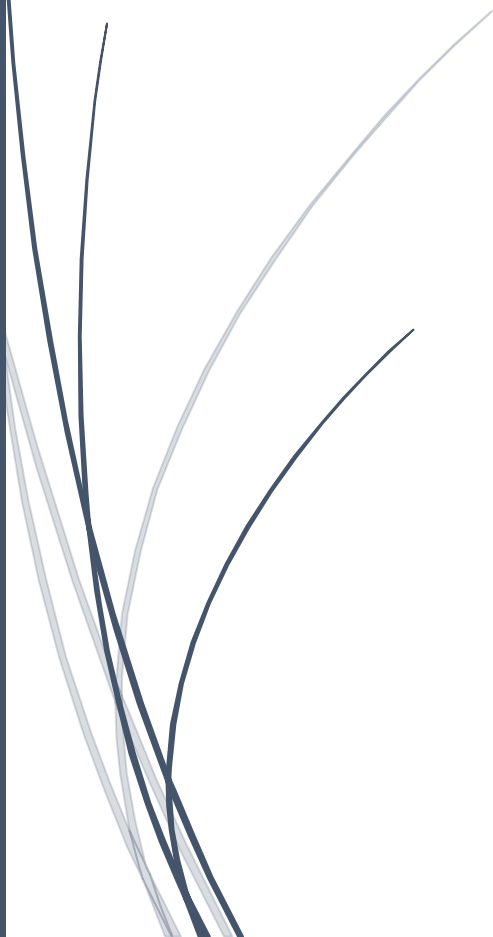


# **CERVICAL CANCER CONTROL IN SIERRA LEONE**

**This thesis is submitted in partial fulfilment of the  
requirement for the award of  
Master of Science in Public Health**

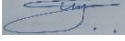
**By  
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**Declaration:**

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

The thesis **Cervical Cancer Control in Sierra Leone** is my work.

**Signature:** 

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## Contents

LIST OF TABLE AND FIGURES	3
LIST OF ABBREVIATIONS	4
ABSTRACT	5
INTRODUCTION	6
CHAPTER ONE	7
BACKGROUND	7
CERVICAL CANCER CONTROL STRATEGIES	8
SIERRA LEONE PROFILE	10
CHAPTER TWO	16
Problem statement	16
Justification	16
Objectives	17
Methodology	18
CHAPTER THREE: STUDY FINDINGS	20
1. Environmental Factors, Health system and accessibility	20
2. Predisposing, enabling and need factors	22
3. Health behaviours, service utilization and coverage	23
4. Comprehensiveness, patient-centredness and quality	26
5. Continuum of care, coordination and accountability	28
6. Health outcomes- Perceived, evaluated and consumer satisfaction.	29
CHAPTER FOUR	31
Discussion	31
Conclusion	36
Recommendations	38
Reference List	40
Acknowledgements	51
Appendices	52
Appendix-I Cervical cancer care pathway	52
Appendix- II Three steps of cervical cancer early diagnosis	53
Appendix-III Conceptual framework of a high quality, interconnected cancer care delivery system	54
Appendix-IV Cancer Monitoring, evaluation and scale-up framework	55

## LIST OF TABLE AND FIGURES

No	Title	Page
Figure.1.	The Life-course approach to CC interventions	10
Figure.2.	The regional division of Sierra Leone	12
Figure.3	Existing Sierra Leone Health Sector Coordination Structure	13
Figure.4.	The Sierra Leone Health services organisation	15
Figure.5.	The conceptual framework for cervical cancer control in Sierra Leone.	20
Table1.0	National HPV Immunisation programs in SSA	28
Figure.6.	available cancer diagnosis and treatment services in the public sector	31

# LIST OF ABBREVIATIONS

<b>AIDS</b>	<b>Acquired Immunodeficiency Syndrome</b>
<b>CC</b>	Cervical cancer
<b>CSO</b>	Civil society organisation
<b>DHMT</b>	District Health Management Team
<b>HPV</b>	Human papillomavirus
<b>HR-HPV</b>	High-risk Human papillomavirus
<b>IEC</b>	Information, Education and Communication
<b>LEEP</b>	Loop Electrosurgical Excision procedure
<b>LMICs</b>	Low-and-middle income countries
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MOE</b>	Ministry of Education
<b>MOF</b>	Ministry of Finance
<b>MOHS</b>	Ministry of Health and Sanitation
<b>MSWGCA</b>	Ministry of Social Welfare Gender and Children’s Affairs
<b>NGO</b>	Non-governmental organisation
<b>PHC</b>	Primary Health Care
<b>RMNCAH</b>	Reproductive maternal newborn child and adolescent health
<b>SDH</b>	Social Determinant of Health
<b>SSA</b>	Sub-Saharan Africa
<b>STI</b>	Sexually transmitted infections
<b>UNSDGs</b>	United Nations Sustainable development goals
<b>VIA</b>	Visual Inspection with Acetic acid
<b>WHO</b>	World Health Organisation

# ABSTRACT

**Background:** Cervical cancer (CC) is the 2<sup>nd</sup> most diagnosed and 2<sup>nd</sup> leading cause of death among women in Sierra Leone with annual death of 244 out of 299 cases. Sierra Leone is among the highest mortality to incidence ratios in West Africa with no CC control policy.

**Objectives:** The study explores strategies required for CC control and recommends best practices for the triple intervention in Sierra Leone.

**Methods:** I conducted an online literature review from databases including PubMed and Cochrane and grey literature from websites including the World Health Organisation (WHO). I thematically analysed the results using a conceptual framework adapted from Andersen's and the WHO Service delivery frameworks.

**Results and key findings:** In Sierra Leone, the major social determinants of health (SDH) of CC are the lack of knowledge and access to health care and unhealthy behaviours, exacerbated by the countless health system bottlenecks.

The competing health priorities in CC policy implementations in many Low-and-middle-income countries (LMICs) results in policy failures and poor patient outcomes. However, the lack of political commitment and poor planning result in inequity, poor quality CC control programs in LMICs.

## **Discussions and recommendations**

The health system barriers due to poor political will and individual SDH are the major contributing factors to the burden of CC The political commitment, multisector collaboration and equity approach reduces CC burden.

Therefore, stewardship, financing, multisectoral collaboration and effective monitoring and evaluation and research are required in Sierra Leone.

**Keywords:** Cervical cancer, Human Papillomavirus Vaccination, Social determinant of health, Low-and-middle-income countries, Sierra Leone.

**Word count-13,400**

# INTRODUCTION

I am Medical Officer from Sierra Leone. I work for the Ministry of Health and Sanitation (MOHS) as a clinician in the department of Obstetrics and Gynaecology (OBGYN). My personal experience during the 11-year civil conflict and working in the four medical disciplines as a medical doctor in Sierra Leone gave me passion for maternal and child health, hence, OBGYN as a clinician and Expanded programs on Immunisation (EPI) as a part-time national supervisor. I have provided supportive supervision during supplementary immunisation activities (SIAs) in the country for 3 years. I also served as the Medical Officer at the Bonthe Government Hospital and then the Sierra Rutile Mining Company, Sierra Leone. In each of these roles, I have thought beyond clinical medicine and critically dive into issues affecting women and children at different times, places and contexts.

Women, girls and children are unimaginably affected by health issues in Sierra Leone. Mostly across the health systems to the household situations. There is always a thesis topic one could write.

However, my motivation to write CC control in Sierra Leone comes from a personal experience. Late morning, while accompanying a hydrocephalic baby delivered via Caesarean section [by me] to Bo, I review a mid-50-year-old woman at the Matru Hospital, Matru Town, Bonthe District. It was an advanced, classical CC case and patient was in shock and too late for lifesaving action. Difficult, but I offered my professional advice. It was a sad scene, as I kept reflecting and asking the reasons for the late presentation and how to prevent recurrence. There was not any CC control program in Sierra Leone. Like other LMICs, the health systems are additional SDH, and they contribute significantly to the burden of chronic diseases and health outcomes. Therefore, it is relevant and urgent to develop a clear and precise road map towards CC control.

In this thesis, I conducted an analysis of the SDH of CC in Sierra Leone and policy and implementation challenges in other LMICs with existing national CC control programs. I made key recommendations on the best practices to the ministry of health and sanitation (MOHS) and partners for policy and strategic document development on CC control in Sierra Leone.

# CHAPTER ONE

## BACKGROUND

CC is the fourth most diagnosed and the fourth cause of death among women in 2020 globally, preceding breast, colon and lung cancers (Arbyn M. et al., 2020), due to demographic changes including aging and population growth and the spread of major risk factors. About 604,000 estimated new cases and 342,000 deaths occurred globally in 2020 (Bray F. et al., 2020). About 90% of the deaths occur in LMICs (WHO, 2019a). The highest regional incidence and mortality are in Sub-Saharan Africa (SSA). The Eastern, Southern and Middle African countries have a considerable rise in incidence with Malawi having the highest incidence and mortality rate (Hyuna Sung et al., 2021).

CC and other non-communicable diseases (NCDs) contribute greatly to alarming premature deaths and healthy years lost in Sierra Leone (Bruni L. et al., 2019a). About 299 new cases and 244 CC deaths occur annually in Sierra Leone (Bruni L. et al., 2019a). This narrow incidence mortality ratio is typical of countries with the highest burden of the disease. A national CC control strategy or guideline is not available in Sierra Leone (Bruni L. et al., 2019a). However, the reproductive, maternal, newborn, child and adolescent health (RMNCAH) policy and strategy 2017-2021 is the service delivery tool currently in use (WHO, 2017). Therefore, there is a need for a clear guideline on cervical control in Sierra Leone. The WHO recommends the integration of CC control into the existing service delivery frameworks in LMICs (WHO, 2020a). However, the competing health priorities and the existing determinant of CC need a context-specific analysis with critical consideration of barriers to access health care in Sierra Leone. The WHO CC elimination strategy is based on Kanfell K. et al., (2020) modelling. Kanfell estimates an incidence impact of 4 CCs cases per 100,000 women-years by 2030 with primary, secondary and tertiary elimination strategies. However, this modelling was limited by data quality in most LMICs. Projections and radiotherapy surrogate data were used. Major SDH including health service accessibility, effectiveness, quality and continuum of care for advanced stages and program monitoring and evaluation (M&E) vary greatly (Kanfell K. et al., 2020). They are critical health systems and accessibility factors that contribute to the burden of CC in Sierra Leone.

Human Papilloma Virus (HPV) is the main cause of CC (Walboomers J. M. M. et al., 1999). High-risk HPV (HR-HPV) contributes to about 99% of CC (WHO, 2019a). However, constitutional factors and the persistent exposure to organic substances including charcoal are also linked to cervical epithelial changes resulting in CC (Leo P. J. et al., 2018; Brown M. A. & Leo P. J., 2019; Horng J. T., 2004). According to the International Agency for Research on Cancer Monographs (IARC), 12 /100 types of HPV cause cancers globally. HPV subtypes 16 and 18 attribute to 70% of CC globally (de Martel C. et al., 2017). Other types include: 6, 11, 31, 33, 45, 52 and 58 (Bergman H. et al., 2019). HPV is a routine sexually transmitted infection (STI), and its mode of transmission and progression is the same globally (de Martel C et al., 2017). Other key cofactors include STIs (Human Immuno-deficiency virus (HIV)/Acquired Immuno-deficiency Syndrome (AIDS) & chlamydia), smoking, high parity and longer oral contraceptive use (Herrero R. et al., 2018). External factors including poor health systems, socio-economic and demographic factors contribute to the high prevalence and mortality in Africa.



The disparity in the burden of CC among and within countries and individuals persists mainly due to socioeconomic and environmental factors which influence the access and the use of HPV and CC services. This is more in places where women pay for services (Sari et al., 2016).

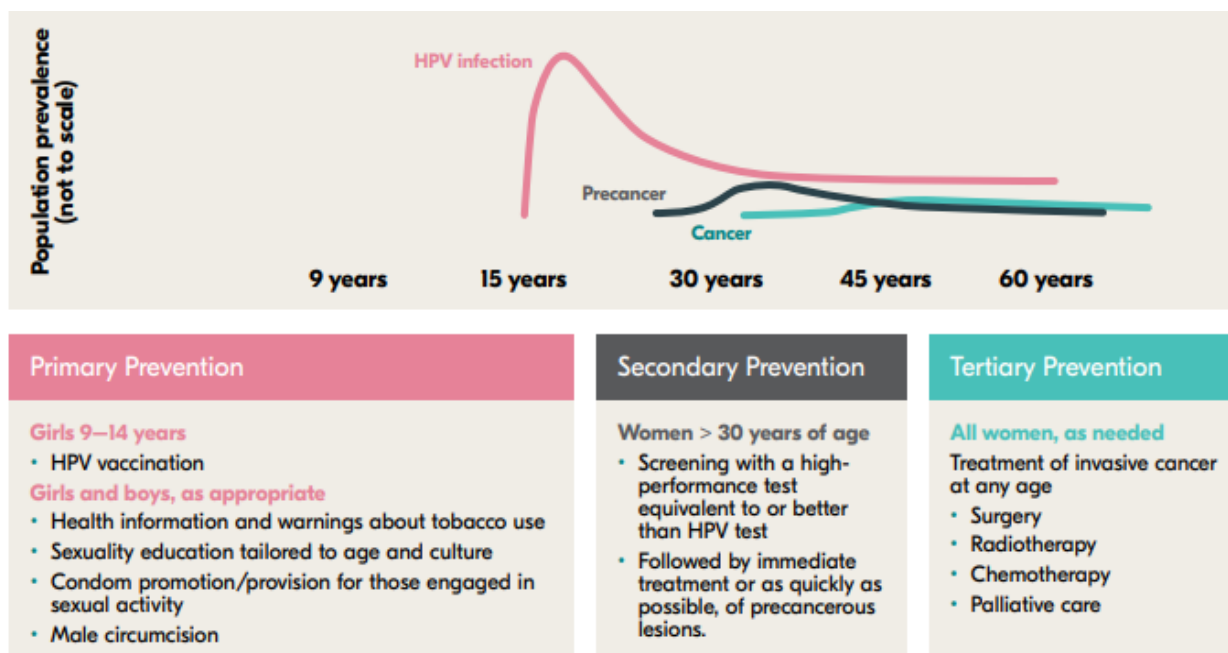
A study conducted in Indonesia shows a positive correlation between household income, age of sexual debut, risky sexual behaviours, nutritional status and STIs, and the risks of HPV infection (Sari et al., 2016). A higher level of education was negatively correlated to CC (Sari et al., 2016) due to positive health-seeking behaviour and the ability to afford services among this group. The patient's age, skills and experience of health workers, availability of diagnostic tools and the hospital settings influence the stage of diagnosis of CC (Bruni L. et al., 2019a). More than 52% of the CC mortality rate each is due to variation in the human development index (HDI) and poverty between and within countries (Singh GK et al., 2012). Also, the gender inequality index (GII) is attributed to the burden of the disease. The death rate is 2-fold higher among women in lower poverty states (Siegel RL et al., 2019). While health expenditure is not related to the burden of CC, a 0.2 unit rise in GII corresponds to a 24% spike in CC diagnoses and 42% death risks (Singh GK et al., 2012). Therefore, a comprehensive CC control strategy should consider the SDH of affected individuals and their communities.

## CERVICAL CANCER CONTROL STRATEGIES

In April 2020, the WHO director-general, Dr. Tedros Adhanom Ghebreyesus, advised the triple, 'cost-effective' and 'evidence-based elimination response including HPV vaccination of girls 9-14 years with at least two doses, screening of women above 30 years and treatment of precancerous and cancerous lesions. Also, addressing barriers to access and service utilization (WHO, 2020a) is critical to the strategy. The elements of the strategies are shown in the Life-course approach to CC interventions below (**Figure.1**).

The strategy is to achieve the 2030 target of CC elimination through HPV vaccination of 90%, screen 70% and detect and treat 90% of CC cases (WHO, 2020a). The target is called the **90-70-90** strategy.

Country investment in CC control interventions would achieve high coverage and, reduces the future CC risks and creates herd immunity for unvaccinated girls in the future (Drolet M. et al., 2019). Two doses of the HPV vaccine fully protect girls (WHO, 2020a), a study on single-dose protection is promising. It is believed to ease the constraints to eliminate CC (Brotherton JM et al, 2019; Stanley M. et al, 2018). Behavioural change interventions such as risk communication of tobacco use or exposure, condom campaigns, male circumcision and age-appropriate sexuality education are relevant to primary prevention strategies (WHO, 2020a). Secondary prevention strategies estimate the burden of CC. The identification of affected women through screening is critical in reducing morbidity and preventing premature deaths from CC. The methods for CC screening are cytology-based, visual inspection with acetic acid (VIA) and HR-HPV testing.



**Figure.1.** The life-course approach to cervical cancer interventions

**Source:** (WHO, 2020a) Global strategy to accelerate the elimination of CC as a public health problem. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.

The cytology-based screening (Papanicolaou) on a large scale produces good results. The patient follow-up, colposcopy and pathology demand resources to achieve high coverage, which has been low in most countries. The VIA is an easy, screen and treat type, but needs a skilled provider to correctly interpret the results. However, it is used in most low-resource settings. The HR-HPV testing has a higher specificity and a strong negative predictive value, and the self-sampling tool gives a 5-year retesting period to women who test negative. This increases acceptability and access to CC services. WHO recommends countries to adopt the HR-HPV-testing tool as first-line diagnoses of HPV (WHO, 2020a).

Health is a fundamental human right. CC patients deserved effective, efficient, timely, and need-based health care. The market dynamics, supply and demand factors are critical to the secondary and tertiary interventions in reducing the burden of CC. Many diagnostics and treatment technology including thermal ablation (precancerous lesions), handheld devices are promising in the elimination of CC (WHO, 2018; WHO, 2019)

The major steps to achieve the 70% screening and 90% treatment targets include: understanding the barriers and creating the enablers for service access; creating and promoting one-stop screen and treat primary care package; providing quality-assured, affordable and high-performance diagnostics and treatment tools; and strengthening laboratory capacity and quality assurance (WHO, 2020b).

The treatment and the disease complications need a management strategy. The physical and psychosocial complications of chemotherapy, radiotherapy and surgery require care. The absence of this records the greatest impact on the year lived with CC. These effects are addressed with complementing spiritual, psychosocial, and emotional supports of patients and their close relatives (Pfaendler KS et al., 2014; Muliira RS. et al., 2017). Developing and implementing CC management guidelines; establishing referral systems and people-centred

nexuses throughout the continuum-of-care; strengthening diagnostic services (pathology); expanding and improving access to surgical, radiotherapy and chemotherapy; and strengthening and integration of palliative care services are critical to achieving the 90% target of treatment and palliative care in LMICs (WHO, 2020b). Most of these structures are lacking in LMICs (Appendix-I p50).

## **SIERRA LEONE PROFILE**

Sierra Leone is on the west coast of Africa. It shares borders with Guinea and Liberia in the Northeast and Southeast and the Atlantic Ocean in the Southwest. It has a tropical climate, rainy and dry seasons and rainforest and savannah vegetations. Sierra Leone is divided into the Northern, Eastern, Southern regions, and Western areas. The central government is in the capital city, Freetown. The regional administration divides the country into sixteen districts. Figure.2. below shows the regional division of Sierra Leone (Stats SL, 2017). The health ministries, departments and agencies (MDAs) are vertical in communication, with the President at the highest power of authority. The health coordination structure of Sierra Leone is shown below (figure.3.).

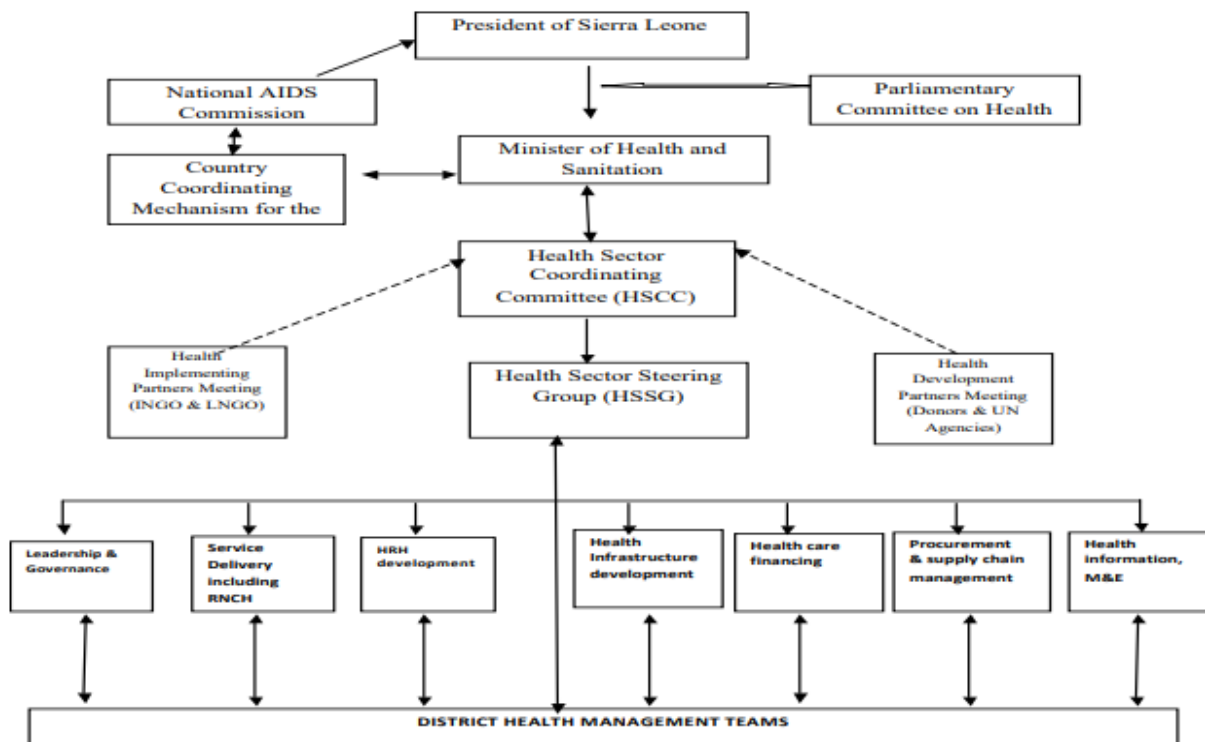
According to the 2015 national population and housing census, Sierra Leone has about 7 million people (Stats SL, 2017). However, a midterm variant shows over 8 million in 2021 (Stats SL., 2021). Women make 50.1% of the Sierra Leonean population. Their median age is 19.6 and about 65% live in remote areas (World Bank, 2021; WPR, 2021). There are about 2 million women above 15 years in Sierra Leone (Bruni L. et al., 2019a).



**Figure.2.** The regional division of Sierra Leone

**Source:** Statistics Sierra Leone (Stats SL) and ICF. 2020. Sierra Leone Demographic and Health Survey 2019. Freetown, Sierra Leone, and Rockville, Maryland, USA: Stats SL and ICF. Pg. XXXVIII.

## SIERRA LEONE HEALTH SYSTEM STRUCTURES



**Figure.3. Existing Sierra Leone Health Sector Coordination Structure**

**Source:** Reproductive, Maternal, Newborn, Child Health and Adolescent Health p.65

Sierra Leone strives to meet the demand of its inhabitants after 11-year civil war, and the Ebola viral diseases (EVD) outbreak. The country remains fragile with major challenges right across the six WHO building blocks of health system. Ultimately, these problems contribute to the burden and outcomes of chronic diseases including CC.

The NCDs burden in Sierra Leone is 29% (IHME, 2020). The widespread health disparity contributes to the alarming poor health outcomes within and between districts and socio-economic and demographic levels in Sierra Leone (WHO, 2016). Key health indicators such as the high maternal mortality ratio in Sierra Leone are being linked to factors including delayed hospital presentations, inadequate staff/lack of training and mentorships, and insufficient drugs and supplies among others (Lisa Denney et al., 2015; MOHS, 2015). Mainly due to the chronic underfunding, heavy burden of diseases, and inadequately skilled health workforce in Sierra Leone.

The health systems structure was disrupted at the end of the EVD outbreak in November 2015. The MOHS set the Mid-2015 Ebola Recovery priorities with seven cross-cutting projects. The Health Sector Coordinating Committee (HSCC) headed this project. The policies and strategies operated through the Sierra Leone health sector recovery plan to strengthen the health system after the shock by 2020. The health sector recovery plan listed five comprehensive strategies: (i) patient and health worker safety;(ii) health workforce development; (iii) essential health services; (iv) community ownership; and (v) information and surveillance due to lessons learned and impacts of the EVD outbreak (WHO, 2017). These strategies are the national health

system strategic plan (NHSSP). The NHSSP provides an overarching five-year framework for policies including the health sector, the basic benefit package of essential health services in Sierra Leone (WHO, 2017). These policies and strategies are executed via a vertical approach in the health systems (figure.3. above).

The MOHS governs the health system at the national and through the district health management team (DHMT) in every 16 districts at the primary health care (PHC). Public-private partnerships are initiated at the national level with the DHMT having lesser control over private health facilities. The MOHS, WHO, and other partners developed key policy documents aligning with the 2030 SDGs in critical areas including RMNCAH at the end of the 2015 Ebola outbreak (WHO, 2017).

The RMNCAH and other policy documents form the framework of the NHSSP 2017-2021. The framework prioritises women and children due to high disease burden in these groups. The two major targets and rationale in the RMNCAH document crucial to CC control includes, **‘Targets 3.4 – ‘By 2030 reduce premature mortality from NCDs’** due to 27.5% risks of dying from Cancers and other NCDs between 30-70 years in Sierra Leone.’ **‘Target 3.c-- ‘Substantially increase the health workforce in developing countries** due to 1.9 skilled health workers per 10,000 people in Sierra Leone’ (WHO, 2017)’.

The specific objectives to these targets are delivered through a horizontal three-tier approach in Sierra Leone.

Formally, the primary health units (PHU), the district hospitals, and the referral hospitals provide the primary, secondary and tertiary services, respectively. Health care is broadly divided into the government, faith-based organizations (FBOs), local and international non-governmental organisations (NGOs), and the private sector. Public, private-for-profit, private-non-profit and traditional medicine practices also exist. The private-for-profit facilities are mainly located in the urban area while the reverse is for private-non-profit and the informal sectors. The informal private for-profit including the traditional healers and traditional birth attendants (TBAs) are the gatekeepers to a significant number of inhabitants across the country (MOHS, 2018). The medical services and management services are the two divisions of health delivery led by MOHS at central Freetown (MOHS, 2018). At the district level, the District Medical Officer (DMO) provides leadership and regulatory functions of the service delivery through the DHMT. However, in terms of data and regulations, only the formal public or private for or non-profit are represented. CC screening services conducted by NGOs are unreported.

There are 58 hospitals out of 1,328 health facility networks. About 24 government-owned public hospitals with the remaining run by private-for-profit NGOs, and not-for-profit FBOs (WHO, 2017). Overall, health delivery is via primary health care (PHC) and include the following categories: Hospitals (58), community health centre CHC (231), community health post, CHP (341), maternal and child health post, MCHP (639), clinic (54) and others (5). No available data on TBAs and Traditional Healers. The Sierra Leone Health services organisation is shown below (**Figure.4.**)



**Figure.4.** The Sierra Leone Health services organisation

**Source:** The ministry of health and sanitation healthcare handbook, Sierra Leone

The major barriers to access are cost, distance to facilities, lack of ambulance services, and human resources. The hard-to-reach communities almost encounter all the barriers. The 2010 Free Health Care Initiative (FHCI) and the national emergency medical services (NEMS) removed the financial and referral barriers respectively on pregnant women, Under-five children and lactating mothers (WHO, 2017). However, reports of user fees request are common. In some instances, patients cannot afford the direct and indirect costs of deliberate referrals by health workers (WHO, 2017).

The human resource for health (HRH) is constrained in numbers and distribution. Ebola killed 221 out of 350 health care workers (WHO, 2015). There are about 10,000 government-employed health staff in over 1,323 service delivery points. About 30% are administrative staff. Freetown inhabits 20% of the Sierra Leonean population and is served by 60% of the government-employed health workforce. There are about 1.9 skilled professionals per 10,000 population and about 4 Drs, 70 nurses, 5 midwives per 100,000 inhabitants (MOHs, 2015). The current human resource for health strategic plan 2017-2021 intends to employ, distribute according to need, and further build their capacity for quality service delivery (HRH, 2016) which is a great opportunity for CC control strategy.

An independent assessment of the FHCI found 6% of the expected stocks including drugs missing and 31% either expired or 6-month countdown shelf life in 2016. Medical products are huge costs on health delivery. Until the national medical supply agency (NAMSA) becomes

functional within legal and policy frameworks, the Sierra Leone health system is stalled by stockouts and shortages (WHO, 2017).

Sierra Leone's gross domestic product per capita is \$ 528 (GDP per capita) and the current health expenditure (CHE) is \$ 656 million. Health expenditure per capita is \$ 86, implying a total health expenditure as a share of GDP of 16.1 %. The general government health expenditure as a share of the CHE is 9.7%. The general government expenditure on health as a share of general government expenditure is 7.2% (The Abuja Declaration recommends 15%). The out-of-pocket expenditure is 45% (OOP) (WHO, 2018). The devolution of users through the 2010 FHCI and introduction of performance-based financing (PBF) among others made the financial structure complex in Sierra Leone (WHO, 2016). Efforts to reduce health inequality, improve access and quality of health have taken many dimensions. The Sierra Leone Social Health insurance scheme (SLESHI) is one of the means to actualize this effort but has met huge resistance and discourse over half a decade (WHO, 2016). This revenue generation and health services delivery conundrum anchors the Universal health coverage (UHC) discussion recently. The Sierra Leone health system demands experts to think it through especially in adopting national CC control policy.

Information system strengthening is one of the positive outcomes of the EVD outbreak. Sierra Leone used the EVD reporting framework to strengthen the information systems and now produce and rely on evidence-informed data for planning routine health data. The user-friendly district health information system-2 (DHIS-2) is used to collect, collate and analyse data at all levels for quality (WHO, 2016). However, data quality, incomplete coverage and availability are data management challenges the MOHs face.



# CHAPTER TWO

## Problem statement

Vaccination remains the most cost-effective public health intervention (WHO, 2020a). Unlike breast, colorectal, and lung cancers, CC is preventable through effective public health interventions which are uneven in most LMIC in SSA (WHO, 2020b). Evidence shows that primary prevention declines the incidence of CC. However, with existing SDH associated, the mortality and disability associated with CC would continue failure to adopt best practices (Bray F et al., 2013). Therefore, analysis of the factors contributing to the burden of CC is critical to the control strategy. Improving socioeconomic levels or behavioural risk reduction, reduced parity, and prevalence of STIs have reduced morbidity and mortality especially in transitioned countries over the past decades (Bray F et al., 2013). In Sierra Leone, these factors are entrenched and have stalled the achievement of major national health priority targets (WHO, 2017). In addition to adopting the WHO strategy, evidence also suggests a comprehensive approach to disease control. Sierra Leone lacks guidelines on CC control (WHO, 2014a). Therefore, there is a need for an evidence-based and contextualised strategy and policy on cervical control in Sierra Leone.

## Justification

CC control requires parallel vertical and horizontal health system approaches using recent evidence from successful national programs in SSA. Sierra Leone and other LMICs should leverage more thoughts on secondary and tertiary control strategies. To reduce the future burden of CC in Africa, Palmer et al., (2019) and WHO recommends a rational implementation strategy that increases service uptake and utilization (WHO, 2019a). In 2013-2014, Global Alliance for Vaccine, and Immunization (GAVI), supported Sierra Leone to conduct HPV vaccine demonstrations in Bo South (WHO, 2014a). Key challenges were appropriate age determination, locating out-of-schoolgirls, incomplete registration, transportation challenges for supervisors, and difficulty accessing private schools (WHO, 2014a). The country, however, introduces a national HPV vaccination in October 2021. However, the secondary and tertiary strategies are still in discussion. Critical analysis of existing policies and health determinants is recommended in national policies, strategic objectives and targets for successful implementation in LMICs (Ruo-Yu Zhuang et al., 2019). HPV vaccination coverage of 1-2% among girls 10-20 years old in SSA (Bruni L et al., 2016a; Brisson M. et al., 2016). Despite the global disparity in HPV vaccination, this is due to the failure to adopt real-time evidence in policy formulation and strategy in most LMICs. Therefore, Sierra Leone and other newly approved LMICs should conduct a critical analysis of the existing health systems, factors contributing to the burden of CCs, using other SSA countries and adopt best practices for effective CC control (Turner HC. et al., 2018). Identification and weighing opportunities,

strengths and weaknesses are vital within competing health priorities in Sierra Leone. This literature review analysed the factors contributing to the burden of CC in Sierra Leone with keen reference to the existing health systems, policy environment of CC interventions in other LMICs and critically analyse these factors in the context of Sierra Leone. This review closes the policy and strategy gaps in Sierra Leone on cervical control through key recommendations from best and successful practices in other LMICs. As a needful tool, health, education and finance ministries, civil society organizations and other policymakers in Sierra Leone and other LMICs would find it useful.

## **Objectives**

### **General objective**

To explore the strategy required for the control of CC and recommend best practices for the triple intervention in Sierra Leone.

### **Specific objectives**

This study aims to

1. Analyse the health system accessibility, predisposing, enabling, need factors and other quality of care progress monitors of CC control in Sierra Leone.
2. Analyse the health service delivery and challenges of CC control in Sierra Leone and other LMICs.
3. Identify best practices for CC control policy in Sierra Leone.
4. Make conclusions and recommendations on the national CC control policy and strategy development in Sierra Leone.

### **Outcome**

The success of CC control programs in LMIC, amidst the spectrum of related and equally relevant health issues, needs evidence-informed and best practices from other countries. This study informed policy ensured proper resource allocation, and adequate coverage of high-quality cervical control interventions in Sierra Leone. The public and private partners including civil society organizations (CSO) would predict, plan, implement efficient and effective CC control programs through level coordination and collaboration using these recommendations. The service delivery, utilization, and M&E of the programs and outcomes are critical quality controls (QC) and assurances (QA) measures in achieving national and global targets.

# Methodology

I conducted a simple literature analysis on CC control strategies and interventions in LMICs. Literature selection included countries with national CC control policy, strategy or a guideline, high burden of CC and with or without successful interventions.

The literature search included articles, reviews, abstracts and manuscripts on CC control in SSA or LMICs using databases including PubMed, The Lancet, CINAHL, Cochrane and VU library. I used Search engines like Google scholar, Refseek and ScienceDirect. Also, I used snowballing technique to extract articles from the search engines and databases. Additionally, I used grey literature from WHO, the United Nations Fund for population activities (UNFPA), UNICEF, World Bank, GAVI, IARC, Global cancer observatory (GLOBOCAN) websites.

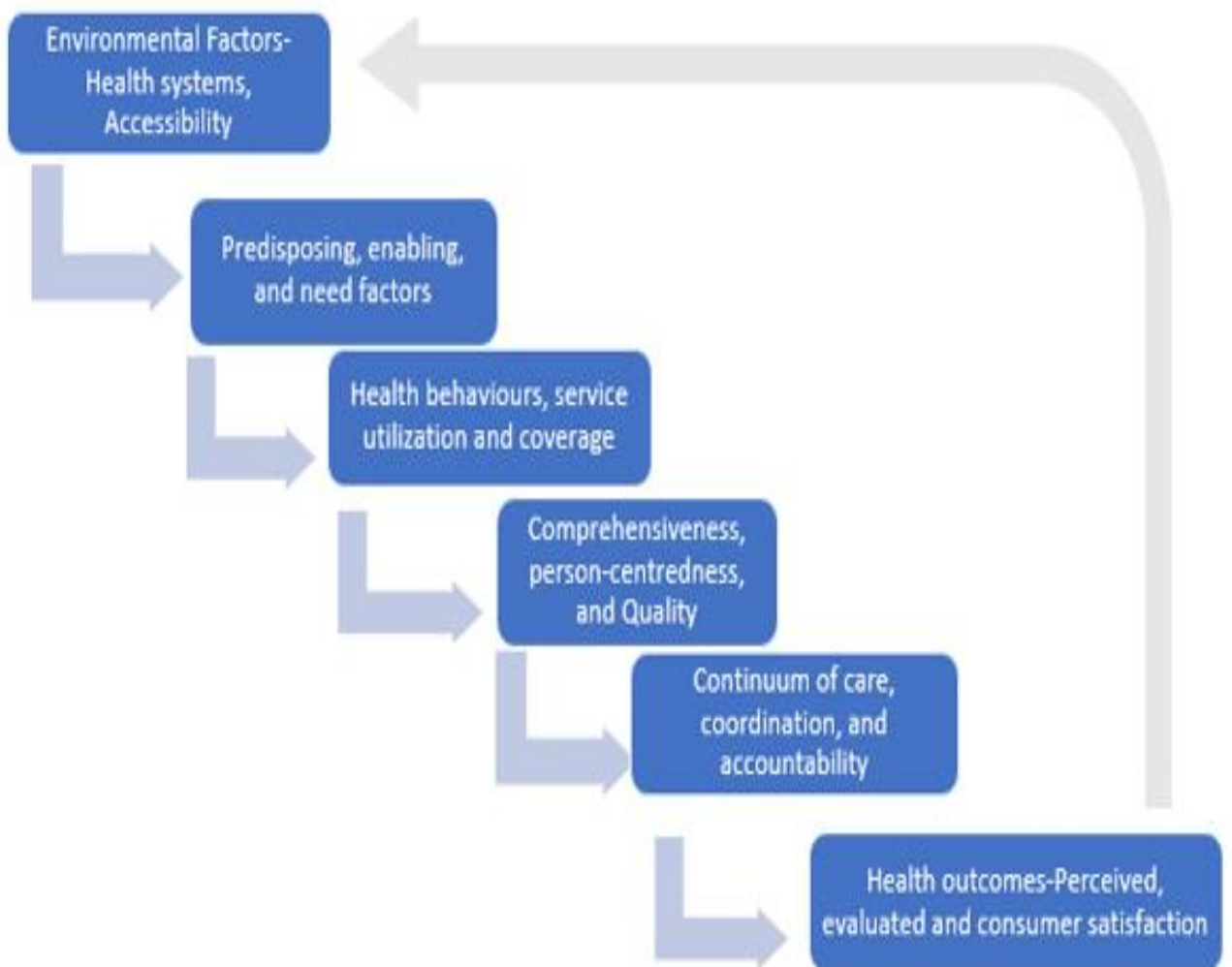
I used the conceptual framework modified from Anderson's health service utilisation and WHO health service delivery models to review the literature on CC control in LMIC. The Medical Subject Headings (**MeSH**) key terms for the topic are 'Cervical Cancer' and 'Uterine cervical neoplasm'. However, I used a combination of search terms to extract literature.

**Key terms:** Cervical cancer, screening, Human papillomavirus vaccination, Cervical uteri neoplasia, Social determinant of health, Health systems, LMICs, Sub-Saharan Africa, Sierra Leone.

Andersen's model has five key elements, the environmental, predisposing, enabling, need factors, health behaviour/utilization and health outcomes; and the service delivery eight; comprehensiveness, accessibility, coverage, continuity, quality, person-centredness, coordination and accountability. According to themes, I merge the elements into six components for analysis of CC control, (i) environmental (health systems and accessibility), (ii) Predisposing, enabling, and need factors (demand), (iii) Healthy behaviour, service utilization and coverage, (iv) Comprehensiveness, person-centredness and quality, (v) continuum of care, coordination and accountability (efficacy) and (vi) Health outcomes (perceived, evaluated, and consumer satisfaction).

The WHO service delivery is used to monitor and evaluate health programs, inform policies and ensure adequate coverage (WHO, 2010). Andersen's health service utilisation model is also widely used to predict and explain service access and utilization in the fields of public health, medicine, sociology and psychology (Abdul-Aziz Seidu, 2020). The model has been used to analyse issues including access to HIV testing (Andrew B., 2013, Conserve DF. et al., 2017), cocaine use (Wright PB. et al., 2014) and primary care utilization by HIV patients (Saint-Jean G. et al., 2011). Also, from low to high-income countries, vulnerable groups including immigrants, young women, with chronic conditions and living in remote settings are researched using this model. In 2008, Andersen responded to Wilson K. et al., (2005) criticism about the missing 'cultural dimensions and social interactions' in his model. He said 'need is a social construct' (Andersen RM. et al., 2008) and, therefore, fully represented in his model. CC control strategy, including financing, drugs and other medical products, needs to pay attention to service delivery, utilization and health outcomes. The predisposing factors

including demographic characteristics of persons at risk, socio-cultural and perceptions about the services (Azfredrick EC et al., 2016), enablers such as availability of staff, diagnostic, and therapeutic equipment (Lo CC. et al., 2018) and need factors such as illness, stage of conditions are critical in the control strategy. These factors, input, progress and output measures form the **conceptual framework** used to analyse CC control in Sierra Leone as shown below (**figure.5.**)



**Figure.5.** A conceptual framework for cervical cancer control in Sierra Leone

**Source:** Adapted from Andersen’s Health Service Utilization (2008) and WHO (2010) Health service delivery models

# CHAPTER THREE: STUDY FINDINGS

The commission on social determinants of health (CSDH) 2008 defines SDH as ‘the condition in which we grow, live, work, age and the system put in place to deal with illness’ (CSDH, 2008). These conditions create inequality among individuals, within communities, and consequent health outcomes. Social determinants of health are critical to the CC control strategy. The target population, in the context of political, social and economic strength, requires policy considerations ensuring accessibility and uptake of services. HPV infection and CC outcomes are linked to factors including health systems and accessibility, predisposing, enabling, need and behavioural factors, service utilization and coverage. We acknowledge HPV infects all persons, but CC disproportionately affects women. Therefore, the discussion of the magnitude in Sierra Leone in this research would focus on women.

## 1. Environmental Factors, Health system and accessibility

Health system accessibility is a major problem affecting many Sierra Leoneans especially with chronic conditions including CC. Other accessibility issues such as geography, physical, socioeconomic, and cultural factors are key considerations for planning the intervention.

The goal of RMNCAH ‘*to accelerate the reduction of preventable deaths of women, children, and adolescents and ensuring their health and wellbeing*’, aligns with both national and international policies and strategic documents. Short and long-term efforts have been applied to make healthcare more accessible to all Sierra Leoneans. The FHCI 2010 and the *Agenda For Prosperity 2013-2018* strive to eliminate disparity among women, children and other vulnerable groups, and to increase access to health services in Sierra Leone. However, the health systems are appallingly accessible to some groups including fishermen, traders and sex workers.

Like other LMICs, accelerating progress is stalled due to the socio-cultural, geographical, and financial barriers to access services. About 65% of women live in rural areas (World Bank, 2021) where access to health services is challenging. Women outside the FHCI pay for services in Sierra Leone.

The human resource for health remains a critical barrier to health care accessibility. The health system is restrained in numbers, skills, motivation and distribution. There are about 4 Doctors per 100,000 inhabitants, 1.9 skilled professionals per 10,000 population, with most nurses as volunteers. This is the 4<sup>th</sup> lowest in LMICs out of 49 countries (HRH, 2016). There are about 4 Drs, 70 nurses, 5 midwives per 100,000 inhabitants (MOHs, 2015). Only about 20% of these staff serve the 60% rural population (HRH, 2016). CC demands a human resource capacity to detect, diagnose and offer basic care at the primary health care (PHC) level. Most PHC staff

lack knowledge of the basic signs of the CC. This often results in misdiagnoses and wrong medication at the cost of the client.

The lack of essential drugs or frequent stockouts and medical products, weak infrastructure, poor referral networks and lack of accountability are negative experiences that significantly reduce health system accessibility (WHO, 2017). Health information from health workers or hospital data and communication through accountability (community participation) are key to access and utilization of services.

The poor political commitment and the lack of health sector coordination result in inappropriate resource allocations. The priority conditions including other vaccine-preventable diseases are inadequately covered due to these barriers in Sierra Leone. This trend is a threat to a successful HPV vaccination. Increasing HPV vaccination coverage additional measures to increase accessibility like out-of-schoolgirls activities like the case of Rwanda (Mugeni, C. et al., 2016) where health workers were trained to access out-of-schoolgirls during vaccination.

Immunization including HPV is a priority public health intervention in Sierra Leone. However, CC screening and treatment are not a national reproductive health priority service. Therefore, health care has not been accessible to patients suffering from CC in Sierra Leone. These objectives of the RMNCAH including health system strengthening, improved quality, community participation and research, monitoring, and evaluation are general. They serve as a strong foundation for CC screening and treatment guidelines for quality service delivery. However, the geographical and human resources constraints would some districts or communities less access to CC services when available, widening the disparity within and among communities and individuals respectively. Also, these constraints affect data quality and availability due to late, incomplete, or no reporting. This generally would result in poor resource allocations hence making healthcare inaccessible to eligible persons.

The RMNCAH services including CC are cost-effective (WHO, 2015; Clark H. et al., 2020). Key stakeholders including the Department for International Development (DFID) UK, Global Fund, World Bank, GAVI, and African Development Bank committed to this policy and strategy. The estimated cost for the national RMNCAH strategy is USD 544.9 million (OneHealth tool modelling). The average cost per eligible person (per capita) is USD 15.4 for the 5-year (2015-2021). This is USD 3.08 per capita per year. Clark H. et al., (2020) estimate a USD 9.0 economic and social dividend per USD 1.0 investment in RMNCAH services (WHO, 2015). The implication is USD 27.72 saved for every dollar invested in the CC control strategy in Sierra Leone according to the projections. The budget carriers are the child health 34% and Immunization (including HPV Vaccination) 31%. maternal, newborn, and reproductive health costs 17%, multisectoral interventions such as coordination and collaboration are 7% with an estimated resource gap of almost 38% in the last four years of the implementation (WHO, 2015). This is a huge motivation to make CC services accessible to all.

## 2. Predisposing, enabling and need factors

### Predisposing and enabling factors

Age is a significant predisposing factor in HPV infection. The period to develop and progression to chronic conditions like CC depends on the age or time of exposure to the infectious agent (HPV). Ultimately, the future burden also depends on the number of exposures at that age. The median age of Sierra Leone is 19.4 years (UNDP, 2020). Sierra Leone has the highest adolescent birth rates, 112.8/1,000 women 15–19-year and the child marriage rate is 30% (UNDP, 2020). The median age of sexual debut among females is 16 and the average fertility rate is 4.2 (5.2 in rural areas) (Stats SL & ICF, 2020). Age of sexual debut and pregnancy or parity or both have been linked to acquiring HPV and progressing to CC due to plausible biological and physiological conditions and persistent exposure of the young cervix (Green J. et al., 2003). This shows a higher risk of contracting HPV earlier in life in Sierra Leone. Sierra Leonean women, therefore, develop the condition in their mid-forties after earlier infection, consistent with the global findings of Marc Arbyn et al., (2019).

The consequences of these risk factors are not limited to the high burden of CCs, but other cofactors such as HIV/ AIDS infections that rate CC development. CC is among the top three burdens of diseases affecting women less than 45 years in 146 out of 185 nations globally (Marc Arbyn et al., 2019). The average age of diagnosis and death are 53 and 59 years respectively (Marc Arbyn et al., 2019). The predisposing factors to HPV infection are prevalent in Sierra Leone. Therefore, interventions or strategies to control CC should include messages to create awareness of these predisposing and enabling factors.

While waiting on a larger study, HLA genes and single-nucleotide polymorphs (SNP) have been associated with the progression of CC (Leo P. J. et al., 2018; Brown M. A. & Leo P. J., 2019; Horng J. T., 2004). Despite the lack of data on the genetic cause of CC in Sierra Leone, one should consider these enabling factors.

### Need factors.

In the context of CC control, the ‘need factors’ influence the acceptability and use of CC control services (HPV vaccination and screening) in the absence of health system barriers. They include knowledge, perceptions, community influence and education. The need to seek health care is key to the early detection and treatment of CC. If detected early, CC is curable (WHO, 2020a). Social and community networks play a critical role in health need identification and service uptake. Vaccine hesitancy is a critical need factor programs must address. The HPV vaccine has faced a degree of hesitancy globally due to many factors which are poorly understood in Africa (Ngcobo N. J. et al., 2019). According to MacDonald and SAGE, 2015, ‘vaccine hesitancy is a delay in acceptance or refusal of vaccination despite the availability of the vaccine’. It varies with time, location, and vaccine. Personal experience and observations in Sierra Leone see vaccine refusal among social and community networks mostly ethnic and high socio-economic groups. The pattern has not changed. The need factors, if unaddressed, create a cohort of unprotected girls at risk of HPV infection and CC later in life. In developing

the guideline, sections to dispel myths, socio-cultural and religious factors that reduce the need must be considered.

HPV and CC misconception, social and community networks, and the lack of confidence in the vaccine are key issues of HPV vaccine hesitancy in HIC (Gilky M. et al., 2015; Betsch C. et al., 2015; Patel P. & Berenson A. 2013; Fontenot H & Domush V., 2015).

The lack of knowledge and understanding of HPV and CC among healthcare workers in a US study resulted in their negative perception and advice given to their patients (Gilky M. & McRee A-L, 2016). Health workers play vital roles in health service delivery. Their full participation as partners in a successful health care system is equally important. They serve as the interface creating health needs. The situation might be different in LMICs but not better. The concerns of parents such as safety, side effects are not properly addressed. Most perceive the HPV vaccine to influence early sexual behaviours among adolescents (Harries J. et al., 2009). According to the Sierra Leone Demographic Health Survey 2019 report, 46% of women are uneducated and 54% live in rural areas (Stats SL & ICF, 2020). These women already have a double barrier to access CC services and are therefore unlikely to identify health needs. They often present at the late stage of CC. Engaging such a group requires proper communication skills and patience as was found during the pilot phase.

The HPV vaccine introduction pilot phase analysis *U-report* in Sierra Leone shows that few respondents have any knowledge of HPV / CC. Their view on prevention is vague and the disease is not considered a threat to the lives of girls and women in Sierra Leone (UNICEF, 2019; Saleem A. et al., 2019). In the absence of supply factors, this does not create the need for HPV vaccination, CC screening, hence management.

### **3. Health behaviours, service utilization and coverage**

#### **Health behaviours**

Unhealthy behaviours are directly or indirectly associated with HPV infection and progression to precancerous lesions. Behaviours such as multiple sexual partners, unprotected sex [no condom use] and cigarette smoking are associated with a high risk of HPV infection or progression to CC. Single or persistent exposures to HR-HPV infection are key to acquiring the infection. Most young women contact HPV after sexual initiation, but very few progress to precancerous lesions. The rest clears up in 12-24 months (de Sanjose S. et al., 2017). Therefore, a single exposure to high-risk HPV or persistent infection through multiple sexual partners is a major contributing factor to the burden of CC. Also, women who initiate sex earlier are likely to have consecutive or multiple sexual partners higher risk of exposure to the infection. The early sexual debut and physiological stress on the cervix is a notable enabling factor for high-risk HPV infection and CC. With a sexual debut at 16 years and about 30% of women in at least 2 sexual relationships in Sierra Leone, this might be a significant contributing factor in the spread of CC (Stats SL & ICF, 2020; Green J. et al., 2003).



In addition to the multiple exposures, individual lifestyle factors such as unprotected sex increase the risk of contracting other STIs. HIV and chlamydia are cofactors strongly linked to CC through weakening the cervical defence mechanism. Sierra Leone has a low but mixed prevalence of HIV. Fishermen and sex workers have a higher prevalence of HIV. Fishermen with 10.8%, and traders 7.6%. Sex workers and partners contributing to about 39.7% of new HIV cases in Sierra Leone (WHO, 2021). Accessibility to healthcare is poor among these groups in Sierra Leone. However, there is an overall prevalence of 1.3% among women 15-49 years.

Furthermore, cofactors such as cigarette smoking and contraceptive use play significant roles in CCs magnitude in Sierra Leone. The prevalence of oral contraceptive use in Sierra Leone is 3.9% (women 15-49 years old) (Stats SL & ICF, 2020; Bruni L et al., 2019a). The highest tobacco user among women, 12.9%, and men 40% in the SSA is recorded in Sierra Leone (Bruni L. et al., 2019a). These risk factors are strongly associated with the progression of HPV infection to CC (Bruni L. et al., 2019a). Active or passive smokers or exposure to tobacco products is a significant risk of progression to CC. The mechanism is via the weakening of the cervical epithelial immune defence systems (Cerqueira EM et al., 1998; Sisokos AG. et al., 2019). Therefore, women or partners smoking is a significant risk of CC. The public health measures, information dissemination, should include tobacco use risk communication to women in Sierra Leone.

## **Service utilization and coverage**

Working environment, educational status, and employment are the key determinants of households' socioeconomic status. Women from low-income households have barriers to CC service utilization. This is especially so when costs are incurred on them. Furthermore, their special preferences for services such as self-testing are poorly communicated (Allen-Leigh et al., 2017). This prevents service utilization and is likely to present with advanced-stage CC when the prognosis is poor. With about 65% of Sierra Leonean women aged 15-49 years living in the rural areas, with overall 46% with no education (World Bank, 2021; Stats SL & ICF, 2020). These women are less likely to utilize CC screening services. The lack of information or money or both contributes to the non-utilization of services. Service utilization is a critical element of coverage; therefore, policy should consider these factors.

Furthermore, the gender power dynamics in households hampers CC service utilization. With background characteristics variance, only 44% of married women 15-49 years participate in decisions about their healthcare in Sierra Leone. Most decisions are taken by their partners (Stats SL and ICF, 2020). These women are unlikely to use CC services, especially where symptoms are not obvious hence contributing to the burden of CC in Sierra Leone. The lack of knowledge on HPV and CC or the service availability or both contribute to the poor service utilization and coverage, and hence morbidity and mortality from CC in Sierra Leone. Effective and early communication is key to service utilization in the CC control strategy. This was one of the strengths of Rwanda in HPV vaccination (Black E & Richmond R., 2018).

Women in high socio-economic households, however, encounter barriers at the healthcare levels. Health care is a critical determinant of CC in Sierra Leone since it lacks all level capacity and resources for disease control as briefly discussed in the earlier chapters. The absence of national HPV vaccination, screening, and clinical management protocol of CC (Bruni L. et al., 2019a) also affects women in high socio-economic groups.

There are poorly regulated and centralized private CC screening programs in Sierra Leone. They are inaccessible by women in rural areas and lack a pathway for positive CC patients. The *Marie stopes International Sierra Leone* (MSISL) (MSISL, 2018), The *See and Treat Smarter Hospital Foundation* (SHF, 2021), The Melvina Edith Patricia Stuart Trust (MEPS) *Well Women Clinic* (MESPS, 2021), and recently, according to the Concord Times news release 2021, the *University of Sierra Leone Teaching Hospital Complex* (USLTHC) in the capital of Sierra Leone screen women for chronic conditions including CC. However, these services are inaccessible, and women in need do not utilize them in Sierra Leone.

The poor service utilization and coverage, late presentation of cancer patients, the lack of trained and qualified service providers, lack of diagnostic tools and infrastructure for early cancer detection, in addition to the other social determinants of health, are in a vicious cycle of causes and effects (Stewart T.S. et al., 2018; Andre M. & Howlett J., 2017). The overall effect is poor coverage of patients in need.

The clinical signs or symptoms of CC are poorly understood at the healthcare, individual, community and social networks level in Sierra Leone. Cases of CC might be misdiagnosed and treated like other medical conditions. Health care providers can communicate lifesaving messages to their patients especially on chronic conditions like CC. This ensures early detection and prevents premature deaths from the disease. Therefore, the magnitude of CC might be underestimated due to this poor coverage and utilization. No data is reported on CC deaths in remote areas of Sierra Leone. Diagnosis is done in urban cities. In addition to the absent data, Sierra Leone is among the three countries in SSA with the highest late-stage presentation of CC based on the mortality to incidence y ratios comparisons (Stewart T. S. et al., 2018; Bruni L. et al., 2019).

Generally, socioeconomic, cultural and environmental correlations to CC burden are complex. This is due to the lack of CC control programs in Sierra Leone. The cultural silence on chronic reproductive health conditions such as CC is endemic in many SSA (Allen-Leigh et al., 2017; Wakwoya EB et al., 2020), so, people know little about the disease. The environmental effects come into play with a positive perception of the disease present and the need to utilize services. In South Africa, cultural barriers contributed to the low vaccination coverage and CC service utilization. Parents perceived the vaccination to influence risky sexual behaviours (Ngcobo N. J. et al., 2019).

## 4. Comprehensiveness, patient-centredness and quality

CC control strategy requires progress monitoring. The health system input measures such as training of health workers, the purchase and supply of diagnostic and therapeutic tools, and financing are critical to enhanced, ensured, comprehensive, and high-quality CC service delivery (WHO, 2010). In most LMICs, due to the multiple health system challenges, these progress monitors are ineffective, resulting in the continued burden of the disease, poor allocation of resources due to poor data quality, and misplaced policies. These best practices, including ‘comprehensiveness’, patient-centredness, and ‘quality is key to CC control in LMICs. According to WHO (2010), comprehensive service is a ‘need-based inclusive’ at a targeted population (preventive, curative, palliative, rehabilitative & promotive). Patient-centredness means the services are centred around the client and not the disease. Patients are different, so do their disease presentation, needs and progression. Services are expected to be ‘responsive and acceptable’ by these diverse patient groups. Ultimately, comprehensive and patient-centred services are ‘effective, safe, centred according to need and timely’. This is what quality CC control best practice is. According to the burden of CC and other competing health priorities, countries adopt practices with ambitious goals, especially in LMICs where bottlenecks are pervasive (Appendix-III).

Zimbabwe is one of the East African countries with the highest burden of CC, mostly attributed to the high prevalence of HIV in the country. Zimbabwe adopted the ‘*see and Treat*’ strategy, but the lack of comprehensiveness resulted in poor quality and an unintended patient outcome. Annually, 2,270 cervical cases are detected and about 64% die (Bruni L. et al., 2016b; Adebamowo CA. et al., 2014). The most common HR-HPV genotypes in Zimbabwe: 16, 18, 31, 33, and 58, with HPV DNA detected in 63% to 90% CC patients. Despite this, the country introduced HPV vaccine against HPV 16 and 18 only (Chin'ombe N. et al., 2014). A diagnostic tool to determine the prevalent HPV genotype would guide HPV vaccine selection. Albeit the resource constraints in Sierra Leone, this is a novel practice. In Zimbabwe, the target population was poorly defined. With high demand, the Visual Inspection with Acetic (VIA) was adopted nationally, then ‘*screen and treat*’ at colposcopy clinics with a further two centrally available hospitals for CC treatment (Oppah Kuguyo et al., 2017). A strategy to integrate people living with HIV (PLWHIV) was implemented with high suspicion of CC as an opportunistic infection (Moodly JR. et al., 2006; Mapanga W, Chipato T &, Feresu SA, 2018). A mixed study by Tapera O. et al., (2019) found chaos in the health system leading to abuse and violations of patients' rights. The services were not free. The CC care was poorly coordinated, health workers lack the knowledge of CC resulting in misdiagnosis and treatment causing catastrophic expenditure on most patients. At the central hospital, therapeutic tools could not meet the demand. Most public facilities were referring to private hospitals and pharmacies due to a lack of drugs, where patients could not afford treatments. There was a clear market failure in service delivery. In most instances according to the findings, patients attrite and resolve to traditional healers / ‘prophet’ or give up (Tapera O. et al., 2019). Furthermore, despite the integration of

HIV and CC screening and treatment, most PLWHIV presented with advanced stage of the disease due to poor communication, centralization and cost of CC screening services in Zimbabwe (Fallala MS, & Mash R., 2015).

In Zimbabwe, the evidence shows that they needed not a bivalent HPV vaccine (HPV 16 & 18), because about 90% of the HPV was due to five subtypes. The poor policy was reflected in the absence of a specific target for the HPV vaccination. Data must be utilised setting target population, and then creating a database for M&E. There was a lack of leadership at a higher level during this event in Zimbabwe. The case of Zimbabwe is mainly due to a lack of comprehensiveness and patient-centredness in formulating control strategies. The strategy, unintentionally, was not need-based, not centred around the patient therefore the poor-quality care. This policy failure often has more impact on the patient. Furthermore, there was a lack of political commitment which was reflected in all findings above.

In South Africa, every twenty-sixth woman had CC in 2008 (van Schalkwyk SL, Maree JE, & Dreyer Wright SC., 2008), more often, they show up when the health care workers have little to offer (Botha MH & Dochez C., 2012). Despite this, acceptability and uptake were low, patients who were positive for cytology often lost to follow-ups, after the introduction of cytology-based CC screening in 2008, (Botha MH & Richter KL., 2015). This implies that there was a lack of awareness about CC and the consequences due to poor social mobilisation. There was no need for service utilization among the affected groups in South Africa. The poor infrastructure and the lack of health system responsiveness were also attributed to the health outcome in the country (Batra P, Kuhn L. & Denny L., 2010). Using ‘opportunistic screening’ in 2015, about 30% of high-risk women were located (Botha MH & Richter KL., 2015). Opportunistic screening is bating eligible girls to access caregivers for screening. This was after the HPV vaccine rolls out in 2014. Barriers such as cost, misconceptions of HPV, and CC causation remain key to screening programs in South Africa.

An HPV vaccination program, however, has been successful. A school-based, 2-dose schedule, 6-months apart was introduced in 2014. An *opt-out vaccine model* was applied, planned, and coordinated. The school coverage was 91%, and vaccination was 86.6%. Issues such as absenteeism, failure to sign consents and illness were notable reasons for non-vaccination (Delany-Moretwe S. et al., 2018). The vaccination implementation has been attributable to ‘strong political commitment. There was hesitancy, logistics, or human resources challenges.

Rwanda conducted the most successful HPV vaccination in LMICs in 2011 (Eleanor B & Richmond R, 2018). Three doses of HPV vaccine were administered to school and out of schoolgirls in Rwanda, vaccinating above 98% eligible girls, more than most HICs (Bruni L. et al., 2019b; Mugeni, C. et al., 2016). This was a record in 2011, as the first LMIC to implement a national HPV vaccination (Mukakalisa I. et al., 2014; Binagwaho, A. et al., 2012). Despite the existing barriers, Rwanda achieved the results without a pilot study, but proper planning, collaboration, coordination, comprehensiveness and political commitment (Dochez, C. et al., 2017; Binagwaho A. et al., 2012).

Key lessons learned from Rwanda: Health and Education ministries’ collaboration, strong partnership (*Merck*), high School enrolment rate in Rwanda (>98%), health workers involvement and early national Information, education and communication (IEC) activities

(Adefuye, P.; et al., 2013; Mugeni, C. et al., 2016; Binagwaho, A. et al., 2012). Therefore, Black E & Richmond R (2018) identified government commitment, comprehensiveness in planning and early social mobilisation as critical to a successful HPV vaccination in LMICs. The table below shows the National HPV programs in SSA and strategies. (**Table1.0.**) In Sierra Leone, the school enrolment rate is 144% (World Bank, 2021).

**Table.1.0 National HPV Immunisation programs in SSA**

Country	Year of Introduction	Delivery Platform	Estimated Coverage
Botswana	2015	School-based (grades 5–7) and out-of-school girls aged 9–13	-
Lesotho	2012	School-based	-
Mauritius	2016	School-based (grade 5)	-
Rwanda	2011	School-based (grade 6) and out-of-school girls	HPV3 98.7% (2014)
Senegal	2016	School-based	-
Seychelles	2014	School-based (grade 6)	HPV1 77% HPV2 76% (2014)
South Africa	2014	School-based (grade 4)	HPV1 92% HPV2 72% (2014)
Uganda	2015	School-based (grade 4) and out-of-school girls aged 10	-

HPV1 = 1 dose of vaccine; HPV2 = 2 doses; HPV3 = 3 doses.

**Source:** Black, Eleanor, and Robyn Richmond. (2018) “Prevention of Cervical Cancer in Sub-Saharan Africa: The Advantages and Challenges of HPV Vaccination.” *Vaccines* vol. 6,3 61. Available from: DOI:10.3390/vaccines6030061

The success of Rwanda HPV vaccination is an outcome measure of comprehensive, patient-centredness, and high-quality program. The *Merck* partnership, a strength that was utilized. Collaboration with health care workers and the ministry of education were great opportunities they used. However, to centre the services around the patient, they started social mobilisation earlier and strategized for out-of-school girls despite the high school enrolment rate.

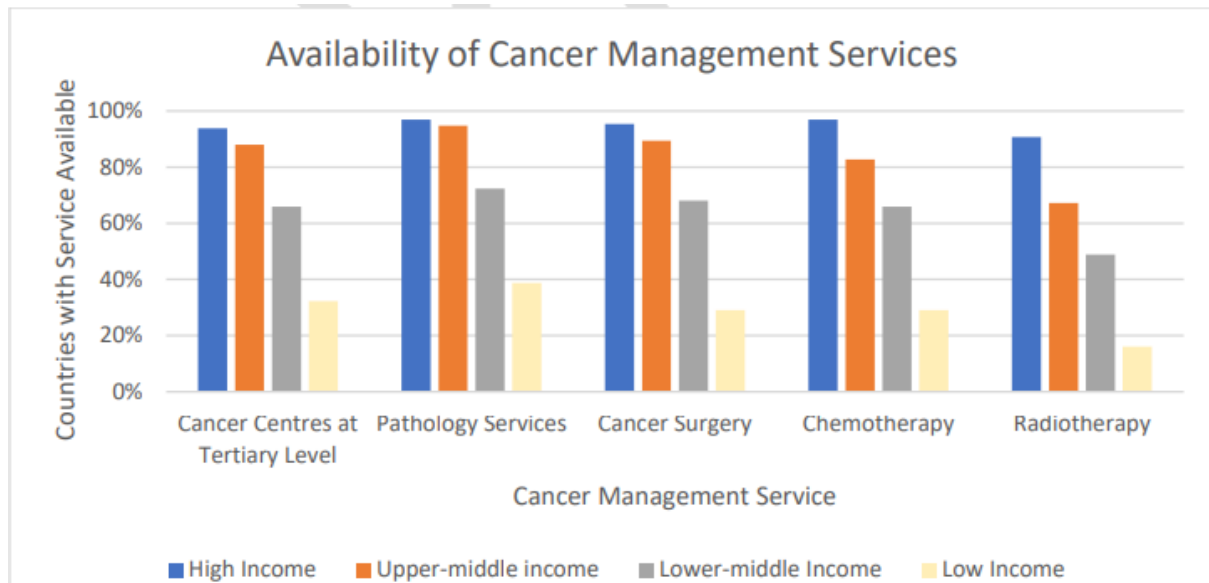
## 5. Continuum of care, coordination and accountability

In CC control programs, service coordination and continuum of care are vital for quality and positive outcomes especially among persons eligible for the next level of care. In Sierra Leone, MOHs are at the core of health coordination. This involves the interagency coordination group in sexual and reproductive health (WHO, 2017). This structure is critical in creating the platform for partners such as the MESP Well Woman Clinic, and Marie’s stopes International in the care coordination. Concerns like attrition, loss to follow-ups and late-stage presentation

are averted through a clear network of services, levels of care and providers and other sectors including psychosocial support through community or civil society organisations (WHO, 2014b). An accountability framework including the core component of service delivery is vital to achieving targets. Prepositioning for active participation of the target group is a key accountability measure (WHO, 2010). Continuum of care and coordination in the management of CC is especially important in persons with comorbidities like HIV/AIDs and the aged population, as in the cases of South Africa and Zimbabwe (Tapera O. et al., 2019; Delay-Moretlwe S., et al., 2018). Patients diagnosed with precancerous or cancerous lesions should have a clear pathway to the next level of care. Health service delivery points for CC should be linked through a single network of effective services delivery (Appendices-I&III).

## **6. Health outcomes- Perceived, evaluated and consumer satisfaction.**

Health outcomes are critical progress M&E and research components of CC control strategies in LMICs. Implementation research is key to measuring patient outcomes (Rodney Hull et al., 2020). The M&E capacity, political commitment, size of the target groups and the availability of diagnostic and therapeutic tools are key challenges measuring patients' satisfaction (Rodney Hull et al., 2020; Karen K. et al., 2020; Mvundura M & Tsu V., 2014). The DHIS-2 is the current tool used in data collection at the DHMT in Sierra Leone. The data is generated at the PHC level and fed into the database (WHO, 2017). Creating an M&E tool is critical in measuring the health outcomes of CC patients enrolled in the care pathways (see Appendix-IV p.53). In Zimbabwe, the health system was destabilized to provide CC care (Tapera O. et al., 2019) due to poor planning and tools constraints. Zimbabwe and South Africa used qualitative and quantitative studies to assess patients' satisfaction (Tapera O. et al., 2019; Hull et al. 2020). This also relies on the availability of equipment for interventions. Most health LMICs lack CC diagnostic and treatment equipment (WHO, 2020b). The graph below shows the percentage of countries with an available cancer diagnosis and treatment services in the public sector, by the World Bank Income group, 2019 (**Figure.6.**)



**Figure.6.** Percentage of countries with an available cancer diagnosis and treatment services in the public sector, by World Bank Income group, 2019

**Source:** World Health Organization. (2020b) Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2019 global survey. World Health Organization. <https://apps.who.int/iris/handle/10665/331452>. License: CC BY-NC-SA 3.0 IGO [Accessed 024 March 2021]

The availability of these tools is an essential component of CC service delivery and outcome assessment. Most LMICs neither afford nor prioritise the purchase of therapeutic or diagnostic tools for CC or HPV. Due to poor political commitment and the lack of financial resources or competing priorities. Zimbabwe for instance had only two centrally located therapeutic tools disproportionately serving CC patients (Tapera O. et al., 2019). In 23 SSA countries, accounting for 64% of regional CC deaths, the estimated 10-year cost for each to equip every VIA screening centre with tools including cryotherapy and Loop Electrosurgical Excision Procedure (LEEP) with procurement expenses is less than \$ 4 million (Mvundura M & Tsu V., 2014). This is estimated to screen 20 million eligible women [less than \$ 10 per woman in SSA]. Furthermore, W. Termrungruenglert et al., (2017) estimated four HPV testing strategies among 30–65-year-old women in Thailand: (1) HPV 16/18 genotyping followed by cytology; (2) HR-HPV testing followed by colposcopy; (3) Papanicolaou standard cytology; and (4) Liquid-based cytology followed by colposcopy (VIA). At a 5-year interval, HR-HPV testing alone was most cost-effective. It was estimated to save about \$ 1.4 million per 100,000 women 30-65 years screened. The WHO also supports the finding (WHO, 2020a; WHO, 2019b). Furthermore, prior estimates by Quentin W. et al., (2011) in Ghana show, VIA and cryotherapy cost \$ 6.12 and \$ 27.96 per woman managed. Service utilization and increased coverage determine these costs. VIA and Cryotherapy national estimated costs were \$0.6-4.0 million on assumed coverage (Quentin W. et al., 2011).

The availability of these tools, effective coverage and service utilisation are the reliable first step in outcome measurements that was lacking in most LMICs.

# CHAPTER FOUR

## Discussion

This literature review finds CC contributing factors from the SDH to the non-prioritisation of its interventions in policies and strategies in LMICs.

CC as a disease of poverty is the main reason 90% of the deaths occurring in LMICs, and SSA with the highest burden, where poverty is high and weak health systems exist. CC disparities are real and pervasive in many communities, geographical locations, households and among individuals in Sierra Leone. The lack of political commitment to prioritise and adequately finance CC control interventions creates significant health system barriers to access the services. Therefore, the health system factors (supply) and other SDH factors are closely linked, and overall, form a positive feedback loop contributing to the high morbidity and mortality of the CC in LMICs. The lack of knowledge, socio-cultural and religious myths, unhealthy behaviours such as smoking, non-condom use, multiple sexual relationships are due to the lack of health promotive and behavioural change interventions in communities. On the other hand, the lack of behavioural change interventions is due to lack of adequate financing, and subsequently due to poor political commitment. Furthermore, the lack of adequate, skilled human resources is due to poor resource allocation to recruit, train and distribute health workers. The result is a lack of a skilled health workforce to provide CC services to the patient in need. The lack of commitment also results in poorly uncoordinated CC control interventions by other sectors. Therefore, CC SDH, government support and intersectoral collaboration are critical in the CC control strategies. They have the potential to stall progress and serve as an impedance to the achievement of key national and global targets or worsen the situation. Therefore, the identification of the opportunities in strategies reviewed is critical in overcoming the many barriers to CC control in Sierra Leone.

Generally, socioeconomic, cultural and environmental correlations to CC burden in LMICs are complex. The literature highlights the cultural silence on chronic reproductive health conditions such as CC in many SSA countries. Anything that deals with the genitals are taboo and less spoken about. This is due to the lack of implementation research on CC, especially in SSA. Health system research on SRHR issues is lacking in most LLMICs, especially chronic conditions like CC. Most qualitative research focuses on HPV vaccination. However, understanding the plights of the CC-affected group is critical in addressing the issues first-hand.

The environmental concerns come into play with a positive perception of the disease presence, challenges to access and the need to utilize services. The overall effect is poor service utilization. With more than two-thirds of women living in rural areas, environmental concerns and strategies to overcome them should be clear in CC policy and strategies in Sierra Leone.



Like most LMICs, the policy environment to ensure effective service delivery and utilization of CC services are lacking. However, with GAVI and other partners' support, Sierra Leone and other LMICs must identify this opportunity in HPV vaccination and ensures high coverage and effective service utilization.

The health system barriers came clearly in the review. Barriers including the number, skills, attitude and knowledge of healthcare workers and costs of CC screening and treatment services, were critical to the HPV vaccination coverage and disease control in Sierra Leone and other LMICs. CC interventions are resource demanding. HPV vaccination requires the MOHS, MOE, MSWGCA and key community stakeholders.

Adequately building the capacity of these implementers is critical to achieving vaccination targets. Health cadres such as Maternal and Child Health Aids (MCHA) Registered Nurses (RN), Midwives, Community Health Surgical Assistants (CHSA) and Community Health Assistants (CHA) should be considered for task shifting roles in CC control interventions. This was absent in most strategies and implementations reviewed. All technical PHC providers should be trained on the knowledge and skill of CC and HPV vaccination procedures as well as outreach strategies for the out-of-schoolgirls vaccination. Furthermore, due to their frequent encounter with the communities and patients, they are better placed to dispel sociocultural and religious myths and misconceptions about HPV vaccine and CC. MOHS should train health workers to create the needed factors such as the lack of knowledge among women and eliminate vaccine hesitancy in social or community networks and hard-to-reach areas in Sierra Leone. In Rwanda, the national HPV control relies on early social mobilisation.

Furthermore, the MOHS should train earmarked health staff including MCHA to conduct HPV vaccination and identify symptoms of CC, Midwives to screen patients for CC and CHSA to confirm and treat precancerous lesions. The training of CHA and Community Health Workers (CHW) for psychosocial supports and community awareness creation in remote settings respectively are relevant. National cold chain maintenance staff could be trained to maintenance radiotherapy equipment. Most of these discussions were absent.

The cost was a major barrier in the review, especially in rural settings. The direct and indirect costs associated with CC screening, treatment and follow-up contributed to the loss to follow-ups and attrition of most patients in SSA. The services were not completely or properly integrated into national programs. While the HPV vaccination's strength is the established EPI programs in most LMICS, CC services had their direct cost attached and not fully absorbed into programs. This resulted in market failure in service delivery in Zimbabwe. The cost for radiotherapy, chemotherapy and consultations was unbearable. The need factors were clear in patients, but the cost served as a significant barrier to access the services. In one of the findings, a client preferred a traditional healer where the cost was lesser. The WHO recommendation should not be limited to integration of CC control services but going beyond to eliminate user fees of CC would be the best buy to achieve the UNSDGs targets and the first step to UHC in most LMICs.

In most findings, the services were not comprehensive and poorly coordinated. Providers without proper knowledge of CC and its consequences are more likely to focus on the short-term benefit of treatment. Therefore, would not develop a clear pathway for patients. Comprehensiveness and coordination are critical progress monitors of service delivery. There should be a clear network of providers from MCHA through Midwives to the Surgical specialist at the tertiary level with patients at the center of care. The lack of this results in abuse of patients and poor-quality data like in Zimbabwe. Sierra Leone has a clearer structure and user-friendly DHIS-2 data collection tool, HSCC and a national referral and emergency ambulance systems (NEMS). These existing health systems structures provide CC control strategy a stronger foundation achieving SDG-3 by 2030 '*equal health for all at all ages*' in Sierra Leone. However, the 'bottlenecks' in the RMNCAH service delivery including human resources, integration and coordination need critical considerations. The MOHS should not be confident but rely on opportunities to build a stronger CC control strategy in Sierra Leone.

The geographical location has an indirect cost and itself a barrier to access CC services. According to the findings, the non-prioritized CC services were centrally located and not accessible to persons in the rural areas of the country in most LMICs. In the reviews, CC programs were viewed and implemented differently. Like Maternal or child health programs, CC screening programs require a horizontal approach. Where patients are expected at PHC. Therefore, centralising the services is the wrong approach. This was evident in South Africa, Zimbabwe and Rwanda where centralisation was assumed decentralisation (Zimbabwe) and decentralised and coordinated intervention (Rwanda). However, since the paradigm remains, the challenge of poor integration remains. Sierra Leone should align both concepts for a fully decentralised implementation of CC programs. Scale-up is a better approach, but achieving the fundamental requirements including human resources, structural framework in the strategy and guidelines is significant for the feasibility of integrated CC quality service delivery. CC control strategy could be prioritized and simply integrated into the RMNCAH given the evidence of cost-effectiveness and donor commitment in the country. CC screening and treatment are Cost-effective. Therefore, human resources, drugs, medical devices, infrastructure and M&E should be key policy considerations developing CC control guidelines and strategy. They would ensure the health system accessibility to CC persons in Sierra Leone.

Service utilization and coverage are key factors in CC control. The literature shows that disparity among patients' groups and other health system factors were major reasons for poor utilization and low coverage of CC in most African countries. Also, the knowledge, location, costs and availability of services influence service utilization and coverage of CC in SSA. The poor service utilization and coverage, late presentation of CC patients, the lack of trained and qualified service providers, lack of diagnostic tools and infrastructure for early cancer detection, in addition to the other SDH, are in a vicious cycle of causes and effects as discussed above. The overall effect is poor coverage of patients, especially those in need.

The key findings on the knowledge were the gap in the identification of the clinical signs or symptoms of CC. They are poorly understood at the healthcare, individual, community and social networks level in Sierra Leone. Cases of CC were misdiagnosed and treated like other

medical conditions in Zimbabwe. Health care providers could not communicate lifesaving messages to their patients especially on chronic conditions like CC because of this gap. However, with the corresponding capacity as discussed earlier, health workers can avert many premature deaths of CC and ensure high coverage. This enables early detection and prevents late presentation and deaths from the disease.

With low coverage and utilization, the magnitude of CC might be underestimated. With the lack of knowledge on CC, deaths would be attributed to other conditions in remote Sierra Leone.

Similarly, centralisation of CC services in most LMICs due to financial constraints and competing priorities resulted in poor service utilization and coverage. Like Sierra Leone, diagnosis is done in the urban cities, patients had to overcome the financial barriers to access diagnostic services. Sierra Leone is also among the three countries in SSA with the highest late-stage presentation of CC based on the incidence mortality ratios comparisons due to centralisation and hence poor service utilisation and coverage. The finding was also consistent with Zimbabwe as discussed above. This leaves many misdiagnosed or unreported CC cases in remote areas who often show up at the advanced stage of the disease.

The literature review found significant SRHR issues that are critical to CC control in Sierra Leone. The 16 years sexual debut, high adolescent birth rates, teenage pregnancy and forced or child marriages and high parity especially in the rural communities. In most reviews, these factors were poorly considered at the intervention level. In areas of social mobilisation, the focus was on HPV vaccination and CC services uptake and utilization. I believe this is a critical primary prevention approach with a huge unintended benefit in the future. Efforts in delaying sexual debut alone enable girls to stay longer in schools hence reaching their full potential, which has an economic impact on the girl, her community and the nation. Furthermore, this would prevent teenage pregnancy and STIs, hence, reducing health expenditure on managing chronic conditions like HIV/AIDS and preventing maternal death. In South Africa and Zimbabwe, despite the high unhealthy behaviours of adolescents leading to the high burden of CC and other health indicators, emphasis on preventing the sociocultural causes was poor. There should be a clear and precise CC control strategy and guidelines against socio-cultural and religious norms in Sierra Leone. Girls and their parents or caregivers must be fully aware of how these norms serve as predisposing factors for HPV infection and CC. Policy considerations to discourage or prevent early sexual debut, early or forced marriages are key. The high rates of child marriages and adolescents birth rates is a clear justification to use opportunities like CC primary strategy for actions. Also, improving access to contraception is relevant in the strategy. IEC empowerment activities, school enrolment and retainment in rural communities are long-term dividends.

Most systematic reviews emphasised unhealthy behaviours and the risk of HPV infection and CC. Behaviours such as multiple sexual partners, unprotected sex [no condom use] and cigarette smoking are associated with a high risk of HPV infection or progression to CC. This was discussed in many articles on the SDH of HPV infection and CC. Single or persistent exposures to HR-HPV infection are key to acquiring HPV infection. Despite this, only a few among the infected progress to precancerous lesions. However, cofactors such as HIV/AIDS,

chlamydia and cigarette smoking triggers the progression of HPV infection to precancerous lesions. There was a clear emphasis on active and passive smoking, both with almost equal risk. In Sierra Leone, multiple sexual relationships, non-condom use and cigarette smoking among women are common. Sierra Leone has the highest cigarette smoking rates among women in SSA. Strategy to effectively communicate these risks (IEC) is vital to the CC control strategy in Sierra Leone. Public health interventions such as information dissemination should include tobacco use risk communication in Sierra Leone. Furthermore, Sierra Leone has a low but mixed prevalence of HIV, with sex workers, traders and fishermen with the highest prevalence. These groups are key to CC control interventions in Sierra Leone.

Progress monitors such as comprehensiveness, patient-centredness were lacking in most strategies, resulting in poor quality interventions especially CC. HPV vaccination, CC screening and treatment of precancerous lesions require a comprehensive and patient-centered approach to provide quality services and positive patient outcomes. This measure of equity was poorly reflected in CC interventions. In other countries including South Africa, Rwanda, Tanzania and Zimbabwe with high HIV/AIDS prevalence, policies to include these groups are adopted though poorly patient-centred. Despite the low national prevalence of HIV/AIDS, key groups such as sex workers and their partners, PLWHIV, persons living with disability, female inmates and males that are symptomatic of HPV cancers should be considered in the Sierra Leone CC policy. In South Africa, Uganda and Zimbabwe, PLWHIV was inclusive but not linked to services hence uncovered. This resulted in the late presentation and death. Sierra Leone has the majority of its women in rural areas and within mining communities where there is an increased risk of STIs. These categories of women must be prioritized during interventions. The services must be centred around individuals, not the disease. The emphasis should not be limited to the data, but how the patients enter and exit the health care system. Each patient's SDH must be considered in the care pathway. If a centralised program is used such as chemotherapy or radiotherapy, the patients should be supported to access the central services and ensure the quality of care. The lack of this would result in a reset to the status quo like the case of Zimbabwe. This requires multisectoral collaborations in Sierra Leone.

The availability of adequate modern diagnostic tools at strategic positions is critical for the screening and treatment of CC patients. Less attention was on pre-positioning and cost-effectiveness of diagnostic and therapeutic tools in most strategies. Most literature emphasised preventing the future impact of CC leaving the already affected women at the mercy of the disease. Many pieces of literature also request the need for research on CC screening in Africa. There is a significant gap in research on the quality of life and the country-specific cost-effectiveness analysis. These should be areas of consideration going forward. With about 2 million women over 15 years in Sierra Leone and a younger population, country-specific estimation would be essential. One main reason for the lack of research is the poor capacity. It is rational to conduct implementation research on interventions such as accessible VIA, cryotherapy, LEEP procedures and coordinated services to measure the outcome of these services. Measure patient satisfaction and overall impact studies. However, these services are lacking in most SSA countries. So, the data are not available.

Therefore, it is not the lack of evidence but, the implementation of best practices that would determine where Sierra Leone and other LMICs stand on CC control by 2030.

The literature search was limited by the number of policy research on national HPV vaccination and CC control programs in SSA. Most were from East and South African countries with a high prevalence of HIV. Some focussed on CC screening interventions only while others on HPV vaccination. However, analysing available data, and snowballing to extract articles on the same country but another strategy that enables me to access adequate data to increase the external validity.

Separate policy documents on CC control strategy were not available, however, I systematically extracted the policy in the articles. This might be due to the recent global awareness raised, and the lack of fully integrated national CC programs in many SSA countries. Despite the limited literature on real-time implementation research in SSA, this literature review is mainly from systematic reviews in SSA or LMICs which have a shred of stronger evidence. Therefore, conclusions and considerations in this article might be exaggerated but relevant for countries with low HIV prevalence like Sierra Leone and apt for high HIV prevalence countries. There is a need for real-time health system research focussing on the key health system factors of CC and HPV vaccination in SSA.

## Conclusion

The review shows that the continued challenges in CC control programs in SSA are not the lack of strong evidence, but the non-use of these best practices. The SDH of CC and HPV infections are known and documented in most policies and strategies, but the political will to prioritize and implement these practices is absent in most SSA countries. While fewer health system barriers were associated with HPV vaccination programs, countless barriers including other key SDH were associated with the secondary and tertiary CC control programs in SSA.

The fact that Sierra Leone and other LMICs have existing reproductive health frameworks, CC control interventions can be absorbed in different levels as an immediate and mid-term strategy. The HPV vaccination that requires a vertical approach must be identified and merged with immunisation activities. It must be clear that the future burden of CC relies on the effectiveness of the HPV vaccination in Sierra Leone. Also, integrate horizontal CC screening and treatment with similar services at the PHC and review financing strategy. This strategy is a direct measurement and mitigation of the burden of CC in Sierra Leone.

The diagnoses and management of CC could be integrated into the service delivery components and rollout with additional cost to the RMNCAH section as indicated above, giving strong feasibility of CC control strategy in Sierra Leone. At the vertical approach, HPV vaccination should be integrated into routine immunization schedules. The cervical control policy is of high priority given the global and national commitment. Strong policies that support the provision of efficient, adequate coverage, high-quality and equal access to CC services are

critical to achieving UHC in Sierra Leone. Considerations of high risk and other disparate groups are also key. Multisectoral collaborations and accountability are critical programmatic, and sustainability strives in the CC control strategy.

Framework for CC control with civil society organisations (CSOs), NGOs and community participation are a key sustainability approach and scale-up strategy. Strategies to remove the barriers to access, service utilisation and the modifiable risk factors through IEC require the framework. In these respects, selecting HPV control interventions must be evidence-based and informed by the existing health system opportunities in Sierra Leone.

CC has not been on the list of priority diseases in most countries in SSA for decades. Therefore, it is poorly researched, lacks policy or guidelines and the capacity to manage the disease. Stakeholders should acknowledge that ensuring service utilization and effective coverage of CC is a daunting task. It requires a strong political will to attract partners and utilise resources. Like most LMICs, the policy environment to ensure effective service delivery and utilization of CC services are poorly developed. Therefore, the strategy to adopt the short-term to full-scale-up approach creates a platform for future policy review using real-time data of CC needs to the formulation.

GAVI and other partners' support to Sierra Leone and other LMICs is a strength and opportunity to build a sustainable national HPV program, and health workers must be at the core of this process.

Building the capacity of the health workers in CC control strategies is a critical step to achieve all targets. The health workers are cross-cutting demand for CC control programs. Overall, the determinant of poor service utilization and coverage leading to the high burden of CC must be considered at all phases of policy and strategy.

The progress monitors are the real-time determinant of best practices in CC control strategy in Sierra Leone. The MOHS should state into policy comprehensiveness, patient-centred approach and quality of CC control and ensure strategies are instituted to achieve them. The structure should include referral systems and a clear pathway for the continuum of care as well as community participation. Most articles have no description of a treatment model for CC patients. Programs must alert patients being diagnosed with no clear pathway in the level of care, lost to follow up, through real-time data. Patients' outcome measures including health outcomes, patient satisfaction is a key quality indicator.

Precise and clarity of the progress monitors are preconditions to their implementation. The policy should make available the framework for progress monitoring in CC. The MOF should budget and make available diagnostic and therapeutic, M&E tools and finance implementation research.

# Recommendations

In the HPV vaccination and CC screening and treatment strategies, the MOHS, MOE, MOF, MSWGCA and CSOs and partners should ensure the following.

## 1. GOVERNMENT OWNERSHIP AND SUPPORT

Take ownership and lead the implementation of the CC control strategy in Sierra Leone. Adequately finance health workers' capacity building, procurement of diagnostic and therapeutic equipment and consumables.

State short, medium and long-term goals of CC control and develop a framework for integration and sustainability.

Collaborate with other sectors involved in the mitigations of the SDH of CC and HPV infection to ensure universal coverage of CC services.

Ensure universal access to the HPV vaccine and CC services through inclusiveness and inequity elimination. Prioritize high-risk groups such as sex workers, PLWHIV, female inmates, PLWD and those with geographical barriers.

Engage UNICEF and UNDP to align programs such as the prevention of early/child or forced marriages, teenage pregnancy, gender power dynamics and school retention with HPV and CC risk communication.

Ensure CSOs, community, youths, students and women's representatives participate in HPV vaccination and CC awareness through workshops or meetings as a step towards sustainability and accountability in CC control in Sierra Leone.

Commit special budget to the bi-yearly HPV vaccination and ensure the procurement of high-quality diagnostic and therapeutic tools.

Provide financial support to economically challenged caregivers via cash transfers to access the next level of CC care from rural areas to prevent catastrophic expenditure in seeking health.

Recruit adequate and build the capacity of health and allied workers for implementation of decentralised CC services. Train all PHC providers on both knowledge and skills in CC control strategies. The knowledge to detect CC symptoms and refer is vital. Train Registered nurses and Midwives to do HR-HPV testing, VIA, colposcopy, cryotherapy and LEEP at the secondary facilities. Train Specialists or medical officers in the relevant departments on invasive procedures.

## 2. HPV VACCINATION, CERVICAL CANCER SCREENING AND TREATMENT APPROACHES

Implement School and out-of-school HPV vaccination and integrate CC screening and treatment into the RMNCAH service delivery framework in Sierra Leone. Establish a strategy to reach the non-school attendees especially in rural areas.

Adopt *Screen and Treat* using VIA and, decentralise services in Sierra Leone. It reduces patients' attrition and lost-to-follow-ups. The government should make diagnostic and therapeutic tools available for the decentralisation of CC control services in Sierra Leone.

Establish HPV vaccination and high coverage and utilization through effective national social mobilisation activities. Engage media houses and commit them to IEC activities on HPV vaccination and CC information. Provide health workers clear role in IEC. Engage parents, religious and traditional leaders and communicate the risk of early sexual debuts, early marriages and HPV infection and CC. Provide youths and adolescents adequate information on unhealthy behaviours such as multiple sexual partners, non-condom use and cigarette smoking and the risk of HPV infection and CC. Include HPV and CC into the comprehensive sexuality education (CSE) school curriculum. Target high-risk groups and miners on behavioural change interventions.

### **3. REFERRAL SYSTEMS**

Establish referral systems through a network of providers and facilities for patients that require the next level of care including radiotherapy or chemotherapy. Use the national emergency medical services as a foundation especially for patients that require urgent lifesaving invasive procedures at the next level. Use the Sierra Leone health service organisation and structures to create the referral framework in Sierra Leone.

### **4. MONITORING AND EVALUATION AND RESEARCH**

Provide a clear entrance and exit of CC cases into the progress monitoring system. These patients should be captured through effective M&E to prevent duplication of data. Create innovative ways to track patients, such as coding patients' cards and then link to the DHS-2 database and the provider to follow up and quality data. Ensure progress monitoring for comprehensives, quality of care, and positive outcomes. Collect and analyse qualitative and quantitative data for the recommendation. Ensure continuous health system research on patient satisfaction and outcomes (See Appendix-IV).



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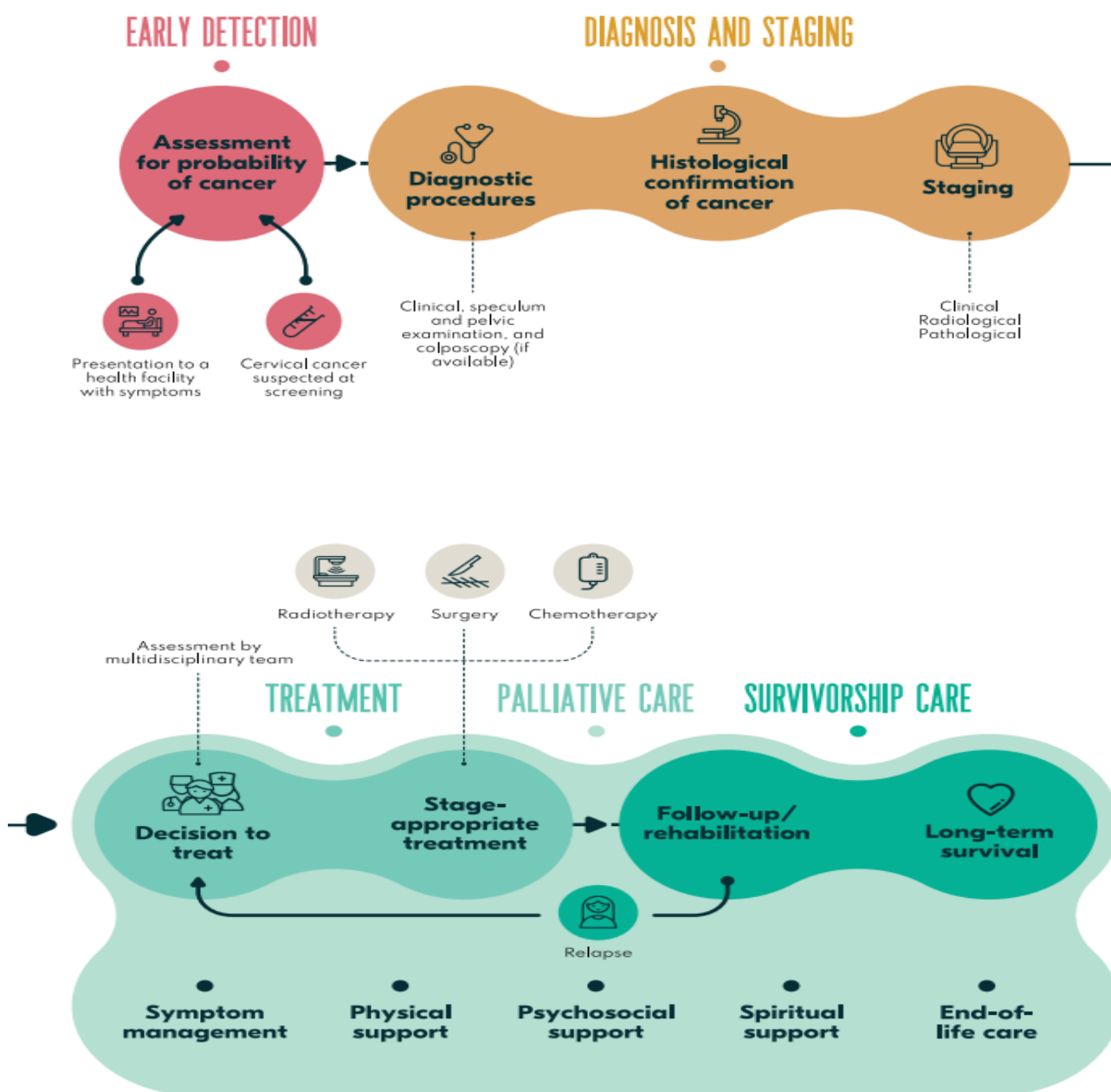
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# Appendices

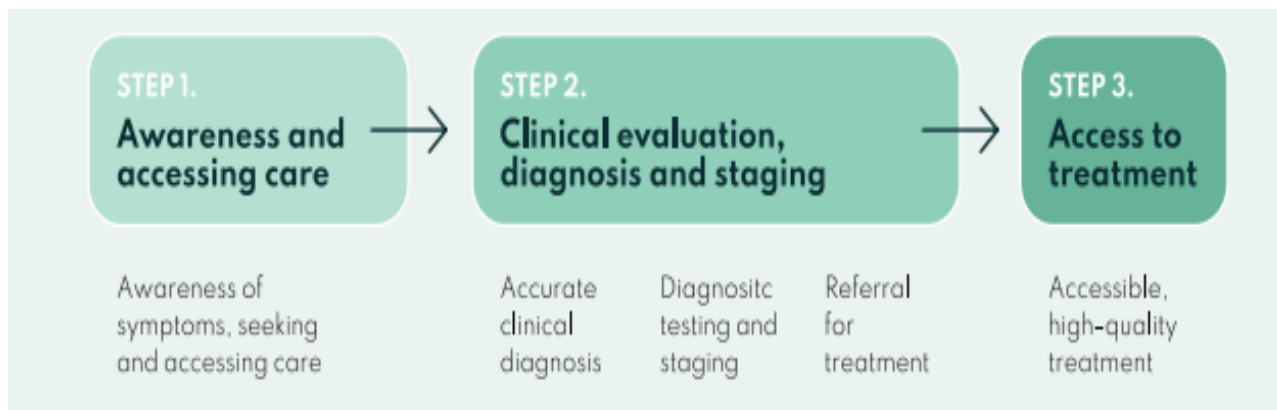
## Appendix-I Cervical cancer care pathway

Cervical cancer care pathway



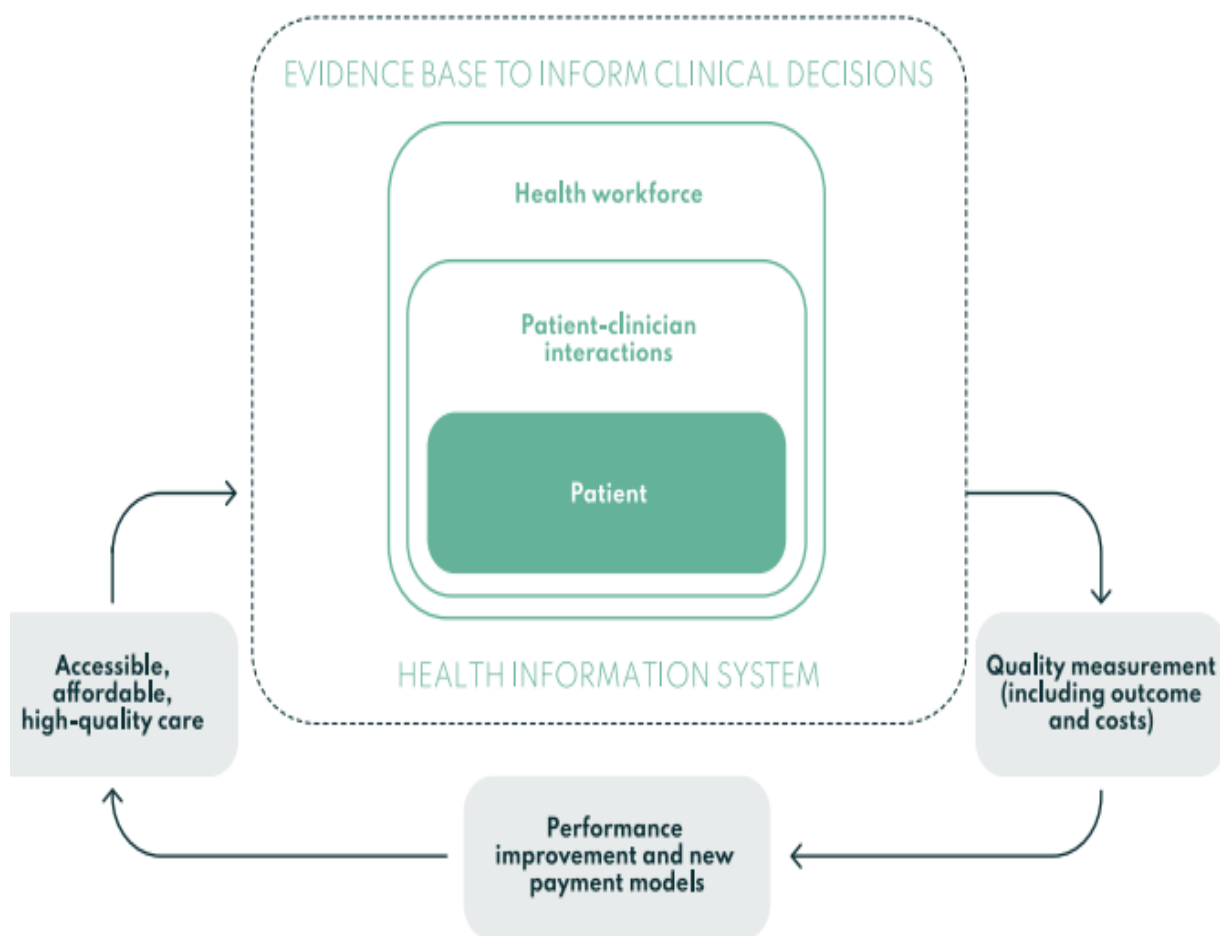
**Source:** WHO framework for strengthening and scaling-up of services for the management of invasive cervical cancer. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO

## Appendix- II Three steps of cervical cancer early diagnosis



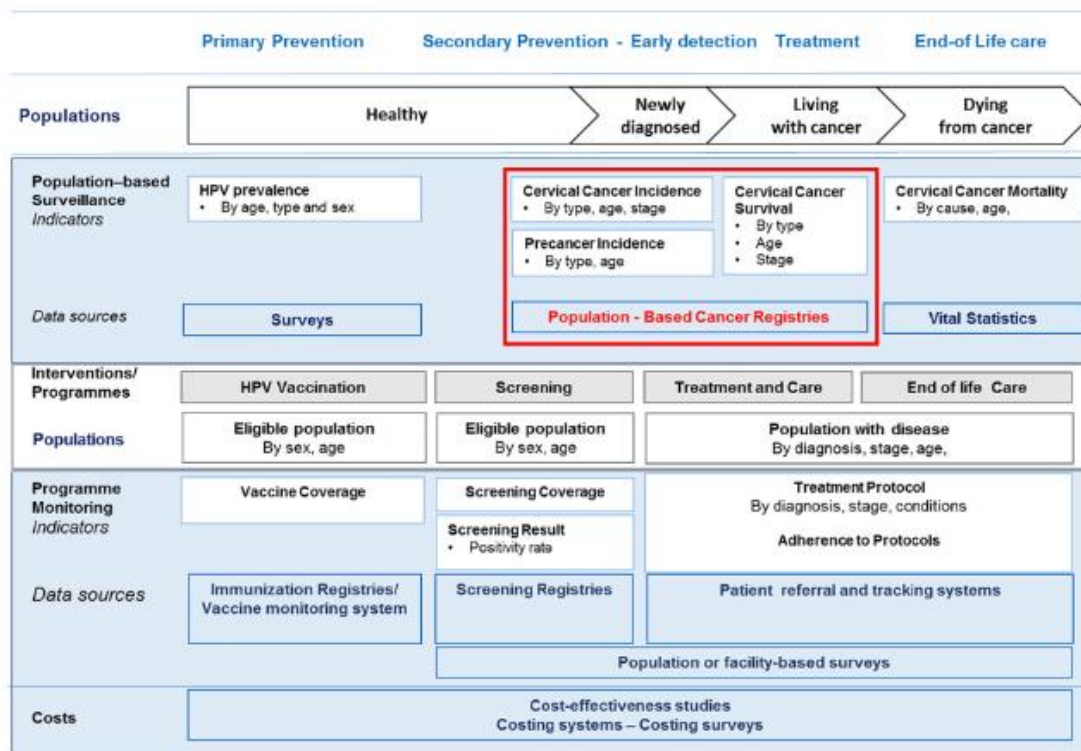
**Source:** WHO. (2017) Guide for cancer early diagnosis. Geneva: World Health Organization

## Appendix-III Conceptual framework of a high quality, interconnected cancer care delivery system



**Source:** Delivering high-quality cancer care: charting a new course for a system in crisis. Institute of Medicine. Washington (DC): The National Academies Press; 2013

# Appendix-IV Cancer Monitoring, evaluation and scale-up framework



**Title:** A framework for the surveillance and monitoring of a scaled-up cervical cancer control program, including the central role of Population based cancer registry (PBCR).

**Source:** Marion Piñeros, Mona Saraiya, Lacopo Baussano, Maxime Bonjour, Ann Chao, Freddie Bray. (2021) The role and utility of population-based cancer registries in cervical cancer surveillance and control, *Preventive Medicine*, Volume 144,2021, 106237, ISSN 0091-7435, Available from: <https://doi.org/10.1016/j.ypmed.2020.106237>.

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