Republic of Rwanda

Ministry of Health

Accelerated Plan for Elimination of Cervical Cancer in Rwanda

2024-2027

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Publication Details:

Publication date: February 2025

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Foreword

Cervical cancer is one of the few cancers that can be successfully prevented and is also curable if detected and treated early. However, cervical cancer is the second most common cancer among women in Rwanda, accounting for 13% of all cancer cases, and it is the leading cause of cancer-related deaths in women.

Almost all cases of cervical cancer are caused by infection with a high-risk oncogenic Human Papilloma Virus (HPV) type, which can be prevented through vaccination against HPV.

In Rwanda, as in most countries, the initial focus of the prevention drive has been on adolescent girls. Complementary efforts to screen adult women and treat pre-cancerous lesions when detected are being accelerated.

Rwanda was the first African country to initiate a national vaccination program against the human papillomavirus in 2011 and has consistently maintained an immunization coverage of over 90%.

The Ministry of Health has also implemented a cervical cancer screening program since 2014, using visual inspection with acetic acid (VIA), integrated into services provided at health centers and hospitals, followed by the treatment of pre-cancerous lesions.

In 2020, WHO launched the Global Strategy to eliminate cervical cancer, with the vision of a world where it is no longer a public health concern. The adoption of this strategy marked the first time that countries have committed to eliminating a cancer.

Demonstrating a strong political will in advocating for cervical cancer elimination, the Government of Rwanda co-sponsored WHO's Global Strategy resolution (WHA73.2) as well as its launch on 17 November 2020.

The Global Strategy calls on countries to meet the WHO 90-70-90 targets by 2030, within the framework of a national policy to eliminate cervical cancer. In alignment with this, Rwanda presents the National Strategy for the Elimination of Cervical Cancer, aiming to achieve these targets by 2027. This commitment translates into vaccinating 90% of teenage girls against high-risk HPV strains by the age of 15, screening 70% of women aged 30-49 with an HPV DNA-based test, and ensuring 90% of women identified with pre-cancer or invasive cancer receive treatment according to national guidelines.

Effective prevention and control will require coordinated multi-sector cooperation and sustained commitment to a life-course approach to women's health.

MINISTRY OF HEALTH

Digitally signed by MOH(Minister)

Dr. Sabin Nsanzimana

Ministry of Health

Acknowledgment

Rwanda Biomedical Center is pleased to extend the heartfelt gratitude to all stakeholders who have played a pivotal role in the development of the Accelerated Plan for the Elimination of Cervical Cancer in Rwanda 2024-2027.

We are deeply grateful to our development partners for their unwavering technical and financial support, which has been instrumental in shaping this strategic document.

We also recognize and appreciate the invaluable contributions of UN Agencies, Development Partners, Non-Governmental Organizations (NGOs) and Civil Society Organizations (CSOs), whose insights and advocacy have greatly enriched the plan. Their efforts in raising awareness and mobilizing communities are essential in advancing cervical cancer elimination.

Our heartfelt thanks to healthcare providers, whose technical expertise and dedication at the frontline of cervical cancer prevention, screening, and treatment ensure the delivery of critical services to women across Rwanda.

We commend the coordination and leadership demonstrated by the Non-Communicable Diseases Division, the Cancer Diseases Unit, and members of the Cancer Technical Working Group. Their collaborative spirit and commitment have been fundamental in designing this comprehensive strategy.

Achieving the ambitious targets of this plan requires sustained multi-sectoral collaboration and innovative approaches. We call upon all stakeholders, government institutions, private sector partners, development agencies, and communities to join forces and support the implementation of this plan.

Together, we can ensure that Rwanda meets the global targets for cervical cancer elimination by 2027, fostering a healthier and brighter future for all.

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Prof. Claude Mambo MUVUNYI

Director General

Rwanda Biomedical Centre

Acronyms and abbreviations

AIS	Adenocarcinoma in situ
ASR	Age-standardized rate
BCCOE	Butaro Cancer Center of Excellence
CBHI	Community Basic Health Insurance (Mutuelle de Santé)
CEHO	Community and Environmental Health Officer
CKC	Cold knife conization
CHUB	University Teaching Hospital of Butare
CHUK	The University Teaching Hospital of Kigali
CHW	Community health worker
CIN	Cervical intraepithelial neoplasia
CSO	Civil society organization
DH	District Hospital
GAVI	GAVI, the Vaccine Alliance
HC	Health Center
HF	Health facilities
HIC	High-income country
HIS	Health Information systems
HIV	Human immunodeficiency virus
HPV	Human Papilloma Virus
KFH	King Faisal Hospital
LEEP	Loop electrosurgical excision procedure
LLETZ	Large-loop excision of the transformation zone
LMIC	Low- and middle-income country
MINEDUC	Ministry of Education
MOH	Ministry of Health
NAAT	Nucleic acid amplification test
NCD	Non-communicable disease
PPP	Public private partnership
RBC	Rwanda Biomedical Centre
RH	Referral Hospital
RSSB	Rwanda Social Security Board
UHC	Universal Health Coverage
TWG	Technical Working Group
VIA	Visual inspection with acetic acid
WHO	World Health Organization

Executive summary

estimated **604,127** were **diagnosed** with cervical cancer in 2022

341,831 died from the disease

Estimated **866 new cases** (ASR 18.9 cases/100,000)

609 deaths estimated for 2022 (ASR 13.8 deaths/100,000)

Cervical cancer is a preventable disease, and curable if detected early and treated appropriately. Nevertheless, an estimated 604,127 women were diagnosed with cervical cancer worldwide in 2022 and about 341,831 women died from the disease.

Cervical cancer is a major public health challenge in Rwanda. The estimated incidence of cervical cancer in Rwanda is 866 new cases (ASR 18.9 cases/100,000), and this figure is projected to double to 2,347 in 20 years if no effective strategies are put in place to reverse this burden. Cervical cancer is also the leading cause of cancer mortality for women, with 609 deaths estimated for 2022 (ASR 13.8 deaths/100,000 women) *Globocan 2022.*

In November 2020, the Global Strategy to eliminate cervical cancer was launched by the World Health Organization (WHO) with the vision of a world where cervical cancer is eliminated as a public health problem, co-sponsored by the Government of Rwanda. In response to WHO's global call to action, Rwanda has developed this National Strategy for the Elimination of Cervical Cancer 2024-2027 that will guide the national response over a period of 3 years. This critical document is grounded in scientific knowledge and innovation, is guided by equitable access to health services, and emphasizes collaboration across sectors, within Rwanda and internationally.

To eliminate cervical cancer as a public health problem globally and achieve the elimination threshold of an age-adjusted incidence rate lower than 4 cases per 100,000 women-years, Rwanda will need to maintain the high coverage rates of HPV vaccination above 90%, significantly increase cervical cancer screening rates to 70%, and improve access and utilization of treatment services to 90% (90% of women screened positive treated for pre-cancer lesions and 90% of invasive cancer cases managed).

This Strategic Plan presents the actions that need to be taken to achieve the 90-70-90 goal by 2027. Considering that the targets will need to be maintained at these levels for years, the elimination strategy is organized in six strategic objectives, each one with several priority areas of focus.

The Ministry of Health will lead the implementation of the strategy in collaboration with Rwanda Biomedical Centre including coordinating resource mobilization, implementation, monitoring, and evaluating of the progress towards the elimination goals with support from a Technical Working Group (TWG), civil society, community leaders, development partners, and other relevant stakeholders.

Table 1: Strategic objectives, priority areas and targets

	STRATEGIC OBJECTIVES AND PRIORITY AREAS	TARGET
1	**Strengthen cervical cancer program organization, governance, and coordination.** i. Strengthen national mechanisms to coordinate the elimination of cervical cancer ii. Establish a plan to sustain cervical cancer elimination investment and gains beyond 2027.	**Sustained, context-appropriate cervical cancer program**
2	**Strengthen cervical cancer primary prevention through awareness, information, education, and HPV immunization to maintain the vaccination coverage above 90%** i. Strengthen primary prevention through awareness, information, and education. ii. Continue HPV vaccination to maintain >90% coverage in young girls aged 12 years old.	**The National HPV immunization coverage is maintained above 90%**
3	**Increase the cervical cancer screening coverage in eligible women to attain population coverage of 70% and 90% treatment of pre-cancerous lesions by 2027** i. Improve awareness, education, and community mobilization and engagement initiatives to increase participation in screening. ii. Increase the availability of quality cervical cancer screening services at all levels of the health care system. iii. Improve equitable access and coverage of cervical cancer screening and treatment of pre-cancerous lesions.	**70% of women-aged from 30-49 years are screened with a high-performance test and 90% of those with lesions are treated.**
4	**Improve access to cervical cancer diagnosis, treatment of invasive cancer, rehabilitation, and palliative care to reach 90% treatment coverage by 2027** i. Harmonize and enhance the quality of care provided to cervical cancer patients across cancer diagnostic and treatment centers. ii. Improve equitable access to histo-pathology, medical imaging services for cervical cancer patients. iii. Increase access to quality cervical cancer treatment services: Surgery, radiation therapy and systemic therapy. iv. Improve access to palliative care, rehabilitative and support services for cervical cancer patients.	**90% of women identified with cervical cancer receive treatment**
5	**Enhance the monitoring and evaluation system for cervical cancer prevention and control services to track the performance, data systems and research** i. Strengthen the existing health information systems to generate quality data on the implementation progress of the strategy ii. Enhance cervical cancer data systems including the National Cancer Registry to produce accurate data on cervical cancer incidence and mortality. iii. Promote research in cervical cancer prevention and control.	**Data-driven decision-making**
6	**Promote Multisectoral collaboration, partnerships and create resource mobilization strategies for a sustainable financing of cervical cancer elimination** i. Establish strengthened intersectoral collaborations and partnerships ii. Ensure adequate and sustainable financing for the implementation of iii. the cervical cancer elimination plan	**Multisectoral collaboration, partnerships and strategic financing**

Costing Overview:

The total investment and resources required to achieve the targets for the elimination of Cervical Cancer in Rwanda over a five-year period is estimated at approximately US$ 38.4 million.

PRIMARY PREVENTION - HPV Vaccination

The estimated cost for the HPV Vaccination is **US$4.5 million USD** for economic costs and **US$1.8 million USD** for financial costs, this cost reflects a **US$ 7.25 per girl vaccinated** under the single-dose approach. In comparison, the financial cost is **US$ 2.87 per girl vaccinated.**

627,889 (12 years- girls) will be **vaccinated**

SECONDARY PREVENTION - Screening and Pre-cancer treatment

The screening and pre-cancer treatment, including program costs, are estimated to **US$16.63 million** for economic cost and **US$ 13.1 million** for the financial costs.

The estimated average economic cost for initial cervical cancer screening in Rwanda is approximately **US$ 13.2 per woman screened,** utilizing both the HPV DNA test and VIA for treatment triaging. In comparison, the financial cost is **US$ 10.2 per woman screened.**

The estimated average economic cost for delivering pre-cancer treatment in Rwanda is approximately **US$ 37.9 per service** via thermal ablation or LEEP, while the financial cost is **US$ 33.6 per service.**

1,366,880 women (30 - 49 years) will be **screened and treated**

TERTIARY PREVENTION - Cancer Diagnosis, Treatment and Palliative Care

The project cost for cancer diagnosis, treatment and palliative care, including program costs, are estimated to **US$ 16.57 million** for economic cost and **US$ 14.03 million** for the financial costs.

The estimated average economic cost for delivering invasive cancer treatment in Rwanda is approximately **US$ 2,640.1 per woman treated,** while the financial cost is estimated at **US$ 2,234.7 per woman treated.**

These averages reflect variations across treatment stages and types, including surgical procedures, chemotherapy, radiotherapy, and diagnostic services, each contributing differently to the overall cost structure depending on the specific needs of each patient.

6,277 women will be **diagnosed and treated**

CHAPTER 1:
EPIDEMIOLOGY OF CERVICAL CANCER

1.1 Global epidemiology of cervical cancer

Cervical cancer constitutes a global public health problem, according to the World Health Organization, cervical cancer was the fourth most common cancer in women, **with around 660,000 new cases in 2022.** In the same year, **about 94% of the 350,000 deaths** caused by cervical cancer occurred in low- and middle-income countries. The highest rates of cervical cancer incidence and mortality are in sub-Saharan Africa (SSA), Central America and South-East Asia. Regional differences in the cervical cancer burden are related to inequalities in access to vaccination, screening and treatment services, risk factors including HIV prevalence, and social and economic determinants such as sex, gender biases and poverty (1)

Cervical cancer is caused by persistent infection with high-risk or oncogenic Human Papillomavirus (HPV) types (3) and it can largely be prevented through (a) vaccination of young girls against HPV, or (b) screening programs followed by immediate treatment of pre-cancerous lesions, which rely on simple, and easy-to-use tools that can be delivered at the lowest level of care. This makes cervical cancer one of few cancers that can be successfully prevented, it is also curable if detected early and adequately managed (2).

The most common method used to screen women for cervical cancer has been cytology, also known as the Papanicolaou test, Pap smear, or smear test. In countries with robust health systems, it has led to an average reduction of approximately 2.6% per year in cervical cancer mortality (4). However, this approach has proven less effective in low- and middle-income countries (LMICs), mainly because of requirements for laboratory infrastructure, equipment, and logistic challenges associated with the screening process; as well as the performance of the Pap test itself, which has shown sensitivity as low as 55% (5, 6).

Newer technologies and approaches, including HPV vaccines, High performance HPV tests, and a screen-and-treat approach, have been developed and proven to effectively prevent cervical cancer (7-10). The cost-effectiveness of these prevention strategies is well documented, showing that HPV vaccination coupled with screening is more cost-effective than either strategy alone (11). Regarding the screening approach, HPV-based screening has shown greater reduction in cervical cancer incidence and mortality compared to other screening tests. If implemented on a large scale, these new cost-effective interventions and approaches have the potential to accelerate reductions in cervical cancer mortality.

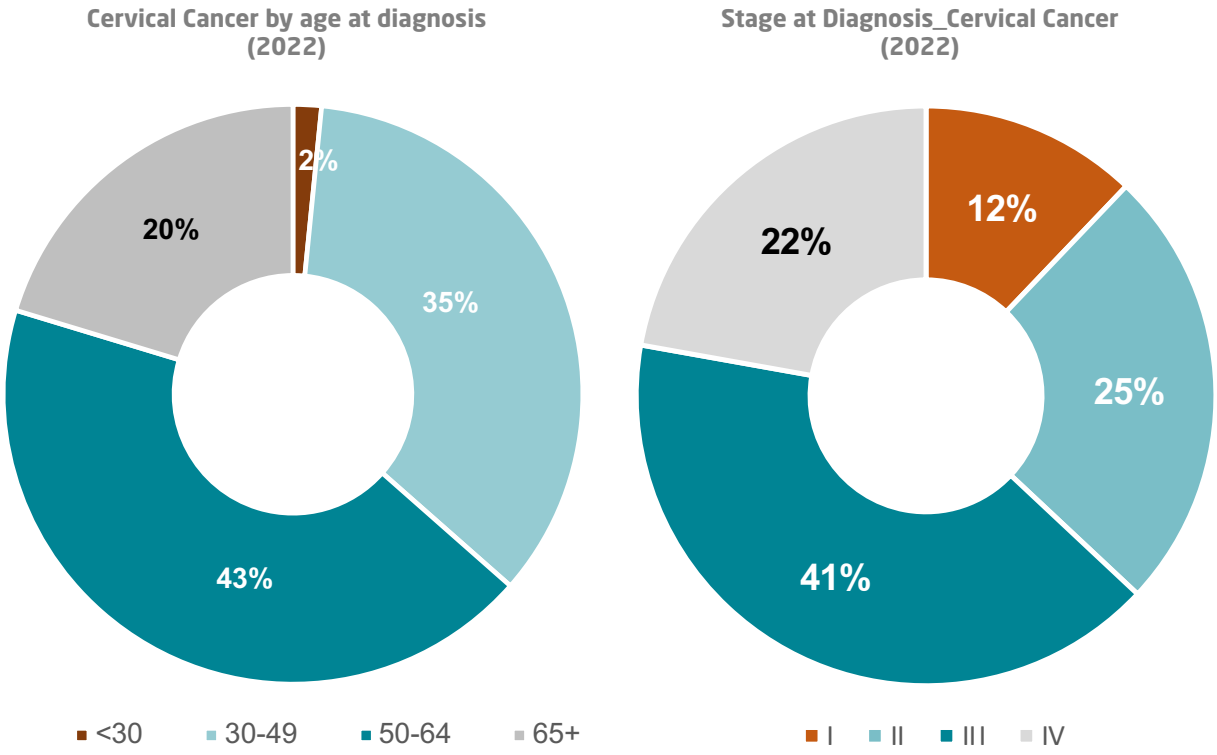
Women living with HIV deserve special attention since they have 6 times higher risk of developing cervical cancer and are more likely to develop it at a younger age (12, 13). Conversely, women infected with HPV are twice as likely to acquire HIV than those without HPV-infection. Despite the improved access to HIV care and treatment, screening coverage for cervical cancer prevention for women living with HIV has been low.

1.2 The burden of cervical cancer in Rwanda.

Rwanda is among the countries with a high burden of cervical cancer which ranks as the 2nd most frequent cancer in both sexes. The estimated incidence of cervical cancer in Rwanda is 866 new cases (incidence rates: 12.5 cases/100,000 women (crude) and 18.9 cases/100,000 (ASR)), and this figure is projected to double to 2,347 in 20 years if no effective strategies are put in place to reverse this burden (14). Cervical cancer is the leading cause of cancer mortality in Rwanda, with 609 deaths estimated in 2022 (mortality rates: 8.8 deaths/100,000 women (crude) and 13.8 deaths/100,000 women (ASR).

The National Cancer Registry recorded 617 new cervical cancer cases in 2022 (1 out of 4 cancers in females) (15). Data from the Registry also shows that more than a third of the women diagnosed with cervical cancer are below the age of 50 years, still at the peak of their productive years. In addition, due to inadequate access to cervical cancer screening and early detection services, around 60% of women are diagnosed at late stages (III and IV)

Improved access to screening and treatment services would significantly reduce the cervical cancer related mortality, saving the lives of women dying at their prime age.



Source: National Cancer Registry 2022

Figure 1: Distribution of cervical cancer by age and stage at diagnosis, 2022

The above figures show that most women (63%) are diagnosed at the age above 50 years, and over 60% are diagnosed at late stages 3 and 4.

CHAPTER 2:
THE RESPONSE TO THE CERVICAL CANCER BURDEN

The response to the cervical cancer burden requires a comprehensive, multi-faceted approach encompassing prevention, early detection, treatment, and supportive care. This begins with vaccination against the human papillomavirus (HPV), a major cause of cervical cancer, to protect young populations before exposure. Equally vital is the implementation of effective screening programs to detect precancerous changes early, allowing timely intervention. For those diagnosed with invasive cervical cancer, accessible and advanced treatment options such as surgery, radiation, and chemotherapy are crucial to improve survival rates. Furthermore, quality palliative care services must be provided to support those with advanced disease, alleviating symptoms and enhancing quality of life. This integrated approach is essential to reduce the impact of cervical cancer and move toward elimination goals.

2.1. Global strategy towards the elimination of cervical cancer as a public health problem.

The Global strategy to accelerate the elimination of cervical cancer as a public health problem was developed by WHO in collaboration with different member states to accelerate cervical cancer elimination, with clear goals and targets for 2030 (16). The strategy proposes a population-based approach to enable countries to reach global targets for key interventions that, in turn, will lead to elimination of cervical cancer as a public health problem.

WHO has defined the threshold for elimination of cervical cancer as a public health problem as an age-standardized incidence rate of less than 4 cases per 100,000 women-years. In order to achieve elimination within a century, the following targets need to be met by 2030 and maintained beyond:

90%

Of girls fully vaccinated with the HPV vaccine by 15 years of age

70%

Of women are screened with a high-performance test (HPV test) by the age of 35 and again by 45 years of age

90%

Of women identified with cervical disease receive treatment and care

(90% of women screened positive treated for pre-cancer lesions and 90% of invasive cancer cases managed)

WHO recommends a life-course approach for an effective and comprehensive strategy to cervical cancer elimination (16), with simultaneous implementation of these three pillars to achieve a maximum impact. Countries can expect a decrease of cervical cancer mortality as access to treatment of invasive disease improves, coupled with a decrease of incidence resulting from implementation of population-based screen-and-treat programs. Vaccination against HPV will offer protection against cervical cancer to future generations.

Guided by the global strategy, countries must develop national strategies for the elimination of cervical cancer and update their protocols for the prevention of cervical cancer and for the care and treatment of affected women either with pre-cancerous lesions or with invasive disease, adapted to their context.

The National Strategy for the Elimination of Cervical Cancer in Rwanda 2024-2027 serves as a comprehensive guide for the country's response to WHO's global call to eliminate cervical cancer. This critical document outlines and promotes the most efficient, cost-effective, and sustainable operational strategies to address cervical cancer in Rwanda.

2.2. Cervical cancer prevention and control interventions in Rwanda.

To eliminate cervical cancer as a public health problem globally and achieve WHO's elimination threshold of an age-adjusted incidence rate lower than 4 cases per 100,000 women-years, countries need to achieve the coverage targets of HPV vaccination, screening and treatment of pre-cancerous lesions, and management of cervical cancer described above by 2030, and maintained at these levels for years.

2.2.1. HPV immunization in young girls.

Rwanda was the first African country to initiate a national vaccination program against the human papillomavirus (17). The initial goal was to protect as many girls younger than 15 years as possible through vaccination campaigns. Vaccination started in 2011 as a school-based immunization program and from 2015, there was full transition to an ongoing routine age-based program. Today, the national strategy recommends systematic vaccination of girls aged 12 years old and eligibility is defined primarily through school-based registers, with some community outreach to 12 year-olds not attending school (17). Since the introduction of the HPV vaccine in 2011, coverage has been consistently above 93% over the years (18). The coverage of immunization among girls peaked at 97% in 2019 (Figure 3.1).

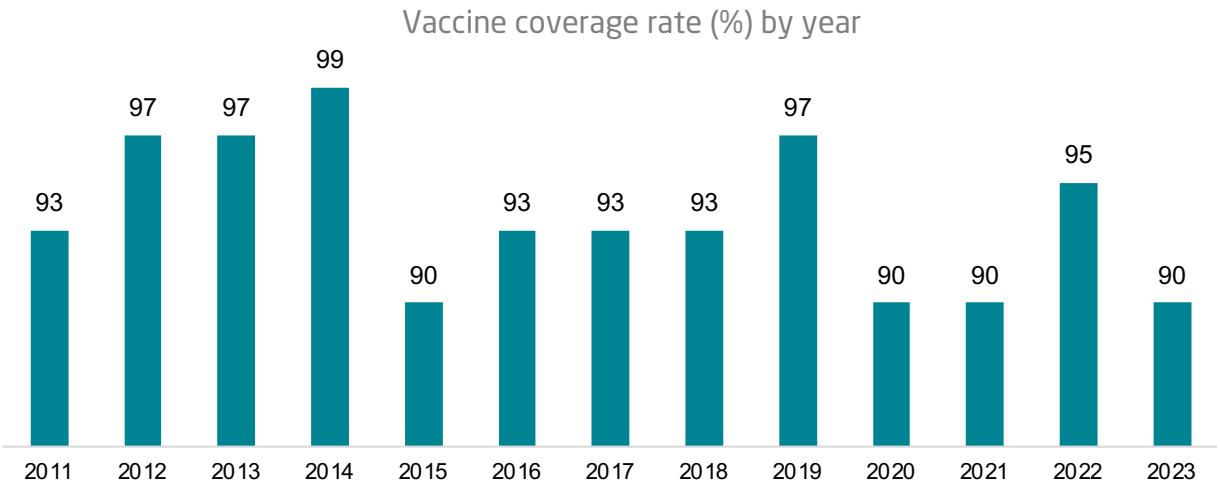


Figure 2: Vaccine coverage rate (%) by year

The success of Rwanda in achieving high HPV immunization rates can be attributed to several factors that contributed over the years to the program's success. Among these are:

- Strong political will from the highest level of the leadership of the country.
- Rwanda's Expanded Program of Immunization (EPI) program was well-established and trusted by the public, which favored the integration of the HPV vaccine.
- The vaccine manufacturer, and the Vaccine Alliance (GAVI) made multi-year commitments for product supply, allowing for longer-term planning.
- The initiative was not limited to teams within the Ministry of Health; a strong collaboration with other ministries namely the Ministry of Education, Ministry of Local Government and Ministry of Gender and Family Promotion was built which facilitated the immunization campaign. The Ministry of Education was especially helpful for the vaccination of school girls and has continued educating girls about cervical cancer prevention.
- Strong partnerships with in-country development and implementing partners.
- Public education was initiated well before program launch using a variety of communication channels, which helped address some of the myths, misconceptions and unfounded concerns around HPV immunization and the safety of the vaccine.
- The Rwandan media was supportive of the effort and a robust, existing network of community health workers (CHWs) was mobilized for outreach. Local and traditional leaders also played an important role.
- The positive results from the first year created momentum and excitement that continued over subsequent years.
- Health facility and program managers assumed ownership of the program.

Research studies show that the current vaccine has a protection of 70% against cervical cancer, and therefore, in order to optimize prevention, screening these girls at older ages is still recommended.

2.2.2.Cervical cancer screening and treatment of pre-cancerous lesions.

Secondary prevention aims at preventing invasive cervical cancer by detecting and treating pre-cancerous lesions of the cervix before they progress to invasive cancer.

The screening methods most frequently used to identify those who have or are at risk for cervical cancer are high-risk HPV DNA-based tests, visual inspection with acetic acid (VIA), and cytology. WHO recommends using HPV DNA detection as the primary screening test rather than VIA or cytology, where resources are available, followed by treatment of pre-cancerous lesions. The recommendations are based on studies showing that the reductions in cancer incidence and related mortality are greater with HPV DNA testing when compared to VIA that estimated that almost triple the number of patients would die due to cervical cancer after VIA screening and treatment as compared to HPV DNA test and treatment (88 patients out of 1 million versus 30 patients out of 1 million respectively) (19). Because of its high level of performance, international recommendations propose that countries transition to HPV testing as the primary method of screening for cervical cancer.

Independently of the screening method and approach, cervical cancer screening requires a matching increase in capacity for treatment of the detected lesions, as screening women without access to treatment is unethical. Based on the size and type of pre-cancerous lesions, available treatment methods include thermal ablation, large-loop excision of the transformation zone (LLETZ) or loop electrosurgical excision procedure (LEEP), cryotherapy and cold-knife conization (CKC).

In Rwanda, the cervical cancer screening program started in 2014 using a VIA-based strategy, integrated into routine activities at health centers where women were invited for screening by trained nurses and midwives. Overall, the screening coverage has been relatively low (~10%) up to end of 2019 due to a variety of reasons,

namely a limited demand, services not consistently available at the health facilities because of competing priorities, untrained or turnover of trained personnel, and frequent break down of existing cryotherapy systems.

In 2020, Rwanda introduced a HPV/DNA screening strategy integrated into primary health care facilities, where the collection of samples takes place at community health centers and testing at the district hospitals where molecular platforms are available. HPV positive women are called back to the health center for VIA triage to assess the extent of the lesions, and treatment with thermal ablation or LEEP depending on the extent of lesions.

More recently, Rwanda has implemented targeted mobile approaches through mass screening campaigns using HPV DNA testing to rapidly increase cervical cancer screening coverage, currently at 24% (Fig 3.1). Mobile screening using a screen-and-treat approach allows programs to reach large populations rapidly, and deliver high quality screening more efficiently, with less procurement costs. Studies show that women require HPV screening only every five to ten years, and even a single lifetime screening can reduce incidence and mortality by up to 50%.

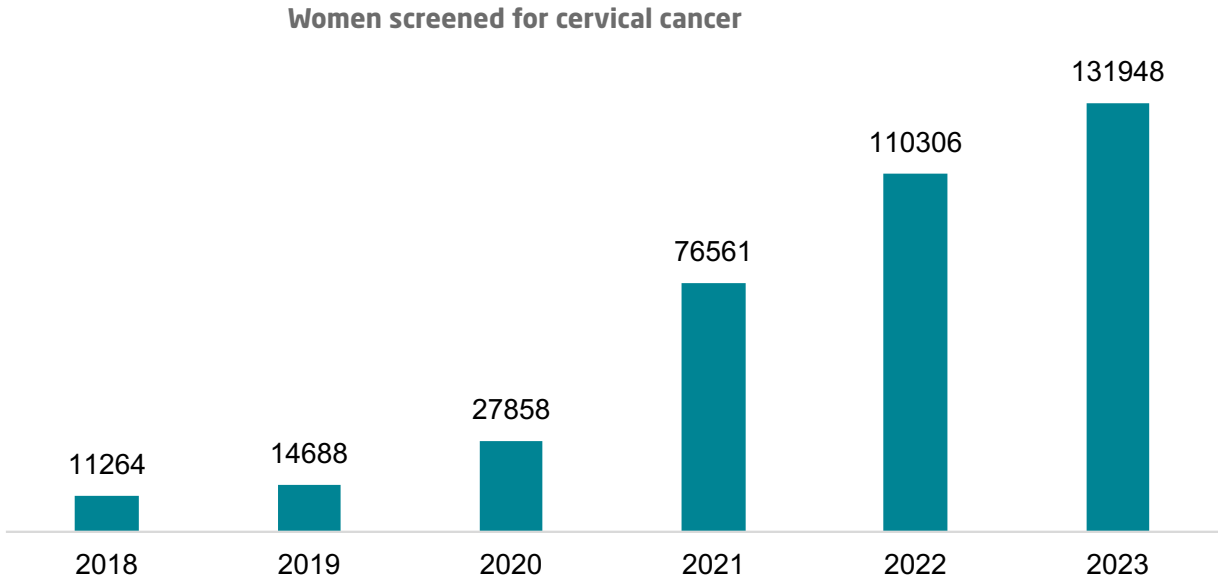


Fig 3: Women screened for cervical cancer (source Rwanda HMIS 2024)

Cervical cancer screening algorithm and target groups.

Following WHO and international guidelines for screen-and-treat strategies for cervical cancer, Rwanda performs screening by using HPV testing followed by an assessment of the extension of the lesions with VIA to determine the type of treatment, or by using VIA and treatment where HPV testing is not available. Rwanda has recently updated the National Guidelines for screening of cervical cancer and treatment of precancerous lesions in 2024 to reflect the latest scientific developments.

Table 2: Current cervical cancer screening guidelines

Screening methods	• HPV testing followed by VIA in health centers, district, provincial and referral hospitals, mobile units • Cytology: national referral hospitals and some private clinics
Target population	• Women living with HIV: 25-49 years old • General population (HIV neg): Women aged 30-49 years old • Women aged from 50-65 old not previously screened
Screening frequency	• Every 5 years for HIV + • Every 10 years general population • 1 year for HPV positive results and post-treatment follow up
Treatment of precancerous lesions	• Thermal ablation if lesions < 75 % • LLETZ if lesions >75% or type 3 TZ with VIA positive
Screening and treatment approaches	• Women living with HIV: Treat all HPV positive, VIA done to determine treatment options • General population: Treat all HPV 16 and 18 positive, VIA results based for other high-risk HR-HPV positive
National Guidelines for screening of cervical cancer and treatment of precancerous lesions., 2024.	

Health facilities implementing cervical cancer screening in Rwanda.

Rwanda is rapidly increasing the number of health facilities that can provide cervical cancer screening and treatment of precancerous lesions. Services are currently available in 19 of the 30 districts of Rwanda, in a total of 353 facilities out of 564.

Table 3: Availability of screening and treatment of precancerous lesions

	VIA	HPV	Cytology	Total
Referral hospitals		4	4	4
District Hospitals	2	29		31
Health Centers	40	278	0	318
Total	**42**	**307**	**4**	**353**

Although most cervical cancer screenings take place in health facilities, mostly health centers, different delivery channels of cancer screening services will be implemented moving forward (mobile units and mass screening) to rapidly increase screening coverage depending on the service capacity and the context.

2.2.3. Diagnosis and management of invasive cervical cancer.

Prevention of cervical cancer through HPV vaccination, screening, and treatment of pre-cancerous lesions is cost-effective and has a high return on investment (20). However, timely management of invasive cervical cancer must simultaneously be strengthened to achieve long-term, sustained impact to reduce cervical cancer mortality.

Cervical cancer diagnosed in its early stages has a higher probability of cure than that in advanced stages. With quality cancer management, even women with locally advanced cervical cancers may have improved outcomes if treated in a timely fashion. Treatment of early-stage cervical cancer is also less complex, less expensive, and more effective, with higher long-term survival rates and better quality of life. In countries where women have access to timely diagnosis and quality treatment, the 5-year survival rate of early-stage cancer can be over 90%.

For patients with incurable or metastatic disease, ensuring access to palliative surgery, radiotherapy, and systemic treatment, as well as integrated supportive care, can significantly increase women's quality of life. The detection of cervical cancer can occur either via screening or early diagnosis, but once invasive cancer is detected, further diagnostic and treatment steps are the same regardless of the access pathway. The table below summarizes the core steps of cervical cancer management (21).

To achieve the cervical cancer elimination goals, it is therefore key that women with suspected cervical cancer are timely referred to effective treatment. In Rwanda, the final diagnosis of cancer is done in hospitals where histopathology laboratories and trained pathologists are available. These include the University Teaching Hospital of Kigali (CHUK), University Teaching Hospital of Butare (CHUB), Rwanda Military Hospital (RMH), King Faisal Hospital (KFH), and Butaro Cancer Center of Excellence (BCCOE).

The treatment of invasive cervical cancer involves surgery, systemic therapy (chemotherapy) and radiotherapy depending on the stage of the disease. Surgery is provided at tertiary levels, and radiotherapy capacity has been established at RMH. Chemotherapy is available at RMH, KFH, and BCCOE. Although treatment modalities are available at selected hospitals, the skills of available gynecologists need to be upgraded to provide quality treatment to patients. In 2022, an in-country fellowship training program in gynecology oncology was established to produce an adequate number of qualified human resources to treat cervical cancer and other gynecologic malignancies, and two fellows have already graduated.

The most effective treatment is provided in an equitable, human-rights based, and sustainable manner. Quality care is associated with accurate diagnosis and staging; evidence-based standards of care; and integrated with rehabilitative services as well as palliative care. It is important to address barriers that limit access to safe, quality, effective, and affordable cancer services by working towards universal health access and coverage that includes diagnosis, treatment, rehabilitation, and palliative care.

CHAPTER 3:
SWOT ANALYSIS FOR CERVICAL CANCER PREVENTION AND CONTROL

Rwanda has made substantial strides in prevention and control through early adoption of the HPV vaccination program and implementation of nationwide screening efforts. However, the burden of cervical cancer remains high due to various challenges, including limited resources and healthcare infrastructure. The following SWOT analysis outlines the strengths, weaknesses, opportunities, and threats in cervical cancer prevention and control efforts in Rwanda, aiming to identify actionable areas to reduce incidence and mortality rates associated with the disease.

Strengths

1. **Government commitment:** Rwanda's government has shown strong political will toward improving healthcare, including women's health and cancer care, and has been proactive in addressing cervical cancer.
2. **HPV vaccination program:** Rwanda was among the first African countries to introduce a nationwide HPV vaccination program, achieving high coverage rates, above 90% among young girls and contributing to long-term prevention.
3. **Community Health Workers' Network:** The extensive network of community health workers across Rwanda helps in raising awareness, educating communities, and facilitating screening and follow-ups, enhancing outreach and accessibility.
4. **Partnerships with strong and committed organizations:** Availability of committed international and local organizations providing technical and financial support for HPV vaccination, screening, and treatment initiatives.
5. **Integration into health sector plans:** Cervical cancer prevention and control have been integrated into Rwanda's national health policies and plans, ensuring a strategic approach to address the burden.
6. **Community Based Health Insurance:** The Community based health insurance also known as Mutuelle de Sante, covering more that 90% of population, includes cervical cancer treatment services in its benefit package, making them financially accessible.
7. **Decentralized health care system:** Rwanda has a good network of primary care health facilities making it easier to provide cervical cancer screening services closer to the population in need.
8. **Availability of HPV/DNA based screening program:** Rwanda has updated the national cervical cancer screening guidelines aligning the with WHO Recommendations, prioritizing HPV/DNA testing over other screening methods.
9. **Availability of comprehensive cervical cancer care and treatment services in the country:** Cervical cancer diagnosis and treatment services are available in the country, provided by trained Rwandan health care professionals.
10. **The National Cancer Registry:** The National cancer registry covers the whole country and is now providing high quality data on cancer incidence and mortality used for program planning and evaluation.

Weaknesses

1. **Limited cervical cancer screening coverage:** While HPV vaccination coverage is high, access to cervical cancer screening in eligible women is still limited with a national coverage of 28%, below the global target (70%).
2. **Resource constraints:** There is a shortage of trained healthcare providers, equipment, and facilities for effective screening, diagnosis, and treatment across the country.
3. **Low level of awareness in the community:** Limited of awareness about cervical cancer prevention and treatment options can lead to late presentation and diagnosis.
4. **Limited treatment capacity and palliative care services:** Access to radiotherapy, surgery and chemotherapy services is still limited as well as access to palliative care for patients with advanced cervical cancer, leading to unmet needs for pain and symptom management.
5. **Low research output on cervical cancer prevention and control:** Clinical research on cervical cancer is still limited.
6. **Inadequate comprehensive integrated cervical cancer care systems** resulting into lost to follow ups
7. **Limited patient support and navigation programs** to enable patients navigating different levels of the health care system.

Opportunities

1. **Increasing global support and resources:** Global initiatives supporting efforts to eliminate cervical cancer, like the WHO's Cervical Cancer Elimination Initiative, provide opportunities to mobilize additional funding and resources for comprehensive care.
2. **Use of digital health and telemedicine:** Innovations in digital health and telemedicine can improve access to cervical cancer care, enabling remote consultations, follow-ups, and awareness campaigns.
3. **Community education and engagement:** Strengthening education and outreach through community leaders and health workers can help reduce stigma, increase awareness, and improve early detection rates.
4. **Integration into existing services:** Integration into well-funded services like HIV, MCCH, would support the implementation of cervical cancer screening services.
5. **Local manufacturing of drugs and medical consumables:** The number of pharma companies engaged in local manufacturing of medicines and lab consumables is increasing, paving the way for local production of HPV DNA test kits, drugs, ...

Threats

1. **High cost of comprehensive care:** The costs associated with screening, diagnosis, and advanced treatment may strain the healthcare system and limit sustainable scale-up of programing.
2. **Healthcare worker shortages:** Limited numbers of skilled personnel in oncology and palliative care could hinder effective management and patient outcomes.
3. **Competing priorities in the health sector:** The burden of infectious diseases and maternal and nutritional conditions is still high and consumes significant resources, which could hinder funding for cervical cancer
4. **Potential funding reductions:** Changes in global funding priorities and reliance on external funds make the program vulnerable to fluctuations that could impact service continuity.

This SWOT analysis highlights the need to build on existing strengths and opportunities, address current weaknesses, and plan for potential threats to achieve Rwanda's cervical cancer prevention and control goals.

CHAPTER 4:
THE ACCELERATED CERVICAL CANCER ELIMINATION PLAN 2027

This chapter outlines the strategies and priority interventions with their related costs that the country will use to achieve the global cervical cancer elimination targets by 2027.

4.1. Vision, Mission and Goal

Vision: A Rwanda where cervical cancer is prevented, detected early, and effectively managed, for a healthier future for all women and girls.

Mission: To eliminate cervical cancer as a public health problem in Rwanda by providing equitable, accessible, and high-quality prevention, screening, and treatment services, ensuring that all women and girls are protected from cervical cancer through education, vaccination, early detection, and timely management.

Goal: To reduce the incidence and mortality of cervical cancer in Rwanda by maintaining 90% HPV vaccination coverage among 12-year girls, achieving 70% cervical cancer screening coverage among women aged 30 to 49 years old, and ensuring 90% of women diagnosed with cervical pre-cancer or cancer receive effective treatment by 2027, in alignment with the WHO Global Strategy for cervical cancer elimination. The long-term impact goal is to reduce and maintain cervical cancer incidence to less than 4 cases per 100,000 women.

4.2. Guiding Principles in Cervical Cancer Elimination

The following guiding principles as adapted from the WHO Africa Regional framework, will guide all stakeholders throughout the implementation of the elimination plan.

Leadership and accountability: Elimination of cervical cancer as a public health problem in Rwanda relies on strong political will, government leadership, ownership, investment and accountability at all levels.

Human rights, gender and equity: All cervical cancer prevention and control interventions should be based on promoting human rights, gender and equity in accessing health care and other essential social services.

Evidence-based and forward-looking actions: The interventions proposed in this framework are up to date and evidence based (including research), to ensure high-quality and effective policies and services.

Life-course approach: Health education to all age groups, vaccinating girls 12 years old, screening women for precancerous lesions, and treatment before progression to invasive disease.

Community engagement and participation: Emphasis on the implementation of this framework should be placed on community-based interventions, ensuring active community participation and ownership by local communities.

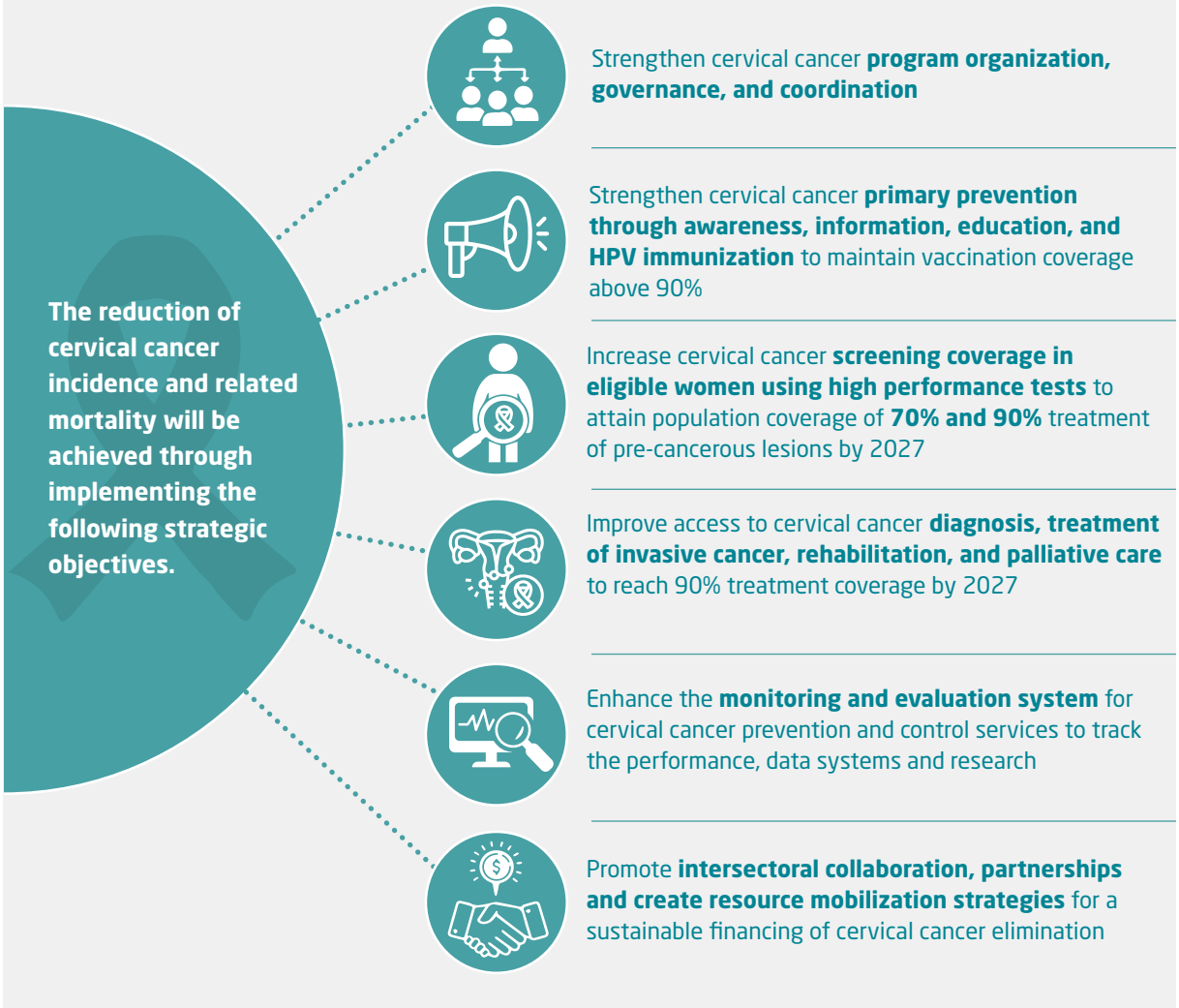
Multisectoral and multidisciplinary approaches: Broad partnerships (including public and private partnership), multisectoral and multidisciplinary coordination mechanisms and integrated approaches are critical for the successful implementation of the framework.

Funding sustainability: Sustaining interventions requires mobilization and proper allocation of domestic and international resources. For long-term sustainability, the financing of cervical cancer interventions should be supported from domestic resources.

Cross-border collaboration: To achieve the elimination target, cross-border collaborations to share best practices and provision of service is important.

Integration into the existing health system: In the framework of reducing missed opportunities, promoting efficiencies and sustainability, the delivery cervical cancer prevention and control services should be integrated into other existing services mainly maternal and child health services, HIV services as well as laboratory systems.

4.3. Strategic Objectives



4.3.1 Strengthen cervical cancer program organization, governance, and coordination

Good organization of cervical cancer programs favors higher coverage for vaccination, increased screening rates, and contributes to increased follow-up of women with abnormal screening test results, all of which will lead to greater impact in reducing cervical cancer incidence and mortality. The following strategic actions will be carried out to strengthen cervical cancer programming:

Priority Area 1: Strengthen national mechanisms to coordinate the elimination of cervical cancer.

Strategic Actions:

- Establish a national task force to support the Cancer Diseases Unit in the coordination and governance of cervical cancer program.
- Establish district level coordination committees to strengthen governance of cervical cancer control.
- Increase the number and capacity of the coordinating team for cervical cancer elimination within the Cancer Diseases Unit, Rwanda Biomedical Centre.

Priority Area 2: Establish a plan to sustain cervical cancer elimination investment and gains beyond 2027.

Strategic Actions:

- Develop a cervical cancer elimination sustainability plan beyond 2027 including some of the below key strategies:
    - ◊ Inclusion of cervical cancer prevention, screening, care and treatment services into the package of Community-Based Health Insurance (CBHI or Mutuelle de Sante) and private insurances.
    - ◊ Institutionalize cervical cancer program within National Health Systems through the integration of cervical cancer prevention and control services into routine healthcare services, ensuring that these interventions are consistently funded and delivered.
    - ◊ Establish strategies for sustained government investment in cervical cancer elimination by incorporating it into long-term national health budgets and policies.
    - ◊ Adoption of new validated technology and innovations such as Artificial intelligence in the delivery of cervical cancer services.
    - ◊ Continuous community engagement through ensuring ongoing community education and awareness campaigns that empower women to seek screening, HPV vaccination, and treatment services regularly.

4.3.2 Strengthen cervical cancer primary prevention through awareness, information, education, and HPV immunization to maintain the vaccination coverage above 90%

Community awareness, information, education, and universal HPV vaccination are essential primary prevention strategies. Health information and education campaigns and educational materials will be enhanced by tailoring them to the specific information needs of individuals and communities; and by communicating up-to-date scientific information and messages about HPV infection, HPV vaccines, cervical cancer, and behavior changes that can reduce risks and prevent cervical cancer, presented in simple, gender-sensitive, culturally appropriate, understandable language.

Sustained HPV vaccination programs also need to be implemented, in accordance with evidence-based guidelines for target age groups and dose, with a view to maintaining greater than 90% national coverage of HPV vaccines as part of national immunization. To strengthen primary prevention, the following strategic actions will be carried out:

Priority Area 1: Strengthen primary prevention through awareness, information, and education.

Strategic Actions:

- Develop standardized cervical cancer communication materials and messages to ensure the content is tailored to the needs and context for different groups of the population
- Promote community awareness and education initiatives about HPV infection and cervical cancer focusing on prevention and risk-reduction strategies.
- Integrate education and awareness messages about the prevention of HPV infection and cervical cancer, and risk-reduction strategies in the package of services provided at all levels of health care provision, including services provided by community health workers (CHWs).
- Engage and educate community leaders, faith-based organizations and churches, opinion leaders, celebrities, social medial influencers, media personnel to effectively run public education campaigns and disseminate cervical cancer prevention information widely,

Priority Area 2: Continue HPV vaccination to maintain >90% coverage in young girls aged 12 years old.

Strategic Actions:

- Sustain the good existing partnerships and collaborations with ministries, institutions and international partners in supply chain and delivery of HPV vaccines.
- Ensure a continuous procurement and delivery of HPV Vaccines.
- Explore the introduction of new generation HPV Vaccines in the national immunization program.
- Review the existing HPV vaccination guidelines to include new evidence and recommendations and explore the possibility of extending the vaccination to new groups (eg: vaccinations of boys and older women tested HPV negative)

4.3.3 Increase the cervical cancer screening coverage among eligible women to attain population coverage of 70% and 90% treatment of pre-cancerous lesions by 2027

Cervical cancer screening will continue to be implemented to reach the highest coverage. Eligible women aged 30 to 49 years old, starting at 25 years in women living with HIV, will be invited for screening at primary health care facilities. We will use targeted efforts to successfully reach the critical 70% screening coverage, including facility-based, mass screening campaigns, and mobile screening strategies. All along the implementation of the program we will focus on strengthening the health care system and community ownership aiming at moving to a population-based screening strategy at the earliest opportunity.

Following WHO and evidence-based recommendations, HPV DNA testing will be prioritized as the standard screening strategy. Women identified with pre-cancerous lesions in VIA-triage will be treated using thermal ablation or LEEP depending on the size of the lesions.

To optimize the cervical cancer screening coverage in eligible women, the following strategic actions focused on increasing the geographic accessibility through integrating cervical cancer screening services at all levels of the health care system and population level screening coverage in eligible women will be carried out:

Priority Area 1: Improve awareness, education, and community mobilization and engagement initiatives to increase participation in screening.

Strategic Actions:

- Develop and disseminate communications materials. for cervical cancer prevention, screening, and treatment of pre-cancer directed to the target population.
- Integrate education and awareness messages on cervical cancer prevention, screening, and treatment of pre-cancer, in the health services provision at all levels of the health care system including community health workers.
- Develop and implement community mobilization strategies involving CSOs, Cancer survivors, local leaders, celebrities, and religious leaders to sensitize and link eligible women to cervical cancer screening services.
- Use mass media, social media, arts platforms, to disseminate cervical cancer screening messages encouraging eligible women to attend screening services.
- Develop and use digital tools like the gamified cervical cancer app and SMS reminders to increase the uptake of cervical cancer screening services

Priority Area 2: Increase the availability of quality cervical cancer screening services at all levels of the health care system

Strategic Actions:

- Review and update cervical cancer guidelines for screening and treatment of pre-cancerous lesions to include up-to date, evidence-based approaches in line with WHO recommendations.
- Build the capacity of health care providers at all levels on updated cervical cancer screening guidelines and in the framework of scaling up cervical cancer services in all health facilities.
- Carry out regular clinical mentorship at all levels of cervical cancer screening services delivery to ensure the quality of services is maintained.
- Integrate cervical cancer screening and treatment of precancerous lesions in the pre-service training curriculum for nurses, midwives, clinical officers and medical officers.
- Strengthen integrated delivery of cervical cancer screening services with women's health services, (e.g: HIV, STIs, ANC, Family Planning, breast cancer, and other cancer and non-communicable diseases screening activities).
- Establish a quality assurance system for HPV testing, VIA and treatment of precancerous lesions.

Priority Area 3: Improve equitable access and coverage of cervical cancer screening and treatment of pre-cancerous lesions.

Strategic Actions:

- Strengthen the supply chain of quality assured HPV DNA test kits and related consumables.
- Ensure an uninterrupted supply of needed consumables to conduct cervical cancer screening services including VIA, Thermal ablation, LEEP consumables.
- Equip health facilities with required equipment and materials to provide cervical cancer screening services based on the need and level of care.
- Implement combined strategies for the delivery cervical cancer screening services including facility-based, mobile units, and mass screening campaigns to optimize the screening coverage.
- Adopt the use of innovative technologies like Artificial Intelligence in cervical cancer screening once approved for use in clinical practice.
- Implement a community based self-sample collection strategy lead by community health workers.

4.3.4 Improve access to cervical cancer diagnosis, treatment of invasive cancer, rehabilitation, and palliative care to reach 90% treatment coverage by 2027

Achieving 90% treatment coverage for cervical cancer by 2027 requires a comprehensive approach to improve access to diagnosis, treatment, rehabilitation, and palliative care.

Access to timely and high-quality diagnostic and therapeutic services is critical to reducing the mortality and morbidity associated with cervical cancer.

Currently, limited resources, inadequate infrastructure, and geographic and financial barriers hinder women from accessing essential cancer services. This objective prioritizes strengthening the healthcare system's capacity to deliver comprehensive, accessible, and affordable cervical cancer care across the continuum of care from early diagnosis and treatment to rehabilitation and palliative care.

By expanding diagnosis and treatment infrastructure, training healthcare providers, and integrating cancer services into primary healthcare, this initiative will ensure that more women receive life-saving treatment and supportive care, significantly reducing cervical cancer's impact on individuals and communities.

To improve access to cervical cancer diagnosis, treatment, rehabilitation, and palliative care, the following strategic actions will be carried out:

Priority Area 1: Harmonize and enhance the quality of care provided to cervical cancer patients across cancer diagnostic and treatment centers

Strategic Actions:

- Review, update, and implement guidelines and protocols for cervical cancer diagnosis, treatment and palliative care based on current scientific evidence and international standards.
- Establish an effective navigation system for cervical cancer patients to promote timely access to treatment and reduce lost to follow up.

- Conduct regular cervical cancer care coordination meetings putting together cancer centers to serving as a platform for knowledge exchange and peer learning.
- Institutionalize multidisciplinary tumor boards in centers diagnosing and treating cervical cancer to foster the quality of care.

Priority Area 2: Improve equitable access to pathology, medical imaging services for cervical cancer patients

Strategic Actions:

- Establish the cervical cancer sample collection and transportation system from district hospitals to histopathology laboratories with an efficient results feedback mechanism.
- Ensure uninterrupted supply of histopathology reagents/consumables and regular maintenance of equipment.
- Establish tele-radiology with PACS system to facilitate remote reporting for prompt staging and timely initiation of the treatment.

Priority Area 3: Increase access to quality cervical cancer treatment services: Surgery, radiation therapy and systemic therapy

Strategic Actions:

- Increase cervical cancer surgical capacity at existing tertiary facilities by establishing newly equipped oncology dedicated theatres and beds.
- Establish a new Radiotherapy Centre with 2 LINCS and Brachytherapy unit with required staffs to increase timely access to radiotherapy services.
- Expand chemotherapy at Teaching Hospitals to improve geographic accessibility to systemic therapy.
- Strengthen the supply chain for cervical systemic therapy drugs and related consumables.
- Train adequate number of Gynecology Oncologists and Radiotherapy staff to manage the increasing number of cervical cancer patients.

Priority Area 4: Improve access to palliative care, rehabilitative, and support services for cervical cancer patients

Strategic Actions:

- Strengthen the integration of palliative care services into existing health care systems including the community and home-based care programmes.
- Improve the provision of psychosocial, nutritional, housing and financial support services to cervical cancer patients and their families.
- Strengthen the supply chain for pain medications to ensure consistent access to adequate pain management for all cervical cancer patients.

4.3.5 Enhance the monitoring and evaluation system for cervical cancer prevention and control services to track the performance, data systems and research

An effective monitoring and evaluation system is crucial to inform the implementation of cervical cancer prevention and control services. By enhancing the M&E system, we will be able to track the performance of cervical cancer initiatives, assess data quality, and advance research efforts. A robust M&E framework will provide timely insights into program effectiveness, identify gaps, and ensure accountability, supporting data-driven decision-making at every level. Connected cervical cancer data systems will generate accurate information to feed various research.

Priority Area 1: Strengthen existing health information systems to generate quality data on the implementation progress of the strategy

Strategic Actions:

- Build the capacity of health care providers and data officers at all levels in M&E for the cervical cancer elimination plan.
- Conduct regular clinical mentorship/ supportive supervision at all levels of healthcare delivery.
- Conduct regular Data Quality Audits, and data reviews at all levels of the healthcare system.
- Conduct annual national cervical cancer symposium including key stakeholders to review and share progress in implementing the elimination plan.

Priority Area 2: Enhance cervical cancer data systems including the National Cancer Registry to produce accurate data on cervical cancer incidence and mortality

Strategic Actions:

- Integrate cervical cancer care in the MOH digital health project for chronic and longitudinal care with clear end points of care that can be measured
- Linkage of the HPV vaccination, cervical cancer screening and treatment digital systems to help tracking the elimination indicators.
- Ensure interoperability/ linkage between EMR systems, and DHIS2, National Cancer Registry, and CRVS system (mortality module).
- Promote data driven decision making by enhancing data utilization at all levels.

Priority Area 3: Promote research in cervical cancer prevention and control.

Strategic Actions:

- Carry out a comprehensive readiness assessment for cervical cancer elimination in Rwanda
- Identify priority research questions in cervical cancer prevention and control (e.g.: implementation science, economic and financial studies, clinical trials) and include them in the national health research agenda.
- Build the capacity of the cancer control team in RBC, health facilities, academicians, researchers and partners to carry out research projects in cervical cancer prevention and control.
- Mobilize research funds to support researchers with outstanding cervical cancer research projects through a competitive process.
- Organize annual cervical cancer research conference including international researchers to share best practices and new evidence in the field of cervical cancer prevention and control.

4.3.6 Promote intersectoral collaboration, partnerships and create resource mobilization strategies for a sustainable financing of cervical cancer elimination.

Achieving the elimination of cervical cancer in Rwanda requires a coordinated approach that goes beyond the health sector. Strategic partnerships and intersectoral collaboration are essential to leverage resources, expertise, and support from various sectors. By fostering cooperation between government agencies, private sector actors, civil society, and international partners, Rwanda can create sustainable financing mechanisms to support prevention, early detection, treatment, and palliative care for cervical cancer. Mobilizing resources through innovative and multi-sectoral strategies is crucial to ensuring long-term sustainability and effective implementation of the national cervical cancer elimination plan.

Priority Area 1: Establish strengthened intersectoral collaborations and partnerships

Strategic Actions:

- Form a high level multisectoral committee serving as platform for cervical cancer elimination dialogue.
- Integrate cervical cancer prevention and control interventions into different sectors as a cross-cutting issue.
- Establish an online cervical cancer elimination information platform to provide updated information to the public and stakeholders on progress in implementing the cervical cancer elimination plan.
- Enhance international and regional collaboration by participating in global and regional cervical cancer initiatives, learning and sharing best practices and lessons learned with other countries pursuing elimination targets.
- Establish a collaborative center of excellence for cervical cancer elimination serving as a continental platform for exchange, capacity building and research in cervical cancer

Priority Area 2: Ensure adequate and sustainable financing for implementation of the cervical cancer elimination plan

Priority Actions:

- Develop an investment case for cervical cancer elimination in Rwanda to use in resource mobilization.
- Increase domestic funding for the sustainability of cervical cancer prevention and control interventions.
- Establish a cervical cancer fund to pool resources from various stakeholders, ensuring a sustained funding stream for long-term program implementation.
- Promote public and private partnerships to increase private investment in screening, diagnosis and treatment services.
- Mobilize resources and technical assistance from international donors and health organizations to support the implementation of the elimination plan.
- Mobilize high-level political support to champion cervical cancer elimination initiatives and attract resources from both local and global stakeholders.

CHAPTER 5:
COSTING FOR THE PLAN

The WHO Cervical Cancer Prevention and Control Costing (C4P) Tool employing a bottom-up approach to estimate both economic (value of all resources used) and financial (monetary outlays) factors for cervical cancer accelerated elimination plan was used to cost the plan. The tool categorizes costs into service delivery and program support activities, annualizes costs for long-term resources, and 3% discounts economic costs to account for the time value of money and reported in US dollars.

Rwanda's accelerated cervical cancer elimination plan requires a total investment of approximately US$38.4 million. This includes US$4.5 million for primary prevention and the remainder US$ 33.9 for screening and treatment of pre-cancerous and invasive cervical cancer.

5.1 PRIMARY PREVENTION - HPV Vaccination

Rwanda targets a high vaccination coverage rate, starting at 91.8% in 2024 and reaching 94.5% in 2027, averaging 93.2% over the four years. The total number of girls to be vaccinated is approximately 627,889. Rwanda's strategy to eliminate cervical cancer leverages its existing strengths in immunization (currently HPV Vaccination is subsidized by GAVI through the agreement with the Government of Rwanda) with an aim to shift to a single-dose approach to optimize costs while maintaining high coverage. The economic cost per vaccinated girl (US$ 7.25) is significantly higher than the financial cost (US$ 2.87).

Table 4: Costing summary of HPV vaccination

	2024	2025	2026	2027	Total
Target vaccination coverage	91.8%	92.8%	93.5%	94.5%	93.2%
Number of girls to be vaccinated/year	151,844	156,789	158,603	160,719	627,889
Financial cost per girls vaccinated/year ($	2.69	3.01	2.96	2.83	2.87
Economic cost per girls vaccinated/year ($)	6.98	7.43	7.37	7.22	7.25

We are anticipating an investment of $4.5 million USD for economic costs and $1.8 million USD for financial costs in the HPV elimination plan. The economic cost distribution shows that vaccines and supplies account for 64.7%, followed by supervision at 13.4% and microplanning at 7.8%. For financial costs, supervision constitutes 23.5%, vaccines and supplies 34.3%, and microplanning 14.1%, among other factors.

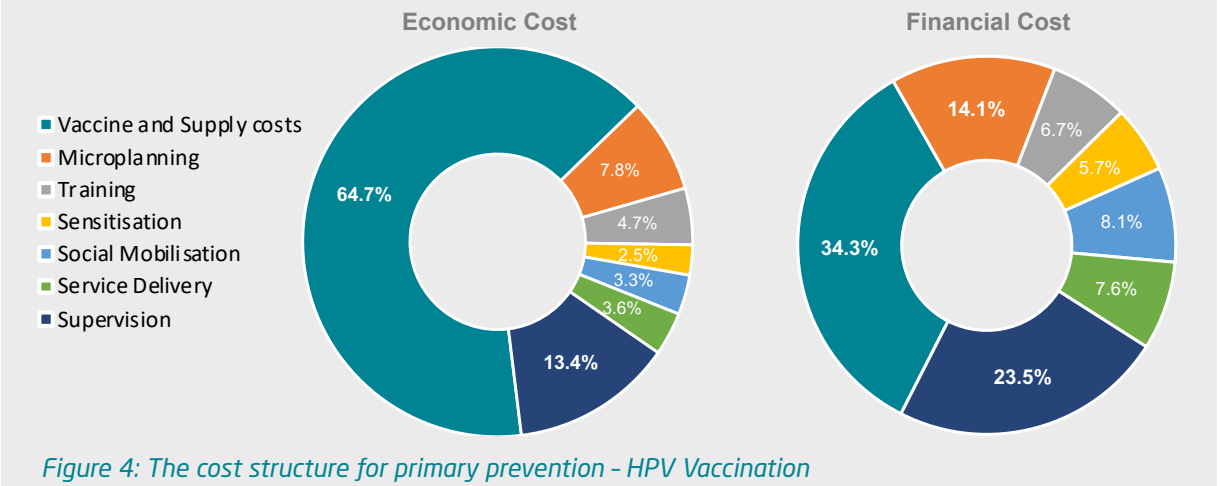


Figure 4: The cost structure for primary prevention - HPV Vaccination

5.2 SECONDARY PREVENTION – Screening and Pre-cancer treatment

The cervical cancer elimination plan rollout of HPV DNA screening between 2024 and 2027 shows a steady increase in the eligible population, rising from 1.69 million in 2024 to 1.83 million in 2027. At baseline in 2024, 367,378 screenings have been conducted, with subsequent annual targets estimated at 328,534 in 2025, 317,607 in 2026 and 285,923 by 2027. The cumulative number of screenings increases substantially each year, reaching 695,912 in 2025 and 1,299,441 by end of 2027. This scale-up effort will raise the cumulative coverage rate from 21.7% in 2024 to 71% in 2027.

Table 5: Predicted population for cervical cancer screening

Screening	2024	2025	2026	2027
Total Eligible Population	1,690,841	1,738,749	1,785,800	1,831,094
HPV DNA TEST				
Screenings at baseline with HPV DNA Test	367,378			
Target Population to be screened		328,534	317,607	285,923
Cumulative annual screenings		695,912	1,013,519	1,299,441
Target cumulative coverage rates	21.7%	40%	56.8%	71%
Visual inspection with acetic acid (VIA)				
Target population to be triaged with VIA	49,879	63,107	66,378	57,150

The estimated average economic cost for cervical cancer screening in Rwanda is approximately US$13.2 per woman, using both HPV DNA testing and VIA for treatment triage. In comparison, the financial cost is US$10.2 per woman screened. The estimated average economic cost for delivering pre-cancer treatment in Rwanda is approximately US$37.9 per woman screened positive and treated with thermal ablation or LEEP while the financial cost is estimated at US$33.6 per woman. The total costs for screening and pre-cancer treatment, including program costs, are US$16.63 million and US$13.1 million. Approximately 83% of these investments are allocated to screening and triage.

Table 6: Costing summary of Cervical Cancer Screening and Pre-cancer Treatment

	2025	2026	2027	Total/Average
Financial cost per screening service	11.1	10	9.5	10.2
Economic cost per screening service	14.4	12.9	12.3	13.2
Number of pre-cancer treatment performed	25,804	22,402	19,234	67,439
Financial cost per pre-cancer treatment ($)	31.3	32.8	37.6	33.6
Economic cost per pre-cancer treatment ($)	35.3	37	42.6	37.9

5.3 TERTIARY PREVENTION - Cancer Diagnosis, Treatment and Palliative care

Over the three-year period (2025-2027), approximately 2,883 new cases of invasive cervical cancer are projected. The associated healthcare resource utilization is significant, with an estimated 6,277 services including staging, treatment, and palliative care required during this period. This demand is expected to decline slightly over time, from 2,306 services in 2025 to 1,969 in 2027, reflecting the decreasing population requiring coverage.

The financial cost of providing these services is substantial. The average cost per service is estimated at $2,235, ranging from $2,044 in 2025 to $2,653 in 2027. In contrast, the economic cost, which incorporates both direct medical expenses and indirect costs, such as productivity losses is significantly higher, averaging $2,640 per service. The economic cost is projected to rise steadily, reaching a peak of $3,128 per service in 2027.

The total projected costs for cervical cancer diagnosis, treatment, staging, and palliative care, inclusive of program costs, are estimated at $16.57 million (Economic cost) and $14.03 million (Financial cost). Specifically, the costs associated with pathological and diagnostic interventions are projected at $0.53 million (economic cost) and $0.47 million (financial cost).

Table 7: Costing summary of Cervical Cancer Diagnosis, Treatment and Palliation

	2025	2026	2027	Total/Average
Diagnosis (Pathology)				
Number of services provided	**13,077**	**11,353**	**9,747**	**34,178**
Financial cost per service per year (US$)	13.5	13.5	13.5	13.5
Economic cost per service per year (US$)	15.4	15.4	15.4	15.4
Cervical cancer staging, treatment and palliative care				
Number of services received	**2,306**	**2,002**	**1,969**	**6,277**
Financial cost per service per year (US$)	2,044	2,043	2,653	2,235
Economic cost per service per year (US$)	2,418	2,416	3,128	2,640

CHAPTER 6: IMPLEMENTATION, MONITORING AND EVALUATION FRAMEWORK

The monitoring of progress towards the elimination goals will be led by the Ministry of Health and Rwanda Biomedical Centre through Non-Communicable Diseases Division/ Cancer Diseases Unit with the technical support from the TWG on Cancer Control which is composed of experts from different areas of cancer control. These experts will carry out the collection, interpretation, and analysis of the indicators detailed in this section.

Implementation reports will be prepared annually by the Cancer Control Unit of RBC, endorsed by the TWG, and submitted to the Director General of RBC, who in turn will officially submit to the Ministry of Health, followed by dissemination to all stakeholders.

To monitor global progress to the elimination of cervical cancer, WHO recommends the collection of performance results and impact indicators. The performance indicators are related to HPV immunization coverage, coverage of screening, and treatment of precancerous lesions and invasive cancer. The impact indicator assesses incidence of cervical cancer.

The majority of data to calculate the indicators are collected at the facility level. Data aggregated across facilities are used to calculate national and global key indicators for monitoring.

6.1. Global cervical cancer elimination indicators.

Global indicators are a small number of indicators that are standardized across countries for global monitoring of the progress towards the elimination of cervical cancer and may be the same as the national indicators.

In Rwanda, national target age ranges for screening align with WHO recommendations and therefore the global indicators are a subset of the national indicators that Rwanda collects routinely. These are:

Table 8: Global indicators

Indicator		Target 2030
HPV vaccine coverage rate	Percentage of girls who have received all the doses of the HPV vaccine by the age of 15 years	90%
Screening rate	Percentage of women aged 30-49 who have been screened with a high-performance test for the first time	70%
Treatment rate for women with pre-cancer	Percentage of women identified with having pre-cancerous lesions that receive treatment	90%
Treatment rate for invasive cervical cancer	Percentage of women identified with having invasive cervical cancer that receive treatment	90%

Table 9: Cervical cancer elimination targets in Rwanda

Indicator	Baseline (2024)	2025	2026	2027
Percentage of girls who have received the HPV vaccine by the age of 12 years	90%	90%	90%	90%
Percentage of women aged 30-49 who have been screened with a high-performance test for the first time	21%	35%	55%	70%
Percentage of women identified with having pre-cancerous lesions that receive treatment	92%	92%	92%	92%
Percentage of women identified with having invasive cervical cancer that receive treatment	81%	86%	90%	90%

Screening coverage for cervical cancer will increase progressively according to availability of resources to procure HPV/DNA kits and related consumables, increased awareness on cervical cancer prevention, organized population-based mass screening campaign and increase in trained human resources able to deliver those services. The treatment coverage for invasive cervical cancer will increase over time as we produce more gynecologic oncologists and establish a new radiotherapy center with two linear accelerators and brachytherapy unit supported by an effective patient's navigation system.

6.2 National service delivery indicators

Rwanda Biomedical Centre will track facility indicators through the established reporting system. Data aggregated across facilities will be used to calculate key national indicators for monitoring the progress towards the elimination of cervical cancer.

Table 10: National indicators

Variable	Indicator	Disaggregation	Data source	Frequency
HPV immunization rate	Percentage of girls who have received HPV vaccine by the age of 15 years	Age	DHIS2 immunization tracker and HMIS reports	Annually
Screening rate (Screening test: HPV DNA)	Percentage of women aged 30-49 years who have been screened for the first time with HPV-DNA test (start at 25 years in HIV+)	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Screening rate (Screening test: VIA)	Percentage of women aged 30-49 years who have been screened for the first time with VIA (start at 25 years in HIV+)	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Screening test positivity rate (Screening test: HPV DNA)	Percentage of screened women aged 30-49 years with a screen-positive result (start at 25 years in HIV+)	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly

Variable	Indicator	Disaggregation	Data source	Frequency
VIA positivity rate in HPV positive women	Percentage of women with aged 30-49 years who are HPV positive, screened VIA positive on triage (start at 25 years in HIV+)	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Screening test positivity rate (Screening test: VIA)	Percentage of screened women aged 30–49 years with a screen-positive result (start at 25 years in HIV+)	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Precancerous lesions treatment rate (Treatment: thermal ablation)	Percentage of screen-positive women with lesions eligible for thermal ablation who have received that treatment	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Precancerous lesions treatment rate (Treatment: LEEP/LLETZ)	Percentage of screen-positive women with lesions eligible for LEEP/ LLETZ who have received that treatment	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Post treatment follow up rate	Percentage women attending the follow up visit 1 year the post treatment	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Suspected cancer cases	Number of consulting women with suspicion of invasive cervical cancer	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Suspected cancer referral	Number of women referred for suspected cervical cancer for further investigations	HIV Status, Age	mUzima, Screening Registers, HMIS reports	Monthly
Suspected cancer referral compliance	Percentage of women referred for suspected cervical cancer for further investigations who attended the referral visit	HIV Status, Age	National EMR, HMIS Reports	Monthly
Biopsy collection	Number of cervical biopsies collected and sent to the pathology laboratory	HIV Status, Age	National EMR, HMIS Reports	Monthly
Biopsy result feedback	Percentage of biopsies sent to pathology lab with results received	HIV Status, Age	National EMR, HMIS Reports	Monthly
Number of invasive cervical cancer cases	Number of women confirmed with invasive cervical cancer	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Medical imaging for staging	Percentage of women with invasive cervical cancer receiving medical imaging for staging as per the national protocols	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually

Variable	Indicator	Disaggregation	Data source	Frequency
Treatment rate_ Surgery	Percentage of women with invasive cervical cancer eligible for surgery receiving surgery as per the national guidelines and protocols	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Treatment rate _Radiotherapy	Percentage of women with invasive cervical cancer eligible for surgery receiving radiotherapy as per the national guidelines and protocols	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Treatment rate: Chemotherapy	Percentage of women with invasive cervical cancer eligible for surgery receiving chemotherapy as per the national guidelines and protocols	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Treatment plan compliance	Percentage of women with invasive cervical cancer completing the treatment as per the treatment plan	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Palliative care treatment rate	Percentage of women with invasive cervical cancer receiving palliative care services per the guidelines	HIV Status, Age	National EMR, DHIS2 oncology tracker, Cancer registry	Annually
Morphine Availability	Percentage of healthcare facilities with a consistent supply of morphine for pain management	Type of facility	Facility Pharmacy, RMS Ltd	Quarterly

6.3 Results M&E framework indicators

The Monitoring and Evaluation (M&E) Framework for the accelerated plan to eliminate cervical cancer in Rwanda incudes selected Impact, Outcome and Output indicators to track and measure progress towards key milestones, ensuring accountability and effectiveness in all programmatic areas. This framework outlines specific indicators for HPV vaccination rates, screening coverage, treatment accessibility, and quality of care, providing a clear basis for assessing outcomes at each stage of the elimination journey. By closely monitoring these indicators, the M&E framework supports data-driven decision-making and enables timely adjustments to strategies, ensuring that Rwanda's efforts remain on course to meet the WHO's targets for cervical cancer elimination by 2027.

Table 11: M&E framework indicators

Result	Goal/Objective	Indicator	Definition	Baseline	2025	2026	2027	Data Source/ mean of verification	Disaggregation	Frequency
Impact	Reduce cervical cancer incidence rate	Incident cases/ incidence (numbers of new cases and rates) of cervical cancer	Recorded numbers and rates (age-specific, crude, age standardized) of new cervical cancer in a year	612: Crude* 18.9: ASR**	TBD	TBD	TBD	National Cancer Registry	Age, stage at diagnosis, HIV status, residence (rural/urban)	Annually
	Reduce cervical cancer mortality rate	Numbers and rates of cervical cancer deaths for the year indicated	Recorded numbers and rates (age-specific, crude, age standardized) of cervical cancer deaths for the year	609: Crude*** 13.8: ASR****	TBD	TBD	TBD	National Cancer Registry, CRVS	Age, stage at diagnosis, HIV status, residence (rural/urban)	Annually
Outcome	Strengthen cervical cancer primary prevention through awareness, information, education, and HPV immunization to maintain the vaccination coverage above 90%	HPV vaccination coverage among girls aged 12 years	Proportion of girls aged 12 years that received HPV vaccine in the current reporting year	90%	90%	90%	90%	Immunization register, DHIS2 immunization tracker, HMIS reports, Census	Age, residence type (rural/urban)	Annually
		Level of knowledge, attitude and Practice on cervical cancer prevention in the population	Proportion of the population with adequate knowledge, attitude and practice on cervical cancer prevention	TBD	TBD	TBD	TBD	KAP Survey, STEPS	Age, Sex and Residence (rural/ urban)	5 years
Outcome	Increase the cervical cancer screening coverage in eligible women to attain population coverage of 70% and 90% treatment of pre-cancerous lesions by 2027	Cervical cancer screening coverage among women aged 30-49 years using a high-performance test (HPV DNA) (start at 25 years in WLHIV)	Proportion of women aged 30-49 years who been screened for cervical cancer with a high-performance test at least once between the ages of 30 and 49 years.	21%	35%	55%	70%	mUzima, Screening registries and HFs reports	Age, HIV status, Residence (rural/ urban)	Annually
		Cervical pre-cancer treatment rate	Proportion of screen-positive women with lesions eligible for ablative or excision treatment who received the treatment in the previous 12-month period. Treatment options include thermal ablation and LEEP	92%	92%	92%	92%	mUzima, Screening registries and HFs reports	Age, HIV status, Residence (rural/ urban)	Annually

Outcome	Improve access to diagnosis, treatment of invasive cervical cancer, rehabilitation, and palliative care services to achieve at treatment coverage of 90% by 2030	Timely Cervical cancer laboratory diagnosis rate	Proportion of cervical biopsies reported within 15 days after receiving the sample in the laboratory	52%	65%	80%	95%	Cancer registry, EMR, LIS	Age, HIV status, Residence (rural/ urban)	Annually
		Cervical cancer patients access to medical imaging for staging	Proportion of cervical cancer patients accessing medical imaging (CT and or MRI) for staging within 30 days after pathology results	57%	75%	85%	95%	Cancer Registry, EMR	Age, Type of staging exam, HIV Status, Stage and Residence (rural/urban)	Annually
		Invasive cervical cancer prompt treatment rate	Proportion of patients with invasive cervical cancer receiving the treatment as per the national guidelines and protocols within 60 days after diagnosis	38%	56%	65%	80%	Cancer Registry, EMR	Age, Type of treatment, HIV Status, Stage and Residence (rural/ urban)	Annually
		Invasive cervical cancer treatment rate	Proportion of women with invasive cervical cancer who have received treatment in a given time period	81%	86%	90%	90%	Cancer Registry, EMR	Age, Type of treatment, HIV Status, Stage and Residence (rural/ urban)	Annually
		Availability of oral morphine solution for palliative care patients	Percentage of health facilities reporting stock out of oral morphine solution	<20%	<15%	<10%	<5 %	HMIS reports, LMIS Reports	Type of Health Facility	Annually
Output	Strengthen cervical cancer program organization, governance, and coordination	Established cervical cancer coordination office at Rwanda Biomedical Centre	Availability of 4 additional staff to coordinate the implementation of the plan	0	1	1	1	MoH and Cancer program annual reports	NA	Annually
		Established a national cervical cancer elimination task force	Availability of a functional National Cervical Cancer Elimination Task Force	0	1	1	1	MoH and Cancer program annual reports	NA	Quarterly
		Approved plan to sustain cervical cancer elimination investment and gains beyond 2027	Availability of an approved National Cervical Cancer Elimination Plan beyond 2027	0	NA	NA	1	Approved cervical cancer elimination sustainability plan	NA	By 2027

Output	Strengthen cervical cancer primary prevention through awareness, information, education, and HPV immunization to maintain the vaccination coverage above 90%	Number of cervical cancer awareness campaigns conducted	Awareness campaigns covering all districts at least twice a year	2	2	2	2	MoH and Cancer program annual reports	Type of communication channels used	Annually
		Updated national HPV immunization guidelines including new WHO recommendations and evidence	Updated national HPV vaccination guidelines aligned to new WHO recommendations and new scientific evidence	0	1	1	1	Approved updated HPV immunization guidelines	NA	By 2025
Output	Increase the cervical cancer screening coverage in eligible women to attain population coverage of 70% and 90% treatment of pre-cancerous lesions by 2027	Percentage of Health Facilities with functional cervical cancer screening services	Proportion of Health facilities providing cervical cancer screening services as per the national standards and guidelines (Hospitals and Health Centers)	78%	100%	10%	100%	Health facilities readiness survey, HMIS reports	Type of health facility	Every 2 years
Output	Improve access to cervical cancer diagnosis, treatment of invasive cancer, rehabilitation, and palliative care to reach 90% treatment coverage by 2027	Effective navigation system for cervical cancer patients is established	A functional digitally enabled navigation system for cervical cancer patients to promote speedy diagnosis, timely access to treatment and reduce lost to follow up	0	1	1	1	MoH and Cancer program annual reports	NA	Annually
		Established cervical cancer sample collection and transportation system	Establish a cervical cancer sample collection and transportation system from district hospitals to histopathology laboratories with an efficient results feedback mechanism	0	1	1	1	MoH and Cancer program annual reports	NA	Annually
		Number of newly equipped oncology dedicated theatres and beds at teaching hospitals	Build and equip three oncology dedicated theatres and beds at teaching hospitals to increase timely access to surgery for cervical cancer patients	0	1	3	3	MoH annual performance reports	NA	Annually

Output	Improve access to cervical cancer diagnosis, treatment of invasive cancer, rehabilitation, and palliative care to reach 90% treatment coverage by 2027	A new Radiotherapy Centre with 2 LINCS and Brachytherapy unit is established	Establish a new Radiotherapy Centre with 2 LINCS and Brachytherapy unit at a teaching hospital with required staffs to increase timely access to radiotherapy services for cervical cancer patients	0	NA	NA	1	MoH annual performance reports, RT commissioning report	NA	By 2027
		Number of new chemotherapy infusion centers established at teaching hospitals	Establish one new infusion center at a teaching hospital to increase geographical access to systemic therapy for cancer patients	0	NA	1	1	MoH annual performance reports,	NA	Annually
		% of health centers with functional palliative care services	Proportion of health centers with trained nurses on palliative care and providing oral morphine solution for pain management	24%	30%	70%	100%	HMIS reports, Cancer program annual report	NA	Annually
Output	Enhance the monitoring and evaluation system for cervical cancer prevention and control services to track the performance, data systems and research	% of health facilities with trained health care providers in the M&E of cervical cancer elimination plan	Proportion of health facilities (hospitals and health centers) with health providers training on the M&E of the cervical cancer elimination plan including data management	78%	100%	100%	100%	RDQA reports, training reports	Type of health facilities	Annually
		Interconnected digital system to track cervical cancer elimination indicators is established	Linkage of the HPV vaccination, cervical cancer screening and treatment digital systems to help tracking the elimination indicators	0	1	1	1	MoH reports, Availability of the system	NA	Annually
		Annual cervical cancer research conference is organized	Organize annual cervical cancer research conference including international researchers to share best practices and new evidence in the field of cervical cancer prevention and control.	0	1	1	1	Conference report	NA	Annually

Output	Promote intersectoral collaboration, partnerships and create resource mobilization strategies for a sustainable financing of cervical cancer elimination	Domestic financing for cervical cancer response is increased	% of annual increase in the domestic budget allocated to cervical cancer interventions	TBD	TBD	TBD	TBD	Health sector budget and expenditures, HRTT	Source of funds	Annually
		A high level multi sectoral committee on cervical cancer elimination is established	Establish high level multisectoral committee serving as platform for cervical cancer elimination dialogue	0	1	1	1	Meeting reports	NA	Annually
		An online cervical cancer elimination information platform is established	Develop an online cervical cancer elimination website for updated information to the public and stakeholders on the implementation of the plan	0	1	1	1	Updated website	NA	Annually

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