

# Global strategy to accelerate the elimination of cervical cancer as a public health problem



World Health  
Organization

**"Through cost-effective, evidence-based interventions, including human papillomavirus vaccination of girls, screening and treatment of precancerous lesions, and improving access to diagnosis and treatment of invasive cancers, we can eliminate cervical cancer as a public health problem and make it a disease of the past."**

Dr Tedros Adhanom Ghebreyesus,  
Director-General, World Health Organization

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Cover image credits:

Millicent Kagonga, survivor and advocate for cervical cancer elimination, with her daughter Grace. WHO/Ash Appleton.

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## In their own words

My daughter is young – she is a teenager – and yet she had to look after me, dressing my wounds, which had broken through my skin. For a long time I had to put up with pains which went through my whole body, especially in my back and my lower body areas. We had no morphine at home and so I was in a terrible state. ... I grew up in a poor family and we didn't have information about HIV and cancer. ... Often it is too late when people go to the doctor and most people don't even know the signs. If I had the chance, I would love to be part of a campaign to tell people about [it]. ... The clinics need to help us be more aware of these, especially about cervical cancer – we need more testing.

*Ubuhle, who worked in a dairy as the main breadwinner for her family when she was laid off due to the severity of her cervical cancer symptoms (South Africa).<sup>1</sup>*

I was snatched from the beginning of my career ... and tossed into a battle for my life ... diagnosed with stage IV-A cervical cancer. ... [A] flood of questions rushed forward – how could this be? The cervical cancer spread to my bladder? To the lower lymph nodes? And possibly to my ovaries? I likely would not be able to conceive and/or carry a child? And probably enter menopause as a 31-year-old? I felt betrayed by my body. ... I came across an article with this startling statement: “Cervical cancer has become a disease of the poor, uneducated minority.” Excuse me? As a Latina, those three bold words seemed to lift off the screen and morph into a finger pointed at me. But ... data out there that lends itself to the heartbreaking finding that black women ... and Latinas suffer from the highest incidence rate ... this was and remains one of the many hard truths that I have confronted since my diagnosis and I will continue to shine a light on as an advocate.

*Jeanette, a cervical cancer advocate and law clerk, passed away one year after her diagnosis (United States of America).*

My stomach started bloating. ... When walking I felt like I would fall any moment. My legs would ache, it was unbearable. ... I went to the hospital. They scanned and said that there were three small fibroids. I did not do anything about it. My life was a mess, my husband was having a relationship with another woman. ... I went to live with my parents. My brother's sons took my scan report to [the hospital]. ... They said that I had cervical cancer. But they said that the condition was advanced and that they could not operate on me. We consulted many other places, and everyone said the same. ... Finally, a lady doctor ... said that I was a risky case but since I was so firm in my decision to have a surgery for uterus removal, she would do it. ... I had lost everything in my life – my marriage, my job. I lost all my hair and would not feel like going out in public. One day ... a nurse ... took me to a counselling centre. ... I learnt to hold on to the positive things in my life. ... I started doing business – bought and sold rice, made good money. ... I feel well, life goes on.

*Anonymous cervical cancer survivor, whose husband remarried when she was unable to have children. Today she is a landowner who supports herself as a rural entrepreneur (India).<sup>2</sup>*

I started suffering from aches, mainly in my ovary. ... With time the pain was becoming severe ... very severe ... almost unbearable. Until one night I woke up screaming as I was not able any more to endure the pain. ... I was diagnosed with cervical cancer [and] was informed that I had to undergo a hysterectomy and remove the left ovary as well. ... I did recover physically from the operation but I am still under the shock that I will not ever be able to give birth to a child of my own. ... Can you imagine how painful it is to lose the hope to have your own child? ... I might have lost the hope to have a child of my own, but I still have hope that some day we will be able to prevent this from happening to other women.

*Anonymous member of a regional support group for women living with HIV (Egypt).*

<sup>1</sup>Testimony provided by Hillcrest AIDS Centre Trust.

<sup>2</sup>Testimony provided by the Rural Women's Social Education Centre, Tamil Nadu, India. Translated from Tamil by T.K. Sundari Ravindran.

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I developed a wound and that did not go. It became very painful. It was too late when I got treatment. My son is such a good boy. He would cook for me and try to care for me but it was too much for him. He is so caring, it breaks my heart. Now he is staying with his father who I don't have much contact with since I have been ill. ... The youth must learn about cancer as well as about HIV, and go to the clinics early to get tested. I didn't have this information.

*Nonjabulo, who lived with HIV, battled cervical cancer at the age of 37. Her 16-year-old son was her sole caretaker until she was admitted to an NGO clinic for palliative care (South Africa).<sup>3</sup>*

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The doctor called me in earlier than the scheduled time. That turned out to be a bad sign. She told me that she had bad news. That I had cervical cancer. ... My daughter asked me to promise her that I would stay alive, but I told her that I couldn't. I didn't want to lie. ... When I went to the specialized hospital they told me after some tests that I could get surgery. I was really relieved and immediately called my kids. From that point on I felt positive. ... The radiation took a big toll on my bladder, intestines and stomach. It also causes an immediate menopause. ... The people around me forget easily that I was sick once. Which is normal of course; everybody needs to move on. But for a former cancer patient there is no real moving on. ... At the same time I'm of course very happy to still be alive. I'm enjoying my life more fully with my children and I'm very grateful for what I have.

*Kim, a cancer survivor and patient advocate. She was diagnosed at the age of 39, a single mother of a 9-year-old son and a 13-year-old daughter (the Netherlands).*

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There was a lot of white vaginal discharge. There was also heavy bleeding — chunks of blood. This would go on for 15–20 days at a time and then stop. Come back again after 10 days. I was unable to go out for farm work or carry out household work. My hands and legs would feel weak and tremble. I went to Dr A in the local town. ... It cost me more than 5000 rupees. There was no change in my condition. Then the same doctor referred me to the medical college hospital. I went there. ... Nothing worked. ... I went with my son to the cancer hospital in Chennai. ... When I returned for the test results, they told me that it was the beginning stage of cervical cancer. ...

I got admitted. They gave me tablets, and also radiation treatment. ... I am doing good now, I can do housework and also do some work in our farm.

*"L", a cervical cancer survivor and mother of four from a rural farming family, whose travel for treatment took 3–4 hours each way (India).<sup>4</sup>*

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I am a Kariyarra woman from the Pilbara region of Western Australia who was diagnosed and received treatment in Perth (Boorloo) which is Whadjuk Noongar land. I'm a mum, three kids, I'm a wife, I'm also a cancer survivor. I was like right, okay. ... What about my kids? I wasn't so much worrying about myself and what it might mean for me, but more so what it meant to my family and how it would affect them. Part of my treatment plan was that I would have 35 rounds of radiotherapy and four lots of brachytherapy. That whole time was such a blur, I don't think I've ever felt as tired in my life trying to not be emotional about that, thinking that I can't even buy food for my kids, was horrible, simple things that you take for granted that you do as a mum. ... I had my screening test and it saved my life.

*Natasha, a cervical cancer survivor (Pilbara Region, Australia).*

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A series of events led to the loss of my husband and two children due to AIDS-related illnesses. Just when I thought I was done with the hurt and the pain, I was diagnosed with stage II cervical cancer. This was the beginning of a long, rough and many times uncertain journey. The sights and sounds of hospital rooms and corridors became commonplace, the agony of being stigmatized by those I thought I could depend on only added salt to my open wounds, I had reached the end of my tether! As a victor, my experience revealed that indeed, cervical cancer is curable. Though I remain with lifetime scars. ... I have to walk around with ... a colostomy bag that collects my stool.... I need two in a day and each costs between 600 and 1000 Kenyan shillings. ... Early diagnosis, easy access to treatment facilities and support groups for the many people struggling with this disease can be a reality. I am an advocate for cancer and my message to the world is NO WOMAN SHOULD DIE OF CERVICAL CANCER. LET US JOIN HANDS AND ELIMINATE IT!

*Sally, a cervical cancer survivor, advocate, and self-described "global hero of hope" (Kenya).*

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<sup>3</sup>Testimony provided by Hillcrest AIDS Centre Trust.

<sup>4</sup>Testimony provided by the Rural Women's Social Education Centre, Tamil Nadu, India. Translated from Tamil by T.K. Sundari Ravindran.

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# Foreword

The success of the drive to eliminate cervical cancer depends on political will, country-led action investments, and global solidarity, as well as sustainable and adaptable partnerships. Member States have committed themselves to the attainment of universal health coverage and the Sustainable Development Goals, leaving no one behind.

Eliminating cervical cancer as a public health problem is part of honouring this commitment and many others related to tackling inequities and upholding the right of women and adolescent girls to high quality, people-centered equitable health services.

Even though the COVID 19 pandemic has taken a heavy toll on health systems across the world, ensuring that women and adolescents continue to receive the health services they need, is a moral imperative.

We have the knowledge and the tools to stop women from suffering and dying from this preventable disease. The time is now for all Member States and development partners to rally behind this strategy to eliminate cervical cancer as a public health problem.

*Together, we can make history – it is within our reach!*

Elimination is within the reach of all countries.

We can all leave behind a great legacy if we seize the opportunities that are within our reach now, so that girls who are born today will live to see a world free of this disease.



**Dr Tedros Adhanom Ghebreyesus**

Director-General,  
World Health  
Organization



**Dr Zsuzsanna Jakab**

Deputy Director-General,  
World Health  
Organization



*“One woman dies of cervical cancer every two minutes...Each one is a tragedy, and we can prevent it.”*

**Call to Action - May 2018: Cervical Cancer: An NCD We Can Overcome**

**Dr Tedros Adhanom Ghebreyesus  
Director-General, World Health Organization**

# 1. Background: why is a global strategy needed?

Cervical cancer is a preventable disease. It is also curable if detected early and adequately treated. Yet it remains one of the most common cancers and causes of cancer-related death in women across the globe. The annual number of new cases of cervical cancer has been projected to increase from 570 000 to 700 000 between 2018 and 2030, with the annual number of deaths projected to increase from 311 000 to 400 000. More than 85% of those affected are young, undereducated women who live in the world's poorest countries. Many are also mothers of young children whose survival is subsequently truncated by the premature death of their mothers (1).

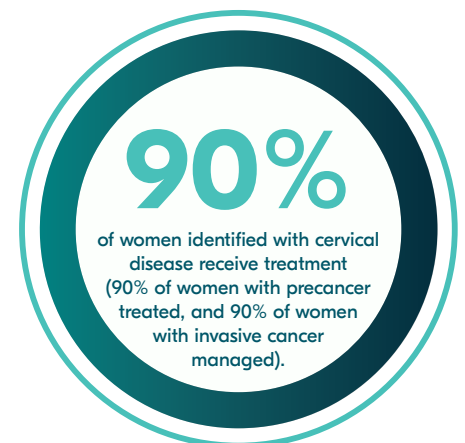
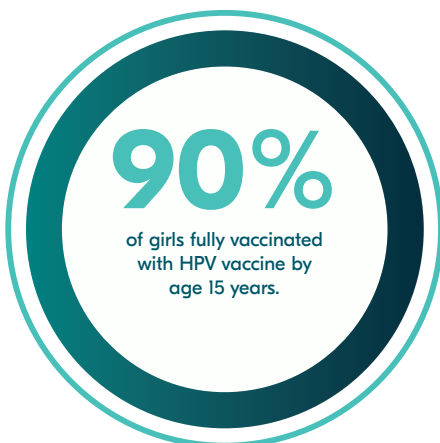
Few diseases reflect global inequities as much as cancer of the cervix. In low- and middle-income countries its incidence is nearly twice as high and its death rates three times as high as in high-income countries.

Proven and cost-effective measures for eliminating cervical cancer exist, but to date have not been widely implemented in regions of the world where the disease burden is highest. To be optimally effective, these measures must be scaled to national levels and delivered using health service platforms that are sensitive to women's needs, their social circumstances, and the personal, cultural, social, structural and economic barriers hindering their access to health services. Health services that are integrated and people centred, and that respect and uphold women's rights and dignity, are vital.

Urgent and bold action is needed to scale up and sustain implementation of the evidence-based interventions (human papillomavirus (HPV) vaccination, cervical cancer screening and management of detected disease) for eliminating cervical cancer as a public health problem, but such action must be strategic.

## This global strategy to eliminate cervical cancer proposes:

- a vision of a world where cervical cancer is eliminated as a public health problem;
- a threshold of 4 per 100 000 women-years for elimination as a public health problem;
- the following 90-70-90 targets that must be met by 2030 for countries to be on the path towards cervical cancer elimination:



- a mathematical model that illustrates the following interim benefits of achieving the 90-70-90 targets by 2030 in low- and lower-middle-income countries:
  - median cervical cancer incidence rate will fall by 42% by 2045, and by 97% by 2120, averting more than 74 million new cases of cervical cancer;
  - median cumulative number of cervical cancer deaths averted will be 300 000 by 2030, over 14 million by 2070, and over 62 million by 2120.

The global strategy to eliminate cervical cancer as a public health problem will require (a) political support from international and local leaders; (b) coordinated cooperation among multisectoral partners; (c) broad support for equitable access in the context of universal health coverage; (d) effective resource mobilization; (e) health system strengthening; and (f) vigorous health promotion at all levels. The interconnected nature of gender and health must stand as the strategic centrepiece of interventions.

The strategy must also be open to the exploration and exploitation of new ideas and opportunities, including advances in developing new medicines, vaccines, diagnostics and treatment modalities. In order to achieve its targets, the strategy must embrace innovative models of service delivery and computerized data and information systems, together with new and expanded training methods (for example, using virtual reality simulations) and interventions scaled up to population level (for example, mass campaigns to screen and treat cervical cancer, and surgical camps). Management science and modern forms of communications technology must be integrated into all aspects of service delivery. The market must be reshaped to eliminate cost as a barrier to prevention and treatment in the world's poorest countries.

The moment has arrived for an ambitious, concerted and inclusive strategy to accelerate eliminating cervical cancer as a public health problem. Elimination is within the reach of all countries. We know what works. The technology and tools exist. We know that prevention and early diagnosis and treatment are highly cost effective. The current focus on universal health coverage demonstrated by the United Nations General Assembly in September 2019 offers a unique opportunity for countries to strengthen interventions for the management of invasive cervical cancer (2).

Half measures and incremental approaches will not suffice. It is time to implement at scale, worldwide. A disease that now stands as one of the world's greatest public health failures can be eliminated.



Adolescent girls enjoying a day in Moscow – Russia

*For the first time ever, the world has committed to eliminate a cancer.*

## 2. Context:

This is the first global health strategy for the elimination of a cancer as a public health problem. It builds on the Director-General’s call in May 2018 for all countries to take action to help end the suffering caused by cervical cancer, in which he argued for renewed political will to realize elimination and urged all stakeholders to unite behind this common goal (3). The global effort is aligned with human rights instruments upholding health as a human right (4), as well as the 2030 Agenda for Sustainable Development and its overarching principle of leaving no one behind. The effort supports the attainment of several Sustainable Development Goals and targets (Box 1) (5) and is a component of the United Nations Secretary-General’s Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030) (6).

### Box 1. Eliminating cervical cancer contributes to attainment of several Sustainable Development Goals and targets

<b>Goal 1:</b>	End poverty in all its forms everywhere.
<b>Goal 3:</b>	<p>Ensure healthy lives and promote well-being for all at all ages:</p> <p>Goal 3, target 3.4: By 2030, reduce by one third premature mortality from noncommunicable diseases through prevention and treatment and promote mental health and well-being.</p> <p>Goal 3, target 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.</p> <p>Goal 3, target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.</p>
<b>Goal 5:</b>	Achieve gender equality and empower all women and girls.
<b>Goal 10:</b>	Reduce inequality within and among countries.

The World Health Organization (WHO) Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020 identifies HPV vaccination and cervical cancer screening and treatment as best buys (7). They are included in the WHO list of interventions recommended for inclusion in Member States’ national health plans.

In addition, the 2016 United Nations General Assembly adopted the Political Declaration on HIV and AIDS (8), which aimed to end the AIDS epidemic by 2030 and emphasized the need for integrated services to address coinfections and comorbidities, including prevention, screening and treatment for viral hepatitis and cervical cancer, as well as other sexually transmitted infections, to guarantee the sustainability of HIV prevention, treatment, care and support services.

*Nine in ten cervical cancer deaths worldwide occurred in low-and-middle income countries.*

*Women living with HIV are six times as likely to develop cervical cancer compared to women who are HIV negative.*

### 3. Global burden of cervical cancer: a manifestation of inequality

#### 3.1 Cervical cancer incidence and mortality

Cervical cancer is the fourth most common cancer among women globally, with an estimated 570 000 new cases in 2018 (9). All countries are affected, but the incidence is higher in low- and middle-income countries (Fig. 1). Age-standardized incidence rates vary from 75 per 100 000 women in the highest-risk countries to fewer than 10 per 100 000 women in the lowest-risk countries (9).

Nearly 90% of the 311 000 deaths worldwide in 2018 occurred in low- and middle-income countries (Fig. 2). Further, the proportion of women with cervical cancer who die from the disease is greater than 60% in many low- and middle-income countries, which is more than twice the proportion in many high-income countries, where it is as low as 30% (10).

The global burden of cervical cancer is projected to continue to increase, rising to 700 000 cases and 400 000 deaths in 2030, with analogous increases expected in future years (11). These rises represent a 21% increase in the number of cases and a 27% increase in the number of deaths over just the 12-year period from 2018. The vast majority of these increases will be in women in low- and middle-income countries, reflecting the severity of the global divide in cervical cancer morbidity and mortality.

Fig. 1. Estimated age-standardized cervical cancer incidence, 2018

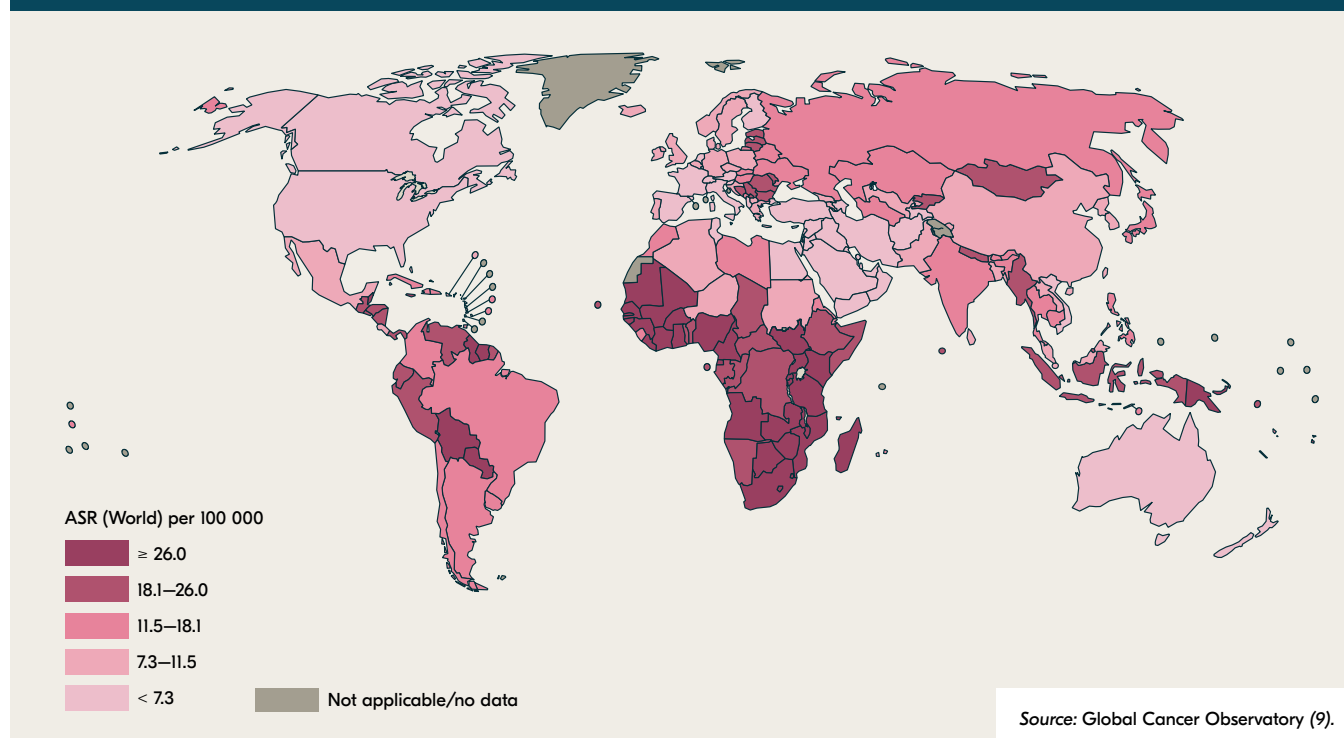
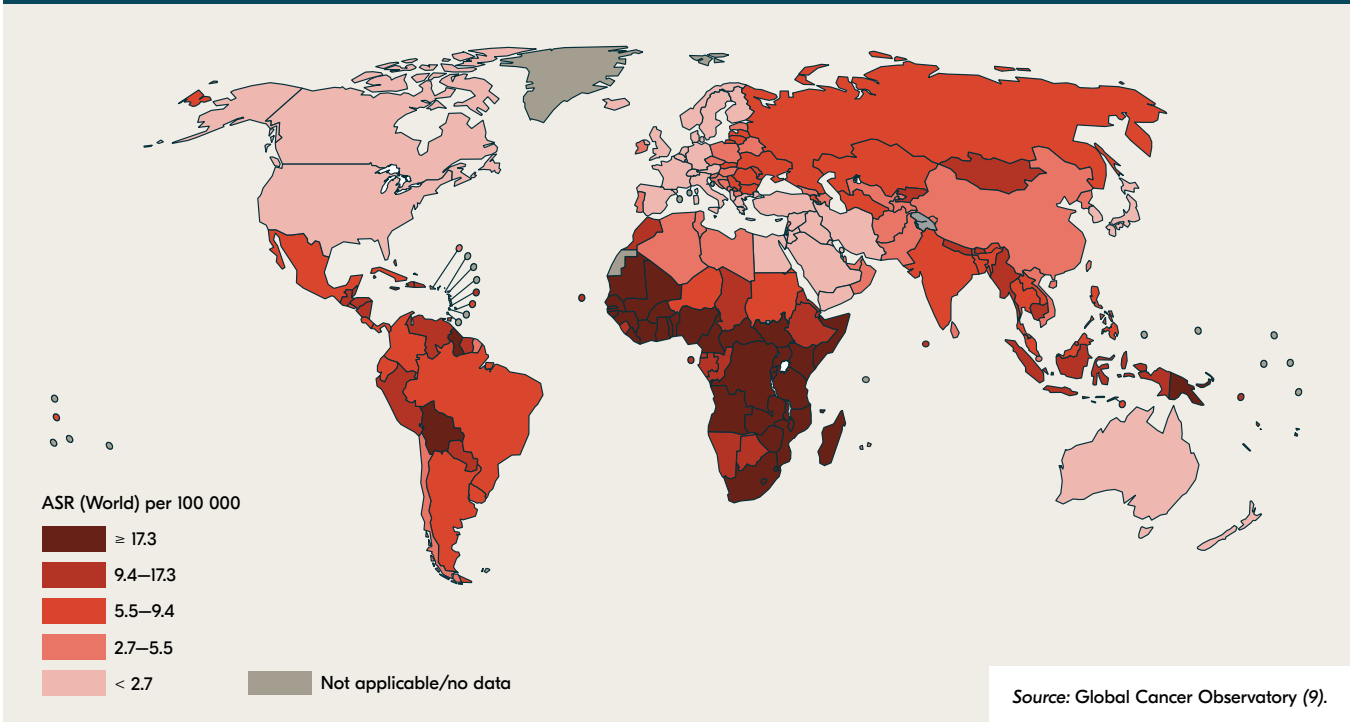


Fig. 2. Estimated age-standardized cervical cancer mortality, 2018



### 3.2 HPV and cervical cancer

The primary cause of precancerous and cancerous cervical lesions is infection with a high-risk or oncogenic HPV type (12). HPV makes up a group of viruses that are extremely common worldwide – there are more than 100 types, of which at least 14 cause cancer. A subset of HPV types is responsible for virtually all cases of cervical cancer. HPV 16 and 18, which together are responsible for about 70% of cervical cancer worldwide, are the most oncogenic types. Cervical HPV is the most common sexually transmitted infection. The pathogenesis of cervical cancer is the same worldwide. The higher rates of cervical cancer incidence and mortality in low- and middle-income countries are not attributable to differences in cervical infection with oncogenic HPV types. Instead, they are mainly attributable to the relative lack of high-quality cervical cancer screening and lack of widespread high-quality treatment of invasive cervical cancer in those countries. Infection with certain HPV types also causes a proportion of cancers of the anus, vulva, vagina, penis and oropharynx, which are preventable using primary prevention strategies similar to those for cervical cancer (13).

### 3.3 HIV and cervical cancer

Cervical cancer is the most common cancer among women living with HIV. Compared with women who are HIV-negative, women living with HIV have a risk several times higher of persistent HPV infection, are six times as likely to develop cervical cancer (14) and are more likely to develop it at a younger age (15, 16).

Despite the gains in prolonged life expectancy associated with access to HIV care and treatment in countries worst hit by the HIV epidemic, cervical cancer in women living with HIV has not received the attention and resources that are needed to address its prevention and treatment, and screening coverage has often been low. Reaching vulnerable women at high risk of developing cervical cancer and acquiring HIV infection will need prioritization of integrated preventive, screening and treatment services for both diseases to increase efficiencies and maximize impact.



*Between 2006 and 2017, 100 million adolescent girls received at least one dose of the HPV vaccine – 95% were in high income countries.*

*Around 30% of low-income countries reported having pathology services, cancer surgery, chemotherapy and radiotherapy generally available in the public sector, compared with more than 90% of high-income countries.*

*Less than 25% of low-income countries have introduced the HPV vaccine into their national immunization schedules.\**

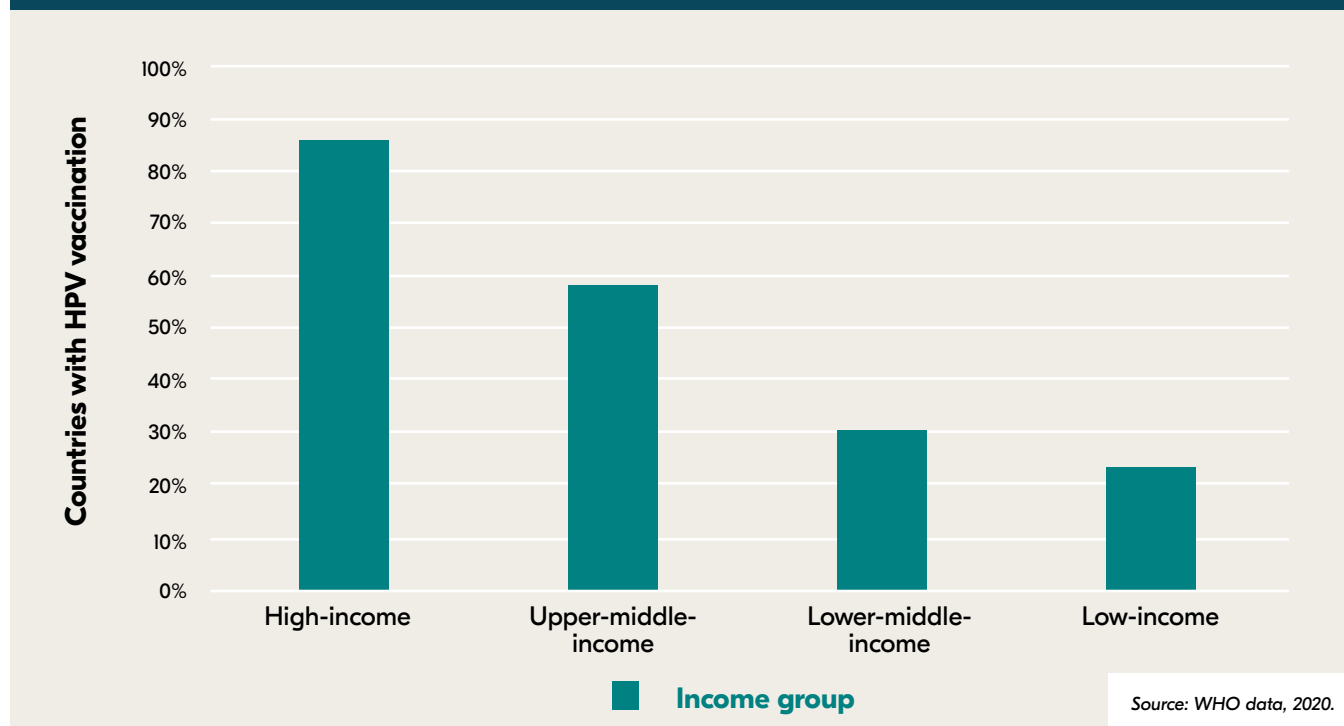
\*As of 2020

## 4. Cervical cancer control interventions: current status of access to HPV vaccines, screening and treatment

Between 2006, when the first HPV vaccine was licensed, and 2017, more than 100 million adolescent girls worldwide received at least one dose of HPV vaccine, 95% of whom were in high-income countries (17). Access to HPV vaccination is improving, and in 2019 more than 65% of the girls being vaccinated each year globally were living in low- and middle-income countries.<sup>5</sup>

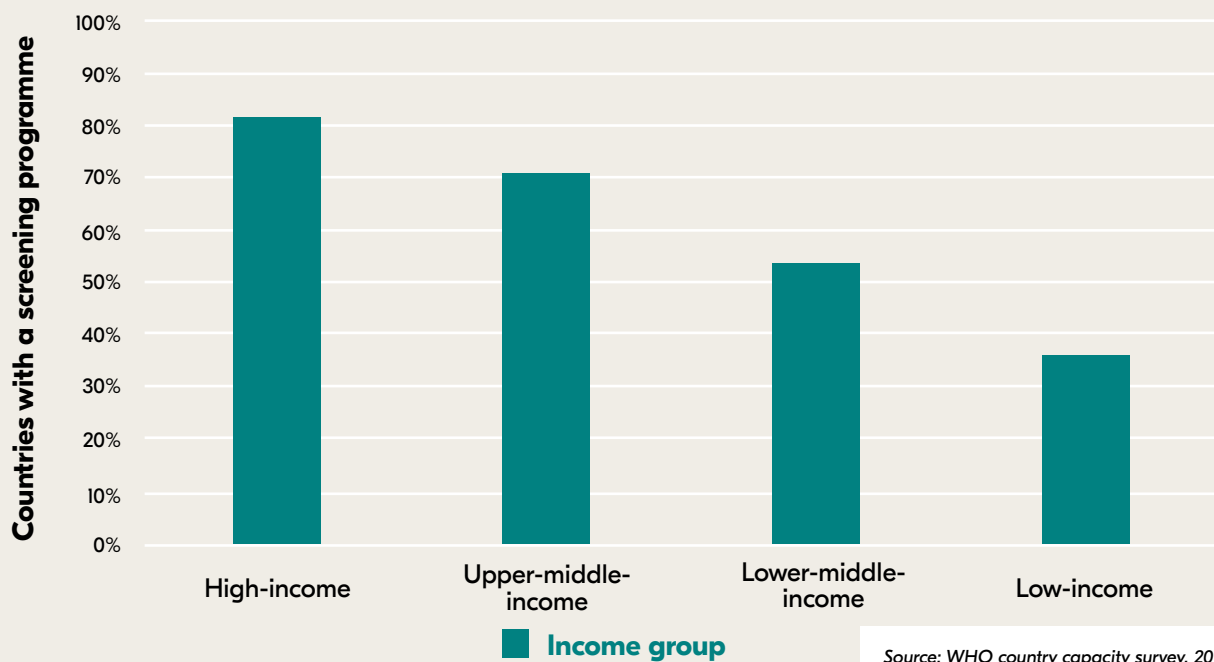
As of 2020, less than 25% of low-income and less than 30% of lower-middle-income countries had introduced the HPV vaccine into their national immunization schedules, while more than 85% of high-income countries had done so (Fig. 3). A similar breakdown is observed in the establishment of cervical cancer screening programmes when examining countries based on income level (Fig. 4).

**Fig. 3.** Percentage of countries with HPV vaccine in the national immunization schedule, by World Bank income group, 2020



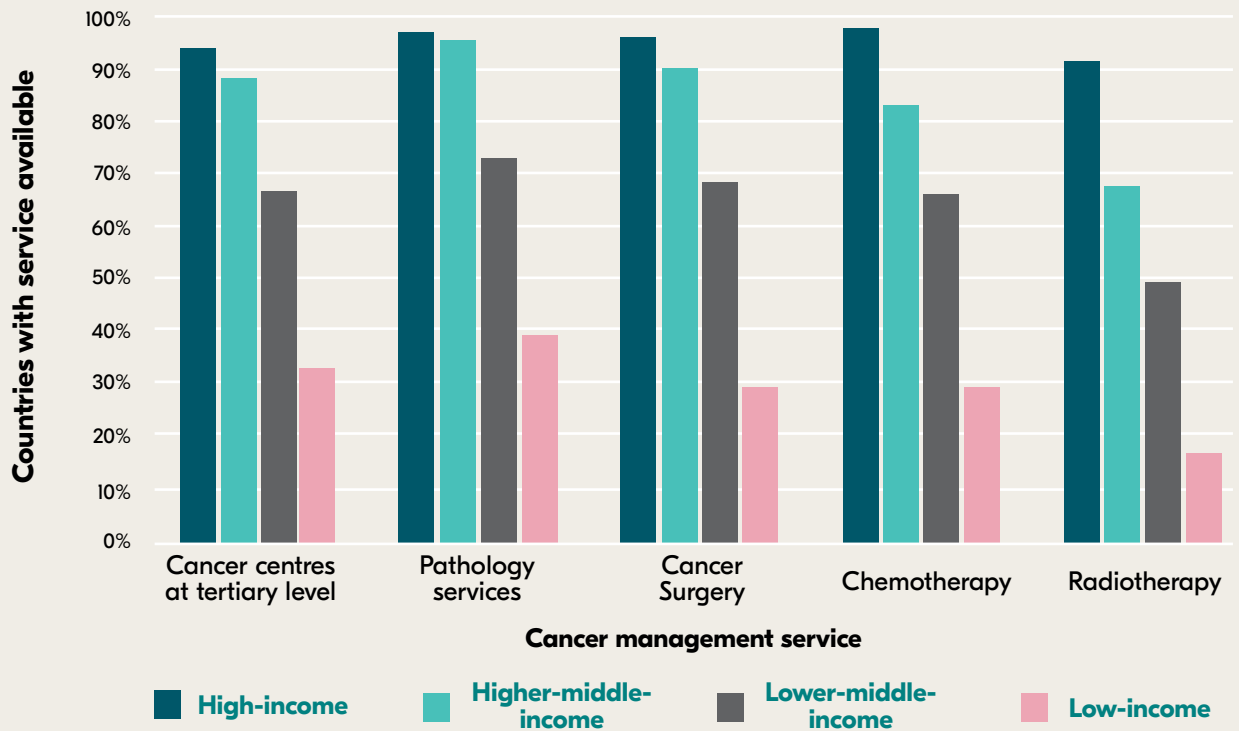
<sup>5</sup>WHO Department of Immunization, Vaccines and Biologicals database.

**Fig. 4.** Percentage of countries with a national cervical cancer screening programme, by World Bank income group, 2019



The disparities among countries in the availability of cancer management services are similarly striking (Fig. 5) (18). Around 30% of low-income countries reported having pathology services, cancer surgery, chemotherapy and radiotherapy generally available in the public sector, compared with more than 90% of high-income countries.

**Fig. 5.** Percentage of countries with generally available cancer diagnosis and treatment services in the public sector, by World Bank income group, 2019



Source: WHO country capacity survey, 2019 (18).

*Achieving the 90-70-90 targets by 2030 would result in over 62 million cervical cancer deaths averted by 2120.*

## 5. The path to eliminating cervical cancer

The huge burden of mortality related to cervical cancer is a consequence of decades of neglect by the global health community. However, with the recent rise in global advocacy for women's health, the commercial availability of prophylactic vaccines, low-cost approaches to screening and treating cervical cancer precursors, development of resource-appropriate management guidelines, novel approaches to surgical training, and initiatives to increase global access to anti-cancer drugs, the script can be rewritten.

Clearing the path to cervical cancer elimination will require bold strategic actions that are designed to improve community awareness; rapidly expand workforce capacity; strengthen health systems; shape the market so as to lower the prices of life-saving products; accelerate the introduction of affordable technology into screening and treatment algorithms; and nationally scale up organized, population-based prevention and treatment platforms. In order to ensure optimal effectiveness, the strategic actions must be developed in concert with front-line health care policy-makers and providers, advocates, and women themselves.

### 5.1 Principles and elimination goal

The term “elimination as a public health problem” is defined as achieving the measurable global targets set by WHO for a specific disease, based on population data. To determine the threshold for eliminating cervical cancer as a public health problem, WHO evaluated the epidemiological data and the distribution of incidence rate across countries (19), considered established definitions of rare cancers (20), and conducted an expert consultation in 2018–2019. To eliminate cervical cancer as a public health problem globally, all countries must work towards an incidence below 4 per 100 000 women-years. To achieve that goal, high coverage targets for HPV vaccination, screening and treatment of precancerous lesions, and management of cancer must be reached by 2030 and maintained at this high level for decades (Box 2).

All recommended interventions, services and policies are evidence based and should be delivered in the context of national efforts to achieve universal health coverage, focusing on primary health care, the public health approach,<sup>6</sup> the life-course approach to health (21), and integrated people-centred health services (22).

The elimination threshold is achievable in the vast majority of countries, including the 78 low- and lower-middle-income countries with the highest burdens of disease (23). Once the elimination threshold is reached, interventions must be sustained to keep incidence rates below the threshold and to maintain low mortality. More ground-breaking technology, effective interventions and sound practices are needed to enable further reduction in the incidence of cervical cancer.

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<sup>6</sup>The core public health functions involve assessing and monitoring the health of specific, most affected populations to identify health threats and priorities, formulating public policies to solve identified health problems and priorities, ensuring that all populations have access to appropriate and cost-effective care, and evaluating the effectiveness of that care.

## 5.2 Interim targets on the path towards elimination (90-70-90)

As countries facing potential barriers to achieving the necessary uptake of the vaccine (for instance, acceptability, cost, programme infrastructure and the anti-vaccine movement) seek solutions, women previously infected with oncogenic HPV types will continue to be at risk for cervical cancer and its sequelae. Therefore, improving access to secondary and tertiary preventive interventions must remain a top priority of the global strategy to eliminate cervical cancer. The business-as-usual trajectory is unacceptable, as every year more and more women will suffer from and die of a preventable condition.

Box 2 presents a set of targets or milestones for 2030 based on the principles and strategy for elimination.

### Box 2. The 2030 targets towards elimination of cervical cancer

Meeting the following 90-70-90 targets by 2030 will put all countries on the path to elimination (24):

- **90%** of girls fully vaccinated<sup>7</sup> with HPV vaccine by 15 years of age
- **70%** of women screened using a high-performance test<sup>8</sup> by 35 years of age and again by 45 years of age (25)
- **90%** of women identified with cervical disease are treated:
  - **90%** of women with precancer treated
  - **90%** of women with invasive cancer managed.

## 5.3 Why the 90-70-90 targets are the key to success

For maximum impact, interventions to meet the three targets must be implemented simultaneously and at scale.

Implementing all three pillars of the strategy will contribute to the immediate and accelerated reduction in mortality rates that results from the treatment of invasive cervical cancers. Incidence rates will gradually decrease as a result of wide-scale implementation of population-based screen and treat services, and vaccination against HPV offers protection against cervical cancer for girls and future generations (26).



Kim Hulscher, a cervical cancer survivor, with her family right after her diagnosis in Almere, The Netherlands.

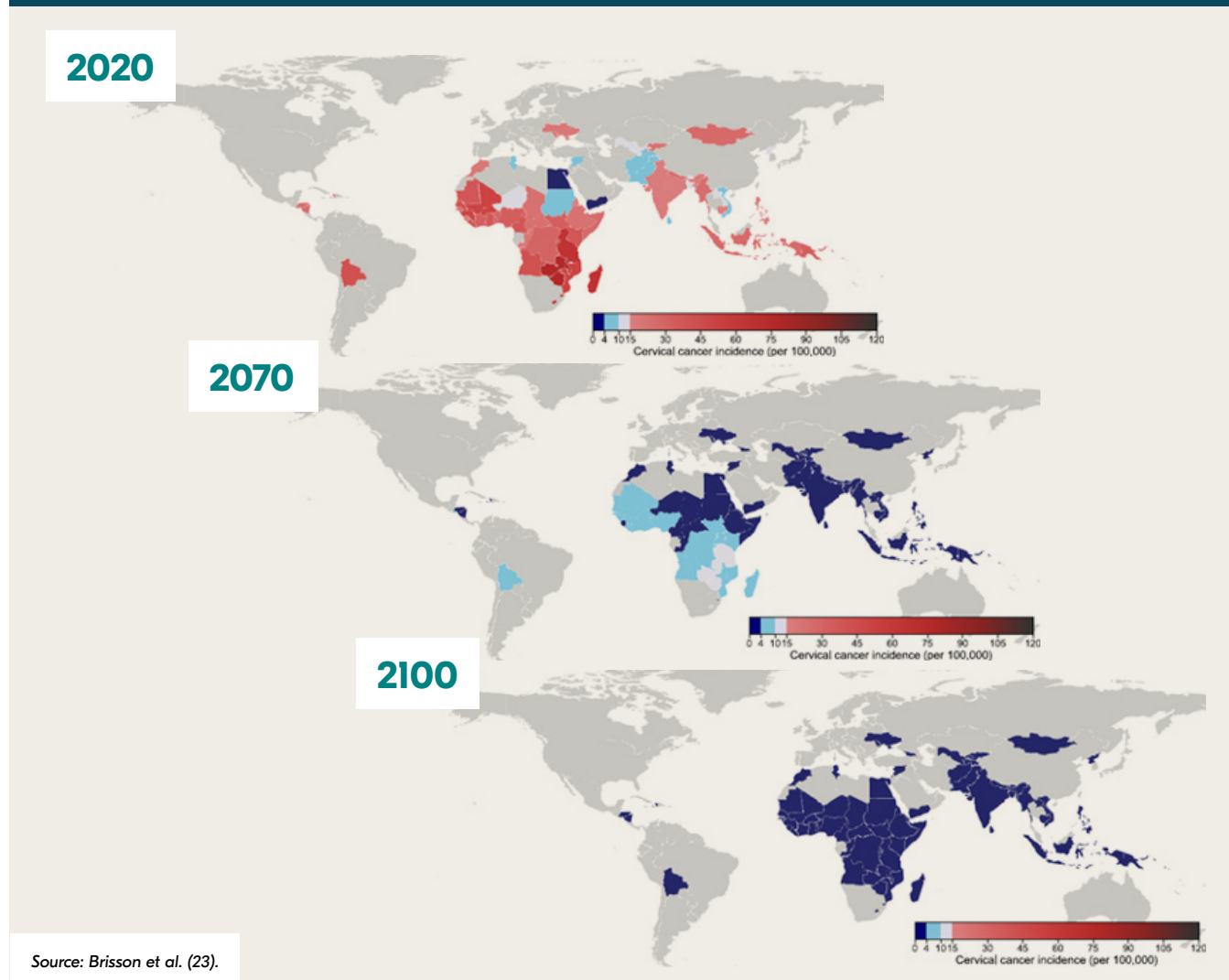
<sup>7</sup>In accordance with the latest recommendations.

<sup>8</sup>A high-performance test refers to a test that would have performance characteristics similar to or better than a HPV test. In future, however, new technologies may become available.

## 5.4 Impact of achieving the 2030 targets on incidence and mortality in high-burden countries

The WHO Secretariat modelled the health and socioeconomic impacts of achieving the 90-70-90 targets by 2030 in 78 low- and lower-middle-income countries (see Annex 1 for details of the modelling). The current heterogeneity in incidence between countries will lead to ongoing variations in cervical cancer incidence and the time frame to reach elimination (Fig. 6).

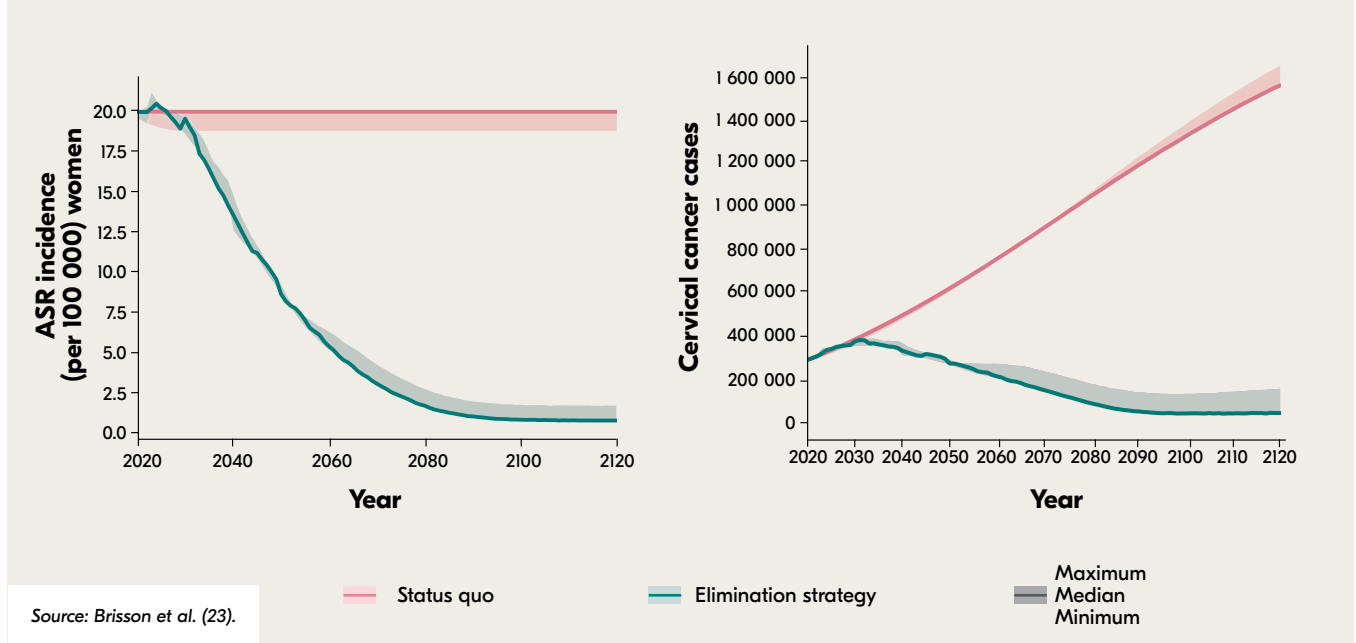
**Fig. 6.** Age-standardized cervical cancer incidence rate in 78 low- and lower-middle-income countries in 2020, 2070 and 2100 after implementation of the elimination strategy



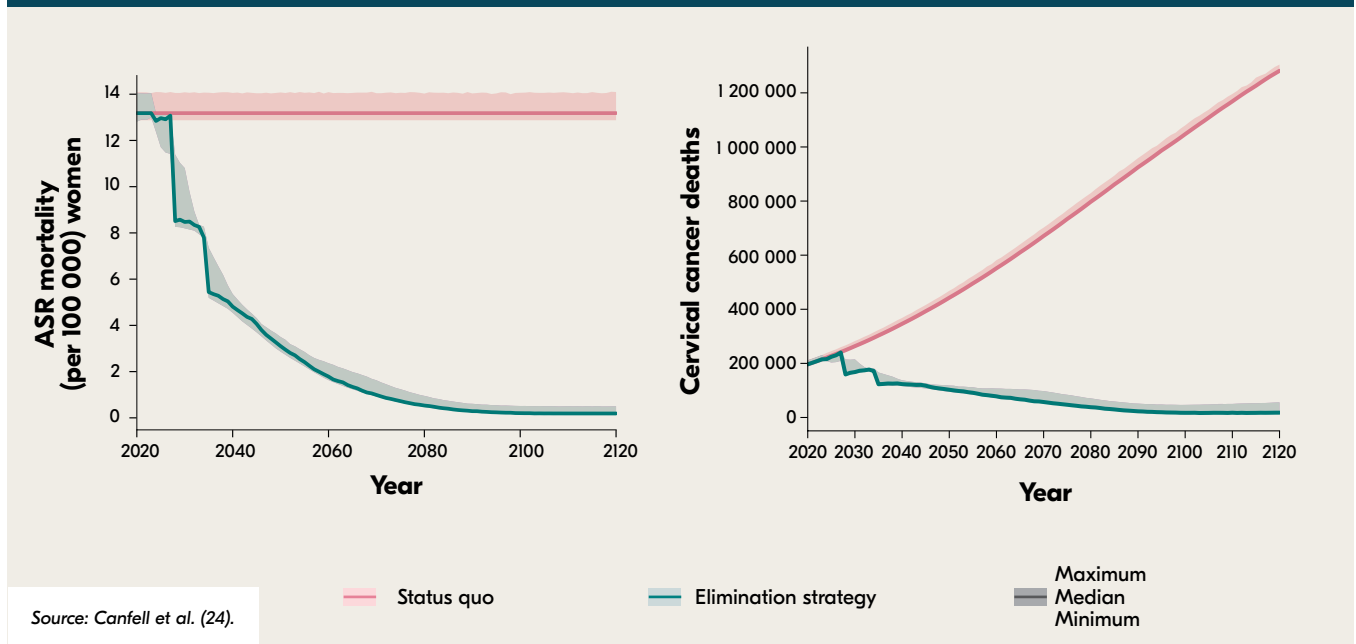


Achieving the 90-70-90 targets by 2030 would mean that median reduction in cervical cancer incidence rate would be 2%, 42% and 97% by 2030, 2045 and 2120, respectively, resulting in 74 million cases averted (Fig. 7). Correspondingly, the cumulative number of cervical cancer deaths averted would be about 2 million, 5 million and over 62 million by 2040, 2050 and 2120, respectively (Fig. 8)(23, 24). Because settings with high HIV prevalence rates currently have some of the highest cervical cancer rates, greater effort may be needed to achieve elimination there.

**Fig. 7. Cervical cancer incidence rate and cervical cancer case projections in 78 low- and lower-middle-income countries, 2020–2120, by elimination strategy and with status quo**



**Fig. 8. Cervical cancer mortality (age-standardized) rate and cervical cancer death projections in 78 low- and lower-middle-income countries, 2020–2120, by elimination strategy and with status quo**



## 5.5 Investment case for eliminating cervical cancer in high-burden countries

Investing in the interventions to meet the 90-70-90 targets offers immense economic and societal benefits. An estimated US\$ 3.20 will be returned to the economy for every dollar invested through 2050, owing to increases in women's workforce participation, with this figure rising to US\$ 26.00 when societal benefits are incorporated (27).

It is estimated that about 250 000 women will remain productive members of the workforce, adding an estimated US\$ 28 billion to the world's economy: US\$ 700 million directly through increased workforce participation and almost US\$ 27.3 billion through the indirect socioeconomic benefits of good health. High socioeconomic benefits would accrue if the 78 low- and lower-middle-income countries achieve the 90-70-90 targets by 2030, by mobilizing and spending the estimated US\$ 10.5 billion needed to scale up cervical cancer prevention and treatment interventions between 2018 and 2030 (26).



Sally Kwenda, a cervical cancer survivor, advocate, and self-described "global hero of hope".

*“Through cost-effective, evidence-based interventions, we can eliminate cervical cancer as a public health problem. Half measures and incremental approaches will not suffice. It is time to implement at scale worldwide”*

**Dr Tedros Adhanom Ghebreyesus**  
**Director-General, World Health Organization**

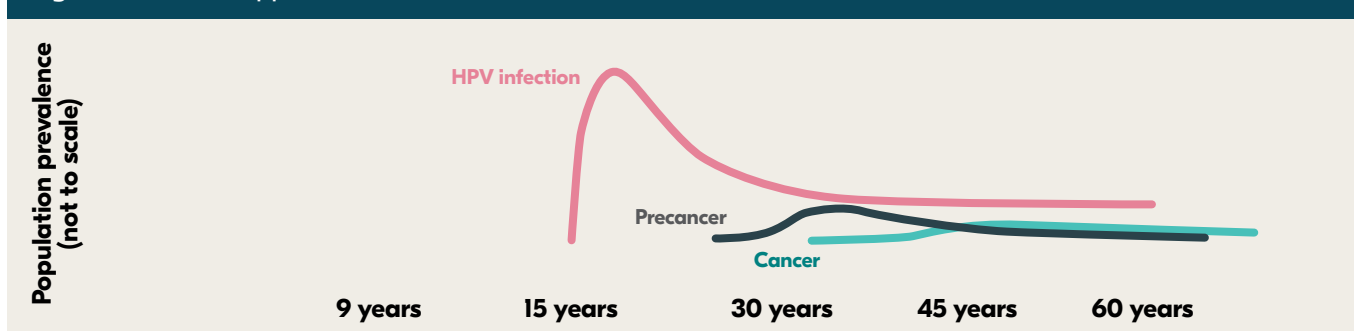
## 6. Strategic actions to achieve the 2030 targets:

Strategic actions to achieve the 90-70-90 targets should be pursued within the framework of a national policy to eliminate cervical cancer. Scale-up should be incorporated into countries’ national strategic health plans to reach universal health coverage. High-level political commitment and stewardship should drive and guide implementation, supported by collaborative partnerships.

Each evidence-based intervention for cervical cancer elimination has its own set of requirements for implementation, and each poses unique challenges. Biomedical and clinical interventions alone will not be sufficient for reaching the targets, as many of the implementation challenges are related to health care system weaknesses that commonly affect low- and middle-income countries, where the disease burden is the highest. Strategic actions must be customized by each country to take into consideration its unique structural deficiencies, level of readiness to implement, and other factors to care (such as sociocultural or gender, and myths and misconceptions about the disease and its prevention and treatment) that drive cervical cancer incidence, morbidity and mortality. Approaches to scaling up interventions in urban settings may differ from those in remote and rural areas. Inequities in health outcomes among vulnerable or underserved populations, including women with HIV, call for tailored approaches.

The global elimination strategy calls for governments to work with key partners, including the private sector and civil society, and for meaningful engagement with and empowerment of affected populations. Private sector efficiencies in management can be leveraged to improve workflow and output in the public sector. Civil society can advocate for accessible, affordable, acceptable health products and services and can increase awareness of cervical cancer prevention and control within their communities, especially those at high risk for the disease. Cervical cancer survivors can serve as advocates for educating women and girls about the benefits of vaccination, screening and treatment and for overcoming stigmatization. WHO recommends a life-course approach to a comprehensive strategy for cervical cancer elimination to ensure that lifetime benefits are maintained (Fig. 9).

Fig. 9. Life-course approach to cervical cancer interventions



### Primary Prevention

#### Girls 9–14 years

- HPV vaccination

#### Girls and boys, as appropriate

- Health information and warnings about tobacco use
- Sexuality education tailored to age and culture
- Condom promotion/provision for those engaged in sexual activity
- Male circumcision

### Secondary Prevention

#### Women > 30 years of age

- Screening with a high-performance test equivalent to or better than HPV test
- Followed by immediate treatment or as quickly as possible, of precancerous lesions.

### Tertiary Prevention

#### All women, as needed

Treatment of invasive cancer at any age

- Surgery
- Radiotherapy
- Chemotherapy
- Palliative care

## 6.1 Primary prevention: HPV vaccination

Vaccination of adolescent girls is the most effective long-term intervention for reducing the risk of developing cervical cancer. The great long-term benefit of HPV vaccination makes it important to initiate and sustain this approach in all countries. There is also strong evidence that high HPV vaccination coverage leads to protection of unvaccinated individuals through herd immunity, further enhancing the protective effect for the community (28). WHO's current guidelines recommend that young adolescent girls between 9 and 14 years receive two doses of vaccine to be fully protected. Data suggesting protection after a single dose have led to trials that will provide evidence for future schedule optimization (29, 30).

HPV vaccine coverage is inequitably distributed across geographical settings and income, with higher-income countries achieving higher vaccine coverage. High vaccine prices coupled with recent supply challenges have significantly constrained the ability of many countries to introduce the HPV vaccine into national immunization programmes and to ensure sustainability of current programmes (31). To ensure high levels of acceptance and sustained coverage, the introduction of HPV vaccination programmes must be accompanied by strong communication strategies for advocacy and social mobilization to affirm the efficacy, safety and benefits of the vaccine. Tailored strategies to address the rising anti-vaccine movement are essential.

In addition to HPV vaccination, a comprehensive prevention strategy must include age-appropriate information on sexual and reproductive health, safer sexual practices – such as delaying sexual debut, decreasing the number of sexual partners, condom use, and male circumcision where appropriate – and cessation of tobacco use. Concerted efforts to promote healthy lifestyles among adolescents (boys and girls) are critical for a healthier population for sustainable development.



Multisectoral delivery platforms, such as school immunization programmes, can play a role in improving coverage of HPV vaccination among girls.  
– Lao People's Democratic Republic

## 6.2 Strategic actions to achieve 90% coverage of HPV vaccination

<p><b>Secure sufficient and affordable HPV vaccines</b></p>	<p>A concerted effort will be needed between partners and the private sector to overcome vaccine supply constraints. Additionally, through appropriate market-shaping interventions, more affordable prices can be achieved while ensuring a healthy HPV vaccines market.</p>
<p><b>Increase the quality and coverage of vaccination</b></p>	<p>Increasing the coverage of HPV vaccination will require efficient and sustainable multisectoral delivery platforms (such as school immunization programmes) and innovative community-based approaches to reach vulnerable populations (such as adolescent girls who are not in school). Monitoring systems or registers should track and improve coverage and quality.</p>
<p><b>Improve communication and social mobilization</b></p>	<p>As HPV vaccination programmes are introduced and expanded, they will need nationwide, evidence-based communication and social mobilization efforts. Understanding the social, cultural, societal and other barriers that may affect the acceptance and uptake of the vaccine will be critical. Some communities will need extra engagement to overcome vaccine hesitancy and counter misinformation.</p>
<p><b>Innovate to improve efficiency of vaccine delivery</b></p>	<p>National guidelines, policies and strategies should be updated as new evidence and innovations become available on better and more efficient approaches to HPV vaccination.</p>



Karen Nakawala, a cervical cancer survivor and advocate – Lusaka, Zambia

### 6.3 Secondary prevention: screening and treating precancerous lesions

The principal goal of secondary prevention is to reduce cervical cancer incidence and mortality by identifying and treating women with precancerous lesions. Cytology-based screening has been successfully used to achieve these goals when implemented as part of national programmes with high coverage and in settings where resources exist for patient follow-up, additional diagnostic tests (colposcopy and pathology) and disease management. In low- and middle-income countries cytology-based programmes have been difficult to implement, and where they have been implemented screening coverage is low. Visual inspection of the cervix with acetic acid followed by treatment (screen and treat) is an alternative approach to secondary prevention in resource-constrained settings. Although relatively easy to establish, the quality of such visual inspection depends heavily on the provider and its sensitivity is variable.

Testing for HPV offers superior specificity, and its strong negative predictive value means that women who test negative only need to be retested after a minimum interval of five years. Providing women with the option of self-sampling contributes to acceptability and access to services. Existing technological platforms that are being used in countries to test for HIV, tuberculosis and other infections can also be used for HPV testing, enabling rapid scale-up. Because of its high level of performance, countries should ideally transition to HPV testing as the primary method of screening for cervical cancer. Evidenced-based strategies for the evaluation and management of women who test HPV-positive are available.

Cervical cancer screening will require a matching increase in capacity for treatment of the detected lesions, as screening women without access to treatment is unethical. WHO's treatment guidelines were recently expanded to include thermal ablation as a therapeutic modality for women who have precancerous lesions eligible for ablation (32).

Market-shaping initiatives to secure affordable, high-quality diagnostics and related supplies will be prioritized. Research on artificial intelligence-based diagnostic technology and simple handheld devices for ablative therapy offers immense opportunities and moves the world closer to the vision of cervical cancer elimination (33).



Waiting room of gynaecologic health outpatient department – Nepal.

## 6.4 Strategic actions to achieve 70% coverage for screening and 90% treatment of precancerous lesions

<p><b>Understand barriers to accessing services and create an enabling environment</b></p>	<p>A robust understanding of the social, cultural, societal and structural barriers to the uptake of services is crucial. Such knowledge will inform the development of context-specific and culturally appropriate demand-creation strategies and the design of acceptable, accessible service delivery platforms. Local communities, especially women, must be engaged and empowered to lead the development of these critical programmes, serve as allies, counter misinformation or stigmatization, and support those needing more complex treatment. Increasing health literacy, knowledge of rights and awareness of cervical cancer prevention and control will help to mobilize, empower and engage communities and civil society, and women in their diversity.</p>
<p><b>Integrate screening and treatment services into the primary care package</b></p>	<p>Services integrated into existing sexual and reproductive health services, HIV care and treatment clinics, antenatal care, well women clinics and school-based health outreach are points of entry for reaching women and girls. People-centred referral mechanisms should minimize inconvenience to patients and reduce opportunity costs.</p>
<p><b>Promote a screen and treat approach</b></p>	<p>Countries will need to expand the number of facilities where a single-visit screen and treat approach could be implemented. Single-visit screen and treat approaches will not be feasible everywhere; however, they should be promoted and implemented as appropriate.</p>
<p><b>Ensure an affordable supply of quality-assured, high-performance screening tests and treatment devices</b></p>	<p>Prompt registration and market shaping for cervical cancer diagnostics and treatment devices will lead to improved access and affordability. WHO will strengthen its prequalification capacity, as appropriate, to remain abreast of emerging technologies. Post-market surveillance for all medical devices, including in vitro diagnostics, will ensure that safety monitoring is in place as programmes scale up.</p>
<p><b>Strengthen laboratory capacity and quality assurance programmes</b></p>	<p>Efficient, integrated networks of laboratory services will maximize the impact of limited human and financial resources. Strong quality assurance programmes are crucial to ensuring that services meet the requisite standards. Training and supervision must be an integral component of service delivery.</p>



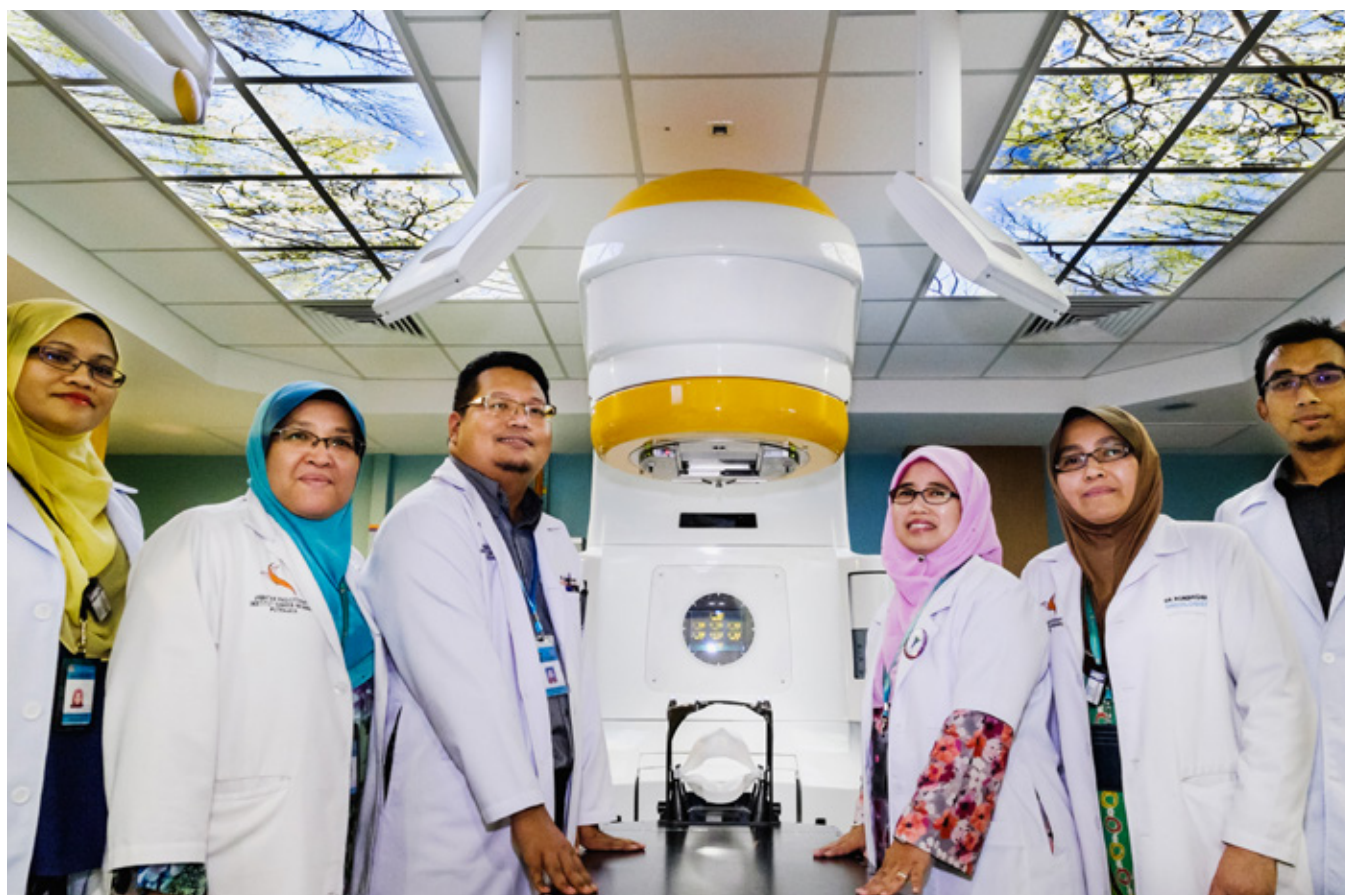
## 6.5 Invasive cancer treatment and palliative care

Timely assessment and referral of women with suspected or confirmed cervical cancer are crucial for saving lives and preventing disability. Comprehensive management of invasive cervical cancer requires well-equipped, appropriately qualified health providers and access to pathology, medical imaging, surgical, radiotherapy and chemotherapy services.

Management of each case is based on adequate staging of the disease (guidelines are available for staging and tumour node metastasis (34, 35)). Early stage cervical cancer is highly treatable by surgery and/or radiotherapy, which can result in long-term survival and/or cure (36). The five year survival rate for early stage cancer is more than 80% in countries where timely diagnosis and high-quality treatment are available. Surgery and radiotherapy, with or without chemotherapy, are among the cost-effective interventions that WHO recommends for early stage cervical cancer (36). Even some locally advanced cervical cancers are curable with high-quality concurrent chemoradiation (37).

Palliative care should be integrated into the treatment plan and provided throughout the course of the disease (38). Currently, very few low- and middle-income countries have palliative care programmes in place. Countries are encouraged to expand the availability of palliative care services, which could readily be extended to other forms of advanced cancers and to non-malignant debilitating disease.

Common treatment-related effects experienced by long-term cervical cancer survivors that affect quality of life include bladder dysfunction, bowel dysfunction, sexual dysfunction, lymphoedema and psychosocial problems. Lack of social support, most importantly from spouses, has the greatest adverse impact on quality of life of women cancer survivors in sub-Saharan Africa. In addition to managing pain and other distressing symptoms, care should encompass psychosocial and spiritual support for women and their families (39, 40).



Radiotherapy team, National Cancer Institute – Malaysia

## 6.6 Strategic actions to achieve 90% treatment and care for cervical cancer cases

<p><b>Implement cervical cancer management guidelines</b></p>	<p>Developing and implementing national cervical cancer management guidelines, adapted to the national context, is central to ensuring high-quality care (41).</p>
<p><b>Establish referral pathways and people-centred linkages throughout the continuum of care</b></p>	<p>Streamlining care pathways and referral networks linking all levels of care will ensure timely management of patients.</p>
<p><b>Strengthen pathology services</b></p>	<p>Access to high-quality pathology services is crucial for management of invasive cancer. The development of regional pathology centres, making use of affordable telepathology platforms, is possible for countries with limited or no capacity to interpret samples. Where telepathology networks are already being used for complex cases, they could be used for routine ones (42).</p>
<p><b>Expand surgical capacity</b></p>	<p>Cervical cancer can often be cured by surgery alone, if diagnosed and treated in its early stages. However, of the cancer patients who live in the world's poorest countries, less than 5% have access to safe, effective and timely cancer surgery (43). In high-income countries the predominant model of postgraduate surgical oncology education consists of multiyear specialty training within accredited programmes, supported by experienced board-certified oncological surgeons and a sophisticated, highly functional surgical infrastructure characterized by readily available anaesthetic services, intensive care units, ubiquitous blood banking and modern laboratory platforms. In most low- and middle-income countries the health care providers performing oncological procedures are generalists (general surgeons, gynaecologists, general practitioners and medical officers) without formal, certified subspecialty training, who provide cancer care out of necessity. Novel attempts to scale up surgical capacity in these environments using focused, competency-based training and North–South twinning partnerships have met with success and should be expanded (44, 45).</p>
<p><b>Improve access to radiotherapy and chemotherapy</b></p>	<p>Most patients with cervical cancers in low- and middle-income countries present at stages that require radiation, so sustainable capacity for curative radiation therapy (external beam and brachytherapy) is critical.</p>
<p><b>Strengthen and integrate palliative care services</b></p>	<p>Treatment plans should incorporate not only end-of-life care and pain relief for patients but also psychological support, family support and other services from the outset. Where possible, home-based models of palliative care should be integrated into primary health care.</p>

<p><b>Optimize health workforce competencies throughout the continuum of care</b></p>	<p>A strategy for long-term national health workforce education and training, recruitment and retention is the key to ensuring sustainable multidisciplinary team-based care. The WHO Global Strategy on Human Resources for Health: Workforce 2030 provides a blueprint for countries to address workforce challenges (46). In addition, a wide range of regional observatories on human resources in health systems provide valuable resources for planning and policy development. More options include twinning programmes, regional training hubs located in centres of excellence, telementoring (47), e-learning (48), mobile learning, and low-cost virtual reality surgical simulation (49). Remote training may be appropriate for areas such as surgery, radiology, pathology and patient consultation.</p>
<p><b>Reduce cancer stigmatization</b></p>	<p>Patient awareness, health literacy and education initiatives, especially through survivor groups, contribute to addressing stigmatization associated with cancer.</p>
<p><b>Provide comprehensive support designed to enhance quality of life and address physical, psychological, social and spiritual challenges faced by survivors</b></p>	<p>Such programmes are best developed locally, tailored to the sociocultural context of affected communities and engaging advocates of sexual and reproductive health and rights.</p>



Icó Tóth, a cervical cancer survivor and founder of a support group for women in Hungary.

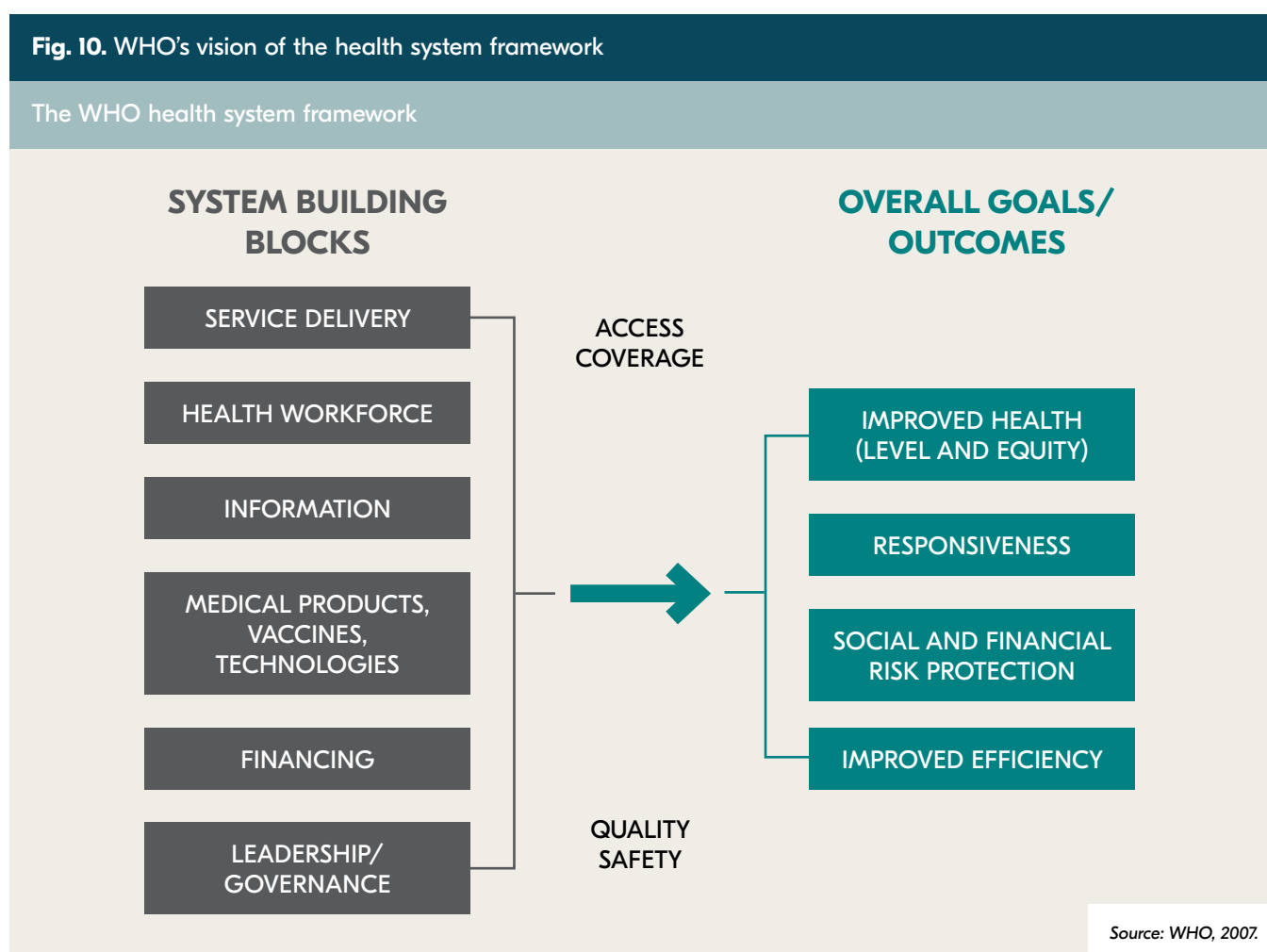
*A primary health care approach is the most effective way to sustainably solve today's challenges to health and health systems.*

## 7. Health system enablers:

### 7.1 Strengthening health system enablers

A primary health care approach is the most effective way to sustainably solve today’s challenges to health and health systems and is fundamental to achieving the shared global goals of universal health coverage and the health-related Sustainable Development Goals. There is a renewed commitment to primary health care as the pathway for all countries working towards universal health coverage. The Declaration of Astana made at the Global Conference on Primary Health Care (Astana, 25 and 26 October 2018) (50) and the Political Declaration of the United Nations High-Level Meeting on Universal Health Coverage (New York, 23 September 2019) (2) reaffirmed the world’s commitments expressed in the Declaration of Alma-Ata of 1978 and the 2030 Agenda for Sustainable Development.

Fig. 10. WHO’s vision of the health system framework



Cervical cancer programmes should be situated within a holistic approach to health systems that is people centred and responsive to the needs of women across the life course (see Fig. 10). Primary care should remain the preferred entry point for cervical cancer prevention interventions, but service structures need to accommodate women presenting at any point in the system. Such efforts should be mutually reinforcing and facilitate the integration of cervical cancer services with other specific programmes. For example, within the health sector, interventions should transcend common dividing lines – between immunization programmes, adolescent health services, HIV and sexual and reproductive health services, and communicable disease and noncommunicable disease programmes, including cancer prevention and control.

## 7.2 Priority actions to strengthen health systems

<b>Reinforce primary health care-oriented models of care</b>	Country programmes should reinforce the drive towards models of care that promote high-quality, people-centred primary health care throughout the life course.
<b>Invest in the primary health care workforce</b>	A sufficiently sized health workforce, with staff who have an optimal mix of skills and who are competent and equitably distributed, can support the delivery of new cervical cancer prevention and treatment interventions, as well as palliative care services.
<b>Improve access to medicines and other health products</b>	Availability and affordability of appropriate, safe, effective, quality medicines and other health products are central to the elimination targets.
<b>Reduce cancer stigmatization</b>	Patient awareness, health literacy and education initiatives, especially through survivor groups, contribute to addressing stigmatization associated with cancer.
<b>Engage with private sector providers</b>	Sound partnerships between public sector and private sector providers for the delivery of integrated health services are required to ensure depth of coverage and affordable access to all.
<b>Universal health coverage and protection from catastrophic costs</b>	Cervical cancer programmes must be fully integrated into universal health coverage. Sustainable financing should be secured through domestic resource mobilization, increased efficiencies in the health system, and ensuring that user fees are not imposed on the poorest, thereby safeguarding their financial protection. Health financing and protection systems, and care delivered closer to where women live and work, are core to achieving elimination.
<b>Innovation and digital technologies for health</b>	Use of digital technologies for health can facilitate access to cervical cancer services, improve effectiveness and efficiency, and promote accountability.
<b>Systems for improving the quality of health care</b>	Systems at the local, subnational and national levels for continuously assessing and improving the quality of integrated health services are important.
<b>Data systems, monitoring and evaluation</b>	Monitoring and evaluation through well-functioning health information systems that generate reliable data on progress towards cervical cancer elimination can support improved decision-making and learning by local, national and global actors.

*The role of civil society, women's groups, nongovernmental organizations and a wide range of local networks is fundamental to the successful uptake of services at the community level.*

## 8. Partnerships, advocacy and communication

### 8.1 Partnerships

WHO will use its convening mandate to engage partners across a wide range of sectors to contribute knowledge and expertise to the implementation of the strategy. Strong collaboration has been established with research institutions and implementing partners with extensive experience in scaling up screening and treatment programmes across a diverse range of populations and settings. Partnerships with global institutions, development partners, and multilateral and bilateral entities will play a crucial role, particularly in resource mobilization and strategic policy dialogue. Ongoing work with other organizations in the United Nations system, such as the Joint United Nations Programme on HIV/AIDS, United Nations Children's Fund, United Nations Population Fund, Unitaid, International Atomic Energy Agency, International Agency for Research on Cancer, and United Nations Development Programme, and other bodies such as the Union for International Cancer Control, Gavi, the Vaccine Alliance, and the Global Fund to Fight AIDS, Tuberculosis and Malaria, will be strengthened.

Partnerships with professional associations and academic institutions will also contribute to capacity-building, skills transfer and strengthening existing collaboration, both between developed and developing countries and between developing countries.

The role of civil society, women's groups, nongovernmental organizations and a wide range of local networks is fundamental to the successful uptake of services at the community level. Innovative ways must be found to secure sustainable resources for these partnerships.

### 8.2 Multisectoral collaboration

Multisectoral collaboration is important "for mobilizing and sharing knowledge, expertise, technologies and financial resources to support the achievement of the Sustainable Development Goals in all countries" (51). Collaborations must allow multiple sectors to agree on and pursue a common vision through maximizing comparative advantages. Strong country leadership for and commitment to inclusive multisectoral collaboration (52) will enable different arms of government (for example, health, education, finance and labour) to work closely with women, communities, civil society, young people, the media, the private sector, development partners, health professionals' associations, patients' groups and other stakeholders to achieve cervical cancer targets. Inclusive and strategic national, regional and global partnerships that extend beyond the health sector are needed to ensure the promotion of health and protection of human rights of women and girls.

At the regional level, new partnerships between countries can be forged for knowledge exchange and skills building, and existing partnerships should be nurtured and strengthened. Civil society representation and partnership should be ensured in collaborative forums. The Global Action Plan for Healthy Lives and Well-being for All provides a sound platform to support country-led implementation of strategies to achieve Sustainable Development Goal 3 and the targets of other health-related Goals (53).



### 8.3 Advocacy and communication

At the global level, advocacy efforts need to focus on securing sustainable financing for health, affirming the inextricable link between health and development while ensuring that issues pertaining to the health of women and girls remain central in these high-level deliberations.

At the regional level, particularly where the burden of disease is highest, advocacy efforts need to build on declarations and action plans such as the Addis Ababa Action Agenda (54) to ensure that the health and livelihood of women and girls are secured.

At the national and local levels, governments need to create an enabling environment for a wide range of nongovernmental organizations, civil society organizations and women's groups with experience in demand-creation strategies to help communities reduce barriers to care.

The fourth industrial revolution, with its proliferation of digital technologies, has dramatically changed the communication landscape, for instance with the proliferation of social media, which has increased the scope and speed of information exchange with consumers. The successful implementation of this strategy to accelerate elimination of cervical cancer demands agile and responsive systems that are able to drive comprehensive, robust and proactive communication to promote the uptake of appropriate interventions, to counter misinformation, and to address vaccine hesitancy and the rising anti-vaccine movement.

Effective advocacy and communication strategies can overcome the many challenges that impede access to and use of cervical cancer prevention and care, if culturally relevant and context-specific content is produced. Such strategies should reflect national policy and be integrated into all levels of the health system.

Media platforms, opinion leaders, influencers, traditional and faith leaders, and patient advocates should be deployed strategically in order to increase access to information. The WHO guidance on community mobilization, education and counselling for cervical cancer prevention and treatment can be used to improve health literacy (55).



The Teal Sisters, Zambia, survivors and advocates for cervical cancer elimination

*"Only one in three countries can report high quality [cancer incidence data] at present."*

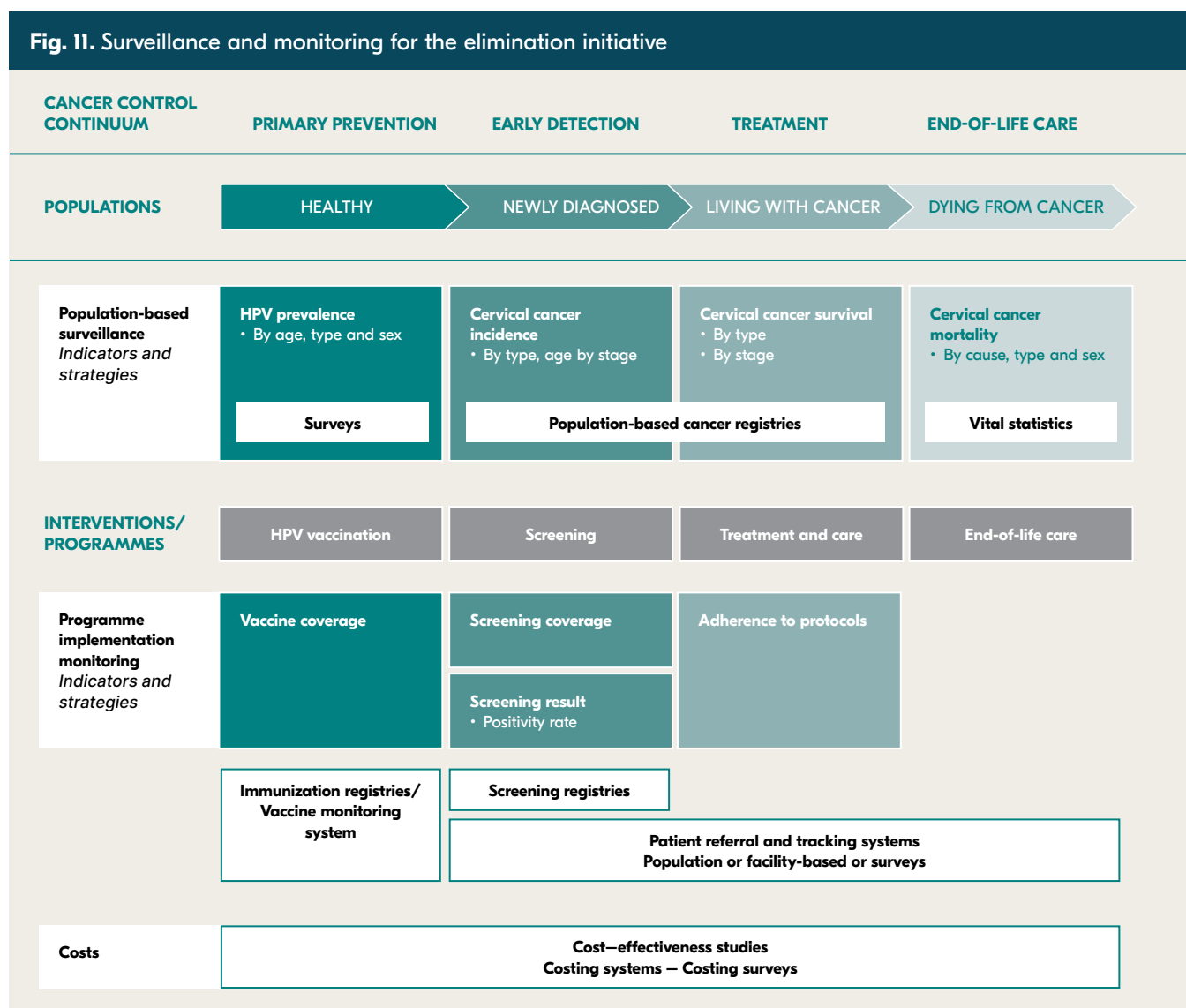
**Global Initiative for Cancer Registry Development (GICR)**

## 9. Surveillance, monitoring and evaluation

### 9.1 Critical strategies for surveillance and monitoring

The scale-up of cervical cancer prevention activities cannot proceed without the framework and tools to assess and evaluate progress towards cervical cancer elimination. It is fundamental that robust surveillance and monitoring systems are developed at the national or subnational level, both to determine the baseline and to monitor and evaluate the impact of the broad interventions and activities implemented as part of the cervical cancer elimination strategy.

Monitoring and evaluation also enable programme managers to identify gaps and take specific actions to improve coverage, quality and outcomes. Fig. 11 illustrates a framework for data collection and indicator development and the different strategies required to obtain such information, differentiating two major components: population-based surveillance and programme monitoring.



## 9.2 Population-based surveillance

At the population level, three complementary measures are essential: (a) cervical cancer incidence (new cases of disease); (b) cervical cancer survival (percentage of patients surviving *n* years after date of diagnosis); and (c) mortality (number of cervical cancer deaths). These indicators, in addition to HPV prevalence (if the means to measure them are in place), are obtained through surveys, population-based cancer registries and vital statistics systems. Assessing whether cervical cancer is a local public health problem in the current year, or will be in the years ahead, requires an ongoing assessment of the magnitude of the cervical cancer burden using these metrics. The ultimate measure of elimination is the threshold incidence of 4 per 100 000 women- years, based on the incidence data calculated from population-based cancer registries.

## 9.3 Population-based cancer registries

Population-based cancer registries constitute a continuous system of data collection, storage, validation and analysis that enables the dissemination of information on incidence and survival for each of the major types of cancer, and by stage at diagnosis. They are an essential foundation in planning and evaluating cancer prevention activities, informing the planning of cancer services and benchmarking the effectiveness of cancer care delivery in different regions and countries through comparisons of the survival of cancer patients. As with any other public health surveillance strategy, the recording and reporting of data are undertaken in a standardized way to ensure maximum comparability.<sup>9</sup>

## 9.4 Vital registration

Cause-of-death data are a key indicator to evaluate cervical cancer mortality in a population. The evolution of cervical cancer mortality trends is relevant to monitoring the effectiveness of screening programmes. In countries where there is no nationwide death registration, governments should prioritize establishing vital registration, beginning in a well-defined geographical area or population. A well-functioning civil registration and vital statistics system registers all births and deaths, issues birth and death certificates, and compiles and disseminates vital statistics, including information on causes of death. The number of deaths provides a measure of the outcome or impact of cancer.

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<sup>9</sup>See International Association of Cancer Registries (<http://www.iacr.com.fr>).

## 9.5 Programme monitoring

Monitoring implementation of the elimination strategy requires close assessment of the quality and coverage of the different preventive interventions. Vaccination coverage, screening coverage, quality of screening and diagnostic services, and the extent of timely and effective treatment modalities will help to monitor the effectiveness of programmes in achieving a reduction in the disease burden.

As illustrated in Fig. 11, cervical cancer prevention programmes present unique challenges to monitoring and evaluation. Information systems need to span primary through to tertiary prevention measures, requiring the recording and tracking of data on individual women across multiple touchpoints in the continuum of care. Countries are encouraged to use this monitoring and surveillance framework according to the recommended set of processes and outcome indicators. Overall, WHO recommends monitoring the following key indicators (56):

### Performance indicators

- HPV vaccination coverage disaggregated by age at vaccination and the number of doses;
- screening rate of the target population (women aged 30–49 years): percentage of women aged 30–49 years who have been screened for the first time in the previous 12-month period;
- positivity rate: percentage of screened women aged 30–49 years with a positive screening test result in the previous 12-month period;
- treatment rate: percentage of screening-test-positive women receiving treatment in the previous 12-month period.

### Result indicator

- coverage rate indicator: percentage of women aged 30–49 years who have been screened with a high-performance test at least once between the ages of 30 and 49 years, and the percentage screened at least twice.

### Impact indicators

- cervical cancer age-specific incidence
- cervical cancer age-specific mortality

## 9.6 Strategic actions for monitoring and evaluation

### The following actions underpin monitoring and evaluation:

- strengthen governance and accountability of programmes related to cervical cancer and conduct regular reviews to help ensure that national strategies, plans and resource allocations reflect actual country needs;
- set country-specific targets, milestones and indicators for monitoring and evaluating the national cervical cancer elimination programme – data on progress towards these objectives should be used to regularly report on the impact of the various interventions being carried out in a country and adjust programme interventions as necessary;
- develop or improve population-based cancer registries so as to inform national cervical cancer elimination programmes and help to track progress towards the goal of elimination;
- track patients throughout the continuum of services to ensure that women and girls in need are being successfully treated;
- work towards disaggregation of data by equity stratifiers to enable detection of differences across population segments and set equity-oriented targets.

## 9.7 Accountability for impact

The WHO Thirteenth General Programme of Work 2019–2023 provides the strategic vision for the work of WHO. This cervical cancer strategy covers six bienniums. The cross-organizational nature of the strategy will help ensure the provision of better-aligned support for implementation. The Impact Framework of the General Programme of Work will strengthen accountability for impact.

The Secretariat will work closely with Member States to bring together different constituencies, sectors, relevant organizations and local implementing partners to ensure alignment and coordinated support. It will continue to work closely with stakeholders, including multilateral and bilateral development agencies, foundations, philanthropies, civil society organizations, the private sector, the research community, academic institutions, health professionals' associations and a wide range of non-State actors in official relations with WHO. Efforts to establish new, strategic and innovative partnerships to support and sustain implementation will be undertaken. Transparent accountability mechanisms will be put in place to bolster momentum and uphold responsibility.

Implementation will focus on strengthening existing programmes and collaborating more closely with partners and organizations in the United Nations system currently providing technical assistance for prevention, screening, and treatment and management of cervical cancer.

## 9.8 Implementation

All six WHO regions have strategies or plans for cervical cancer control that reflect the diverse nature of challenges and offer opportunities to scale up all three pillars of the prevention-to-care continuum. Each region has a range of strategic partnerships, agencies and institutions with context-specific expertise to support implementation of the global strategy. To ensure alignment with the global strategy, the Secretariat will support Member States in implementation as outlined in the mandate from the World Health Assembly when it endorses the strategy.



In front of the main WHO building, a statue commemorates the 30th anniversary of the eradication of smallpox.

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## Annex. Costing, financing and investment case

**Estimating the economic impacts and implications of an accelerated strategy will help to clarify the benefits and global investments required.**

### *Costing national cervical cancer prevention and elimination plans*

To bring low- and middle-income countries onto the pathway towards cervical cancer elimination, financial resources need to be assigned to the early stages of prevention and elimination plans. An initial investment between 2020 and 2030 is necessary to start bending the incidence curves for cervical cancer downward. To mobilize resources to reach the 90-70-90 targets, the Secretariat has already provided support to health ministries in several countries to generate national costing plans for scaling up HPV vaccination, screening cervical cancer, treating precancer and managing invasive cervical cancer (1).

Derivation of the cost projections involved consultation with and validation from multiple stakeholders, including members from academic institutions, civil society, development partners and United Nations partners. The results estimate the total cost of scaling up national plans by activity as well as the costs by service and per capita.

The cost of scaling up the interventions varies by country and depends on specific attributes, such as the existing health system infrastructure, the demographic and epidemiological characteristics and the coverage goals in each country's national cervical cancer plan. Once completed, the cost projections can be used to plan and operationalize a national cervical cancer prevention and elimination programme tailored to a country's needs. WHO will take advantage of these initial detailed costing case studies to develop global guidance for countries' resource mobilization efforts.

### *Global cost-effectiveness of elimination strategies*

WHO's Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020 provides guidance on the cost-effectiveness of interventions to prevent and control those diseases (2). HPV vaccination and cervical cancer screening and treatment have been identified as best buys and thus already form part of WHO's recommended list of interventions for country implementation. To identify the value for money of different intervention scenarios, additional global cost-effectiveness analyses have been conducted for elimination trajectories.

Impact modelling has demonstrated that global elimination is possible within the next century, and the number of cervical cancer cases prevented can be substantial in the 78 low- and lower-middle-income countries studied (see section 2). But since countries face budget constraints, the Secretariat assessed cost-effectiveness and resource use, building on the results of impact modelling.

Cost-effectiveness was estimated by comparing the cost, health and economic benefits of various intervention scenarios over time.

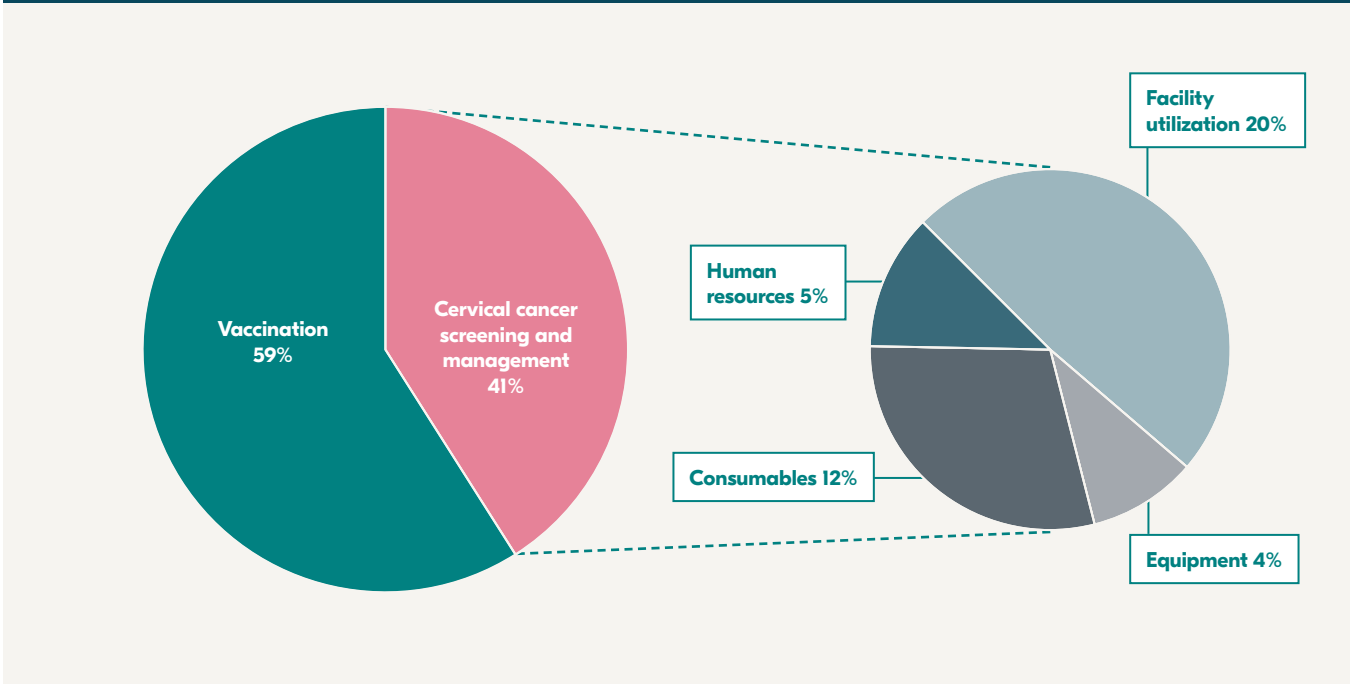
Applying information on the costs of the interventions and information on the scale-up of interventions required over the next 100 years (2020–2120), the same impact models were used to analyse cost-effectiveness and determine that the 90-70-90 targets are the optimal strategy for eliminating cervical cancer in the 78 low- and lower-middle-income countries with the highest burdens of cervical cancer. For 74 of those countries (95%), the elimination strategy was found to lead successfully to elimination and to be cost effective over the period 2020–2120 for at least two of three models.

## Investment case for cervical cancer elimination

Of the estimated total US\$ 10.5 billion financing needs (see section 5.5 above), 59% is for vaccination programmes and 41% for cancer prevention programmes (Fig. A1). By far the greatest need in cancer prevention programmes is related to health system strengthening, dominated

by infrastructure needs. Consumables, largely consisting of pharmaceuticals and diagnostics, make up about a quarter of the cancer prevention programme costs. The cost of care, including medication and pathology testing, should be covered by government expenditure – to ensure that the poorest women can access the services they need and to protect all citizens from the possibility of catastrophic expenditure from having to pay out of pocket for expensive treatment.

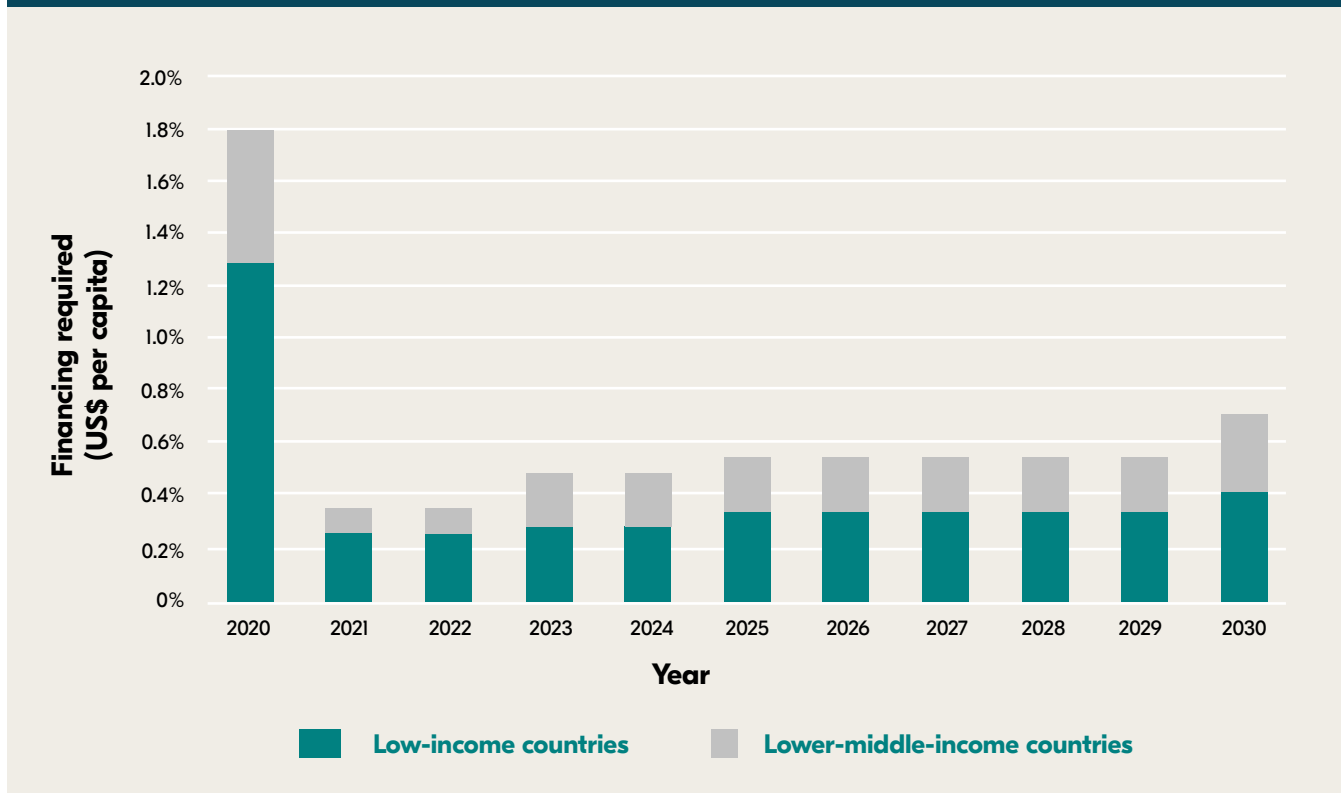
Fig. A1. Breakdown of costs, 2019–2030 (total = US\$ 10.5 billion)



In low-income settings, where locally produced goods have the lowest price but the current vaccination and treatment coverage is also lowest, an average of US\$ 0.40 per person per year is needed to finance elimination, while in lower-middle-income countries US\$ 0.20 per person per year is needed. Expenditure in the

first implementation year dominates these costs, when a catch-up cohort of 10- to 14-year-olds is vaccinated. Costs drop in the second year but increase through 2030, as cancer prevention programme coverage increases and vaccination costs change with cohort size (Fig. A2).

Fig. A2. Total annual per capita needs to finance the elimination of cervical cancer, 2020–2030



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World Health  
Organization

