

THE IMPACT OF COMMUNITY HEALTH WORKERS ON PRIMARY HEALTHCARE DELIVERY AND HEALTH OUTCOMES IN RURAL NIGERIA: A SYSTEMATIC REVIEW

Comment [UnderCove1]: I suggest it's titled "IMPACTS OF..." rather than "THE IMPACT OF...". My reason being that multiple parameters and elements are being considered as impact not a singular element.

Abstract

Healthcare is an essential right of every citizen and resident. Almost half of Nigerian population live in rural communities where access to healthcare is limited. The Federal government of Nigeria has done well to decentralize healthcare by creating more Primary Healthcare Centers (84.8%), 70% of which are in the rural communities. The heartbeat of Primary Health Care centers (PHCs) is the Community Health Workers (CHWs) with between 60% and 70% of the workforce in PHCs being CHWs. There are limited professional healthcare personnel in rural communities making CHWs perform functions outside their scope. This direct involvement ranges from providing support services to prescribing On the Counter (OTC) drugs. These extended services have significantly impacted both the quality of service (healthcare delivery) as well as the outcome (of diagnosis and treatment). The involvement of CHWs has helped in rapid response to reported healthcases as well as in prevention of epidemics and management of pandemics. CHWs have also helped in reducing childbirth and in family planning issues. However, only about 20% to 30% of CHWs have formal training in healthcare management. This has often led to misinformation of patients and inaccurate diagnosis which have had serious negative impact on the outcome of patients' health management. The government will do well to provide continuous training to CHWs, provide opportunities for advancement as well as financial motivation. The government should also provide infrastructures that will make their service delivery seamless. The introduction of Tele-Medicine into healthcare delivery in rural communities will also enable easy and rapid access to professional advice especially in times of emergency. This if put in place will ensure proper healthcare delivery and successful healthcare outcomes at PHCs in rural communities of Nigeria.

Comment [UnderCove2]: Elaborate on what you mean by this statement please

Keywords: Primary Healthcare Centers (PHCs); Healthcare Delivery; Healthcare Outcomes; Rural Communities of Nigeria; Community Health Workers (CHWs).

Introduction

Primary Health Care (PHC) is the most readily available Healthcare system that every citizen can access. In Nigeria, the facilities are built so close to the masses that patients with acute challenges can easily be attended to.

The establishment of PHC dated back to the late 1970s and early 1980s as a response to the growing need for a more accessible, efficient and community-based health service delivery system³. The major milestones include: Alma-Ata declaration by global leaders (1978)²; PHC Adoption by the Federal Government (1980s)¹; The Bamako Initiative which led to establishment of drug revolving funds in health facilities (1988)³; The establishment of National Primary Health Care Development Agency, NPHCDA (1992)⁴; Ward Health System which establishes PHC at ward level (1990s)⁵ and The National Health Act which provided legal backing for PHC implementation and establish the Basic Health Care Provision Fund, BHCPF to finance PHC services⁶.

PHC includes three interrelated and synergistic components: (i) comprehensive, integrated health services that incorporate primary care and public health goods and functions as central elements; (ii) multi-sectoral policies and actions to address the upstream and broader determinants of health; and (iii) engaging and empowering individuals, families, and communities to increase social participation and enhance self-care and self-reliance in health⁸.

The influence of PHC in Nigeria cannot be overstated. According to statistics obtained from Nigeria Health Facility Registry (HFR) under the Federal Ministry of Health, of the 38,813 Healthcare facilities currently available in the country, 32,911 of facilities are Primary Healthcare facilities accounting for 84.8% of the total registered Healthcare facilities in the country¹. The implementation at ward level also about 70% of the PHC facilities are built at the most remote areas of Nigeria⁹. These areas are targeted because about 46% of the Nigerian population live in the rural areas⁸.

Several pieces of legislation govern the framework of primary care and other aspects of care in Nigeria. NPHCDA is the agency saddled with the responsibility of governing the activities of PHC⁴. They also provide technical support to the planning, management and implementation of primary health. State Primary Health Care Development Agencies (SPHCDA) are established under state primary health care development agency laws⁴. The SPHCDA are statutorily conferred with authority to supervise and manage primary healthcare in the states under the Laws. The Laws also establish the local government health authority whose responsibility is direct management of primary health facilities. The NPHCDA provide minimum standards and direction under the Primary Health Care "Under One Roof policy"⁸.

PHC systems are designed to be resilient in situations of crisis and proactive in detecting early signs of epidemics¹⁰. According to WHO, PHC might just be the "front door" of the health system and provides the foundation for the strengthening of the essential public health functions to confront public health crises such as COVID-19¹¹.

Comment [UnderCove3]: I suggest this paragraph is closed up with the previous and the entire work is properly paragraphed.

Who are the Community Health Workers (CHWs)

In an article published in June 2023, UNICEF refers to CHWs as “The Heartbeat of Global Primary Healthcare”¹². CHWs fill the void in rural community providing care and saving lives¹³. CHWs usually share ethnicity, language, socioeconomic status, and life experiences with the community members they serve¹³. When recruiting CHWs, people who are indigenes and residents are prioritized. This is because they need to have connections, be readily available and understand the health history of the community¹⁴. CHWs contribute significantly to healthcare delivery across Africa¹⁵. They have bridged the critical gap in human resources for health in the last mile and their positive impact across the continent is commendable¹⁶.

Traditionally, CHWs are mainly involved in infectious diseases programs as well as maternal and child health services¹⁷. In a research published by the PMC PubMed Central, CHWs frequently delivered services beyond the scope of practice stipulated in the National Standing Orders¹⁸. This may be due to the ever rising cases for specific health issues in places where there are not enough professional health practitioners¹⁹.

The WHO considers CHWs to be members of the community with varying levels of formal education who are trained to address the health problems of individuals and the community²⁰. In Nigeria, CHWs titles include Community Health Officers (CHOs), Community Health Extension Workers (CHEW) and Junior Community Health Workers (JCHEWs)²¹.

CHWs can be categorized into three groups by education and pre-service training²². These are Lay Health Workers²³ (with little or no formal education but few days to few weeks informal training); Level 1 paraprofessionals^{21, 22} (with some forms of high school education and subsequent informal training); and Level 2 paraprofessionals²³ (with high school training and some forms of formal training lasting a few months to more than a year).

A study in Rwanda published by Nigerian Health Watch three years ago revealed that most CHWs work as volunteers, receiving only a stipend for their services which is usually not enough to cover their basic need. This goes against the principle of equity and can be demotivating²⁴.

Healthcare Access in Rural Communities

Access to healthcare services involves the quality of care, physical accessibility, availability of the right type of care for those in need and financial affordability²⁵. In rural communities, health services are underutilized because of glaring gap in access²⁶. World Bank data from 2022 estimated that 47% of Nigerians live in rural areas²⁷. That figure reduced to 45.72% in 2023²⁷. Rural residents often encounter barriers to healthcare that limit their ability to obtain the care they need²⁵.

Nigeria Health Watch reported five years ago some dialogue they had with some residents of a rural settings in the Anambra state on the challenges they face accessing healthcare. *“Hospital dey too far from us. Before we go see bike carry us go there, the pikin for don die. That na why we dey buy this ‘agbo’ to drink for fever”* and *“if I go hospital go born, dem no go*

answer me till I pay money and I no get am. I go born for house where I fit give angwanzoma wrapper or 'omo' to help me".

The United States Government Accountability Office (GAO) researched into "Why Healthcare is Harder in Rural America". Here are some things they found. "Many rural residents are seeing their local hospital close. More than 100 (or 4% of) rural hospitals closed from 2013 through 2020. As a result, residents had to travel about 20 miles farther for common services like inpatient care, and 40 miles farther for less common services, such as alcohol or drug misuse treatment. Rural areas without hospitals generally had fewer health care providers overall compared to those without closures. Often rural residents lack insurance coverage, which is associated with less access to care and increased risk of poor health outcomes. Many rural residents may turn to tele-health services meaning health care services delivered via phone or video. Tele-health can be an option to address limited provider availability in rural areas. However little to know internet coverage can limit such access. Even though this study was in the United States, the findings are similar to what is achievable in other part of the planet²⁸.

A study on improving access to healthcare in rural communities emphasized the need for a paradigm shift towards re-orienting²⁹ and integrating Patent and Proprietary medicine vendors (PPMVs)³⁰ and other drug outlets into mainstream primary healthcare delivery system³¹. They will serve as an opportunity to provide more coverage.

Expected Outcomes of Healthcare Services

Dr. Johannes W. van der Spek, a Medicare specialist when responding to a question on Quora about the expectation of patient when seeking services from PHC mentioned that patients expects miracles³². They expect 30 years of neglect to be removed with one visit at zero cost. That all advice over the past 25 years such as healthy diets, exercise, weight loss can be obtained in one day³².

Ideally, better access to PHC is linked to better outcomes³³, including improvements in self-rated health and a reduction in all-cause mortality³⁴. Outcomes are valuable because it generally focus on what is most meaningful to patients and other stakeholders³⁵. As healthcare competitive dynamics continue to evolve, it is no longer sufficient to define healthcare outcomes in terms of clinical outcomes alone³⁶. The inclusion of patients' satisfaction is fast becoming an important dimension because of notion of consumer driven healthcare increasingly applies to patient choice in healthcare industry³⁴.

Healthcare outcomes are generally focused on the enhancement of patients' quality of life³⁸ which according to Briggs R. and Muller K. in Geriatric Physical Therapy is a subjective, broad and multifaceted construct which includes all elements that provide life satisfaction³⁷. The main healthcare outcome are measured as measure of illnesses³⁹. In addition, healthcare outcomes include measure of healthcare utilization such as length of stay, number of primary care consultations, or use of medication³⁶.

One must understand how to measure healthcare outcomes to know if the objectives have been met³⁴. Ann Tinker opined the top seven measurement of healthcare outcomes in her column in "HealthCatalyst" as mortality; readmission; safety of care; effectiveness of care; patient experience; timeliness of care and efficient use of medical imaging⁴⁰.

According to WHO, Quality health care can be defined in many ways but there is growing acknowledgement that quality health service should be effective, safe and people centered³⁸. To realize the benefits, health care must be timely⁴¹, equitable⁴², integrated and efficient⁴³.

Outcome of healthcare are primarily defined and prioritized by national organizations including National Association for Healthcare Quality and in Nigeria⁴⁴, The Federal Ministry of Health⁴. With emphasis on 'quality outcomes', it is becoming increasingly critical for healthcare organizations to develop and implement a sound strategy for providing effective care that is appealing to patients and focuses on controlling costs⁴⁵. Healthcare as a whole faces the challenge of attracting and retaining patients and talented employees⁴⁷ while delivering consistently effective and efficient care⁴⁸.

The Impact of Community Health Workers on Primary Healthcare Delivery in Rural Nigeria

Comment [UnderCove4]: As discussed in the title

We have earlier discussed the roles of CHWs and how they have positively contributed to healthcare system in Nigeria. It is however one thing to be present⁴⁹ and another to ensure the services provided are as desired⁵⁰. There are two major roles that CHWs play in PHC: Maternal and Child health⁵¹ as well as prevention and containment of epidemics⁵⁰. Although all health related challenges are reported. CHWs have implemented preventive interventions for maternal and child health. CHW programs have been shown to reduce child mortality⁵¹, reduce maternal depression⁵², improve access to healthcare⁵¹ and improve child growth and development⁵³.

Using CHWs is a globally recognized effective approach to increasing uptake in family planning⁵³. Most CHWs are now allowed to provide non-clinical contraceptive methods such as condoms, pills, fertility awareness methods⁵³. Many country also allow CHWs to give injectable contraceptives⁵⁴ and some are even moving towards allowing them to give implants⁵⁵.

CHWs appear to frequently engage in implementing diverse public health intervention programs⁵⁵. During the COVID-19 pandemic, CHWs have aided in the home delivery of medication¹¹, follow up of patients⁵⁶, health education⁵⁵, nutrition screening¹¹, vaccine delivery⁵⁶ as well as psychological and social support⁵⁶. In a research published in BMC Primary Care on "Leveraging CHWs for COVID-19 in DRC, Nigeria, Senegal and Uganda", CHWs played a critical role in linking communities to health systems⁵⁶, supporting the prevention and control of diseases in many low and middle income countries⁵⁷. However, such roles have not been properly recognized and documented⁵⁸.

During Ebola outbreak, CHWs work with community leaders, going house to house to provide important information about Ebola and searching for active cases and contacts⁶⁰. They helped religious leaders to expand their education⁵⁸ and outreach strategies⁶⁰.

Despite the positive impact of CHW programs, it has appeared that the positive impact of CHWs on health outcomes is more difficult to achieve in rural context than in more densely populated and peri-urban areas⁵⁷.

In a post COVID study amongst CHWs in Kaduna, Kwara and Ogun states, it was noted that CHWs are frequently lacking in appropriate support from the health system¹¹ due to inadequate, physical, social and financial resources. They also noted that their health and well-being is seldom considered⁵⁶. Regardless of this, the CHWs still played major role in management of the pandemic. This is attributed to the emotional connection they usually have with the members of the community where they are attached.

The challenges faced by CHWs when implementing healthcare programs must be considered for success. Investments such as transport and the well-being of CHWs may be required to ensure the effectiveness of interventions managed by CHWs.

Impact of Community Health Workers on Health Outcome in Rural Nigeria

In most rural communities of Nigeria, CHWs roles have evolved from just administering vaccines⁵⁷ and assisting professionals⁵⁵ to treatment of patients⁵⁷. In many PHCs, CHWs prescribe medicines, dispense drugs and suture wounds. This is mostly because there are not enough healthcare professionals like Medical Doctors, Pharmacists and Laboratory Technologist in-situ. Also, where you have a few, the PHCs have little healthcare infrastructures to operate functional healthcare services⁵⁷.

In some PHCs in rural Nigeria, the few healthcare professionals attached to them are living far from the community and are only available for few days in a week. Most health issues that require specific attention such as gynecology, optometry, geriatrics etc. may have to wait for appointments while acute issues like malaria, typhoid, gastric upset etc. are attended to by the available CHWs⁵⁶.

The impact of CHWs on outcome is relative. It is sometimes positive and other times not so well. Most of them are capable of giving first aids⁵⁷. Out of the experience of working with healthcare professionals for a long time, they understand the first thing that pop to mind when facing a challenge. They know a few OTCs that can be recommended in relation to patients' complaints. Some CHWs will put a healthcare professional on call, describing the situation and asking for advice. This makes a fast response to challenges⁶⁶.

Similarly, there are more PHCs than Specialist centers as earlier mentioned. This means more CHWs than specialists⁷. In times when epidemics are being managed, CHWs makes the process more rapid because they are able to reach the most remote communities to give information⁵⁴, administer vaccines⁵⁷ and identify infected individuals⁵⁵. This makes for an encouraging outcome.

However, the little to no formal training amongst CHWs have impacted healthcare outcomes significantly⁶⁰. In a research published in BMC Primary Care this year on roles of CHWs in management of hypertension, only about 31% of the selected CHWs can correctly diagnose the condition while only

15% knew the baseline investigation to be requested⁵⁹. In some unpublished research into the operations of CHWs in 5 PHCs in Niger state, it was found that the percentage of CHWs with maximum of just high school education working at the PHCs is at an average of 64% compared with those with advanced healthcare training. The ADHOC staff is about 82% compared to the documented staff 78% of which do not have any formal training as a healthcare professional. This level of literacy have had potential negative impact in healthcare management in rural Nigeria.

The significance of CHWs are felt better when they are supported and supervised in rural context⁶⁰. Such will enhance the outcomes from the healthcare services provided. Another potential negative impact is the potential misinformation⁶¹. A person can only give information within his capacity. In some instances when a CHWs believe he has enough information and use that to give recommendations, it could go wrong and worsen the case⁵⁸. WHO believes CHWs may unintentionally promote health myths or cultural biases affecting the trust and credibility of healthcare intervention with misinformation⁶².

A study published in the Journal of Health policy and Planning discusses how CHWs, while effective in delivering basic healthcare services, often lack the training and tools to handle emergencies or complex health conditions⁶³, requiring timely referrals to more advanced care facilities⁶⁰. Such wastage of time or failed management will negatively affect the outcome.

Conclusion and Recommendations

In healthcare delivery, the creation of PHCs and the use of CHWs in managing the infrastructure has been valuable especially in reaching the remote parts of the country. The CHWs has been involved in virtually most activities of healthcare in the country ranging from support work during medical outreach to drugs dispensing. Their contribution in prevention of epidemics and management of pandemics are obvious as already pointed out in many researches. Furthermore, the impact of CHWs making response to reported health challenges rapid and as well in the follow up of health services cannot be under-estimated.

However, the Federal Government of Nigeria and the Ministry of Health need to recognize this impacts of PHCs and CHWs and analyze to understand the challenges they face in a way to help bridge the gaps. One of the major way to help is by subjecting them to frequent training and capacity building. They need to know what is trending in healthcare delivery. Such will enable them make better decisions which will in turn produce desirable outcomes.

Many researches have shown that CHWs are not well remunerated and therefore may be disinterested. Most residents in rural areas are living below the poverty line. Requesting them to make payments before getting care will only be a waste of time. This can make them prioritize alternative to conventional healthcare. If government can subsidize such care and remunerate CHWs better, the turn out will be better and the outcome of care will be satisfactory. Non-financial incentives such as opportunities for professional development, certifications and recognition within the community will also encourage the CHWs.

Similarly, the government need to be intentional in acknowledging the roles of CHWs in healthcare management especially when successes are recorded just as the case of management of COVID-19 and Ebola diseases outbreak and in the reduction of incidence of malaria and childbirth issues. When their involvement is publicized just like other healthcare professionals, they will be motivated to want to do better. In health planning, in budgeting, the PHCs and CHWs need to be given more attention than they currently receive.

However, when integrating CHW programs into healthcare organization, several factors should be addressed to ensure effective team effort. The healthcare staff should understand the roles of CHWs on the team including the extent of their services. This will also foster teamwork and increase precision and accuracy of diagnosis and health outcomes.

The concept of telehealth (telemedicine) can be introduced into PHC operations. A statistics obtained from "statista" reported that 42.2% of Nigerian households have internet access⁶⁸. That figure is projected to reach 51.04% by 2027 and 64.07% by 2029⁶⁸. This exponential increase means in little time, all rural parts of Nigeria will have internet access. The Federal Ministry of Health needs to take advantage of this by starting to implement Telehealth in PHCs. With Telehealth, there will be AI bots that can help when troubleshoots of healthcare challenges are uploaded. Telehealth will also ensure easy access to healthcare professionals without their actual physical presence⁶⁷. With such technology, CHWs can know when an appointment is booked, which medical professional is available and other necessary information⁶⁶.

The invention of rapid diagnostics tools such as kits for some of the common infective conditions has enhanced healthcare delivery. Provision of these resources in PHCs will help CHWs who may be available at the time to make better decision and have better outcomes. Resources like BP machines, thermometers, first aid kits must be available. Digital tools such as computer systems that can help track patients' data faster are of utmost importance.

We have found out earlier that under supervision, CHWs perform better. It is important that a few professionals are readily available at the PHCs over time. The presence of such professionals will ensure better delivery and outcomes. All stakeholders involved in healthcare administration need to be actively involved and intentional about improving healthcare delivery and outcomes of diagnosis and treatment in rural Nigeria by integrating and developing Community Health Workers already available in the already numerous Primary Healthcare Facilities.

References

1. Federal Ministry of Health (2019). Nigerian Health Facility Registry (HFR). Abuja. <https://hfr.health.gov.ng>
2. Rifkin B. S. (2024). Alma Ata after 40 years: Primary Health Care and Health for All – From consensus to complexity. *BMJ Global Health* 3(3).
3. Uzochukwu B. S.; Onwujekwe O. E. and Akpala C. O. (2002). Effect of Bamako-Initiative drug revolving funds on availability and rational use of essential drugs in primary health care facilities in South East Nigeria. *Health Policy Plan.* 17(94): 378 -83.
4. Federal Ministry of Health. National Strategic Health Development Plan II: 2018-2022. Abuja: Federal Ministry of Nigeria (2018).
5. Njelita I. A.; Ikani P. A.; Eyisi I. G.; Nwachukwu C. C.; Ifeadike C. O. and Njelita C. U. (2023). Ward Health System in Nigeria: Are health workers in Local Government well informed? *American Journal of Public Health Research.* 11(2) 44-50 doi: 10.12691/ajphr-11-2-1.
6. Enabulele O. and Enabulele E. J. (2016). Nigeria's National Health Act: An assessment of health professionals' knowledge and perception. *Niger Medicine Journal.* 57(5): 260 – 265 doi: 10.4103/0300-1652.190594 PMID: PMC5036296 PMID: 27833244
7. Abde-All M.; Abimbola S.; Joshi R. and Praveen D. (2019). What do Accredited Social Health Activist need to provide comprehensive care that incorporates non-communicable diseases? Findings from a qualitative study in Andhra Pradesh, India. *Hum Resour Health.* 17:73 doi: 10.1186/s12960-019-0418-9.
8. Abubakar A. (2021). Community Health Workers are Backbone of Primary Healthcare Delivery: Rwanda's Approach. *Nigeria Health Watch.* <https://articles.nigeriahealthwatch.com/community-health-workers-as-the-backbone-of-primary-healthcare-delivery-rwandas-approach/?amp=1>.
9. THISDAYLIVE (2022). 70% OF Nigeria's population rely on Primary Healthcare Facilities. <https://www.thisdaylive.com/index.php/2022/12/16/70-of-nigerias-population-rely-on-primary-healthcare-facilities>.
10. World Health Organization (WHO)(2024). Quality of Care. https://www.who.int/health-topics/quality-of-care#tab=tab_1
11. Yahemba D.; Chowdhury S.; Olorufemi T.; Dubukumah L.; David A.; Umunnakwe C.; Dalumo V.; Haruna S. and Dean L. (2023). Exploring the impact of COVID-19 on frontline health workers through a photovoice study in Kaduna, Kwara and Ogun states, Nigeria. *African Population and Health Reseach Center.* Doi: 10.1093/inthealth/ihad005. Ssn: 1876-3405 (15).
12. United Nation International Children Emergency Fund. These are the community health workers who are the heartbeat of global primary health care. <https://www.unicef.org/stories/communityhealth-health-workers-heartbeat-global-primary-health-care>
13. Austin-Evelyn K.; Rabkin M.; Macheke T.; Mutiti A.; Mwansa-Kambafwile J. and Dlamini T. (2017). Community Health worker perspectives on a new primary health care initiative in the eastern cape of South Africa. *P Los One.* 12(3):e0173863.
14. Joshi R.; Besigye I.; Heredia-Pi I.; Sharma M.; Peiris D. and Mash R. J. (2022). How do diverse low-income and middle-income countries implement Primary Health Care team integration to support the delivery of comprehensive primary healthcare? A mixed-methods study protocol from India, Mexico and Uganda. *BMJ Open.* 12:e055218. Doi: 10.1136/bmjopen-2021-055218.
15. Nigeria Health Watch (2019). To the last mile. Can Nigerian states improve health access in rural areas through innovative finance mechanism? *Nigeria Health Watch Thought leadership.* <https://articles.nigeriahealthwatch.com/to-the-last-mile-can-nigerian-states-improve-health-access-in-rural-areas-through-innovative-finance-mechanisms/?amp=1>

Comment [UnderCove5]: List your references in Alphabet order; not necessarily number them.

16. Viswanathan M.; Kraschnewski J.; Nishikawa B.; Morgan C. L.; Thieda P.; Honeycutt A.; Lohr K. N. and Jonas D. (2009). Outcome of Community Health Worker Intervention. *Evid Rep Technol Assess.* (181): 1 -144, A1-2, B1-14. PMID: 4781407. PMID: 20804230.
17. Dynes M.; Buffington S. T. and Carpenter M. (2013). Strengthening maternal and newborn health in rural Ethiopia: early results from frontline health workers community maternal and newborn health training. *Midwifery.* 29:251-259
18. National Primary Health Development Agency (2015). National Standing Orders for Community Health Officers (CHO) and Community Health Extension Workers (CHEW). Abuja. <https://nphcdang.com/publications>
19. Jarvis L. and Termini N. (2012). Community Health Workers for maternal and child health. *Population Council Fact Sheet.* 1:1-10
20. World Health Organization and Global Health Workforce Alliance Synthesis paper of the thematic working groups – health work force 2030 – towards a global strategy on human resources for health. (2015).
21. Lehmann U. (2007). Community Health Officer: What do we know about them? *World Health Organization.*
22. Okafor S. C.; Ahmat A.; Osunbor M. and Nyoni J. (2022). Assessing staffing need for Primary Health Care centers in Cross River state, Nigeria: a workload indicators of staffing needs study. *Human Resources for Health* 19(S1). Doi: 10.1186/s12960-021-00648-2.
23. Lewin S.; Dick J.; Pond P.; Zwarenstein M.; Aja G. N. and Wyk B. E. (2005). Lay Health workers in Primary and Community Healthcare. *Cochrane Database Syst* 1: CD004015 doi: 10.1002/14651858.CD4015.pub2
24. Abubakar B. (2021). Community Health Workers are the Backbone of Primary Health Delivery: Rwanda's Approach. *Nigerian Health Watch.* Tourolight Africa.
25. Karanja S.; Gichuki R.; Igunza P.; Muhula S.; Oftung P. and Lesiamon J. (2018). Factors influencing deliveries at health facilities in rural Maasai Community, Kenya. *BMC Pregnancy Childbirth.* 18(1):1-11.
26. Chen X.; Orom H.; Hay J. L.; Waters E. A.; Schofield E.; Li Y. and Kiviniemi M. T. (2019). Difference in Rural and Urban Health Information Access and Use. *The Journal of Rural Health.* 35(3):405-417.
27. World Bank Indicators (2023). <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS>
28. Hundrup A. M. (2023). Why Healthcare is Harder in Rural America. *U. S. Government Accountability Office.* <https://www.gao.gov/blog/why-health-care-is-harder-access-rural-america>.
29. O'Connell T.; Rasanathan K. and Chopra M. (2014). What does universal Health coverage mean? *The Lancet.* 383(9913)277-9.
30. Oyeyemi S. A.; Oladepo O.; Adeyemi A. O.; Titilayo M. A.; Burnett S. M. and Apera I. (2020). The potential role of patent and proprietary medicine vendors' association in improving quality of service in Nigeria's drug shops. *BMC Health Service Research.* 567
31. Gillam S. (2008). Is the declaration of Alma Ata still relevant to Primary Health Care? *BMJ Clinical Research Edition.* 336(7643):536-538.
32. Quora. (2024). What are the expected outcomes of effective primary healthcare services? <https://www.quora.com/what-are-the-expected-outcomes-of-effective-healthcare-services>.
33. Berenson R. A. and Cassel C. K. (2009). Consumer-driven healthcare may not be what patients need. – Caveat Emptor. *JAMA.* 30(3):321-3.
34. Glickman S. W.; Baggett K. A.; Krubert C. G.; Peterson E. D. and Schulman K. A. (2007). Promoting Quality: the healthcare organization from a management perspective. *International Journal of Quality Healthcare.* 16(6):341-8.
35. Fan V. S.; Burman M.; McDonnell M. B. and Fihn S. D. (2005). Continuity of Care and other determinants of patients' satisfaction with Primary Healthcare. *Journal of General International Medicine.* 20(3):226 – 33.

36. Scotti D. J.; Harmon J. and Behson S. J. (2007). Links among high performance work environment, service quality and customers' satisfaction: an extension to healthcare sector. *Journal of Healthcare Management*. 52(2):109 – 24.
37. Briggs R. and Muller K. (2012). Hospice and End of Life. ScienceDirect. *Geriatric Physical Therap*. 3:1-35
38. World Health Organization (WHO)(2024). Quality of Care. https://www.who.int/health-topics/quality-of-care#tab=tab_1
39. St. Sauver J. L.; Warner D. O. and Yawn B. P. (2013). Why patient visit their doctors: assessing the most prevalent condition conditions in a defined American population. *Mayo Clinic Proc*. 88(1): 56 – 67.
40. Tinker A. (2022). The Top Seven Healthcare Outcome Measures and Three Measurement Essential. *HealthCatalyst*. <https://www.healthcatalyst.com/insights/top-7-healthcare-outcome-measures>.
41. National Healthcare Quality and Disparities Report (2019). Quality in Healthcare. *National Center for Biotechnology Information*. 10:1-10.
42. Young M. and Smith M. (2022). Standards and Evaluation of Healthcare Quality, Safety and Person-centered Care. *StatPearls Publishing*. PMID: 350515457.
43. Padget M.; Peters M.; Michael A.; Brunn M.; Kruk M. and Kringos D. (2024). Health systems and environmental sustainability: updating frameworks for new era. *BMJ*. 385:e076957 doi: 10.1136/bmj-2023-076957.
44. Watts S. and Bowles J. (2023). National Association for Healthcare Quality, Overview & Roles. *Study.com*.
45. Ginja R.; Riise J.; Willage B. and Willen A. (2022). Does your Doctor Matter? Doctor Quality and Patient outcomes. *SSRN Electronic Journal*. Elsevier BV. Doi: 10.2139/ssrn.41330163 hdl: 11250/2997666.
46. Padget M.; Peters M. A.; Brunn M.; Kringos D. and Krug M. E. (2024). Health systems and Environmental sustainability: updating frameworks for a new era. *BMJ*. 385:e076957.
47. Allan S. and Vadean F. (2021). The Association between Staff retention and English Care Home Quality. *Journal of Aging and Social Policy*. 33(6): 708 – 724.
48. Crocker H.; Kelly L.; Harlock J.; Fitzpatrick R. and Peters M. (2020). Measuring the benefits of integration of health and social care: qualitative interviews with professional stakeholders and patients' representatives. *BMC Health Services Research*. 20(1): 515.
49. Ajisegiri W. S.; Abimbola S.; Tesema A.G.; Odusanya O. O.; Peiris D. and Joshi R. (2023). "We just have to help": Community Health Workers informal task shifting and task-sharing practices for hypertension and diabetes care in Nigeria. *Front Public Health*. 11:1038062 doi: 10.3389/fpubh.2023.1038062 PMID: 36778542.
50. Le Roux K. W.; Almirol E.; Rexvan P. H.; Le Roux I. M.; Mbewu N.; Dippenaar E. Stansert-Katzen L.; Baker V.; Tomlinson M and Rotherham-Borus M. J (2020). Community health workers impact on maternal and child health outcomes in rural South Africa – a non-randomized two-group comparison study. *BMC Public Health* 20:1404.
51. Anyanti J.; Akuyibo S.; Idogho O.; Amoo B. and Aizobu D. (2020). Hypertension and Diabetes management practices among healthcare workers in Imo and Kaduna states, Nigeria: an exploratory study. *Risk Manag Health Policy*. 13:2535 -43. Doi: 102147/RMHP.S271668
52. Bolas M. (2023). Community Health Workers role grows with evidence that they improve care and equity. *Leonard Davis Institute of Health Economics. Health Equity*. <https://ldi.upenn.edu/our-work/research-updates/community-health-workers-roles-grows-with-evidence-that-they-improve-care-and-equity/>
53. Christodoulou J.; Le Roux K.; Tomlinson M.; Le Roux I. M.; Katzen L. S. and Rotherham-Borus M. J. (2019). Perinatal maternal depression in rural South Africa: Child outcome over the first two years. *J Affect Disord*. 247:168-74.

54. Khaldun J. and Mathew-Juarez P. (2023). The Crucial and Overlooked Roles of Community Health workers. *Healthiest Community*. US and World News. <https://www.usnews.com/news/health-news/articles/2023-11-30/the-crucial-and-overlooked-roles-of-community-health-workers>.
55. Kurapati J. and Thippaiah A. (2022). Contribution and Challenges of Community Health Workers in Achieving Sustainable Development Goals. *National Journal of Community Medicine*. 13(12): 896-903 DOI: 10.55489/njcm.131220222525.
56. Namuhani N.; Babirye Z.; Salawu M.; Bosonkie M.; Bello S.; Kabwama N. S.; Egbende L.; Bamgboye A. E.; Tusubira A.; Kashiya Y.; Kizito S.; Afolabi R. F.; Adebowale S. A.; Dairo M. D.; Diallo I.; Leye M. M. M.; Ndiaye Y.; Fall M.; Bassoum O.; Seck I.; Fawole O. I.; Mapatano M. A.; Ndejjo R.; Wayenze R. K. and Kiwanuka S. N. (2024). Leveraging Community Health Workers for COVID-19 response in DRC, Nigeria, Senegal and Uganda: roles, barriers and facilitators. *BMC Primary Care*. 25 (269). <https://doi.org/10.1186/s12875-024-02531-0>
57. O'Brien M. J.; Squires A. P. and Bixby R. A. (2009). Role Development of Community Health Workers: an examination of selection and training process in the intervention literature. *Am J Prev Med*. 37:1.
58. Olaniran A.; Smith H.; Unkels R.; Bar-Zeev S. and van der Broek N.; (2017). Who is a Community Health Worker? A systematic review of definitions. *Global Health Action*. 10(1): 1272223 doi: 10.1080/16549716.2017.1272223 PMID: 28222653; PMCID: PMC5328349.
59. Oseni T.; Olawumi A.; Isaac A.; Abiso M.; Sanusi I.; Ilori T. (2024). The role of community health workers in the management of hypertension in Nigeria. *BMC Primary Care*. 25: 266.
60. Shah R. Rehfuess E. A.; Paudel D.; Maskey M. K. and Delius M. (2018). Barriers and facilitators to institutional delivery in rural areas of Chitwan district, Nepal: A qualitative study. *Reprod Health*. 15(1):1-13.
61. Slum and Rural Health Initiative. The state of Primary Healthcare in Nigeria. www.srhin.org
62. U. S. Department of Health and Human Services (2014). Role of Community Health Workers. New York. <https://www.nhlbi.nih.gov/health/educational/healthdisp/role-of-community-health-workers.htm>
63. World Health Organization. Global Health Workforce Crises Key Messages. Geneva: World Health Organization (2013). <https://www.who.int/workforcealliance/media/keymessages2014.pdf>
64. World Health Organization. Health Workforce Requirements for Universal Health Coverage to Achieve Millennium Development Goal. Geneva: World Health Organization (2016).
65. Allsop D. B.; Chelladurai J. M.; Kimball E. R.; Marks L. D. and Hendricks J. J. (2022). Qualitative methods with Nvivo software: a practical guide for analyzing qualitative data. *Psych*. 4(2):142-59.
66. Asiki G.; Newton R.; Kamali A.; Marions L. and Smedan L. (2018). Feasibility of using smartphones by villages for pregnancy registration and effectiveness of mobile phone text messages on reduction of home births in rural Uganda. *PLoSOne*. 13(6):e0198653
67. Dusabe-Richards J. N.; Tesfaye H. T.; Mekonnen J.; Kea A.; Theobald S. and Datiko D. G. (2016). Women Health Extension Workers: Capacities, opportunities and challenges to use e-health to strengthen equitable health systems in Southern Ethiopia. *Can J Public Heal*. 107(4-5):e355-61.
68. J. Degenhard (2024). Nigeria: Percentage of Household with internet access from 2001 to 2029. www.statista.com