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Optimizing the role of Community Health Workers in childhood immunization uptake in Sierra Leone

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OPTIMIZING THE ROLE OF COMMUNITY HEALTH WORKERS IN CHILDHOOD IMMUNIZATION UPTAKE IN SIERRA LEONE

A thesis presented as partial fulfilment of the Master of Science in Public Health requirement

By

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Declaration

Where people's work has been used, (from either a printed or virtual source, or any other source), this has been carefully acknowledged and referenced in accordance with academic requirements.

This thesis "**Optimizing the Role of community health workers in childhood immunization uptake in Sierra Leone"** is my own work

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Abstract

Background: Worldwide, childhood immunization saves the lives of about 2.5 million children under the age of five every year. Yet, in Sierra Leone, low immunization uptake contributes to a high child mortality rate, one of the highest in the world. Community Health Workers (CHWs) were integrated into the health system to complement the health workforce. They have been playing a crucial role in promoting childhood immunization uptake, but certain factors influence their roles.

Objectives: To identify factors influencing the role of CHWs in promoting childhood immunization uptake in Sierra Leone and to provide recommendations to policymakers to improve the role of CHWs in childhood immunization.

Methodology: A review of the literature on factors influencing the role of CHWs in promoting childhood immunization. A conceptual framework on factors influencing CHWs performance proposed by Kok et al. was used to guide the analysis of this review.

Results: A range of factors were found to influence the role of CHWs in promoting childhood immunization uptake. These included contextual factors such as sociocultural norms, values and practices, socioeconomic status, and geographical location. Also health system factors such as insufficient human resources for health (HRH) and finance, insufficient supplies and logistics especially vaccine shortage, and intervention design factors around CHW's management, their tasks, and roles.

Conclusion: Contextual factors, health system factors, and intervention design factors affect the role of CHWs in promoting childhood immunization, and their primary role was promotion/prevention. Therefore, the stakeholders in the health system and CHW intervention implementers should consider all these factors when designing CHWs intervention to improve the role of CHWs in childhood immunization.

Keywords: Immunization, vaccination, child health, CHWs, role, performance

Word count: 10,802

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List of abbreviations

BCG	Bacillus Calmette–Guérin
CBS	Community-based surveillance
CHC	Community Health Centre
CHW	Community health worker
CHP	Community Health Post
CHE	Current Health Expenditure
DFID	Department for International Development
DHMT	District Health Management Team
DHIS	District Health Information System
DPT	Diphtheria, Pertussis, and Tetanus
EPI	Expanded Program on Immunization
FHCI	Free Health Care Initiative
GAVI	Gavi, the Vaccine Alliance
GDP	Gross Domestic Product
GHWA	Global Health Workforce Alliance
GVAP	Global Vaccine Action Plan
HDI	Human Development Index
HRH	Human Resource for Health
HRM	Human Resource Management
LMIC	Low Middle-Income Countries
MCHP	Maternal and Child Health Post
MDG	Millennium Development Goals
MoHS	Ministry of Health and Sanitation
NGO	Non-Governmental Organization
OOP	Out Of Pocket
PHC	Primary Health Care
PHU	Peripheral Health Unit
RMNCAH-N	Reproductive, Maternal, New-born, Child, and Adolescent Health and Nutrition
SDG	Sustainable Development Goal

SIA	Supplementary Immunization Activities
SLDHS	Sierra Leone Demographic and Health Survey
SSA	Sub-Sahara Africa
UHC	Universal Health Coverage
UNDP	Global fund, United Nations Development Programme
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
USAID	United States Agency for International Department
US-CDC	United States-Centers for disease control
VPD	Vaccine-Preventable Diseases
VU	Vrije Universiteit
WHO	World Health Organization

Definition of terms

Immunization: according to World Health Organization (WHO), it is a process by which an individual's immune system reacts when they receive a vaccine. These **vaccines** strengthen the body's natural defenses to create protection and lower the risk of contracting a disease (1).

Vaccine uptake: total number of individuals that received a recommended or specific dose(s) of vaccine (2).

Vaccine-preventable diseases (VPDs): infectious diseases brought on by bacteria or viruses preventable with vaccination (3).

Community Health Workers (CHWs): healthcare providers who reside in the community they serve and have less formal education and training than other types of healthcare professionals, such as nurses and doctors (4).

Peer supervision: supervision of CHWs performed by former CHWs who received additional training with a focus on mentoring and coaching. This peer supervisor provides regular supportive supervision to a group of CHWs in a particular catchment area (5).

Dedication

Mr. & Mrs. Lagawo (deceased) and Ms. Rugiatu Lagawo (deceased)

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CHAPTER ONE – INTRODUCTION

1.1 BACKGROUND INFORMATION

Immunization is a defensive measure against infectious diseases (6). Childhood immunization continues to be one of the most effective public health interventions, reducing infectious diseases-related morbidity and mortality of children at a low cost (7). It saves the lives of almost 2.5 million children under the age of five every year (8). Vaccines have also significantly reduced child mortality and disease prevalence and have been evident in the eradication of smallpox, the reduction of the global incidence of polio by 99%, and new-born tetanus by 94% (9).

The Global Vaccine Action Plan (GVAP) 2011-2020 has initiated a set of goals to ensure universal access to immunization (9). The initiative is designed to ensure that all countries around the world have the full benefits of childhood immunization. This will help to expand coverage for existing immunization thereby averting death and seeking the elimination and eradication of certain childhood illnesses (9).

Despite the existence of the GVAP initiative, several nations continue to face inequities in accessing fundamental immunizations. It is emphasized that these underserved populations must be reached because they are more likely to suffer disease burdens (9). Although childhood immunizations are becoming more widely available for protection, more has to be done to reach children, mostly in developing nations, where there is a shortage of human resources for health and where places are difficult to reach with vaccines (8).

Due to the lack of healthcare personnel, healthcare delivery services especially childhood immunization were not easily accessible. Because of this, the Community Health Workers (CHWs) initiative was designed to provide basic healthcare services especially promoting childhood immunization in communities where the populations have difficulty to access the services (10).

The CHWs are selected from the communities and are known to be trustworthy. They provide primary healthcare services and address a range of health issues within their communities. The duties and responsibilities of CHWs may vary among countries, depending on the country's level of economic development (11). They serve as a crucial connection between healthcare and the communities they serve. CHWs may also be referred to as lay health workers or health extension workers in some countries (12).

The CHWs are healthcare providers who reside within the communities they serve and have received less formal education and training compared to nurses and doctors (4). They are capable of providing a range of basic healthcare services, including those crucial for women and children in Low-Middle Income Countries (LMICs) (13), and also life-saving interventions both in their communities and at homes (10). The integration of CHWs into healthcare systems is necessary to meet current health demands, to attain Universal Health Coverage (UHC) and fulfil the Millennium Development Goals (MDGs) following the Sustainable Development Goals (SDGs), especially SDG 3.2: End preventable infant and child mortality by 2030, with

all nations seeking to lower neonatal mortality to at least 12 per 1,000 live births and under-5 mortality to at least 25 per 1,000 live births (14).

This thesis explores the role of Community Health Workers (CHWs) in childhood immunization and its optimisation in Sierra Leone. It begins by providing an overview of the country and delving into the specific research problem that the study aims to address.

1.2 SIERRA LEONE COUNTRY PROFILE

1.2.1 Geo-demographic

Sierra Leone is a country located on the West Coast of Africa, bordered by the Republic of Guinea to the north and the Republic of Liberia to the southeast. The western border along the Atlantic Ocean extends for 465 km (15,16) and the total size of the country is 71,740 sq. km, with a land area of 71,620 sq. km (17,18). Sierra Leone's geography consists of diverse landscapes, including coastal plains, inner lowland plains, plateaus, hills, and mountains. The nation is also abundant in natural resources, such as mineral deposits, fertile agricultural land, and a deep natural harbour (15). In Sierra Leone, the weather is tropical, with two distinct climate seasons: the rainy season, which lasts from May to November, and the dry season, which lasts from December to May (17).

According to the provisional census results from 2015, Sierra Leone has a total population of 7,092,113 people. Out of this number, 1,180,793 are children aged 0-5 years old. Approximately 4,187,016 individuals, or 59.0% of the total population, reside in rural areas, while 2,905,097 people, or 41.0%, live in urban areas (19).

Sierra Leone is divided into five administrative regions: Northern, Southern, Eastern, North-Western, and Western. The country has 16 districts in total, with the capital city, Freetown, consisting of two districts. The remaining 14 districts are made up of 186 chiefdoms, each governed under the administration of the local paramount chief (18). The districts are governed by a council made up of a chairman, administrators, and councillors (17). Sierra Leone has roughly 20 ethnic groupings, each with their own unique cultural traditions. English is the national language (17).

1.2.2 Socio-Economic context

Sierra Leone's infrastructure and human capacity were ravaged by the civil war which occurred between 1991 and 2002. Progress has been made to improve the economy in the post-conflict period but these efforts have faced hindrances due to the Ebola crisis of 2014 to 2015, which was a significant obstacle for the healthcare system and the country as a whole (20,21). The crisis brought about numerous social and economic problems, causing the actual growth of the real gross domestic product (GDP) in 2014 to be 7.0% instead of the anticipated 11.3% before the Ebola outbreak (22).

In Sierra Leone, adult literacy rate is estimated at around 40%, and 70% of the country's young population is either underemployed or unemployed. On the Human Development Index (HDI) in 2019, Sierra Leone had a life expectancy of 59.8 years and was ranked 181 out of 189 nations. The GDP of Sierra Leone is 4.042 million U.S. dollars and its growth rate is 4.1%

according to the World Bank 2021. Despite the decline in the annual inflation rate to single digits in 2021 and an increase in the GDP, over 50% of the population still lives below the poverty level of $1.90 a day (16,23–25).

1.2.3 Health Sector

In Sierra Leone, there are approximately 1,278 health facilities, including 632 Maternal and Child Health Posts (MCHPs), 319 Community Health Posts (CHPs), 231 Community Health Centres (CHCs), 24 government hospitals, 45 private clinics, and 27 private hospitals (17). The health care system is divided into two levels of care: secondary care which includes district and referral hospitals; and primary care which includes Peripheral Health Care Units (PHU) with an extended community health program. MCHP, CHP, and CHC are the three types of PHUs (17). The health service delivery structure is shown in the diagram below.

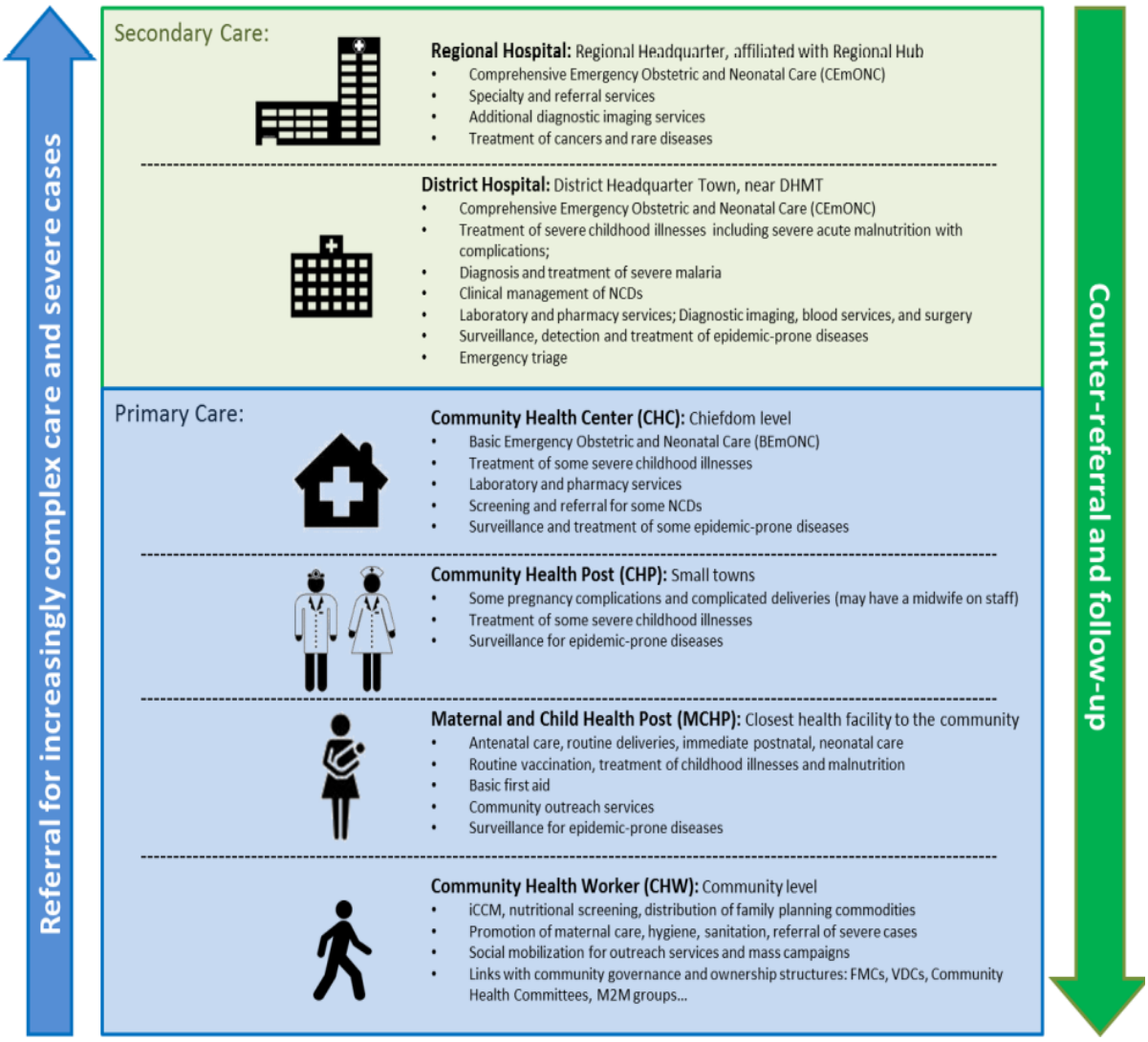

Figure 1: The health service delivery system in Sierra Leone (17).

In Sierra Leone, CHWs have been in existence for decades and served as volunteers offering community health services in their communities (26,27). The CHWs programs were implemented by Non-Governmental Organization (NGOs). The programs differed by location, and different NGOs were in charge of carrying out implementation in various regions (27). The Ministry of Health and Sanitation (MoHS) released a policy for CHWs in Sierra Leone in 2012, which outlines the recruitment, selection, training, and supervision procedures for CHW programs implemented by NGOs (28). During these programs, CHWs made significant contributions to improving the health of the communities they served (27). Based on their contributions to improve the health services in their communities, the MoHS promoted their good use to ensure the successful and efficient delivery of community health services across the nation. To show that the government is focusing on the CHWs, they were integrated into the health system to strengthen the weakened health system by delivering expanded and comprehensive primary health care (PHC) services at the community level across the country (16).

The initial national policy for Community Health Workers (CHWs) was created in June 2012 and later revised in 2016 to be known as the National CHW Policy 2016-2020 (27). The revised policy aimed to professionalize CHWs and build a unified government-led program across the country. This policy serves as a guide for implementing CHW programs within the healthcare system (27). With the support of national and international health partners, the local council, community stakeholders, and the MoHS, CHWs were selected from the community for recruitment to enhance the efficiency and effectiveness of the CHW program at the community level (5).

According to the revised CHW Policy 2016-2020 (5,27), the criteria for recruitment of CHWs were specified. The criteria outlined in the policy include: the ability to read and write and basic numeracy skills (which are not necessarily mandatory, especially for women who have prior experience working with pregnant women and nursing mothers); permanent residency within the community; fluency in the local language; understanding of the cultural norms of the population being served; having the respect and trust of the community members; possessing desirable personality traits such as good communication skills, a willingness to learn, and enthusiasm for work; and being 18 years of age or older.

After recruitment, the CHWs undergo a 21-day training program that is broken down into three modules. The first module focuses on basic community health, the second on integrated community case management and the third on reproductive maternal, new-born, and child health. Upon completion of the training, 10 CHWs are assigned to each healthcare facility, with the main task of promoting and increasing access to vital primary healthcare services, including childhood vaccinations. A staff member from the PHU is responsible for overseeing the CHWs on a monthly basis and visiting them in their communities every quarter. A peer supervisor is selected to ensure proper coordination and effective service delivery among the CHWs, acting as a link between the health personnel, community, and CHWs. Each CHW is intended to serve between 100-500 people and should be willing to serve as a volunteer. The CHWs are not on a government payroll but instead receives a monthly incentive of Le 100, 000 ($10) for their services; and a logistic cost ranging from Le 50,000 ($5) to Le 80,000 ($8). Peer Supervisors receive Le 150,000 ($15) per month and Le 100,000 ($10) for logistic costs (5).

In 2017, the Government of Sierra Leone, through the MoHS, recruited 15,000 CHWs (5). Despite their integration and recruitment into the health system, they are not regarded as

National Civil Service employees (16,29). Fewer female CHWs were recruited than male CHWs. Out of 14,935 CHWs trained, 10,652 were men (71%) and 3,280 women (29%) (26). According to a recent survey conducted, 17,000 CHWs are working in collaboration with the health system to improve the health of the people in their various communities (30), but there is no data to show the CHW's retention status from the time of recruitment into the health system in 2016 up to date.

CHWs are tasked with the role of providing basic curative and preventive health services, including health promotion, and referral services in the areas of reproductive, maternal, new-born, child, and adolescent health and nutrition (RMNCAH-N); communicable and non-communicable diseases; community-based surveillance (CBS) of diseases and events. Their tasks also includes assisting in immunization activities during outreach services, and supplementary immunization activities (SIA) during mass immunization campaign (5).

1.3 PROBLEM STATEMENT AND JUSTIFICATION

Immunization is one of the most effective and affordable health interventions and has prevented millions of children from terrible infectious sicknesses and disabilities (8,31). In 1974, the World Health Organization (WHO) developed the Expanded Program on Immunization (EPI). This program was developed to ensure that all children have access to the routine recommended immunizations to prevent morbidity and mortality of infectious Vaccine-Preventable Diseases (VPDs) among children under the age of five (32). Despite these benefits, vaccine-preventable infections continue to be a leading cause of childhood morbidity and mortality, especially in low-income countries like Sierra Leone (33,34).

Sierra Leone continues to have the world's highest child mortality rate, due to significant shortages in its Human Resources for Health (HRH) (35). This puts pressure on the country's health system and puts individual and community health, especially that of children under five years old, at risk (5). To reduce the child mortality rate, it is vital to reach every child with life-saving interventions such as immunization, which requires active involvement of the community.

With this, the community highly participate in the selection and recruitment of CHWs and their services are to deliver basic healthcare in the community especially promoting childhood immunization. They function as a bridge between healthcare delivery facilities and the communities, since they live in the community in which they work and understand the issues faced there (5). Therefore, they have an important understanding of the community's attitudes towards childhood immunization and play a role in promoting it by organising outreach and mass campaigns, providing health education on childhood immunizations, and persuading members of the community to understand the value of immunizations for children and bring their children to the clinic for vaccinations. This is done through home visits and community sensitization (35–37). During the process, they keep track of children who have missed their vaccines by checking their immunization records, and also remind caregivers of the importance of utilizing immunization services for their children on the scheduled date, but they are not authorized to administer routine vaccines (35,36). With their role, they have made an additional 10% contribution to geographic access outside of the 5 kilometres of a functioning PHU (16).

The role of CHWs in promoting childhood immunization is also critical in Sierra Leone considering that 80% of the population including caregivers do not have basic education (38).

Despite their significant contribution to the promotion of childhood immunization in Sierra Leone, the services provided by CHWs are often overlooked and there is a lack of data to measure the impact they have had on the uptake of childhood immunization in the country (39). Moreover, despite being a part of the health system for nearly a decade, Sierra Leone still faces a coverage challenge when it comes to childhood immunization (40). Vaccine-preventable diseases remain one of the leading causes of death among children under the age of five, accounting for over 30% of such deaths (41).

According to the Sierra Leonean Demographic and Health Survey (SLDHS), the childhood recommended vaccines in Sierra Leone for basic antigens include a single dose of Bacillus Calmette-Guérin (BCG), a dose of measles vaccine, three doses of Polio and Diphtheria-Pertussis-Tetanus (DPT)-hepatitis B-Haemophilus influenzae type B (Pentavalent vaccine). Despite this, only 56% of children have completed the full course of these recommended vaccines and coverage remains low for other recommended vaccines, as illustrated in Figure 2. This highlights that the country has yet to reach its goal of 95% routine vaccine uptake at the national level (41). The figures below displays the proportion of key antigen uptake in 2019.

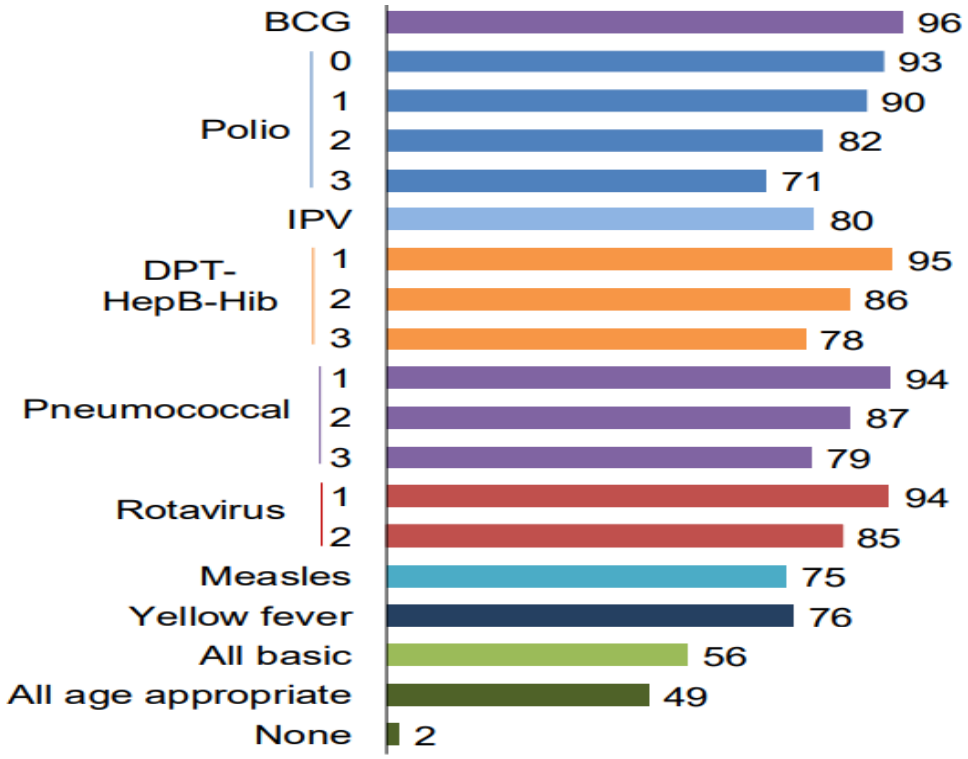

Figure 2: Childhood vaccinations and the coverage (42)

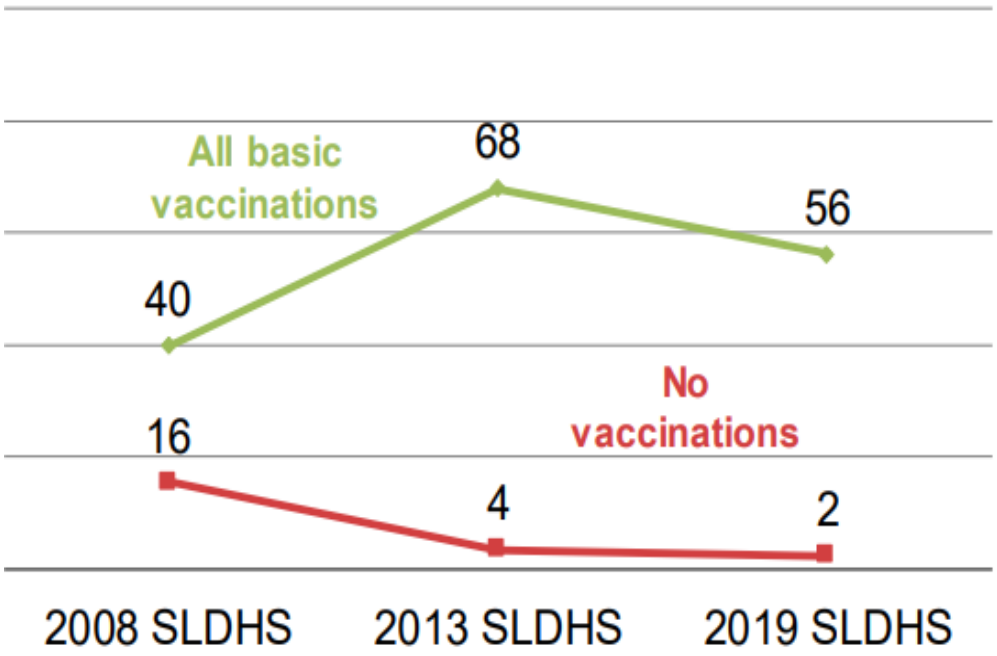

Figure 3: Trends in childhood immunization (42)

According to the SLDHS (Figure 3), there has been a fluctuation in the uptake of basic recommended vaccines for children aged 12-23 months. In 2008, the uptake rate was 40%, but it improved to 68% in 2013 (42). Unfortunately, by 2016 the uptake rate had declined again to 56%. The decline has been attributed to a range of factors such as cultural beliefs, poor economic status, geographical location, vaccine shortages, fear of side effects, and lack of knowledge. These factors also have an impact on the role of CHWs in promoting childhood immunization uptake (39,43,44).

Therefore, this research endeavours to shed light on the various factors that have an impact on the role of CHWs in promoting childhood immunization in Sierra Leone. By uncovering these factors, the study aims to provide valuable insights to decision-makers on ways to enhance the CHW's contribution to the increase in childhood immunization uptake. The ultimate goal is to reach the target for routine vaccine uptake, which is 95% coverage at the national level, and ultimately reduce child mortality in Sierra Leone.

1.4 RESEARCH OBJECTIVES

1.4.1 General objective

This study aims to identify factors influencing the role of CHWs in promoting childhood immunization uptake in Sierra Leone. Findings will be used to formulate suggestions for policymakers to enhance the contribution of CHWs in increasing childhood immunization uptake and ultimately achieving the target vaccination goals in Sierra Leone.

1.4.2 Specific objectives

- To identify contextual factors influencing the role of CHWs in promoting childhood immunization uptake.
- To investigate health system factors that influence CHW's role with respect to childhood immunization.
- To explore interventional design factors (how the CHW programme is designed) that position CHWs and their roles on childhood immunization.

To formulate these specific objectives, the conceptual framework described in Chapter 2.5 is utilized.

CHAPTER TWO - METHODOLOGY

The method and conceptual framework used to address the research objectives for this study are described in this chapter.

2.1 STUDY TYPE

This study is a literature review, that aims to analyze factors influencing the role of CHWs in promoting childhood immunization uptake using various sources of information to answer the study objectives. Peer-reviewed research articles, systematic reviews, gray literature, reports, and government documents will be used.

2.2 STUDY AREA

The study area is Sierra Leone, particularly focusing on the role of CHWs in childhood immunization in the health system. General aspects of the country were already presented in the introduction section.

2.3 SEARCH STRATEGY

The search was made online, looking for sources such as systematic reviews, peer-reviewed research articles, dissertations, grey literature, MoHS reports, and reports from international organizations involved in CHWs and childhood immunization such as WHO, United Nations Children Funds (UNICEF), and United State Agency for International Department (USAID). By using multiple sources and including both peer-reviewed research articles and grey literature, increased the chances of finding relevant and up-to-date information. Additionally, including reports from international organizations like WHO, UNICEF, and USAID gives a better understanding of the global perspective on the topic of community health workers and childhood immunization.

The search for articles was limited to those published in English from 2006 to date. The rationale for this is to include historical findings from articles published before the CHWs were integrated in 2016 to date.

Articles were retrieved from the Cochrane Database, PubMed, Google Scholar, and Vrije Universiteit (VU) Library, and relevant websites. The search focused on factors influencing the role/performance of CHWs in promoting childhood immunization in Sierra Leone but also looked into articles from other LMICs for additional context. Using key terms like “CHWs”, “immunization”, “vaccination”, “childhood”, “child health”, “role”, and “performance”, and the AND, OR Boolean operators. Additionally, the snowballing technique was used to retrieve relevant articles by scanning the articles' reference lists. Table 1 below has more details on the search strategy.

Table 1: Search Terms

S/N			AND				
			Problem/issue terms		Factor-related terms		Geographical scope
			CHWs		Immunization		SL
			CHVs		Vaccination		Africa
					Childhood/		Sub-Sahara Africa (SSA)
					Role		LMICs
					Performance		
		OR		OR		OR	

2.4 INCLUSION AND EXCLUSION CRITERIA

Only studies and literature published in English were included, as well as published between the years 2006 and 2022. This is to track all pertinent published literature from the MDG era to the present SDG era. They served as the foundation for the historical findings to produce robust evidence on the subject of the study.

The search was focused on studies on the role/performance of CHWs and childhood immunization conducted in Sierra Leone. Even though Sierra Leone was the primary focus, also peer-review articles from other SSA and LMICs were included in the study, for which primarily systematic reviews were used. This was done to provide extra context to fill gaps and comparison with Sierra Leone. The study looks into results from various methodologies; studies that used quantitative, qualitative, and mixed-method approaches were included.

Exclusion criteria were published and unpublished articles that are written in other languages than English, those that did not have a scientific or methodological approach, or only opinion comments. Published and unpublished literature on other aspects but without a focus on the role/performance of CHWs and childhood immunization or child health were also excluded.

2.5 CONCEPTUAL FRAMEWORK

This study adopted a conceptual framework on factors influencing CHW's performance from a review by Kok et al. 2015 (45). The conceptual framework identified three main categories of elements that could influence CHW's role: the contextual factors, health system factors, and intervention design factors. These factors allow us to understand how contextual, health system, and the intervention design factors work together, facilitating or hindering CHW's role in promoting childhood immunization uptake. Figure 4 below shows a diagram of the original conceptual framework in the review by Kok et al.

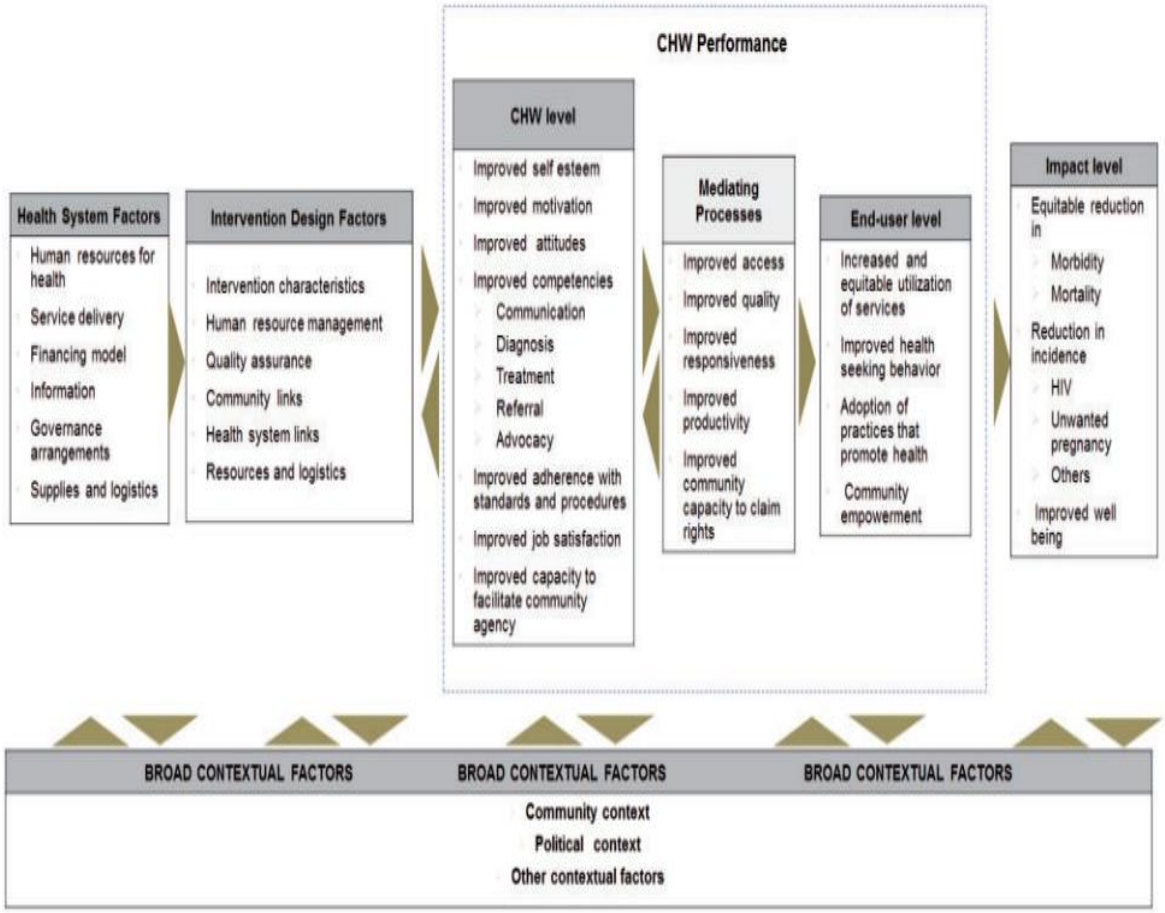

Figure 4: Conceptual framework on factors influencing CHW performance (45)

The contextual factors, which the study is focusing on, include factors such as sociocultural norms, values, beliefs and practices, economic, and environmental. The delivery of health services, human resource provisions, financing mechanisms, supply and logistics, and health information systems are all aspects of the health system factors. Human Resource Management (HRM) (such as recruitment, training, supervision, incentives), tasks and roles, coordination and communication between professional health workers and CHWs, community involvement, logistics, and resources are all aspects described by the intervention design factors. All these factors interact with each other with the assumption that when they are in place will position the CHWs to perform their role in promoting childhood immunization effectively and will result in the improvement of CHW role/ performance.

The framework highlights categorises of CHW performance into three levels: CHW level, mediating processes, and End-user level. Self-esteem, attitudes, skills, job happiness, and ability to act as a community change agent regarding childhood immunization are components of the CHW level. The end-user level components such as service use, health-seeking behaviour, and adoption of practises that support childhood immunisation, are influenced by the CHW level components. End-user components are also influenced by a variety of mediating components such as access, responsiveness, productivity, and community capacity to claim rights.

The three levels of which CHW performance consist, are intermediary elements that eventually contribute to improve the uptake of childhood immunisation. Therefore the final column ‘impact level’ (see Figure 4) should be read as: ‘Improved uptake of childhood immunization’, ‘Reduced incidence of VPD’, and ‘Reduced childhood morbidity and mortality’.

CHAPTER THREE - RESULTS

Peer-reviewed literature on CHW and childhood immunization specifically related to Sierra Leone is limited. Nevertheless, valuable information could be found in several studies and the policy documents produced by the MoHS. To fill gaps and to compare with Sierra Leone, high-quality systematic reviews related to CHW were identified and used.

The findings from the literature are analysed with the use of the conceptual framework. Factors, as identified in the literature, are listed as per specific objective, which follows the framework. All mentioned factors can influence the role of CHW in promoting childhood immunization uptake in a positive or negative sense.

3.1. CONTEXTUAL FACTORS

There is a range of contextual factors influencing the role of CHWs in promoting childhood immunization uptake in Sierra Leone.

Studies relating to childhood immunization have shown that sociocultural norms, values, practice and belief, and economic and environment are significant contextual elements that affect the uptake of childhood immunization and this in turn influences CHW's role (39,43,44,46–48). These studies revealed that distrust in the vaccine, parental/caregivers' knowledge and attitude, fear of vaccination side effects, lack of support from spouse/partner, long time traveling to vaccination point/poor access to vaccination services, language barrier, missed opportunity for vaccination, forgetfulness of parents regarding immunization schedule date services are being provided, sociocultural beliefs and norms, parental/caregiver perception and community belief. For instance, certain communities/caregivers have a perception that vaccines carry disease. This leads to postponing or denying administering some or all vaccines to their children even when services are available.
All this factors have been categorised as parental barriers in a review by Bangura et al 2020 (49) and they serves as an obstacle to the uptake of childhood immunization uptake, which in turn affect the CHW role. This is because the CHWs in childhood immunization interact with parent for the uptake of childhood immunization.

Enria et al and Vallières et al further derived that environmental challenges characterized by geographical distance and terrain serve as a barrier to the uptake of childhood immunization (39,43). For instance, the caregiver who is to receive care at the public health facility may need to spend cash they do not have, especially the high cost of transportation to access the health facility due to the poor roads in remote chiefdoms. Also the geographical terrain like the riverine areas where caregivers find it challenging to get to the health facility where their children are receiving vaccinations due to the lack of transportation.

A study by Babughirana et al in 2018 on the Assessment of the Readiness of CHWs to participate in a Mobile Training and Support Services innovation in Bo District, Sierra Leone, reveals that due to an environment that is characterized by difficult geographical terrain makes it difficult for some CHWs to participate in the assessment survey even when they are included in the survey (50). Due to this difficult geographical terrain, sometimes CHWs can find it difficult to provide childhood immunization services within their catchment area, especially those remote communities. According to the CHWs policy document in Sierra Leone, CHWs should be responsible for delivering services to 100-500 individuals, ideally, those who reside

within the catchment region they serve (5). Due to the remote nature of some communities, which may be sparsely populated, the CHWs have to serve two or more communities outside the community they stay in. They have to go outside certain communities to provide health services which require them to drive long distances to get to their catchment area and serve their population. As a result of the remoteness of some communities, the CHWs are not able to go and render childhood immunization services to the people, so some populations in certain communities are left underserved.

This is in agreement with other studies and/or reviews in LMICs conducted by Favin et al in 2012, Galadima et al in 2021, Bangura et al in 2020, and Périères et al in 2022 that socio-cultural belief and norms, geographic, parental/ caregiver practical knowledge, attitude and perception of vaccine, and economical hurdles to accessing healthcare services have slowed down progress on childhood immunization uptake (49,51–53). Bangura et al in 2020 and Périères et al in 2022 further revealed that parental/caregiver barriers are the most common barriers affecting the low uptake of childhood immunization. These parents/caregivers are living in the community for which the CHWs render childhood immunization services to them and this also affects their roles in the promotion of childhood immunization.

A review by Ozawa et al distinguishes these barriers to vaccination based on the population: hard-to-reach population and hard-to-vaccinate population (54). The review recommends that hard-to-reach populations be identified as those who face supply-side barriers to vaccination because of geography by distance or terrain, passing or traveling movement, provider judgment, and inadequate vaccination systems. Hard-to-vaccinate populations are those who can be reached but are challenging to immunize because of distrust in the vaccines, fear of side effects, religious beliefs, poverty or low socioeconomic status, lack of time to access available immunization services, or lack of knowledge about the benefits of vaccination.

This was further confirmed by a review by Kok et al in 2015, that the CHWs role was found to be influenced by contextual factors that are linked to community characteristics such as sociocultural norms, beliefs, and practices, economy, environment, education, and target group knowledge level. These contextual factors can all interact to influence the effectiveness of the CHW role and impact CHW performance (55).

3.2 HEALTH SYSTEM FACTORS

In Sierra Leone, the MoHS offers overall leadership of the health system, with District Health Management Teams (DHMT) at the district level in charge of managing primary healthcare (24,56). The MoHS creates policies, guidelines, and standards, participates in advocacy and resource mobilization, and monitors the entire delivery of healthcare services in the nation. At the national level, public-private partnerships are started, and the DHMT has less control over private healthcare facilities (24).

The MoHS oversees the operation of the CHW programs, but they rely on donors and partners for financial, technical, and implementation support (29). The donor-supported CHW Hub formed in the MoHS, which is under the Directorate of PHC is in charge of managing the National CHW Program and is distinct from the Directorate of HRH (29). Due to this fact, the

coordination of the CHWs was greatly aided by technical working groups that included representatives from the MoH, implementing NGOs, and donors (29).

Sierra Leone has been relying on donor assistance for health for decades (29), and its main source is out-of-pocket payment (16,56). According to data from the World Bank, Sierra Leone's Current Health Expenditure(CHE) (as a percentage of GPD) is 8.75%, with 55.18% is from Out-Of-Pocket (OOP) health spending, 29.98% is from external health spending, and 14% is from government health spending (57). The Government of Sierra Leone is striving towards UHC as its ultimate long-term goal. However, most of their health programs (Free Health Care Initiative (FHCI) and CHW program) are relying primarily on unsustainable donor funding and this has a great impact on the health system of the country (58).

The major donors like GAVI, the World Bank, Department for International Development (DFID), United States Centers for disease control (US-CDC), Global fund, United Nations Development Programme (UNDP), UNFPA, the African Development Bank, the European Union, UNICEF, and USAID assist human resource development in the health sector (29,40,59,60). The World Bank, UNICEF, USAID, and JSI are the primary source of funding for CHW programs (29). These partners have helped the WHO in building public management capacity for HRH and providing multi-tiered technical assistance and training to improve the delivery of health care services (29,40,59,60).

Donor organizations, in particular GAVI, UNICEF, and WHO are responsible for the majority of the funding for EPI in Sierra Leone, covering 80% of the budget for all operations, including procurement of vaccines, cold chain equipment, logistics, capacity building, technical support, Immunization Services Strengthening, Health Systems Strengthening, and other activities (41).

With all this, Sierra Leone is still challenged to train and retain employees in the health system and also enhance workforce efficiency, especially CHWs in childhood immunization (16,24,61). This is because government spending on healthcare is below the 15% proposed in the Abuja Declaration and is insufficient for a comprehensive set of necessary services for healthcare (62). All this has an impact on healthcare services delivery and access to healthcare by the population especially childhood immunization.

The healthcare services delivery in Sierra Leone is also a major challenge due to the insufficient HRH and finances and/or poor infrastructure (24). The service delivery is composed of three levels: referral hospitals, district hospitals, and peripheral health units with additional support from CHWs (17,24,56). There are approximately 20,000 health professionals from various cadres providing services in the health system both private and public, of which are approximately 10,000 volunteers. The evaluation of the HRH about health workforce provided don’t include the CHWs (16,56). This is because they are not considered to be part of the national civil servant’s employees and therefore not considered in the HRH analysis (16,29), but they are approximately 15,000 (16,56). These CHWs are being relied on by the government to provide basic healthcare services at the community level including childhood immunization (5,16).

The government-employed health professionals are approximately 10,000 working in 1,323 service delivery locations. Around sixty percent (60%) of the government's health workforce is employed in the city of Freetown where 20% of the population resides. About 30% of these employees work with 60% rural population (16,27,56,59). This unequal distribution of skilled

trained health professionals between rural and urban areas, particularly at the clinical levels, is a great problem in rural settings in Sierra Leone. Also, there is a high level of volunteerism among the health workforce including CHWs (16,59,61).

This is in line with the WHO report 2006, which revealed that the number and distribution of skill-mixed trained health professionals between rural and urban facilities is a challenge in many countries, Sierra Leone inclusive (63). This makes access to quality child healthcare services in many communities still challenging in Sierra Leone(16,64).

Due to these circumstances, the availability of healthcare service delivery is still challenging in rural areas in Sierra Leone. Also, accessibility will be another obstacle, where high out-of-pocket (OOP) costs involved to access healthcare services will be a great problem for the people in these settings (24,56). This is because caregivers/ parents in these areas cannot afford the direct and indirect costs of healthcare services (56,65). The FHCI 2010 was introduced to remove user fees for pregnant women, children under the age of five, and nursing mothers, but user fee requests are, however, frequently reported (39,44,48,56). This affects the role of CHW in promoting childhood immunization uptake as referral of defaulter children for immunization presented several difficulties (36).

Maureen Lewis studied informal payment and the financing of healthcare in developing and transition countries. This study confirmed that the informal payment of finances for healthcare services to health workers is increasing in most developing countries (66). This has a significant effect on caregivers' health-seeking behaviour to utilize healthcare services.

The HRH capacity both in terms of skills and number is one of the major obstacles to improve the quality of healthcare service delivery (16,24,56). There are around 4 medical professionals per 100,000 population, with 4 doctors, 70 nurses, and 5 midwives per 100,000 population (56). The trained health professional density is extremely low ranging between 0.15 to 0.19 per 1,000 population (56,67), ranking among the lowest in the world (67,68). Sierra Leone like any other LMICs, particularly in Sub-Sahara Africa, is been challenged by HRH and they do not meet the threshold of the WHO density indicator which is 2.28 healthcare professionals per 1,000 population (64,67,68).

All these issues make the availability and accessibility of service delivery for immunization weak (24). The service delivery for immunization is been carried out in the following ways: firstly, they have fixed sites at the various hospitals and PHUs that serve as the primary means of service delivery. It enhances outreach service delivery which is another way held regularly in towns that are located within the health facility's 5-kilometer catchment area. Another strategy is the mobile service where the mobile teams at the district level visit remote settlements greater than 5 kilometres from the nearest PHU. Mobile teams frequently travel from community to community offering immunizations and other healthcare services for at least a day at a time. Due to insufficient resources, this strategy has not been maintained (41).

Supplies and logistics in the health system are still challenging which makes service delivery to be difficult. This is because of the regular shortage and/or stockout of logistics, especially drugs like vaccines. The shortage and stockout will continue to be a problem in the Sierra Leone health system due to improper management of the medical supply chain (24,59). In 2016, an independent assessment was made on medical supplies, 31% of these supplies including medications and other logistics were either missing or had shelf lives of less than six months. Medical supplies are a major expense for providing healthcare (24,56,59). All of this affects the role of CHWs in promoting childhood immunization uptake.

Over the years, the information system was poor in Sierra Leone. Data was collected manually on different types of reporting forms, which leads to poor data quality. The poor information makes service delivery to be challenging (41). One of the benefits of the EVD outbreak is the enhancement of the information infrastructure. The concept of a district-based electronic data management system, known as the district health information system (DHIS) was adopted. The DHIS interface is used to gather, compile, and perform quality data analysis at all levels. This has made it easier to provide reports for the DHMT at the national level as well as for input to PHUs and the community level. Stakeholders use it as well during review sessions and decision-making at all levels (24). However, the MOH is being confronted with data management difficulties due to data quality, insufficient coverage, and availability.

3.3. INTERVENTION DESIGN FACTORS

This section is going to look into how intervention design for CHW impact childhood immunization. In Sierra Leone, a study has shown that intervention design for CHWs is by the National CHW policy 2016-2020 document (69).

In intervention design, the role and task for CHWs in childhood immunization uptake are primarily preventive/promotion services, mainly childhood immunization education/ sensitization services (5,35). Promotional services such as education/sensitization of childhood immunization and referring caregivers to the health facility for their children to be vaccinated have an impact on the CHW's role, especially in poor and vulnerable community where caregivers can't afford the expenses incurred for accessing the health facility.

A review conducted by Glenton et al in 2013 revealed that CHW's services are considered to be insufficient or irrelevant especially when they primarily provided promotional services (70). This finding is similarly in line with the finding of the CHW's role in Sierra Leone where they are primarily providing promotional services in the uptake of childhood immunization. This is insufficient because it does not achieve the aim of extending immunization services to every child, especially those living in poor and vulnerable communities.

Studies revealed that there is no specific work outline for CHWs, they perform multiple work with regards to health. This makes them to be overburdened with work (26,39). This affects the CHW's role in promoting childhood immunization.

Reviews by Kok et al 2015 and Jaskiewicz et al 2012 (45,71) revealed that for CHWs to perform their role effectively in the community, there should be a well-defined role. Kok et al further revealed that giving curative/injectable tasks to CHWs can enhance motivation leading to an effective role.

The HRM such as selection and recruitment, incentives, training and supervision are intervention design factors that have an impact on the role of the CHWs in childhood immunization uptake in Sierra Leone.

The selection and recruitment of the CHWs is done by PHU staff to which the CHW will be attached and relevant stakeholders in the DHMT together with the local authority and community structure According to the CHW policy 2016-2020 document (5). It has been found that when community members are involved in the selection of CHWs for recruitment they

give support to the CHWs while they are performing their roles, this motivates them to retain in their roles (26,36). In recruiting CHWs, there are criteria set but it does not focus on their educational level even though it was recognized and preferred, especially for the female candidates (5). A study revealed that some CHWs are challenged to read and get an understanding during the training or even take notes and review the material covered in the sessions (26). This has a negative effect on CHW's role, as not understanding the module during training will not enhance better knowledge. Considering CHW's literacy and numeracy skills in the recruitment process will help them to have a better understanding of modules taught during training sessions and that will enhance them to gain better knowledge which will enable them to perform their role effectively and efficiently.

Incentives is an element of HRM that influence the role of CHW in childhood immunization. According to the CHW policy 2016-2020 document, incentives are to be disbursed monthly to CHWs but studies revealed that there is a delay in the disbursement of the CHWs stipends which negatively influences the CHWs in performing their role in promoting childhood immunization uptake in Sierra Leone (26,36,39). This was confirmed in one of the studies that CHWs had not received their allowance. The CHWs used their funds to travel around their communities to perform their role in promoting childhood immunization uptake and also go to meetings at health facilities (26). This led to the CHW being sub-optimal in performing its role in promoting childhood immunization uptake. The lack of financial support was often used as a reason for diversifying their sources of income outside their volunteer work as CHWs.

Kok et al's systematic review in 2015 looked at which intervention design factors influence the performance of community health workers in low- and middle-income countries. It revealed that both financial and non-financial incentives are essential elements to position CHWs to perform their role effectively (45). When CHWs are rewarded with incentives, they realised they had accomplished something positive at work. This is a motivating factor that makes them feel at ease to perform their role effectively. This is in agreement with other reviews on approaches for improving the performance of CHWs in LMICs by Ballard et al 2017, Scott et al 2018, Shipton et al 2017, Glenton et al 2013, and Ogutu et al 2021 (70,72–75).

Training is a component of HRM that is vital and influences CHW's role in the uptake of childhood immunization. A study conducted by Raven et al 2020, found that training has been challenging for some CHWs to comprehend the training materials, the reporting systems, and the interpretation of the most important health education messages. This is because most CHWs lack basic education (26). This is confirmed in another study by Enria et al 2021 and Jalloh et al 2022, as it shows that CHWs are not well knowledgeable in performing their role in promoting childhood immunization uptake. This is because many issues about childhood immunization posed by caregivers to CHWs are being referred to the nurses (39,47).

In Enria et al 2021 study, CHWs were included in a research process. The training that was conducted positively influence the CHWs in performing their role in promoting childhood immunization uptake. The knowledge acquired in this training helps them to identify the flaws in their roles (39). Since many of the CHWs lack formal education, they need continuous in-service training but that was unclear in the CHW policy 2016-2020 document (5). This makes the CHWs lack the necessary opportunities to practice under supportive job training supervision from the connecting healthcare facilities on their deployment in their community, and it affects their roles.

In 2017, Scott et al reviewed programs of community-based health workers, and it revealed that continuous training can enhance CHW's performance (73). This is in agreement with

reviews by Shipton et al 2017, Glenton et al 2013, Ogutu et al 2021, Kok et al 2015, and Kane et al 2010 (45,70,74–76).

Kane et al 2010, Glenton et al 2013 and Kok et al 2015 further revealed that training for CHWs should be based on particular tasks intended for particular situations. Training that is focused on a particular task will enhance the CHW's effective outcomes. Skills development training gearing to a specific task and practice sessions helped CHWs gain an active understanding of the tasks and created a sense of confidence in their ability to perform their role. Doing this will position the CHWs to effectively perform their roles with ease and confidence. Training should be done in the form of knowledge and skill-based combined with continued on-the-job mentoring and supervision.

Supervision is an element of HRM and is critical according to the 2016-2020 CHW policy document, this is because there is shortage of health workforce at PHU level and they are tasked with the full responsibility of conducting supportive supervision for CHWs monthly (5).

Peer supervisors were trained to be conducting supportive supervision but a study revealed that supportive supervision faced many difficulties in Sierra Leone by many peer supervisors due to delayed disbursement of transport allowance or insufficient supply of logistics. They frequently made extensive journeys, sometimes at their own expense to go and oversee the CHWs in their various catchment areas or communities (26). This can negatively influence CHWs in performing their role in promoting childhood immunization. As supportive supervision is important because gaps identified in performing their role will be rectified during supportive supervision and this is not often done. In this light, insufficient supportive supervision greatly affects the CHW role.

In 2017, Ballard et al studied interventions for improving CHW's performance in LMICs. In the study, it was found that regular supportive supervision can position CHWs to effectively perform their role in promoting childhood immunization uptake (67). When supervising CHWs, the use of tools is essential because it develops technical skills. This enhances supportive supervision which gives guidance to the CHWs to perform their role effectively. This is in agreement with other reviews by Scott et al 2018, Shipton et al 2017, Glenton et al 2013, Ogutu et al 2021, Kok et al 2015, Jaskiewicz et al 2012, and Kane et al 2010 (45,70,71,73–76) that constructive and supportive supervision enhances CHWs performance.

Resources and logistics is another intervention design factor that has an impact on the role of the CHW in childhood immunization. The insufficient and/or lack of logistics such as tally sheets, defaulter tracing forms, monthly summary forms and work identification cards has an impact on CHW role. It poses difficulty in community health education and outreach as many caregivers do not follow the health advice from the CHWs due to the absence of identification card (26,29,32).

According to a review by Scott et al 2017, it was found that sufficient supplies of logistics to CHWs will influence their performance. The accessibility and availability of logistics for CHWs will aid them to perform their role effectively. When CHWs have the necessary logistics to aid them in performing their role, the respect given to CHWs from the community has a great influence on their role in performing healthcare delivery services. This is in line with other reviews by Ballard et al 2017, Ogutu et al 2021, Kok et al 2015 and 2017, and Jaskiewicz et al 2012 (45,71,72,75,77).

Community and health system linkage is another intervention design factor that has an impact on the role of CHW in promoting childhood immunization uptake. A study shows that community members give respect as a sign of appreciation and sometimes give support to CHWs through gifts and other little acts of kindness (36). This has shown a strong community link and it has served as a motivation for retention.

Another study has revealed that there is a lack of coordination between the CHWs and the health facility staff. This sometimes makes the health facility staff not deliver the necessary resources and logistics needed by the CHWs to perform their role effectively and this negatively affects their role. This is the fact that some healthcare workers perceive CHWs as stealing their jobs (which supplement their inconsistent pay with additional revenue) and abusing them by giving them resources and logistics that are in low supply (26). The verbal expression of health workers towards the caregivers due to their negative attitudes influences the CHW's role. This verbal expression makes caregivers perceive that some comments are dehumanizing and hence discourage subsequent use of services at the health facility (39).

The review by Kok et al 2015 found that wholesome coordination and communication between CHWs and formal health officials can increase CHWs' credibility which will enhance their performance(45). This is in line with other reviews by Scott et al 2018, Glenton et al 2013, Jaskiewicz et al 2012, and Kane et al 2010 (70,71,73,76)

CHAPTER FOUR: DISCUSSION

The literature review found that the primary role of CHWs in childhood immunization is to promote health and educate, create awareness among parents/caregivers about childhood immunization, and refer them to health facilities for immunization. However, the role of CHWs is influenced by a variety of factors, including those related to the context factors, the health system factors, and elements of intervention design.

The study showed the interaction of these factors affecting the CHW roles and, consequently, the strength of its connection between CHWs, their communities, and stakeholders in the health system. Intervention design factors such as the task and role, supportive supervisory system, training, incentives, community and health system links, and supplies and logistics are all impacted by the health system. Also, the intervention design and contextual elements interact to affect how well CHWs can perform their role in promoting childhood immunization uptake in the community through the experiences, perspectives, and values that impact the community connections and behaviour.

The CHW intermediary position between the community and health sectors in promoting childhood immunization is crucial, especially the need for building trustworthy relationships between the community and the health system. The strength of relationships between CHWs and key players in the health sector, as well as the community, can influence the access and utilization of childhood immunization uptake in the community.

Based on findings, access to and utilization of CHW health care delivery services can be influenced by contextual factors such as socio-cultural norms, beliefs, practices and attitude of the population, geographical distance and terrain, and the economic status of the community. It is believed that CHWs are better capable to know limitations brought on by contextual factors such as sociocultural norms, beliefs, practices and attitude of the people because they are a part of the environment in which caregivers/parents live. But there are different socio-cultural practices in the community, CHWs sometimes cannot influence the health-seeking behaviour of certain people in the community towards childhood immunization uptake.

With this, when selecting CHWs to carry out childhood immunization programs in the community, it is essential to take into account the social and cultural norms of the community. CHWs serve as a crucial link between the community and the health system, and their success in promoting childhood immunization can be impacted by cultural norms and relationships. It is therefore important for intervention design to support the role of CHWs from both the health sector and community perspectives. However, CHW interventions often neglect to consider sociocultural norms and values, which can make it challenging for CHWs to effectively promote childhood immunization uptake in some communities. To overcome this challenge, stakeholders in the health system must consider the context factors when designing interventions for CHWs, and include elements that will help CHWs better understand how to perform their role and change sociocultural norms and attitudes surrounding childhood immunization.

The results indicate that CHWs play a vital role in advancing childhood immunization in communities. However, a poorly functioning healthcare system characterized by inadequate

facility infrastructure, poor planning, lack of HRH and financing, can hinder their efforts and lead to poor healthcare services delivery, particularly to hard-to-reach populations with regard to childhood immunization. The support and interaction between caregivers and healthcare providers at public health facilities significantly impact the role and utilization of CHWs in the community for promoting childhood immunization. These factors must be addressed to ensure CHWs can effectively perform their role and promote childhood immunization in the community.

Another factor to take into account is that the integration of CHWs into the health system was managed by the MoHS and was facilitated by the CHW hub, which was supported by donors within the MoHS. The MoHS and the CHW hub, which is supported by donors in the MoHS, have differing views on the capabilities of CHWs, and these differing opinions and perceptions have an impact on the relationships and trust between them and CHWs. This, in turn, affects the effectiveness of CHWs in promoting childhood immunization.

The community as well, where the CHWs are recruited and where healthcare services are provided, have their own health seeking behaviours. These communities have their cultural norms and values in which they believe and practice and that creates a connection between them, and it has an influence on their behaviours regarding childhood immunization. With this, they have their mechanism on how CHWs can perform their role in promoting childhood immunization for effective outcomes. All these interfaces affect the CHW relationship and trust with all actors and that affects how effectively the CHWs can perform their roles in promoting childhood immunization uptake.

The CHW are vital in promoting childhood immunization especially they are living in the community and they will be able to achieved the national goal of the routine immunization target. With this, it is essential for the effectiveness of the integration of the CHWs into the health systems, and to meet the population criteria for UHC and the SDG 3.2 with the available resources, it is essential to take advantage of opportunities from CHWs and placement as members of the primary health care teams. To achieve this, CHWs must be integrated into public policies, including those related to national HRH planning, governance, legal frameworks, and financing for health services. The policies must be aligned to ensure the proper integration of CHWs into the health system, enabling them to receive support from the health system and the health system to effectively utilize CHWs in promoting childhood immunization. This integration should also foster collaboration and effective communication between CHWs and other stakeholders in the health care system.

Based on this review of literature, the CHW role is significantly and directly impacted by the design of CHW interventions. The intervention design elements such as incentives, training, supportive supervision, health system and community linkages, and logistics and supplies, all these elements are linked to the health system. As a result, the performance of CHWs in promoting childhood immunization is influenced by the overall efficiency of the health system. Additionally, since the intervention is carried out in the community, the interaction between the CHWs and the community plays a crucial role in determining how effectively the CHWs can carry out their roles in promoting childhood immunization uptake. To maximize the impact of CHWs in promoting childhood immunization, it is crucial to consider these factors when designing CHW interventions.

The incentives, training, supportive supervision, health system and community linkage, and logistics and supplies are all required by the CHWs to effectively carry out their role in promoting childhood immunization uptake. All these are frequently insufficient and inadequate, and CHWs' expectations regarding these issues do not relate to the policy.

In Sierra Leone, incentives are stated in the CHW policy document 2016-2020 to be given to the CHW monthly but are not forthcoming. It frequently takes three months before monthly incentives are reimbursed to CHWs. The majority of CHWs relied on their job to provide for their families financially. Due to this dependence, CHWs in childhood immunization uptake will forego their roles in favour of their income-generating as a result of a lack of financial incentives. Since low-income residents make up the majority of CHWs, they will seek for alternative employment opportunities in the private sector rather than volunteering their time. Due to this, the CHWs' role in promoting childhood immunisation in Sierra Leone remains sub-optimal.

From review of literature, incentives are one of the intervention design elements that can position CHWs to effectively perform their role in promoting childhood immunization uptake in their community. Incentives, both financial and non-financial, are essential to enhance the activities carried out by the CHWs and it also complements their role in promoting childhood vaccine uptake. Giving financial incentives to CHWs regularly will create a situation that makes them feel at ease when performing their role and that will lead to effective outcomes. Giving CHWs financial incentives according to their jobs will foster a sense of obligation to perform their role in promoting childhood immunization uptake.

According to the findings, in Sierra Leone majority of the CHWs lack the ability to apply efficient childhood immunization health education to caregivers/parents to persuade their health-seeking behaviour regarding childhood immunization in the community. This is because CHWs are recruited with a lack of basic education and training is not frequently provided. Most of the training provided to CHWs is basic general health training and does not have a clear directive or emphasis on a particular area like communication skills in delivery messages regarding childhood immunization. In this regard, the training is insufficient and does not necessarily assist CHWs in carrying out their roles in promoting childhood immunization uptake with confidence and credibility. As a result, some CHWs lack the knowledge necessary to carry out their role effectively regarding childhood immunization.

Training is essential for CHWs in promoting childhood immunization in Sierra Leone since the majority of CHWs are illiterate. From the review, training is one of the intervention design factors that position the CHWs to perform their role effectively. Training should be directive and focus on a specific purpose. Training is vital for CHWs promoting childhood immunization, and it should build their skills and abilities needed to develop the facilitation skills necessary to start a reflection on cultural practices and beliefs of people in the community regarding childhood immunization, from the perspective of public health, which will prevent people from changing their behaviour or using services. This is necessary because CHWs' role in childhood immunization is mainly promotion and they need to feel empowered and supported when they are expected to persuade and change the perspectives of the people in the community concerning childhood immunization. In this regard, they need training in soft skills like communication, problem-solving, and maintaining confidentiality. Given this kind of training to CHWs in promoting childhood immunization will position them to increase their knowledge to persuade caregivers to immunise their children. Giving proper information to

caregivers regarding childhood immunization will build trust in terms of immunization which can increase childhood vaccine uptake.

On the other hand, supervision is insufficient in Sierra Leone. The national CHW policy document 2016-2020 mentions the insufficient health workforce at PHUs and emphasizes how important supervision is. The CHWs in the promotion of childhood immunization is primarily supervised by the peer supervisor, who serves as a point of contact between the health facility and the CHWs. But the supportive environment from the health system is not given to the peer supervisors to regularly do supportive supervision.

The availability and design of the supervisory system have an impact on the strength of connections between CHWs and significant stakeholders in the health sector, as well as between CHWs and the community. If the supervision is designed in the way in which the community networks are involved in the role of identifying issues in service delivery on childhood immunization and monitoring changes within the CHW interventions, this will then help to strengthen their relationships, and thus CHW's role will be improved.

Improved, supportive supervision is required, along with training for supervisors in technical abilities, people management, and the implications of CHWs' intermediary position for community connection building. Since supervision is a type of human connection, techniques that reduce the social gap between the supervisor and the supervisee, including team-building exercises, may enhance interactions and productivity. The relationships between CHWs and their communities may benefit from improved oversight from the health sector as a result of increasing recognition.

Logistics and supplies play a role in the uptake of childhood immunization and this has an impact on the CHW roles. From this review lack of supplies such as drugs especially the persistent stock out of vaccines in the health system has a great impact on CHW's role in childhood immunization. Also, lack of logistics such as mobility like bicycles, defaulter tracing forms, and identification card, all negatively impact the role of CHWs when providing routine immunisation services in the community.

From the review logistics and supplies are one of the intervention design factors that can position CHW to perform their role. For CHWs to perform their role effectively and gain the respect and trust of the communities, CHWs need a steady supply of logistics and there must be regular replenishment of vaccines in the health facilities.

Overall, results endorse the critical role CHWs can play in increasing access to and utilization of essential health services, especially for children under five years of age. By working in collaboration with the health system and health personnel, CHWs are able to bridge the gap in the human resource capacity and improve the overall health of the community, particularly the most vulnerable population, children. It is essential to continue to support the CHW program and its implementation in order to achieve the goal of reducing the high child mortality rate in Sierra Leone.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The findings of this literature review provide insight into all the factors that influence CHWs role in promoting childhood immunization and their roles was primarily promotion/ preventive. These include contextual factors such as cultural norms and beliefs, parental knowledge and attitude, economic and geographic location, and also health system factors such as insufficient funding, inappropriate integration of the CHWs into the health system, shortage of the HRH and insufficient supplies and logistics especially vaccine. And intervention design factors such as delayed payment of incentives, insufficient training, supportive supervision, resources and logistics, health system linkage and lack of basic literacy of the CHW also play a role. The Sierra Leone's status of all of these factors have hindered their potential positive impact on the role of CHWs in promoting childhood immunization uptake in Sierra Leone. Community support was the only factor found to have had a positive impact on CHW role in the country.

The effectiveness of CHW interventions showed to be heavily influenced by the design of the intervention and the various factors that interact with each other. It is crucial that policymakers in the health system take into account the community's practices and beliefs when designing CHW interventions, in order to support CHWs in navigating the sociocultural norms and values of the community they serve.

Another important factor is the clarity on the role of CHWs, with a time commitment that aligns with the compensation provided. Training programs should not only provide technical skills but also emphasize the importance of social skills, such as counselling and communication, including confidentiality. Continuous training should be linked with ongoing supportive supervision that involves both health professionals and the community. Adequate logistics and supplies, as well as reliable transportation, should be provided to CHWs to allow them to effectively perform their role.

Community and health system integration showed to be also crucial in promoting CHW retention, motivation, and performance. Furthermore, CHWs career integration should be integrated into the health system's HRH policy to ensure that their role is properly recognized and supported.

To enhance the CHW's role in promoting childhood immunisation, policymakers must carefully consider these pieces of evidence. Doing so will improve access to and utilization of the childhood immunisation services provided by CHWs in their communities and throughout the nation, which will help achieve SDG goal 3.2 and UHC.

5.2 RECOMMENDATIONS

The CHW's role in promoting childhood immunization uptake in the community is crucial, and useful in achieving the UHC and SDG goal 3.2 "By 2030, end death of new-borns and children under 5 years of age with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-five mortality to at least as low as 25 per 1000 live birth". The role of CHWs to childhood immunization uptake needs to be strengthened.

Therefore policymakers, programme managers, and other stakeholders must carefully consider the following recommendations based on the findings of this review, for an improved role of CHWs in promoting childhood immunization uptake.

1. The government should solicit funds from partners working on childhood immunization programs and projects. This can be done through stakeholders meeting with key development partners and government to highlight the gaps and the need for funding.

2. Government should disburse monthly incentives to CHWs on time. This can be done through stakeholders meeting with the MoHS presenting the importance of paying workers on time.

3. The government should provide logistics and supplies such as vaccines, cold chain facilities, reporting forms, mobility, and identification cards to enhance CHW's role in promoting childhood immunization uptake. This can be done by mobilizing resources through meetings with implementing partners that are involved in childhood immunization. The MoHS should involve district-level players including the DHMT and health facility staff.

4. Government should consider appropriate integration of CHWs as part of HRH policy and the civil servants which will enable them to be on the government payroll rather than incentivize them. This is done by meeting with the stakeholders and the government, pointing out the essence of integrating the CHWs as part of the HRH policy

5. The DHMT and program implementers should provide thorough and integrated training such as communication and counselling including confidentiality and also a refresher training to be conducted for CHW at least every year to improve on their knowledge on providing services on childhood immunization.

6. The DHMT and program implementers should enhance the supportive supervisory structure such as including the community and the formal health sector to conduct frequent on the job mentoring and supervision to promote CHW productivity in childhood immunization uptake (offer constant feedback, train problem-solving skills, and connect CHWs to the formal health sector).

7. The DHMT, program implementers and the community should consider the educational level at least basic literacy in the selection for recruitment process of the CHWW and also take into account the socio-cultural norms and values when designing an intervention.

8. Health system researchers should carry out a research assessing CHW's role, specifically investigating the number of children served and the percentage of services delivered on time.

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