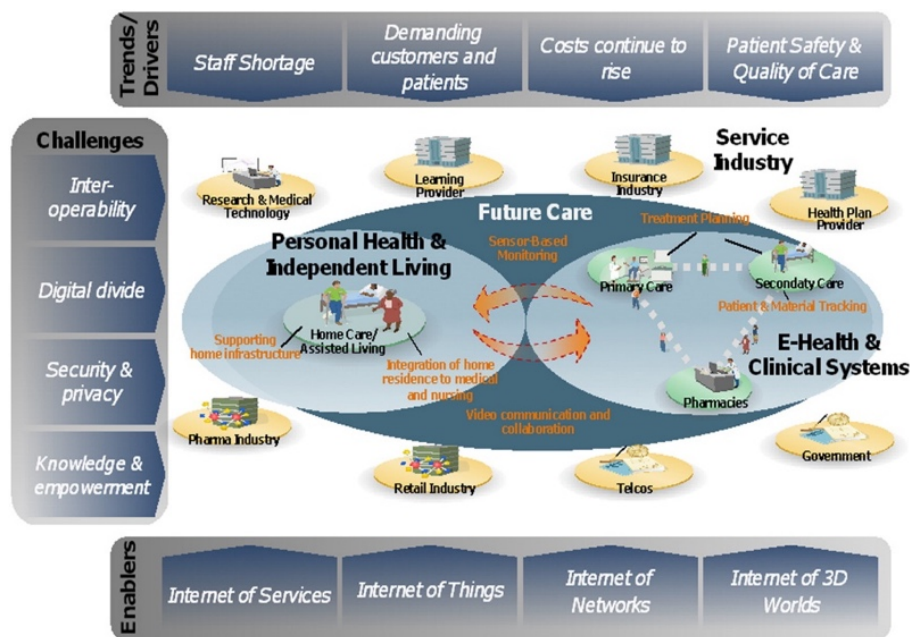


Figure 4 Health Information System⁶

7. About Innovation in Nigeria and its impact on the PHC

What is Innovation

There are many definitions of the term innovation:

For example, according to Damanpour (1999), innovation is the adoption of an idea or behaviour, whether a system, policy, program, device, process, product, or service, that is new to the adopting organization. While Acs and Audretsch (1988) see innovation as a process that begins with an invention, proceeds with the development of the invention, and results in the introduction of a new product, process, or service to the marketplace. On the other hand, Avlonitis and Salavou (2007) see innovation as a company's ability to introduce new products, which are also successful. In the third edition of the European Scientific Journal July 2015 edition vol.11, No.19 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431 Oslo Manual (OECD, 2005) defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace, organization or external relations.”

To summarize, McCormick and Maalu (2011) define innovation to comprise a product or process, continuous or discontinuous, and radical or incremental innovations leading to improved or new products. They see ‘radical’ innovations as new products that result from advances in knowledge/technology. ‘Incremental’ innovations include improvement of process or product designs, with or without up-grading of machinery and/or acquisition of new machinery. The duo concluded that the most common form of innovation for small firms is non-technological innovation which includes marketing innovation, measured by whether or not the firm has implemented a new design or product packaging, significantly changed the way the merchandise is displayed, introduced a new channel for selling goods and services, or

⁶ What constitutes the field of health information systems? Fostering a systematic framework and research agenda Tobias Mettler and Dimitri Aristotle Raptis

introduced a new method of pricing products.

It is therefore in order to quickly create a list of things that the different schools of thought have considered to define innovation and use it in our analysis of the Primary Healthcare innovations in Nigeria.

- Damanpour (1999) innovation is the adoption of an idea or behaviour for a system, policy, program, device, process, product, or service, that is new to the adopting organization. In this regard, we are looking at Nigeria's PHC. Nigeria has adopted several policies and programs. For example, to improve Primary Health Care, in the August of 1987, the Nigeria Federal Government launched the Primary Health Care plan (PHC) This plan had the following major 8 objectives:
 - Improve collection and monitoring of health data
 - Improve personnel development in the healthcare
 - Ensure the provision of essential drug availability
 - Improve immunization programs
 - Promote treatment of epidemic diseases
 - Improve food supply and nutrition
 - Improve material and child care, and family planning
 - Educate people on prevailing health problems and the methods of preventing and controlling them.

As much as the idea for PHC Policy adopted by Babangida Government has not achieved all its intended objectives mainly due to a lack of infrastructural, personnel deficit, lack of adequate financing from the government and finally poor public health management, following Damanpour (1999) definition, this was an innovation in the PHC.

Why Innovation is important for the Nigeria PHC

Organizations and institutions that fail to allow innovation as part of their business and service delivery become uncompetitive due to the obsolete of their products and processes. Borrowing from McAdam, Reid, Harris and Mitchell (2008), who noted that innovative companies are a prerequisite for a dynamic and competitive economy. The same argument holds for the Nigerian PHC. In addition, McAdam, Reid, Harris and Mitchell (2008) continued to state that the importance of innovation is mounting as a result of increased global competitiveness, reduced product life cycle, an increase in the technological capacity of companies, and rapidly changing consumer requests. In our case Nigeria PHC patients.

Nigeria as a country does not exist in a vacuum. It is part of the global community in this era of globalisation. Nothing shed the light more than the recent Covid-19 pandemic which affected countries across the world irrespective of their level of advancement or wealth. In addition, for Nigeria to compete globally effectively it needs to borrow from Kodicara, 2009, who stated that globalisation has exposed developing countries' SMEs to foreign competition and the majority of them cannot withstand this competitive pressure because they are not yet sufficiently competitive. Maybe the right question to ask is how this play in Nigeria's PHC.

Barriers to innovation in the Nigeria PHC

Many documents have over time and time again that innovation diffusion faces barriers, Barriers in this case are obstacles which include motivation. There is no defined scientific way of measuring barriers to innovation. However, there have been several attempts to classify

them. According to Piatier, 1984, barriers can be differentiated between external to the firm or exogenous and internal or endogenous ones. Furthermore, external can be further subdivided into supply, demand, and environment-related.

In this regard, supply barriers include difficulties in obtaining technological information, raw materials and finance. On the other hand, demand barriers are associated with customer needs as well as their perception of the risk of innovation as well as domestic and foreign market limitations. On the other hand, environmental barriers may come from different government regulations, antitrust measures and other policy actions. Finally, according to Rush & Bessant, 1992, Internal barriers can be further subdivided into resource related, for example, lack of internal funds, technical expertise or management time, culture and systems related, for example, out-of-date accountancy systems and human nature related, for example, the attitude of a top manager to risk or employee resistance to innovation.

According to an article titled “NACETEM identifies barriers to innovation in Nigeria”, the National Centre for Technology Management (NACETEM) identified a lack of technical information and qualified personnel as top innovation barriers for Nigerian firms. This information can be adapted to mean the same challenges that face the country’s PHC. This article was written by Vanguard; a local newspaper on September 9, 2019.⁷

The newspaper quoted Dr Abiodun Egbetokun, Assistant Director of Research in NACETEM, who said that the report was based on a survey jointly carried out by NACETEM and Centre for Innovation Indicators (CesTII). NACETEM and CeSTII are responsible for the production of science, technology and innovation indicators. Below are some of Dr Abiodun Egbetokun from the report:

“Our comparison tells us that funding-related issues are crucial in both Nigeria and South Africa in manufacturing and services alike.”

“But, with such old data that we have in Nigeria, for instance, it is difficult to design the right interventions because what the data tells us may already be yesterday’s story.”

“So, we need to be more serious about data collection and curation”

“This is one aspect where, with the right amount of resources, NACETEM is well positioned to deliver the goods,”

“Both surveys were conducted using the OECD’s Oslo Manual, allowing for international comparability of data. GDP data was sourced from Statistics South Africa and Nigeria’s National Bureau of Statistics”

According to Egbetokun, some innovation challenges were time-invariant where he cited lack of funding as an example. In addition to him, *“innovation is a costly affair, mostly because it is risky and no firm can precisely tell a prior whether it will succeed or fail”*.

“This remains true irrespective of how old the data that indicates that problem is”

” What needs to be done in this case is for government to underwrite some of the risks involved in innovation.”

He recalled how most of the technologies underlying the iPhone were the results of heavy government investment in research and development.

⁷ <https://www.vanguardngr.com/2019/09/nacetem-identifies-barriers-to-innovation-in-nigeria>

“In effect, what Apple simply did was to couple these results into a new product.

“This is what innovation economics call recombinant novelty. Such things cannot and do not occur where firms have to bear all the financial risks themselves.

Egbetokun mentioned that innovation thrives where there are redundancies – that is, slack resources that could be diverted into innovative efforts.

“That is why companies like Google allow employees to take up to 20 per cent of their paid work time off to work on personal projects,”

“In Nigeria, firms have to struggle to provide their electricity, water, security, haulage, etc. By the time they are done with all of these, they barely have any resources left to do much beyond their usual production runs. Moreover, our bureaucracy is a killer; from multiple taxation to a lack of protection for strategic sectors. One can count several areas where simple interventions can make a lot of difference”

To him, it would take the country many years of intentional efforts to come out of dependence on the importation of technology.

“We should start talking seriously about how to move from where we are to where we need to be by developing our local innovation. An innovative economy is not cheap but that does not mean it is unattainable; we only have to be willing to develop the requisite resources for it, beginning with a deliberate effort towards an educated citizenry. Today, we have too many children out of school, and too few of those in school learning any skill relevant to our development challenges in this century. So, in addition to providing the kind of interventions, already highlighted above, we need to be more aggressive in human capital development,” he said.

The research carried out, focused on how the productive sector of the economy fared, particularly in relation to the creation and application of knowledge. Other factors that Egbetokun mentioned as barriers to Innovation in Nigeria include:

- Uncertain demand,
- Difficulty in finding cooperation partners

In conclusion, Egbetokun, retaliated that the starting point to improving on the innovation challenges was to understand the nature of the problems in manufacturing and service firms.

8. Case Study Tech Innovators and players in Nigeria PHC



The Primary Healthcare in Nigeria is facing many challenges. Some of these challenges can be tackled using modern communication technology. As such this desk research has identified areas where further investigation is needed to identify areas where innovation can help improve service delivery.

One of the areas that have seen rapid growth in technology use in Primary Healthcare in Nigeria is telemedicine and mobile-based solutions. For example, globally, telemedicine has seen great success in dermatology and psychiatry. This is because

it combines real-time images and sounds which replace physical presence. Areas of telemedicine include:

- Telepathology
- Teleradiology
- Teledermatology
- Telepsychiatry
- Telepharmacy
- Telesurgery
- Others

Advantages of Telemedicine:

- Reduce congestion at the healthcare centres hence greatly helping reduce the spread of infections.
- It also saves time and money since one does not have to move from home to the health centres.
- It offers immediate services hence no long wait, which means that it is very ideal for the venerable and in emergency cases.
- Help monitor patients at home

“And you can actually see how they take their medications every day, what the home environment looks like. All of that gives you such a richer picture potentially of a patient’s health than an office visit,” Dr Nonso Egemba, one of the medical doctors working under Doctorcare24, told Vanguard, a leading Newspaper in Nigeria.

Finally, telemedicine provides patients with freedom and choice on when to go for healthcare services, and the quality of healthcare to receive. Besides, it is:

- It is 24/7 and 365 days a year
- Therefore, it is convenient
- It is said to be affordable healthcare and besides it is in demand.

One of the main players in Nigeria offering telehealth is **Doctorcare24**. This is a telemedicine platform that offers instant medical access in the comfort of their homes. This means that geography and time are not issues to worry about. The platform has helped reduce the long waits experienced when one visits a health centre. Furthermore, the platform offers service immediately even in emergencies or when the patient is on move. Consequently, the platform brings health closer to the patients and helps fill in gaps within the Nigeria PHC.

The Private Sector Players

Nigeria entrepreneurs have identified the gap in the provision of Primary Healthcare several have come up with innovations. Such include but are limited to:

- **Health Connect 24×7**: combines next-generation telemedicine, telemonitoring, and home health to provide immediate access to round-the-clock healthcare.
- **Tremendoc**: offering a 24-hour holistic virtual experience that provides accessible and affordable health care services through telemedicine.
- **CribMD**: a hospital on-demand where patients with a subscription plan can request a doctor for house calls and consult remotely.
- **iWello**: medical consultations for as low as 300 Naira, iWello is a Nigerian start-up

making healthcare available to people who live from paycheck to paycheck or below the poverty line.

- **Medsaf:** Named one of Nigeria's most promising startups in 2017, Medsaf is an e-health startup that is making the process of buying and selling medication in Nigeria's complex health system easy and efficient.
- **LifeBank:** This is a platform that makes blood available to Nigerians by mobilizing blood donations, taking inventory of all blood available in the country, and delivering blood to where it is needed.

9. Conclusions

Nigeria's Primary healthcare system has the following narrative:

- Lack of manpower i.e. low doctors to patients ratio
- Unbalance in service delivery between rural and urban areas
- Inadequate budgetary allocation by the Federal Government
- Lack of skilled person
- Lack of medicine

Undoubtedly, the incorporation of new technologies in the healthcare system is currently changing the narrative in the health system. Good Health Weekly examines how innovations are making it possible to reduce errors, and costs and increase precision in the healthcare delivery system. The desk research was intended to have an exploratory view of the situation in Nigeria's PHC and innovation. As such it is not conclusive enough. The research process is ongoing with:

- Qualitative Phase: In-depth Interviews among Key informants as well as semi-structured questionnaires among main players in the innovation and PHC in Nigeria.
- Quantitative study among Nigeria's Primary Healthcare Health Care Workers in the following five states:
 - Lagos State
 - Edo State
 - Ogun State
 - Plateau State
 - Niger State

The Research Final Report (foreseen in early 2023) will provide details on the identified key digital and business innovations, along with the relevant enablers and roadblocks.



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Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Abuja / NIGERIA
T +234 7044369589
E sedin@giz.de
I www.sedin-nigeria.net