FACTORS INFLUENCING ACCESS TO CERVICAL CANCER SCREENING AMONG WOMEN OF REPRODUCTIVE-AGED IN LIBERIA.

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Factors Influencing Access to Cervical Cancer Screening among Women of Reproductive in Liberia.

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Master of Science in Public Health

by

Tehye Nyenatoh

Declaration:

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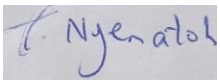
Signature 

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Abstract

Introduction

Few cervical cancer screening and related services are offered in Liberia. Despite the efforts of the authorities and other stakeholders to stem this menace seen through the creation of recent limited cervical cancer screening programs, there are no dedicated cancer hospitals; cervical cancel screening uptake is discouraging due to this limited access to cervical cancer screening services. This study examines the factors determining access to the currently limited cervical cancer screening among Liberian women, provides lessons from other countries and recommends findings to policymakers to strengthen programs that remove barriers to cervical cancer screening.

Methodology

Using the USAID evaluation conceptual framework, relevant literature and papers regarding cervical cancer and screening in Liberia and other countries with similar cervical cancer screening circumstances were obtained and examined.

Results

Cervical cancer screening demands and supply were influenced by women's age, marital status, socioeconomic level, psychology, knowledge of cervical cancer screening, empowerment status, and cultural concerns. There are limited policy formulation and enforcement in Liberia, insufficient human and financial resources, and the institution of cervical cancer screening development programs and services.

Conclusion and recommendation

Interrelated demand and supply factors affect access to cervical cancer screening. Despite recent attempts to eradicate cervical cancer through HPV vaccination and screening, a comprehensive national policy for preventive measures for women of reproductive age is needed. As a result, proper policy design and execution, improved financing, Community Health Workers training, cervical cancer screening commodity security and logistics, the inclusion of religious and community leaders in cervical cancer screening awareness and education, intensive public and Non-Governmental Organizations collaboration, and an expansion of cervical cancer screening services to more health centers are recommended.

Keywords: Cervical cancer, cervical cancer screening, human papillomavirus, women of reproductive age, human immunodeficiency virus

Word Count: 12,770

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Abbreviations

AIDS	Acquire Immunodeficiency Syndrome
BPHS	Basic Package of Health
CC	Cervical Cancer
CCS	Cervical cancer Screening
CHAI	Clinton Health Access Initiative
COVID-19	Corona Virus Disease
EVD	Ebola virus Disease
GDP	Gross Domestic Product
GOL	Government of Liberia
HDI	Human Development Index
HIV	Human Immune Virus
HPV	Human Papillomavirus
HWP	Health Work Force Program
JFKMC	John Fitzgerald Kennedy Medical Center
LCS	Liberia Cancer Society
LDHS	Liberia Demographic Health Survey
LISGIS	Liberia Institute of Statistic and Geo-Information Service
LMIC	Low- and Middle-Income Countries
MOH	Ministry of Health
MOH&SW	Ministry of Health and Social Welfare
NCD	Noncommunicable Disease
NCDD	Noncommunicable Disease Division
NCP	National Cancer Policy
NCPL	National Cancer Policy Liberia
NGO	Non-Governmental Organization
NH&P	National Health Policy and Plan
NPHIL	National Public Health Institute of Liberia
NPHPSP	National Policy and Strategic Plan for Health Promotion
NSCS	Non-Standardize Cancer Service
NTD	Neglected Tropical Disease
RH	Reproductive Health
SBCC	Social Behavior Change Communication
SSA	Sub-Sahara Africa
STI	Sexual Transmitted Infection
TRF	Total Fertility Rate
UNICEF	United Nations Children Fund
UNPFA	United Nations Population Fund
USD	United States Dollars
WHO	World Health Organization

Key Terms

Cervical cancer- This type of cancer develops from cells lining the cervix, the lowest part of the uterus (womb). The uterus's body, which is the part of the organ responsible for fetal development, is connected to the vagina by a structure called the cervix (birth canal)(1).

Cervical cancer Screening- This screening detects the presence of the human papillomavirus (HPV) in the cervix and checks for signs of malignancy(2)**.**

Human immunodeficiency Virus- This is a virus that causes damage to the immune system of the body. It originated from a specific chimpanzee species in Central Africa(3).

Human papillomavirus- Human papillomavirus (HPV) is a small double-stranded circular DNA virus with a genome of about 8000 base pairs. It is a member of the papillomavirus family. It spreads through skin-to-skin or mucosa-to-mucosa contact and gets into the host's body through the skin or mucosal injuries. HPV is the most common sexually transmitted disease, but the immune system can usually heal it(4).

Non- communicable Disease- Non-communicable diseases are long-term health problems that cannot be passed on to other people. Even though getting a diagnosis can be scary, there are many ways to treat or stop symptoms(5).

Sexual transmitted Infections- These are caused by bacteria, viruses, or parasites that can be passed from one person to another through blood, sperm, vaginal fluids, and other body fluids(6).

Women of reproductive age - These are women between the ages of 15-49 - the generally acceptable age range at which a person can bear children(7).

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Introduction

Cervical cancer (CC) is slow-growing, sometimes without a symptom, and forms in tissues of the cervix (the organ connecting the uterus and vagina)(8). It is almost always caused by human papillomavirus (HPV) infection but is detected by regular Pap tests (a procedure in which cells are scraped from the cervix and looked at under a microscope). HPV can be sexually transmitted, and high-risk HPV DNA is present in 99.7% of cervical cancer specimens(9). Although there are many types of HPV associated with cancerous diseases, HPV 16 and HPV 18 are the most carcinogenic, accounting for over 70% of all cervical cancers(10,11).

By the year 2030, cervical cancer will be responsible for the deaths of over 443,000 women per year across the globe, the vast majority of whom will reside in sub-Saharan Africa (SSA)(12,13). In SSA, the incidence of this disease is constantly rising, and each year there are more than 75,000 new cases and 50,000 deaths resulting from it(14). Human immunodeficiency virus (HIV) infection contributes to this trend by worsening it(15).

According to the World Health Organization (WHO), CC is one of Liberia's leading causes of cancer mortality among women, with around 40% of all cancers and two-thirds of all cancer-related deaths attributed to it(16). HPV vaccinations were introduced within the national immunization program with limited coverage; 42% and 18% for first and second doses, respectively, focusing only on nine-year-old girls(17). For secondary prevention, national screening programs have yet to be established, and there is a lack of knowledge of cervical cancer screening (CCS), leading to missed cases and late detection(17). The few screened patients do not have the requisite treatment facilities for CC. Moreover, management and supportive care have been negatively affected by shortages in radiotherapy, commodities, and shortages in staff, including surgeons(17). Further, as observed by the author of this paper, hysterectomy is taboo for a woman in Liberia due to the cultural significance of childbearing, as motherhood epitomizes an "accomplished woman" or maintains her marriage. Hence, women were not prepared to go for hysterectomy options.

However, there has been limited research on the factors affecting the assets of CCS among women of reproductive age in Liberia. Hence, this study aims to examine the factors influencing access to CCS among reproductive women in Liberia and recommend findings to policymakers to strengthen programs that remove barriers to CCS among these women.

Chapter 1: Background information on Liberia

1.1: Country context

Liberia is bounded by Sierra Leone to the northwest, Guinea to the north, Côte d'Ivoire to the east, and the Atlantic Ocean to the south and extends across a total area of 96,320 km^2 (18). The country has five geographical regions and 15 political divisions (counties), with its capital and seat of government (Monrovia) having a population of a little less than a million, making it the most populated city in Liberia. Liberia has a population of around 5 million(16), equating to ~52.5 per km^2 in population density (123rd globally), with ~53 % living in urban areas(19). Christians comprise 84% of the population, Muslims comprise 14%, whereas only 1% have no religious affiliation(20). Liberia has 16 main indigenous ethnic groups that account for 95% of the population. The Kpelle, mainly in central and western Liberia, comprise the largest group(20). There are 1.2 million women of reproductive age between the ages of 15 and 49, and the average life expectancy for men is 63.5 years, while the average life expectancy for women is 66.5 years(21). Approximately 52% of Liberian women and 75% of Liberian men are literate(20). Liberia's total fertility rate (TFR) is 4.2 children per woman. The Liberia population pyramid for 2022, with a total population of 5 million, is resented in Figure 1.

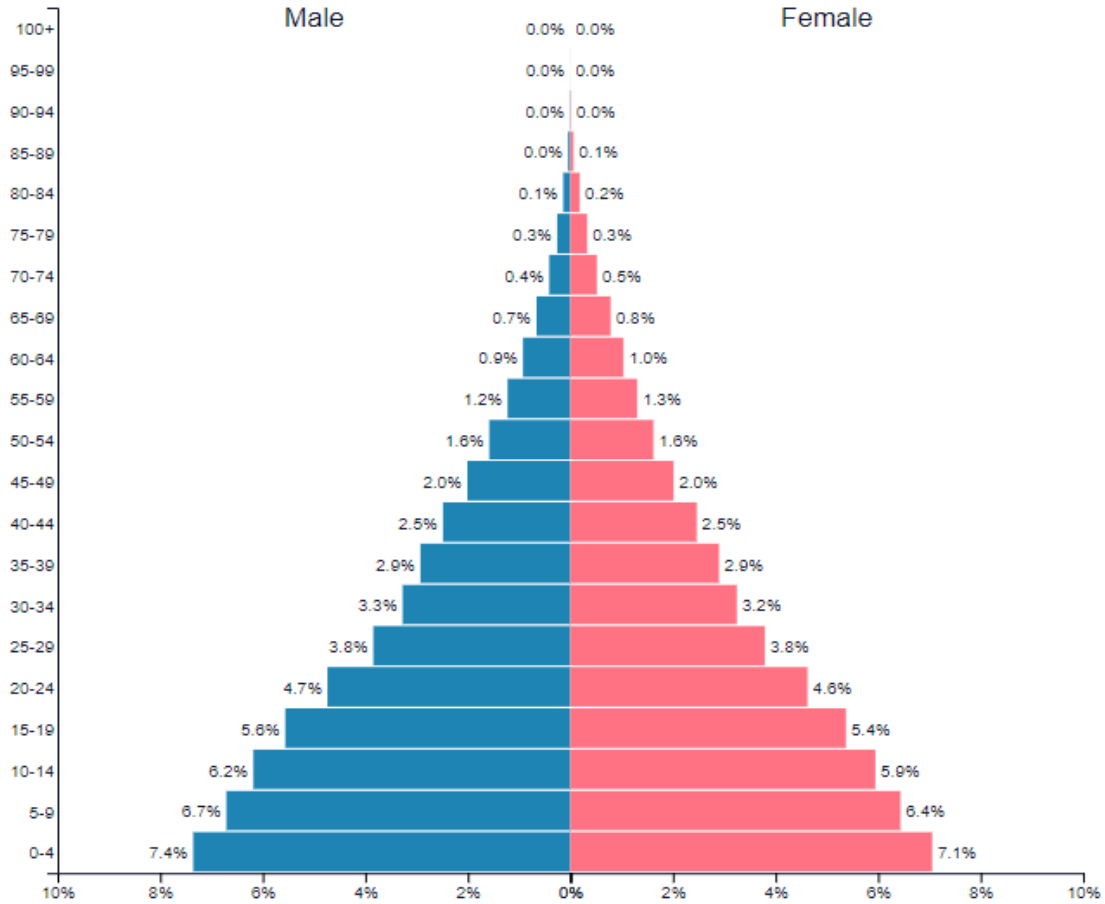

Figure 1: Liberia population pyramid 2022(22)

1.2 Socioeconomic situation

Liberia's human development index (HDI) in 2021 was 0.481, positioned at 178 out of 191 countries and territories, which is in the low human development category(23) and is considered a low-income country with a 2021 GDP per capita of US $ 625.49 (24). The GDP was 3.49 billion USD(25), and the GDP growth rate was around 4%(26) in 2021, a recovery after the Covid-19 Pandemic. Economic growth was resurgent, especially in the mining and agricultural sectors, with a 2023 projected GDP growth of 4.3 % from a growth of -3.0 % in 2020 (24) due to the Covid-19 Pandemic. Over 40% of Liberians live below the poverty level of $1.9 per day(21). Despite the country's abundant natural resources, such as rubber, mineral resources, and iron ore, poverty is widespread throughout the country.

1.3 Health system

Due to infrastructural destruction and a severe shortage of healthcare staff caused by the 14-year Liberian civil conflict (1989-2003), the nation's healthcare system fell into a dysfunctional state. Furthermore, the economy collapsed during the conflict due to the deaths of many individuals, including health staff, heightening public distrust in their capacity to get healthcare. Numerous communicable, non-communicable, and neglected tropical diseases (NTDs) threaten the nation(21,27). The delivery of health services, particularly health promotion, is hampered by a shortage of skilled and untrained staff. The nation has made substantial efforts since 2005 to reform and implement the Basic Package of Health Services (BPHS), followed by the Essential Package of Health Services (EPHS), to reconstruct the country's health system(21,27). Many healthcare organizations are operated by the government, donors, or non-governmental organizations (NGOs), including faith-based organizations. Liberia suffers from critical shortages of life-saving medicines, medical equipment, and supplies(28).

Liberia's health expenditure as a percentage of GDP was 8.5% in 2019, with health spending per capita at USD 53. Liberia's per capita health spending increased by 13.33% per year from 13 US dollars in 2000 to 53 US dollars in 2019(29). Between the ages of 15 and 49, only 4% of women and 7% of men have health insurance. Most women and men who have insurance (3%and 5%, respectively) get it through their jobs(20). The health sector funding allocation in the national budgets for the five fiscal years (2016-2021) averaged around 14% of the total(30). While the country strives to promote universal and inexpensive healthcare, low funding and an unsustainable dependency on aid for many important basic healthcare programs are two significant contributions to Liberia's poor healthcare services.

Chapter 2: Problem statement, justification, and objectives

2.1 Problem statement

Cervical cancer is women's fourth most common cancer (globally) and the second most common after breast cancer in terms of incidence and mortality in women in low human development index (HDI) countries, mainly in Southeast Asia and SSA, with Guinea, Burkina Faso and Mali taking the lead in West Africa(31). The burden of cervical cancer is most significant in SSA, accounting for more than four-fifth of cases and deaths worldwide, and would worsen without an immediate and rapid scale-up in CC prevention, screening, and treatment(32). SSA has one of the highest rates of CC in the world, with an estimated overall age-standardized incidence rate (ASR) of 31 per 100,000 women with varying rates per region(33). Age-standardized incidence rates account for population age distribution discrepancies by applying each group's reported age-specific incidence rates to a standard population. The age-standardized incidence rate is a weighted average of age-specific incidence rates per 100,000 people, with the weights indicating the proportion of persons in the relevant age groups in the WHO standard population. The burden of CC in Western Africa and the whole of Africa is given in table 1. The rise in the number of CC cases in Africa can undo the gains that African women have made to lower female mortality and increase life expectancy(34).

Table 1: Cervical cancer burden per 100,000 in Africa(35)

	Western Africa		**Africa**	
	Incidence	**Death**	**Incidence**	**Death**
Annual number of new cases/deaths	27,806	18,776	117,316	76,745
Crude rate	13.9	9.41	17.5	11.4
Age-standardized rate	22.9	16.6	25.6	17.7
Cumulative risk 0-74 years (%)	2.48	1.88	2.82	2.05
Ranking of cervical cancer (all women)	2nd	2nd	2nd	2nd
Ranking of cervical cancer (15-44)	2nd	2nd	2nd	2nd

Source: https://hpvcentre.net/statistics/reports/XFX.pdf

In Liberia, CC is one of the primary causes of cancer deaths in women. It is responsible for more than 40% of all cancers that occur in women and two-thirds of all cancer-related deaths. CC is the most prevalent form of cancer in Liberian women between the ages of 15 and 44, making it the primary cause of cancer in women overall in Liberia(16). There is a high frequency of sexually transmitted disease (STI) infections among teenagers and young people partly because they lack an understanding of the risks of unprotected sex and multiple sexual partners. As a result of their risky sexual behavior, these people may suffer from CC in the

long run (28). There are not many different treatment choices available in Liberia. Because there are not enough oncologists in the country, just a select few hospitals provide chemotherapy, and radiation therapy is not currently an option for cancer patients. Those requiring radiation must travel to nations with better resources, which is an option only available to those with the financial means to do so(36). Due to this, most women with CC either stay at home and succumb to their disease without seeking medical care(37).

As was said earlier, HPV is responsible for almost all CC cases and can be transmitted both sexually and non-sexually(38). The early detection of CC is critical in its treatment, as are all other cancers. Primary prevention methods such as HPV vaccination were only recently introduced in Liberia and have not taken any appreciative effect yet(17). For secondary prevention, national screening programs have yet to be established, and there is a lack of knowledge of cervical cancer screening (CCS), leading to missed cases and late detection(17). However, the unavailability of screening and treatment facilities hampers the fight against CC in most countries in SSA.

CCS programs are only lately being created, and there are no dedicated cancer hospitals(39). In 2021, the World Health Organization (WHO) offered financial and technical assistance to the Liberian Ministry of Health (MOH) to establish pilot centers. In December of the same year, the MOH successfully established pilot centers in two of Liberia's five geographical zones (Redemption Hospital in Montserrado County and Phebe Hospital in Bong County). The project's primary focus was providing high-quality, all-encompassing services for diagnosing and treating HPV earlier (17). Healthcare workers were taught cervical and breast cancer screening and treatment techniques and how to operate the equipment properly. Some workers were taught as trainers to help with future scale-up, while others were trained to give the essential sensitization and awareness aimed at empowering women. For now, access to health education and information is limited, so few women attend screenings(39). It is hoped that when the project is full-blown, the WHO's global objective to eliminate CC as a worldwide public health problem by 2030, which sets a 70% screening coverage target(24), will be achieved in the target areas shortly.

Various governmental and commercial organizations are providing palliative care for late-stage cancer. Due to the lack of policy and weak health systems, there are still significant gaps, such as the absence of a comprehensive, evidence-based program, standardized treatment protocols, and a comprehensive cancer registry for the general population. As a result, the country has implemented various non-standardized cancer services(40).

2.2 Justification

Through the 90-70-90 objectives for 2030, the WHO's Global Strategy for the Elimination of Cervical Cancer as a Public Health Problem offers a road map(41). By age 15, 90% of girls have a complete HPV vaccine, 70% of women are tested with a high-performance test, and 90% of women with precancer or invasive cancer receive treatment or management(41). This road map shows that CC is preventable, treatable, and can be ended. However, these goals can be achieved only with the full support of governments, donor organizations, civil society, and the general public. For instance, achieving these goals would call for coordinated efforts and lobbying for CC prevention measures, treatment, and management services that are simple to obtain and affordable.

According to WHO, HPV screening is one of the best methods for early cancer detection; when diagnosed, early treatment has a better chance of successfully curing it(42). However, an effective screening technique is the best choice for reducing the incidence of CC and its mortality rate(43), and the second important tool for cervical cancer elimination is a nationally organized screening program(43). CCS has regularly been found to reduce the incidence rate, the number of new CC cases, and CC death by finding cervical precancer before it turns into cancer. However, CCS attendance rates in many countries, including Liberia, are still far from ideal(44).

As stated above, Liberia's primary prevention is essentially nonexistent. Therefore, the focus is placed on CCS. Improving the effectiveness of the CC program in Liberia requires a better understanding of the critical barriers to accessing screening, which can only be gained through research. Some evidence-based research from other African nations has found cultural norms and values, religious beliefs, gender inequality, and other factors influencing access to cervical cancer screening(45–48). However, few studies have been conducted in Liberia on CCS risk factors. Hence, this study seeks to investigate the demand factors and supply environment and analyze evidence-informed CCS intervention in Liberia and other countries with similar contexts among women of reproductive age. This study aims to inform programs that directly benefit women on the critical issues of CCS accessibility. It will provide policymakers and stakeholders with recommendations to address the factors influencing access to CCS and develop strategies to increase the utilization of the available health facilities for screening among those women.

2.3 Objective

2.3.1 General objective

To investigate the factors influencing access to cervical cancer screening among women of reproductive age in Liberia to gain insights into how screening can be strengthened in the country and to make recommendations to policymakers and stakeholders to increase the utilization of available health facilities for screening among those women.

2.3.2 Specific objectives:

1. To explore the demand factors influencing access to cervical cancer screening among women of Reproductive age in Liberia.

2. To explore the factors in the supply environment that influence access to cervical cancer screening among women of reproductive age in Liberia.

3. To analyze evidence-informed cervical cancer service interventions in other countries with similar contexts to Liberia among women of Reproductive age

4. To make recommendations to policymakers and stakeholders to increase the utilization of the available health facilities for screening among women of reproductive age.

Chapter 3: Methodology

This study analyzes the literature on the CCS program in Liberia and SSA. A literature review was conducted. Also, relevant peer-reviewed articles were employed. This review was done to achieve the research objectives above-mentioned.

The databases PubMed/MEDLINE, CINAHL, Scopus, Embase, and Google Scholar, were searched for available articles. The World Bank, Non-Governmental Organization Report, the United States Agency for International Development (USAID), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), and other international organizations' websites were also utilized. Additionally, a search was done on the websites of different national agencies, including the Liberia Institute of Statistics and Geo-Information Service (LISGS) and the Liberia Ministry of Health and Social Welfare (MOH&SW). These limited sources from Liberia prove the nation's difficulties with CCS and its efforts to overcome them. The reference lists of previous studies were also closely examined using the snowballing process to identify potential new studies.

The medical subject heading for CCS techniques served as the basis for creating the search phrases. Search terms like HPV and CCS individual knowledge, prevention, belief, Education, Socioeconomic barriers, Gender, Socio-cultural norms, Married women, unmarried women, Health behavior, Financial/Human resources, health services, poverty, lack of follow-up, policies, laws, rights-based, and integration monitoring treatment, were used to look for papers that would discuss the use of CCS. These keywords were combined with terms such as Liberia, Africa, Sub-Saharan Africa, West Africa, Low-and-Middle-Income Countries, and Developing Countries to limit the study to LMICs, especially in Africa.

3.1 Inclusion criteria:

The following is a list of the inclusion criteria for literature:

- Documents from/about the MOH and CCS program, peer-reviewed articles, grey literature, and CC transmission and prevalence rates in SSA and Liberia were included. Using articles from other West African nations, sub-Saharan African nations, and low and middle-income countries (LMIC) with comparable circumstances as Liberia meets the objective of finding evidence-informed practices from other countries.
- This study was limited to women between the ages of 15 and 49 because there is no established age range for screening in Liberia. Although CC rarely develops in women at age 15, this age range is used because it is just about the age at which first sexual intercourse occurs in Liberia. The upper ages are included because malignant lesions are more likely to form in women in this age range.
- Articles written in English and published after 2010 were included. Books and articles covering CCS provide details on risk factors and transmission in women of reproductive age at the individual, socioeconomic, cultural, and health systems, policy, and intervention levels utilized.

3.2 Exclusion criteria

Previous research before 2010 is not utilized in this work except for policy-related information. Abstracts, opinions, and articles that described an intervention other than HPV-related

intervention were excluded from all these works. Age above 49 and other languages were also excluded

3.3 The Conceptual framework

The USAID evaluation conceptual framework used in reproductive health programs was chosen for this study because it illustrates how CCS achieves its objectives(49). The approach considers both the supply and demand sides. Women's access to CCS is influenced by social, cultural, economic, political, and legal institutions (Figure 2). Demand factors, in general, address social and cultural systems. On the other hand, the supply factors are concerned with the political and legal systems. Both the demand and supply determinants deal with the economic system. All the discussions on the various aspect of the framework are discussed in the different sections under the demand and supply environment.

The figure's upper left side, brightly shaded, emphasizes the importance of demand, showing how a population that actively desires the services ("high demand") based on societal norms and preferences will find it much simpler to achieve results. The supplied environment factors are tinted in a darker tone in the lower left corner of the framework.

While the original model focused on contraceptives, it was altered to show the factors that affect women's access to CCS; that is, the framework was modified from the original structure to better suit the setting and research issue of the study. Sociodemographic characteristics have been included in the list of individual elements in the framework's demand section. Age, sex, and marital status are sociodemographic characteristics that affect decision-making in the Liberian CC screening demand context.

The demand environment (placed in the upper left side of the framework) considers individual aspects as well as the status of women and girls and their level of empowerment and is influenced by more systemic factors. Four categories of individual characteristics can be distinguished: sociodemographic, socio-cultural norms, socioeconomic (including education and poverty), and psychological (Locus of control, self-efficacy, risk aversion, and stigmatisation) — these characteristics impact healthcare demand, including personal well-being, care seeking, and gender equity.

The supplied environment includes the functional elements that enable service delivery and the physical environment in which service delivery occurs. Functional or operational parts of a program include management, training, CC security, logistics, behavior change communication, research, and evaluation. These structure interventions (in the clinic, hospital, or the community). These directly influence how many users utilize the service.

The utilization of services is influenced by supply and demand. It is crucial to remember that factors not directly connected to the program could affect participants' health-related habits and results. For instance, women's health behaviors are influenced by gender stereotypes and gender inequity. Women have less power over health-related decisions and low access to resources (such as transportation), making it more challenging for women to use the services offered. The chain of events that result in a particular health behavior directly impacts the overarching objective of RH programs, including CC, to enhance health outcomes regarding fertility, mortality, and illness. This approach will aid in the analysis and organization of this research paper since it addresses essential supply and demand factors that affect women 15–49's access to CCS.

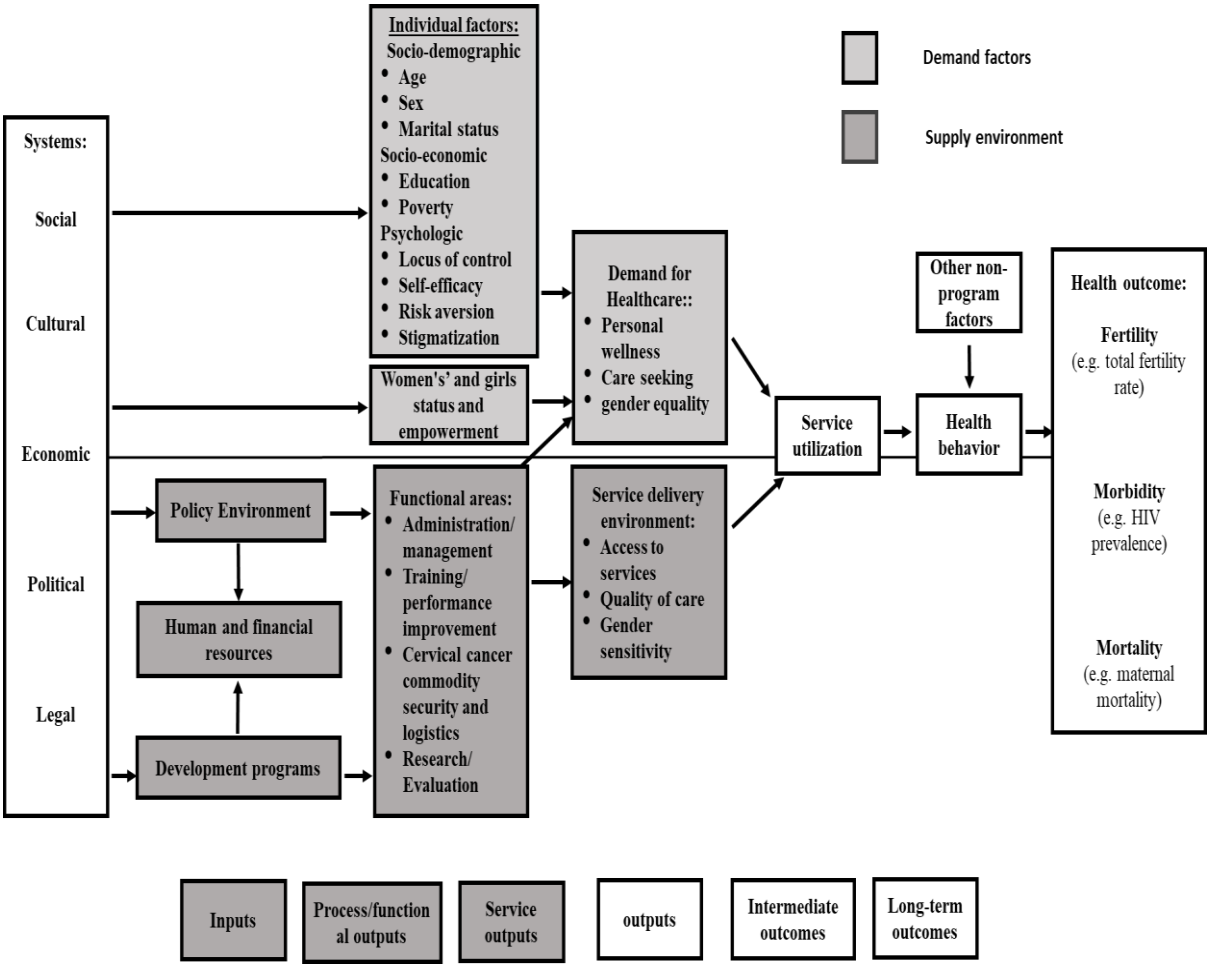

Figure 2: Conceptual framework in reproductive health programme(49)

3.4 Limitations of the study

Literature from other countries that have a context comparable to that of Liberia is being used because there are not many studies on the research subject being investigated in Liberia. This research will concentrate on those factors that directly impact accessing CCS, even though CCS is entangled with a wide variety of other aspects of society. Another restriction of the study is that findings are based on literature reviews of previous research, which is also a constraint of the study.

Chapter 4: Study results

There are many different levels at which health systems and populations interface, and this chapter utilizes a conceptual framework to explain how these interactions affect access to CCS in Liberia. It investigates the factors influencing access to CCS among women of reproductive age in Liberian. As stated earlier, the framework discussed in Chapter 3 will be employed to analyze the factors discussed in this work. The adopted framework will therefore be utilized to establish the connection of CCS to the systematic parameters: social, cultural, economic, political, and legal. Hence, factors such as age, sex, marital status, education, and others, as embedded in the conceptual framework, will be considered to determine their positive and negative contributions to accessing CCS, with the accrued results endorsed for their applicability to CCS in Liberia.

4.1 Demand factors

4.1.1 Individual factors

4.1.1.1 Sociodemographic factors

Age/sex/marital status

This paper analyzed previous studies on age, sex, and marital status to determine how each factor contributes to CC and potentially to CCS. In Liberia, 75% of the population is under 35(28). 1.47 million women in Liberia are at least 15 years old. It is estimated that roughly 4.3% of these women ages 15-44 are affected with the HPV-16/18 virus at any given moment and are at risk of developing CC(50). Adolescents and young adults are more likely to contract sexually transmitted diseases (STIs) because of multiple sexual partners, early marriage, in which they are not allowed to make their own decisions, and polygamy marriage, in which women are forced to bear children in order to remain in their husband's household. This high-risk sexual behavior these individuals engage in can also lead to CC in the long run(20,28). It is possible that gender norms, one's standing in society, and economic power dynamics all play a part in whether or not a person will engage in early sexual behavior or even be able to negotiate safe sexual behavior(51). In developing countries, risk factors for CC include early age at the first sexual encounter and early pregnancy(33). Post-war Liberia is experiencing increasing early-age sexual intercourse activity and multiple sexual partners practised by both males and females, with reports indicating that among sexually experienced adolescents in Liberia, 34% had had sex for the first time at ages ≤ 14, whilst more than a quarter had never used condoms(52). Unprotected sex at an early age is a crucial factor when considering exposure to HPV infection and pregnancy(53), especially with uncircumcised males with a high number of sexual partners(54).

It is fair to anticipate that age will be a significant factor in accessing CCS in underdeveloped nations. It has been proved in several research studies, with findings indicating that women in their late teens or twenties are the least likely to have a Pap test(55,56). In Liberia, this is the most likely scenario.

A woman's marital status is another important factor in accessing CCS. Spousal encouragements connected favorably to a wife accessing CCS. For example, it was shown that women whose husbands gave them approval and a social push were more likely to obtain Pap exams(57). Some married men have poor knowledge of cervical cancer but are willing to

support CCS conditional on their pre-information and consent(58). Other research indicated that some wives did not have CCS owing to their spouse's lack of participation and permission. According to studies, a woman who is not married cannot access CCS since she needs the approval of her husband or fiancé to do so(59,60). On the other hand, lack of spouse support was one factor that influenced access to CCS; many married women were afraid to access CCS because their husbands were not pleased with the idea of a male health practitioner having access to their private parts(46,60). These issues are likely also to play a role in Liberia.

4.1.1.2 Socioeconomic factors

Education/poverty

Socioeconomic status is comprised of two factors: education level and financial status. The average person's level of education rises along with household affluence. According to research done in Ethiopia, mothers with a secondary and college education were three and six times more acknowledgeable than mothers without a formal education about CCS(61). In Liberia, 33 percent of women in the top quintile in terms of wealth have completed at least senior high school. Only 2% of women in the bottom quintile have a senior high school diploma or higher(20). One reason women in Liberia have limited access to information about CC and its treatment choices is the country's low level of education. The educational attainment of Liberian women (age 15-49) is provided in Table 2. In all age groups, less than 20% completed high school and no more than 10% attained higher education level. However, it is clearly shown that younger women 15-34 are more educated at almost all levels of schooling than older ones. Even the median years completed are higher for the younger women.

Moreover, even those attending schools do not have adequate knowledge of CCS. This lack of access can be attributed to Liberian schools' low emphasis on health literacy. Sexual and reproductive health focusing on cancer and related issues are virtually nonexistent in the Liberian national elementary and high school curriculum (62).

Table 2: Educational attainment of women in Liberia(20)

Age	Highest Level of Schooling									Median years completed	Number of women
	NE	SE	CE	SJE	CJH	SSH	CSH	Higher	Total		
15-19	10.4	34.8	5.3	4.2	29.3	2.9	12.2	0.8	100.0	5.3	1,657
20-24	14.8	18.9	3.0	4.1	18.4	14.5	19.8	6.6	100.0	6.4	1,506
25-29	24.5	15.4	3.1	2.8	13.0	21.7	10.3	9.3	100.0	6.1	1,375
30-34	34.7	14.2	2.7	1.7	11.2	18.0	7.4	10.1	100.0	5.2	1.112
35-39	51.1	18.3	3.8	2.6	5.0	9.2	4.0	6.0	100.0	0	1.020
40-44	57.2	13.8	2.3	1.9	8.0	9.0	2.8	4.9	100.0	0	769
45-49	63.1	17.9	2.3	0.2	5.5	5.2	2.0	3.7	100.0	0	626

NE = No education, SE = Some elementary, CE = Completed elementary, SJE = Some junior high, CJH = Completed junior high2, SSH = Some senior high, CSH = Completed senior high.

Source: Liberia Institute of Statistics and Geo-Information Services (LISGIS), Ministry of Health [Liberia], and ICF. 2021. Liberia Demographic and Health Survey 2019-20. Monrovia, Liberia, and Rockville, Maryland, USA: Liberia Institute of Statistics and Geo-Information Services (LISGIS), Ministry of Health, and ICF.

The inability to access knowledge on CC from other sources, such as the internet, is also a significant cause of the lack of knowledge on CC among the Liberian population. The lowest one-fifth income bracket spends 48% of their monthly earnings on purchasing 1 GB of data whilst the highest one-fifth of income earners forfeit 8% of their monthly income for the same access, more than the UN's 2% threshold(63). Moreover, even the mass media is not a significant way of accessing information among Liberian women. For example, around 60-70% of women in all age groups do not use the major mass media (Table 3). Even if women were accessing the mass media, it is unlikely that broader coverage would be given to CCS, given the generally low publicity and awareness observed in Liberia. Thus, access to CCS knowledge from these sources is almost nonexistent for women in the lower socioeconomic bracket due to its substantial financial burden.

Table 3: Exposure to mass media: Women Percentage of women aged 15-49 who are exposed to specific media weekly, according to background characteristics(20)

Age	Reads a newspaper at least once a week	Watches television at least once a week	Listens to the radio at least once a week	Accesses all three media at least once a week	Accesses none of the three media at least once a week
15-19	1.9	14.6	20.1	0.4	72.0
20-24	2.1	18.7	26.8	0.5	65.2
25-29	1.5	20.6	30.8	0.7	62.0
30-34	2.5	17.0	25.9	1.6	66.8
35-39	1.7	18.4	30.2	1.0	65.5
40-44	1.7	12.3	30.4	1.4	66.3
45-49	3.6	11.3	23.4	3.0	71.8

Sources: Liberia Institute of Statistics and Geo-Information Services (LISGIS), Ministry of Health [Liberia], and ICF. 2021. Liberia Demographic and Health Survey 2019-20. Monrovia, Liberia, and Rockville, Maryland, USA: Liberia Institute of Statistics and Geo-Information Services (LISGIS), Ministry of Health, and ICF.

Like Ebola, this lack of information occasions a prevalent misconception that CC is brought on by sources beyond medical science models, such as witchcraft or sorcery, and can only be treated by traditional healers, especially among women with low socioeconomic status (57,58,59). A woman with a low social and economic position is less likely to utilize health facilities for CC prevention(64). However, according to one qualitative study, financial constraints are the most significant barrier to getting diagnostic and treatment services(55). Currently, most cancer care in Liberia is provided by the private sector, making it challenging for women from lower socioeconomic quintiles and those who live in remote areas to receive high-quality healthcare(65).

According to a study, the connection between women's education and their participation in screenings was five times higher among moms with secondary education than among mothers

without a formal education. CCS knowledge was seven times more advanced among women with a degree or certification than those without formal education(66). Seven studies found that knowledge about CC increased the number of people screened for the disease by approximately five times(67).

In any case, women are more likely to go to the doctor for CC prevention services if they know more about the disease. This observation means that women must know about CC causes, risk factors, signs, and symptoms to take preventive measures. Therefore, the level of education coupled with the financial status of Liberian women is one factor that contributes to women's restricted access to knowledge regarding CCS and treatment options available for the disease.

4.1.1.3 Psychological factors

Locus of control/self-efficacy/risk aversion/stigma

When it comes to the gynecological issue, a person's beliefs may make it hard for them to get help from health personnel. Locus of control (perceived vulnerability/invulnerability), self-efficacy, risk aversion, and stigmatization may all be essential hurdles to preventive healthcare and treatment-seeking behaviors. However, there is a lack of studies on psychological barriers to obtaining CCS among Liberian women with and without CC. Locus of control refers to the degree to which people believe they influence life occurrences(68). There are two types of locus of control: internal locus of control, in which people believe that if they work hard enough, they will succeed and that failure is due to a lack of talent or drive, and external locus of control, in which people believe that what happens to them is determined by their fate, chance, opportunity, or actions(68). There has been some evidence of a link between locus of control and CCS uptake. Given the difficulties associated with cervical cancer treatment, locus of control is critical to early seeking treatment behaviors and treatment uptake(69). One study conducted in Indonesia(68) showed that respondents with an internal locus of control believed that hard work [including early detection of cervical cancer using the inspection visual of acetic acid (IVA) technique] was needed to avoid CC. This observation suggests that people with an internal locus of control would report for early screening if they knew about the disease. However, internal locus did not translate into higher attendance for CCS, most likely due to insufficient knowledge of CC and CCS(68). Hence knowledge of the CCS is more critical as it influences people's beliefs.

Another term for the psychological effects of CCS adoption is self-efficacy. This expression refers to a person's belief in their ability to succeed in a specific situation. A positive attitude impacted the intention to screen and participate in screening programs(70). However, societal factors may significantly impact the degree of self-efficacy. For example, social Islamic humility and devotion to the Islamic religion, for example, diminished screening intention and self-efficacy(70). Islam is the second largest religion practiced in Liberia. It is assumed that there could be a substantial level of low uptake of CCS among Muslim women when the service is eventually provided nationally. This scenario could most likely occur in intensely conservative Christian communities in Liberia.

A third major psychological factor influencing the uptake of CCS is risk aversion. Although follow-up procedures (colposcopy, cryotherapy, or LEEP) of initial positive pap test are usually without serious side effects, complications include dark discharge, pain, bleeding, cramping, nerve damage, swelling, scarring, and skin infection may occur after these procedures(71). Moreover, it was reported that whilst the Pap smear had false positive and negative rates of

40.2% and 37.4%, the false positive and negative rates at VIA were 21.2% and 4.6%, respectively. A false positive leads to unnecessary follow-ups, leading to complications that could ultimately increase the risk of long-term impacts on fertility and pregnancy, particularly in younger women(72). Hence, women are less likely to use CCS because they worry about those side effects, whether they have already experienced them or are just anticipating them. Several women in Kenya and Nigeria admitted to being afraid of their cervixes being screened and possibly having a positive result(73,74).

Societal stigmatization is a significant psychological barrier to accessing CCS factors since it is associated with humiliation for women(46). Women's attitudes and personal beliefs influence CCS access and societal stigmatization of CC, as women may avoid CCS due to potential adverse effects, shame, and possible violation of privacy or due to their partners' opinions. For instance, it was reported that the link between pelvic examination and treatments of diseases acquired from unsafe sexual practices might cast a negative light on a woman undergoing CCS(75). Avoiding the impression of being under demonic torment or practicing unhealthy behavior, including having an unhygienic lifestyle or multiple sex partners, may deter women from attending CCS. Women have been ostracized after revealing that they were CC positive, even internally, within their social networking groups(46). These beliefs and actions have undoubtedly hindered the uptake of CCS in SSA.

4.1.2 Women and girls' status and empowerment

Women's empowerment may be characterized as boosting women's self-esteem, ability to make their own decisions, and right to influence societal change for themselves and others(76), and it is closely associated with the number of decisions in which she has the final say, either with her husband or herself. This statement reflects the degree of decision-making and control a woman can exercise in her life and the environment that impacts her. A summary of women empowerment statistics is provided in Table 4. Fewer women were employed (a difference of 21%), and more were likely to be unpaid (2 times more) than male. 11% of women said that their spouses are the primary decision-makers of their earnings, and 12% said their husbands are the primary decision-makers of their health care(20). More men claim ownership of assets in all aspects than women do. More surprising was that a considerable number of women (25%) agree that a husband is justified in beating his wife for reasons such as burning food, arguing with him, or refusing sex with him(20).

In this patriarchal country, men control most decision-making power, resulting in a high morbidity and mortality rate. Female autonomy over reproductive health issues is severely limited in Liberia. The empowerment of women is an essential component of CCS. Women who are working, whether for cash or not for cash, have a greater likelihood of participating in decisions about their health compared to women who are not employed(20). A study of women's empowerment in an HPV self-sampling social entrepreneurship program in Peru(77) found significant improvements in all aspects of the study, including a 100% increase in social contacts, an 86% increase in unaccompanied visits to a healthcare provider, 100% confidence in discussing reproductive topics, and a 35% improvement (postintervention) in the ability to make household financial decisions from 57% (preintervention).

Moreover, empowering women to take charge of their lives may be crucial for those who confront the issues mentioned above. Hence, a novel breakthrough allows women to harvest their cervical cells for testing, removing obstacles and reaching women who would not otherwise have access to screening, despite concerns about the risks of self-sampling, such as

self-injury, home-based self-sampling enhanced cervical screening attendance among never-screened and under-screened indigenous women in New Zealand(78). Self-sampling creates a sense of empowerment and participation in one's health that is difficult to achieve in traditional settings and provides increased access to cervical screening for women who do not participate in regular screening, serving as a socially and economically viable choice.

Table 4: Liberian women empowerment statistics(20,79)

Description	Male	Female
Employment		
Married women's and men's employment	97	76
Likelihood of being unpaid	17	34
Control over spouse earnings		
Earnings controlled by spouse	15	11
Earnings controlled by self	28	26
Joint control of earnings	57	63
Ownership of assets		
Own house (alone or jointly)	31	24
Own land (alone or jointly)	28	14
Own and use a bank account	21	12
Own mobile phone	61	47
Women's participation in decision making		
Woman's healthcare	-	70
Major household purchases	-	80
Visits to family or relatives	-	80
Participate in all three decisions	-	69
Participate in none of these decisions	-	12
Attitudes toward wife beating (agree that a husband is justified in beating his wife for specific reasons)		
Burns the food	10	5
Argues with him	29	19
Goes out without	23	13
Neglects the children	27	15
Refuses sexual intercourse	10	5
Any of these reasons	37	25
Attitudes toward negotiating safer sexual relations with husbands		
Woman justified in refusing sex with her husband because of infidelity	73	72
Woman asking husband to use a condom if he has STI	86	76

Capable of refusing to have sex with husband if they do not want to have sex	-	82
Asking her husband to use a condom	-	59

Sources: https://dhsprogram.com/publications/publication-FR362-DHS-Final-Reports.cfm
https://countrymeters.info/en/Liberia

4.1.3 Demand for healthcare

Personal wellness/healthcare seeking/gender equity

The general need for healthcare may influence CCS adoption. Women who are conscious about personal well-being may seek better healthcare services and information. However, this is dependent on society's level of gender parity. Freedom in making healthcare decisions is crucial for women who use CCS services. For example, women who can make autonomous healthcare decisions and those who practice shared decision-making are more likely to receive CCS(80).

In contrast, multiparous and rural-dwelling women, and those in religious affiliations with a high level of gender inequality, are less likely to receive cervical cancer screening(80). These women prefer informal healers for cultural competency of care, gender-induced affordability, avoidance of social shame and labeling, and coping with the burden of cultural expectations, among others(81). On the other hand, men prefer formal care because of the convenience of access, the quality of treatment, and the expected outcome of therapy(81). It has already been stated above that gender disparities and their accompanying stigmatization contributes to women's poor access to CC health outcomes, and stigmatization by community members influences access to CCS. As a result, gender equity, at least in health decisions, can enhance women's attendance at CCS, particularly in patriarchal nations like Liberia.

4.2 Supply environment

4.2.1 Policy environment

Liberia's government is committed to health promotion as a signatory to the African Region's 2013 Health Promotion Strategy. As a result, significant progress has been made in the improvement of the health of its citizens. The National Policy and strategic plan for health promotion (NPHPSP) 2016-2021 was developed to ensure that health is a fundamental human right that should be provided to everyone, including availability, accessibility, acceptability, and quality(21). Due to the significance of cancer due to its increasing incidence, a specific cancer policy [the National Cancer Policy for Liberia (NCPL)] was validated by the Ministry of Health (MOH) and its partners in 2018(40). The main objective of this policy is to strengthen the country's cancer prevention and control capacity by investing in cancer awareness, human resources, infrastructure, surveillance, and cancer research to expand effective cancer screening, diagnosis, treatment, and care services(65).

The MOH and its partners are responsible for this policy's successful administration and execution. The National Cancer Control Committee (NCCC) and the National Cancer Control Program (NCCP) are to be created to ensure that policies are implemented consistently and effectively(65). It will oversee the implementation of the National Cancer Control Policy

through the NCCP. The committee functions as a management team directed by a coordinator, the MOH, or their delegate.

Representatives from the Ministry of Health and other relevant official institutions, the commercial sector, communities, relevant UN agencies, academic institutions, oncology and surveillance, registrars' groups, and the country's best hospitals will make up the committee. Furthermore, the committee will organize a technical working group on breast and cervical cancer. This working group will have several functions, including outlining national objectives for early detection and awareness raising and suggesting solutions to remove previously identified hurdles(65).

Although there are no certified cancer preventive health workers, the NCPL recommends the development of a training guide for community health workers who will raise awareness and report suspicious cancer cases to suitable facilities. Cancer policy implementation relies strongly on the availability of trained human resources at all levels. As a result, the policy urges primary health care providers to be educated on CC basics such as its age of start, symptoms, risk factors, etiology, HPV vaccinations, disease course, and choices for diagnosis and treatment, as well as how to do cryotherapy and other relevant operations. Furthermore, the policy calls for clinicians to be trained in all elements of CC etiology and pathophysiology to provide screening and treatment at all phases, including VIA and HPV testing, biopsy, and other non-invasive lesion diagnostics.

The most significant barrier to implementing cancer control strategies in Liberia and health promotion is a lack of funds(21). The government's budget for health promotion initiatives is insufficient to support logistics and operations. Although there is no particular plan for cancer commodity security in Liberia, it is envisaged that a policy on CC commodity security will be implemented soon as CC takes center stage in Liberian health conditions. However, the central government has implemented the Reproductive Health Commodity Security Strategy (RHCSS). This plan intends to ensure the continuous availability of reproductive health products at all healthcare delivery and commodities distribution sites.

Regarding research, the strategy encourages the creation of cancer monitoring systems, especially a population-based cancer registry(65). The data collection and usage will be critical in improving local research capability and enabling clinical data to guide strategies to address the country's cancer burden. The cancer registry data will be linked to the MOH's Health Information System (HIS). Furthermore, the policy suggests regular assessment of the progress and impact of anti-cancer therapies to guarantee that the planned interventions are performed within the time limitations defined and within the standard of care proposed by this policy. Interim and final evaluation of policy implementation shall be carried out in line with the National Health Development Plan(65).

4.2.2 Human and financial resources

Being responsible for managing health and related issues in Liberia, MOHSW launched steps to increase healthcare delivery in Liberia. These actions aligned with the national development priorities - create and implement a National Health Policy and Plan (NHP&P) based on evidence to unite the vision and direction for reforming Liberia's health system after the conflict(80). The health system is hierarchical at the administrative or management levels based on policies, plans, and the gathering and distribution of resources. These are done at the national level and the decentralized system for providing services at the county, district, and

neighborhood levels. In conjunction with MOH, WHO has reacted to the national cancer strategy validated in 2018 with its technical knowledge by designing a cost-effective, comprehensive training program to provide screening services in two centers in two distinct catchment regions. WHO offered funding and technical assistance to the MOH to train national trainers and service providers in cervical cancer screening(17).

However, resources to lay the foundation for screening are required to save lives by accelerating the elimination of CC as a public health problem globally by 2030. WHO provided funds to the MOH to construct a three-phase pilot project that trained national trainers and service providers in CCS and established pilot centers in two of Liberia's five geographical zones(17). Although the amount spent in Liberia on CC screening and prevention from all sources in 2020 is unknown, it was estimated that a total of $43.4 million would have been spent for the same purpose in LICs and LMICs(81). The budget allocation to the health sector dropped to 11.3% for 2022(82) from an average of 14% for the past five fiscal years (2016-2021)(30). No specific budget was allocated from GOL for CCS; even cancer treatments are partly but significantly funded by NGOs, making it hard for women in the lowest wealth quintile or living in remote areas to get adequate cancer care(83).

Although low health sector budget allotment affects growth in its human resource capacity, it has not stopped growth entirely, as the number of people employed in the healthcare industry rose from 1,396 in 1998 to 11,430 in 2016. The number of hospitals and medical clinics rose from 618 in 2010 to 770 in 2017. In 2016, the nation contained 137 pharmacies, 35 hospitals, and 618 health clinics and health centers (27,84).

Amidst the low budget allocation described in the preceding paragraphs, the fund provided by WHO was to train healthcare workers in screening and treatment techniques for cervical cancer, its equipment, and its safe usage using an integrated health system-based approach. Due to the limited budget, 20 medical, nursing, and paramedical staff received training(17). After this, training on data collection, monitoring, and assessment took place without adding more work for the medical staff. In order to support the scaling up in the future, two national senior consultants received training to become trainers for other health workers, especially CHWs. As a component of the continuum of care, training was provided to a total of twelve community health assistants so that they would be able to deliver the essential sensitization and awareness to empower women(17,85). Inadequate human resources and a shortage of competent employees for CC are two of the many obstacles that prevent women from gaining access to CCS. Hence, four clinical laboratory technicians received task-shifting training over six months from volunteers from the American Society of Clinical Pathology to prepare for the pathology laboratory's launch(86).

The WHO-funded pilot project described above has started to gain dividends by screening women, with seven women diagnosed with CC, three with precancerous lesions who have received treatment, and three detected with stage IV cancer and referred to a specialist hospital for treatment. However, national screening systems for secondary prevention have yet to be created, resulting in missing cases and late discovery. Furthermore, shortages in radiotherapy, professionals, especially surgeons, and commodity supplies have harmed management and supportive care(17). The last aspect, commodity supply, is as significant as the rest. Several continuing health promotion programs could provide the initial and fairly efficient commodity security and logistics systems for CCS at its nascent stage when it is rolled out nationally. However, most continuing health promotion programs are project-based and externally

sponsored(40), implying that they will not be sustained when the project expires. As a result, civil society and non-governmental organizations (NGOs) are being called upon to promote awareness and organize financial and political support for projects which could strengthen the commodity security and logistics of the health systems in Liberia.

More importantly, Task 4 of the USAID Deliver Project began on September 30, 2010(87). This project strengthens logistics management information systems, streamlines distribution systems, identifies financial resources for delivery, and enhances supply chain operations for essential healthcare goods. As a result, these existing facilities and supply chain operations could act as a springboard for CCS commodity security and logistics in the short term until a more robust system is set up for CCS service as it becomes more comprehensive and widely available.

Even with introducing a national screening system for secondary prevention with adequate funding, management, and commodity security and logistics, altering women's behavior will be critical to increasing CCS utilization. However, behavior modification implementation depends on the commitment and engagement of health professionals, particularly at the community level. As a result, CHWs have been promoted to reduce cervical cancer's incidence and death rate globally, particularly in places where health workers are scarce(88), such as Liberia. CHWs are known to assist with or execute screening and follow-up after screening. Cervical screening information should be easy to access, relevant, intelligible, detailed, client-centered, phase-specific, and provided at several levels. A solid communication plan should reflect health providers' screening skills and communication competence(89). Therefore, a well-informed CHW can influence women's behavior and enhance CCS use in Liberia.

For the body of trained CC-related health workers to function correctly, it will require much research to be carried out to identify the potential problems and possible and applicable solutions. The lack of research related to CC and related activities, including need assessment and others, hampers Liberia's fight against the disease. Furthermore, cancer incidence statistics for Liberia were highly imprecise since they are not based on a population-based cancer registry(90). For the same reason, this is true for other cancer research aspects. Although the Liberian National Cancer Registry was revived during the conflict, it had various obstacles in reconstructing its service due to underpaid and nominal employees and a lack of in-country pathology(86). It obtained a furnished structure, office equipment, and a pathology/FNA laboratory from WHO-provided funding in the last few years. The data obtained from the registry will be used to enhance the fight against CC.

4.2.3 Development programs

As seen in the previous two subsections, the Liberian health policy prescribed more development programs relative to CC and CCS, and the significance of these programs was introduced. However, in this section, more details are given about the programs initiated by the government and its partners relative to the training of health workers, commodity security and logistics, and awareness and services for CC and CCS.

Liberia and its international partners had a tremendous and unique chance to end CC when the WHO Global Strategy to Accelerate the Elimination of CC was published in November 2020. An essential part of the approach is screening and appropriate treatment. The number of new cases of the disease and deaths that result from it could decrease by 40% in the year 2050 if all three strategies are successfully implemented(17,83). LCS is an organization made up of

volunteer members who have been working for a long time to increase awareness of all types of cancer and mobilize more significant resources for cancer treatment in the country(36).

There was a dearth of staff to give teaching and training sessions for primary prevention and screening programs. For example, community health worker training was advised to increase coverage. As a result, a variety of training interventions were put in place. Four chemistry laboratory (pathology) technicians and two pathologists were trained in preventative and diagnostic services. At the same time, more than 20 physicians were sent overseas for cancer-related training in therapeutic services, and one obstetric gynecologist is pursuing a fellowship in gynecologic oncology (surgical training)(86). Fourteen nurses were trained. After screening 978 patients over two years and completing VIAs on all of them, the post-test evaluation revealed an improvement in knowledge about HPV, preventive and treatment methods, and increased abilities in speculum examination, visual inspection of the cervix, and cryotherapy treatment(91).

One of the most problematic areas in Liberian healthcare initiatives is supply chain management difficulties, including inadequate warehousing and inventory and a lack of information exchange, which continue to contribute to material shortages and medicine quality uncertainty(92). In 2017, funding provided by USAID was used to design an intervention in Liberia to strengthen the Collaborative Support for Health (CSH) Program(93). One of the intervention's primary objectives was to support the national Health Information System (HIS) implementation and accelerate improvements in health and logistics information systems. Liberia, as previously stated, lacks a functional CCS commodity security and logistical system. However, through initiatives such as RHCSS, USAID Deliver Project Task 4, and the CSH intervention, Liberia's healthcare system is projected to offer at least the first security of products and logistical services required when CCS is implemented across the country. Furthermore, the USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) is working with the Liberian National Drug Service (NDS)/Central Medical Store (CMS) to increase the availability and accessibility of life-saving pharmaceuticals(92). The latter program's primary focus is storage and distribution, such as centralizing warehouses.

In 2009, due to a campaign to raise awareness about cervical cancer, Liberia's capital city's primary teaching hospital, JFKMC, opened an outpatient chemotherapy center that mainly provided palliative care. This awareness allowed women with similar symptoms and diagnoses to meet and talk about their experiences with one another, their families, and other women who lived in their villages(86). Several new non-government organizations were started to raise awareness about cancer, but diagnostic and treatment programs could not keep up with the growing number of awareness activities(86). The pilot project was to provide high-quality, all-encompassing services for the early detection and treatment of precancerous lesions(17). In February 2020, Public Health Initiative Liberia (PHIL) and an NGO launched the "See and Treat" cervical cancer mobile outreach program using Visual Inspection with Acetic Acid (VIA) for screening and a C3 Coagulation device for treatment of precancerous cervical cancer in a single day visit(83). Community mobilization is another effective tool that LCS volunteers and providers use. This action is a way to go against harmful social norms(36).

4.2.4 Service delivery environment

Access to service/quality of care/gender sensitivity

The service delivery environment focuses on healthcare accessibility, care quality, and gender sensitivity. According to estimates, 60% of Liberians reside in rural regions, and 29% must walk an hour (5 kilometers) to the nearest medical facility, making accessing primary healthcare challenging (20). As a result, CCS is out of the question for women in this demographic; thus, many women in Liberia have expressed discontent with reasons such as a financial barrier and distance to a health facility that prevent them from getting care(20). This scenario is especially true for rural-dwelling women. Although some services are more available to individuals with greater levels of education and money(20), those with the financial resources are frequently flown abroad for crucial cancer-related therapies.

Because of inadequately equipped and untrained health personnel and a lack of functional systems and infrastructures, health facilities in rural and urban regions now deliver poor-quality treatment. Furthermore, there has been an avalanche of patient complaints about staff misconduct and poor service quality, with repeatedly expressed concerns about staff belligerence, antagonism, and disinterest toward patients at various critical Liberian health facilities(94).

Policy, human/financial resources, and development program functional areas all impact the service delivery environment, especially at the community health level, which has been discussed as critical for access to CCS in this work. Several system barriers hamper the expansion of community health interventions due to low governance, shortage of community health workforce (human resources), and inferior service quality, including monitoring and evaluation and surveillance systems(95).

Although women and men should have equal access to excellent health care, women in many LMICs, including Liberia, have less access to adequate health care services and primary health information than men(96). Women in Liberia have less access to education, health care, property, and justice than men. This disparity is partly due to inadequate investment in women's health care and education, limited access to services, and legal and cultural constraints that limit women's decisions(97). This difference is particularly pronounced in rural areas or among disadvantaged groups, underscoring the link between gender bias and other types of discrimination in sexual and reproductive health and rights, such as CC(96).

4.3 Best practice for addressing cervical cancer screening in a setting similar to Liberia

4.3.1 The reason why countries are chosen for best practices in similar situations

HPV screening is one of the greatest approaches to the early identification of cancer. Early cancer treatment is more likely to effectively cure it when discovered earlier (96). Even though there are not much good data on CCS in most SSA, some countries have been able to reduce it by using practical and evidence-based methods. Ethiopia and Rwanda stand out among several countries in the SSA in cancer prevention.

4.3.2 Findings in selected countries

4.3.2.1 Rwanda

In 2011, a CCS pilot project was carried out to provide quality care for Rwandan women in the preventive and early treatment program(98). This project utilized and implemented the findings of existing cervical screening programs to develop the type of screening method used and the education provided to health care providers and women. The team also provided CCS training

for healthcare providers(98). During the training, doctors and nurses learned how to use Visual inspection with acetic acid (VIA) to check for cancer in the cervix. The team screened women who had never been checked for CC, did not know about it, or could not pay for medical care. The team goes to some villages where women do not have access to medical care. Nurses are essential members of interprofessional teams as first responders and advocates for patients in many developing countries(98). These activities were done with the total involvement of the entire community, including community and religious leaders and the men in those communities. As a result of the unique approaches taken by a nurse who had lived in Rwanda and the United States, this pilot project was a success. It paved the way for future partnerships because it was a crucial player in clinic planning, informational strategy formulation, and communication with African and American partners(98).

Although there is insufficient evidence on the adoption or efficiency of the national CCS program(99), 50% of health facilities now have trained healthcare professionals and operational women's CCS clinics(100), and all healthcare facilities are expected to be covered by 2023. Furthermore, in the first year of the screen-and-treat project, which started in 2021, the Huye district in the Southern Province screened 13,377 women out of 63,953 eligible(99). Going by these results, it is inevitable that large cities such as Kigali would screen more eligible women.

Rwanda capitalized on international assistance, collaboration, and solid political lobbying. Interviews with key informants and a review of peer-reviewed literature and policy briefs formed the basis for a comparative policy analysis that was carried out that will make CCS a success(101) by having 70% of women screened by the age of 35. Furthermore, the Rwanda Biomedical Center at the Ministry of Health (RBC/MOH) oversees the creation of national cancer-specific guidelines through a collaborative and interdisciplinary group of healthcare specialists(100). Moreover, there are currently various advocacy organizations whose primary activity has been raising public awareness of cancer, promoting early detection programs, and providing mental health services. Although screening is also expensive (an HPV test costs $25, with the Rwandan government and Unitaid paying the cost), plans are in the works to reduce the cost to $3 per person per year through funding from the partnership. The country also provides chemotherapy and radiation for CC, and a fellowship program educates gynecologists on how to do complex cancer-related surgeries(99).

4.3.2.2 Ethiopia

In 2009 the first pilot project for CC prevention and control was launched in Ethiopia by Pathfinder in collaboration with Ethiopia's Ministry of Health, Stanford University's Program for International Reproductive Education and Services, and with support from the Centers for Disease Control and Prevention in the United States(102,103). The five-year project focused on HIV+ women; they are most likely to get CC because their immune systems cannot fight the HPV, which causes CC. The project, the Addis Tesfa (New Hope)-implemented WHO is a "single-visit approach" (SVA), which combines a visual inspection of the cervix with a vinegar wash, which shows up abnormal cells, and same-day treatment of precancerous lesions with cryotherapy or referral of women with advanced lesions for the Loop Electrosurgical Excision Procedure (LEEP). Between August 2010 and March 2014, thirty-two public hospitals were able to screen 33,000 eligible women for CC using a combination of public education and training of health workers(102). Within the same period, the project counseled 16,632 women

with HIV about the single-visit approach, and nearly all of these women (99.4%) agreed to be screened with VIA, and of those screened, 10.0% had positive VIA test results(104). The project laid the groundwork for the Cancer Prevention and Control Plan and demonstrated that VIA is a feasible and appropriate screening method for the Ethiopian context(104), with 93% of those treated with cryotherapy or LEEP having precancerous lesions(102). This feat was accomplished using a combination of public education and training of health workers; in total, 2,883 women who tested positive for precancerous lesions underwent cryotherapy or LEEP.

Ethiopia is a knowledge transfer and training hub for successful and promising CC practice, and the Ethiopian central government has pushed CC(102) prevention and developed a framework for large-scale screening(103). Before gaining this status, there had been no concerted efforts to establish well-coordinated national policy guidance for CC and related activities. However, from the 2009 pilot project, policy change came in 2015 when Ethiopia's federal government issued recommendations for preventing and controlling cervical cancer(105). Its primary goal is to give standard recommendations for cervical cancer prevention and control in healthcare delivery to healthcare professionals, implementing partners, and other stakeholders participating in cervical cancer prevention and control in Ethiopia.

These policies and guidelines include a "single-visit approach" (SVA) in the national strategy for reproductive health. CC prevention through SVA is now seen as an essential part of a complete package of health care for women that also includes sexual and reproductive health care.

As a show of strong political will and efforts, the then-first lady of Ethiopia, Roman Tesfaye Abneh, publicly championed CC prevention, garnering attention and funding for the cause and establishing a National Cancer Control Taskforce (103). Since 2015, the Ethiopian Ministry of Health has been expanding cervical cancer prevention and control efforts across the country, building on the success of the Addis Tesfa program(102–104). The initiative is now being carried out in ~250 public health institutions, but there are plans to increase that number to 800 facilities, which would equal one health center for each district(102,103).

The lessons learned from Ethiopia have been adapted to their situations and programs in the four countries (Burundi, Mozambique, Nigeria, and Tanzania)(102). In Mozambique, for example, the program serves sex workers at risk of developing cervical cancer. Task-sharing in Tanzania has included community health workers to address human resource shortages. 13 healthcare facilities screened 10,000 women in the four countries, and more than 500 were treated for precancerous lesions. These projects can provide valuable information on cervical cancer prevention in lower and middle-income countries.

Chapter 5: Discussion

5.1 Demand factors

Age and marital status of women are two of the most critical factors influencing CCS among women of reproductive age in Liberia. According to findings first sexual debut was associated with CC. Research shows that being young and engaging in risky sexual behaviors were the most critical determinants. Younger persons are significantly more likely than older persons to get infected with HPV and other STIs for various reasons. In young individuals, the possibility of sexual risk-taking activities such as having numerous partners and having unsafe oral, vaginal, or anal sex is significant, owing to the intense desire for sexual adventure or exploration. They are, however, more physiologically prone to skin/membrane tears and ruptures, which can contribute to STI acquisition. Even as that, they are the least likely to attend CCS as their access to the service depends on personal beliefs, friends and family opinions, marital and socioeconomic statuses, education level, and empowerment, among others.

As all these demand factors are interdependent and interrelated, they affect each other. For instance, psychological factors may cause a person to exhibit certain attitudes and health behaviors toward CCS services. Negative health behaviors can impact mental faculties, attitudes, and views about HPV infection and CCS services. However, knowledge and awareness of CCS is the most crucial factor in attending CCS service CC treatment-seeking inclinations. At every stage, knowledge influences the effect of all other HPV factors. Age, for example, may influence HPV infection acquisition; however, knowledge impacts not just HPV acquisition but also the CC preventive measures, including HPV vaccination and CCS. The knowledge and awareness of HPV infection and CCS services are critical in determining the occurrence of CC, compliance to preventive measures, risky sexual behavior avoidance, lower negative psychological factors, and positive health behaviors at any age, education level, or socioeconomic status.

Once CCS services become more widely available in Liberia, their uptake can be affected by several social demographic factors, including a person's age, sexual activity, and marital status, with age and sexual imprudence and indiscretion being the most significant risk factors for acquiring CC. In contrast, marital status/spousal attitude preponderates in determining access to CCS. Hence, given the high prevalence of infection with high- and low-risk HPV genotypes in SSA women and the early onset of coitus and sexual risk behavior, more cervical cancer screening is necessary for this category of women. In addition, effective initiatives must include the community, including males, in raising cervical cancer awareness and preventative behaviors. Although CCS underutilization in the youngest age groups may not present a significant public health risk as they are less likely to develop cervical cancer, it is vital to pay particular attention to them because most persons in this age category are sexually active.

5.2 Supply environment factors

The political context, personnel, financial resources, and development projects influence CCS in Liberia. There is no CCS-specific policy to ensure the service is available, accessible, inexpensive, and uniform. According to the findings, many health professionals are not trained to deliver CCS services, and trained personnel are not spread evenly across the country. Moreover, half of Liberia's 10,000 health professionals are non-physician or unskilled, with

half working in the country's capital, Monrovia. The high incidence of attrition, particularly in rural regions, is leading to a rise in morbidity and death. Because there is no revenue dedicated to the national budget for CCS initiatives, all programs in Liberia are supported through donor donations, resulting in a shortage of equipment and supplies and a lack of skilled health providers for screening facilities around the country. The findings show that in-service and other forms of training are required. Although the private sector owns 30% of healthcare facilities and most government-run health centers are significantly funded by NGOs, many women cannot afford and use these facilities due to exorbitant costs.

However, every facet (management, training and improvement, commodity security and logistics, behavior change communication, research and evaluation) of the many supply variables (policy environment, people and financial resources, and development programs) are interconnected and influences each other. They, in turn, impact the demand factors in some way. In Liberia, for example, there is a scarcity of skilled health staff specialized in CCS services. Even if robust policies and skilled staff are available, the existence of development programs aimed at executing such policies will improve the battle against CC. Furthermore, training CHWs to work directly with the targeted areas would necessitate significant political commitment from the national government and ongoing financing. As a result, it is necessary to make coordinated efforts at all levels to elicit favorable reactions from the many supply elements impacting CCS.

On the other hand, more CHWs will enhance CCS knowledgeability at the community level. When people become more knowledgeable through intense CCS education and awareness, demand will increase for CCS services which will then initiate more robust management and training of health workers at the community level and provision of improved CCS services, provided other supply factors such as political will and funding are available.

The availability of funding is crucial in the fight against CC. If the cost of CCS is dramatically decreased to make it affordable to impoverished women, they will most likely attend CCS with the necessary knowledge despite other difficulties.

Positive behavior changes for women and the entire community, including community leaders and other stakeholders, will be one of the most viable avenues to increasing CCS use in Liberia. Even amid a supportive infrastructure, women must be able to attend CCS without psychological barriers, as has been witnessed in practically every minority or extremely traditional or conservative community. This achievement is only possible if the stigma surrounding CCS is reduced.

5.3 Best practices in addressing cervical cancer screening in similar countries that may be applied in Liberia

Ethiopia and Rwanda have successfully addressed access to CCS among their citizens. A potential strategy to achieve this is bridging the gap between leaders and citizens. According to the findings of this study, Liberia has a local government in districts and counties, yet those local leaders do not prioritize CCS, and the policy is not yet validated. Research has shown that effective connection and communication between the government and citizens was a viable way for their citizens to access CCS in these countries. Adopting this approach in Liberia would be a feasible way of increasing CCS services in Liberia. Particularly policy and creating awareness. The government and its partners can communicate effectively by involving community and religious leaders and prominent citizens.

Health workers who are currently on the job could make a huge difference. It is intended that training health workers and public education could make a huge difference in access to CCS services, as is done in Ethiopia and Rwanda. This method can be integrated into Liberia because some health workers were already trained during the pilot project in Liberia. The government needs to train more health workers to distribute them in health facilities in the rural areas where most of the population in Liberia resides. The local government could significantly contribute to the initiative by utilizing the efforts of the CHAs who are already in assistance. Those already trained could be encouraged to take an assignment in rural areas or trained more health workers via salary and housing incentives. They could also contribute significantly by spreading awareness about available CCS services and the misconceptions about diseases in the communities. This action can be done by providing needed CCS facilities and staff to meet the increased demand.

Furthermore, the support of the local government could encourage Liberian men to serve as CHAs, providing primary CC education and services to Liberian men. Male involvement will give more men adequate knowledge to support their wives and partners accessing the CCS. This action could lead to the majority of Liberian women accessing CCS because it is one of the significant factors contributing to them not accessing CCS.

Ethiopia also targets CC prevention through SVA, which is now recognized as a vital component of a comprehensive package of women's health care, including sexual and reproductive health (SRH)care. This action would be accomplished in Liberia by including SVA as an essential component of the women's health care package, as CC is presently included in SRH care. An NGO that addressed the SVA called PHILL successfully implemented CCS programs in Liberia. The Liberian government can collaborate with this NGO to make this CCS a national initiative.

The MOH can copy information from Rwanda and Ethiopia about current cervical cancer programs to develop effective screening methods and provide education for health workers and female relatives to learn about CCS and the use of VIA for the cervix. Because it is simple to implement in Liberia, health personnel who will be taught can also apply the SVA approach to minimize CC incidences.

5.4 Thesis strengths and weaknesses

The study discussed some social, cultural, economic, political, and legal challenges women of reproductive age encounter while seeking CCS services and will face if complete national CCS coverage is created in Liberia. It presented data from a wide range of reputable and relevant sources and provided evidence-based practical interventions for accessing CCS. However, findings from similar nations were utilized due to a lack of literature in the Liberian study context. This situation limits the scope of this inquiry since there are significant cultural, economic, political, and legal variations between Liberians and other contexts impacting access to CCS. Difficulties hampered this approach in identifying evidence-based best practices from other countries that might be implemented in Liberia — many of those interventions did not apply to the Liberian setting. CCS data were more for older women than women in their late teens and early twenties.

Chapter 6: Conclusion and recommendation

6.1 Conclusion

MOH and its partners established the National Cancer Policy for Liberia (NCPL) with the primary goal of strengthening the nation's capacity for cancer prevention and control by investing in cancer awareness, human resources, infrastructure, surveillance, and cancer research to increase the availability of efficient cancer screening, diagnosis, treatment, and care services. However, Liberia has a dearth of oncologists and other relevant cancer-related health workers due to a lack of funding for sending doctors abroad to specialize in cancer treatment or for training staff locally. Moreover, as CCS programs have only recently been developed, no specific cancer hospitals exist in the country.

Women in their early twenties are the least likely to obtain a Pap test; hence age is an essential consideration in determining CCS in impoverished countries. Due to the low level of education in the nation, lack of research on the psychological obstacle Liberian women with and without CC face in obtaining CCS, and the stigmatization of women by society, which acts as a significant psychological barrier to accessing CCS factors, women in Liberia have limited access to information about CC and its treatment options.

It is difficult for socioeconomically disadvantaged women who have poor earnings or reside in remote areas to get screened for CC. Liberia's most significant obstacle to adopting health promotion and cancer control initiatives is a lack of funding relative to governmental support. Since Liberia now has access to non-traditional cancer treatment options, there is an urgent need for a national strategy to guide cancer planning and management in the country. This scenario is due to the lack of a systematic functional mechanism to quantify the burden of cancer in Liberia.

There is no consistency in the treatment of the condition and no legal enforcement due to cultural and religious views, a shortage of competent healthcare staff and resources, and a lack of policy. Due to ignorance, many community members incorrectly believed that all stages of cervical cancer result from an evil curse and associated it with witchcraft, contributing to the stigmatization of the condition. This observation highlights the necessity for a national cancer policy to guide cancer planning and management in the country, as there is no systematic and valuable approach to estimating the burden of cancer in Liberia.

Two of the numerous barriers preventing women from accessing CCS are a lack of human resources and a lack of qualified workers for CC, with the lack of the development of national screening systems for secondary prevention, leading to the loss of detection of CC cases and late discovery.

6.2 Recommendation

The following recommendations address the key obstacles impeding the effective and efficient operationalization of cervical cancer screening in Liberia.

6.2.1 Government support

- To ensure that the private sector or NGOs are not the sole funding source for CC therapies, the government should set aside a particular budget for CCS.

- To effectively execute CCS measures, policymakers should raise domestic financing and push for additional donor contributions. This action would offer funding to assist ongoing training for institutional and community health workers, ensuring that new information is applied correctly and without misunderstanding.
- The government should support the development of national secondary prevention screening programs to monitor late cases and missing instances, ensure that testing equipment is available at important CCS clinic locations at the district and county levels, and improve specimen transportation using efficient mobile transport services.
- Health authorities should support and encourage the implementation of quality assurance mechanisms and frequent review and monitoring to assess the quality and performance of CCS services in Liberia. This action will allow the public and commercial sectors to assess the efficacy of services, identify bottlenecks, and devise solutions to alleviate them.

6.2.2 Establishment of a cancer registry and commodity security and logistics

- The MOH should take action to improve Liberian access to CCS via the formulation and implementation of CC and CCS-specific policies and guidance, as well as promoting the development and maintenance of adequately managed cancer surveillance systems, notably a population-based cancer registry.
- Authority should strengthen already existing reproductive health commodity security and logistic facilities and services via the incorporation of more robust CCS commodity security and logistic services

6.2.3 Training of healthcare workers

- Healthcare professionals should receive training in cervical cancer screening and treatment techniques that cover safe equipment use. In particular, in deeply ingrained conservative cultures, a strong communication plan should reflect health providers' screening abilities and communication skills so that trained female healthcare workers will be better suited to work with targeted women as these women feel at ease and confident interacting with other women.
- To induce behavioral change in women to enroll in CCS, healthcare staff for the established national CCS programs and facilities should get efficient training in CCS awareness. The implementation of behavioral modification will be favorably impacted by the use of a range of training interventions because the effectiveness of such training depends on the dedication and engagement of health professionals, especially at the community level.

6.2.4 Education and Awareness

- There must be more outstanding education, financial empowerment, and academic support for impacted women and those at risk of developing cervical cancer. Substantial barriers to participation could be removed by addressing disparities in HPV-related knowledge, cultural prejudice, and opinions of provider collection on cervical cancer screening. Because of this awareness, women with comparable symptoms and diagnoses can connect and share their stories with their families and the other women in their villages.
- Programs should use community-based approaches to CC awareness, prevention, and testing to promote understanding of CC and raise awareness of a person's CC status.

These programs should involve easy access to cervical cancer resources and ongoing media and other social platforms/gathering awareness-raising campaigns (text messages, radio talk shows, CC prevention promoters at various churches and mosques, and CC health clubs at various schools).

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Appendix

Table 5: Keywords and expressions used to locate appropriate literature, with objectives. Search terms were combined using "AND" or "OR".

Literature	Search databases	Objective one	Objective two	Objective three	Objective four
Peer-review published articles	PubMed/MEDLINE, CINAHL, Scopus, Embase, and Google Scholar	HPV and CCS individual knowledge, prevention, belief, misconceptions, age, reproductive age, adolescents, prevalence, incidence, transmission, prevention	population perception, value and society, Women, Age, cervical cancer, cervical cancer screening, SDGs, Education, Socio-economic barriers, Gender, Socio-cultural norms	Institutions, Policy, organizations, communities, Married women, unmarried women, Health behavior, Financial/Human resources, health services	Liberia, Africa, Sub-Saharan Africa, West Africa, Low and Middle-Income Countries, and Developing Countries
Grey Literature	The World Bank, NGO Reports, USAID, WHO, UNICEF, UNFPA	Poverty, lack of follow-up, policies, laws, rights-based, integration monitoring, evaluation Interventions, and best practices improving CCS services uptake at individual, community, health system, and at national levels, CCS targets, coverage, challenges	Gender-sensitive, Barriers, Providers, Availability, accessibility, affordability, quality care	Stigma and discrimination, support/network group for cervical cancer screening, religious influences, families and communities interactions, male involvement	Liberia, Africa, Sub-Saharan Africa, West Africa, Low and Middle-Income Countries, and Developing Countries