# Cervical cancer elimination in Romania: Translating political commitment into action

Argyro Pavlidou, Gheorghe Gindrovel Dumitra, Bianca Enciu, Dana Farcasanu, Radu Ganescu, Carmen Ungurean, Alina Zaharia, Urška Košir


iHE
THE SWEDISH INSTITUTE FOR HEALTH ECONOMICS
ENABLING INFORMED DECISION MAKING

Authors:
Argyro Pavlidou, IHE – The Swedish Institute for Health Economics, Lund, Sweden
Gheorghe Gindrovel Dumitra, Romanian National Society of Family Medicine, University of Medicine and Pharmacy of Craiova
Bianca Enciu, Department of Epidemiology II, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
Dana Farcasanu - Centre for Policies and Services in Health
Radu Ganescu - Coalition of Chronic Disease Patients' Organizations (COPAC)
Carmen Ungurean - National Institute of Public Health
Alina Zaharia - National Institute of Public Health
Urška Košir, IHE – The Swedish Institute for Health Economics, Lund, Sweden

Please cite this report as:
Pavlidou A, Gindrovel Dumitra G, Enciu B, Farcasanu D, Ganescu R, Ungurean C, Zaharia A, Košir U. Cervical cancer elimination in Romania: Translating political commitment into action. IHE REPORT 2026:5, IHE: Lund, Sweden

This report was prepared by IHE and was commissioned and funded by MSD. IHE bears sole responsibility for the content of this report, including the analysis and conclusions. The findings and views expressed are those of the authors, and MSD does not interfere with the content.

IHE REPORT 2026:5
e-ISSN:1651-8187
ISSN:1651-7628

© IHE- The Swedish Institute for Health Economics, Lund, Sweden

The report can be downloaded from IHE's website www.ihe.se

# Foreword

The elimination of cervical cancer is one of the flagship opportunities in public health to translate scientific evidence into measurable population level impact. Effective tools are available, international targets are well defined, and a growing number of countries have demonstrated that this disease can be prevented and ultimately eliminated as a public health problem.

Romania continues to face important challenges in cervical cancer prevention and control, particularly in achieving equitable access to vaccination, screening, and timely care. At the same time, it is equally important to recognize the significant steps forward made in recent years. Since 2020, HPV vaccination has become increasingly accessible in Romania, and uptake has shown a positive trend. Nevertheless, reaching national and European targets will require sustained, coordinated efforts and continued focus on implementation and system integration.

This white paper will enable further progress. Its purpose is to move the discussion beyond strategic intent and toward practical, evidence based solutions that can guide decision making across the health system.

Drawing from international collaboration and experience, the actions put forward will protect the society from increasing HPV-related burden. I believe that coordinated action, shared responsibility, and engagement of the broader communities make eliminating cervical cancer in Romania an achievable goal.

Lund, April 2026

Peter Lindgren
Managing Director, IHE

# Table of Contents

Foreword ..... 3
Summary ..... 5
Abbreviations ..... 6
1. Introduction ..... 7
1.1 Cervical cancer: The most preventable HPV-related cancer ..... 7
1.2 Global and European momentum towards elimination ..... 7
1.3 White paper: Objectives and process ..... 8
2. Cervical Cancer in Romania ..... 10
2.1 Societal and economic burden ..... 11
2.2 Cervical cancer patient pathway ..... 13
3. Primary prevention through HPV vaccination ..... 16
3.1 Infrastructure for monitoring and evaluation in primary prevention ..... 19
3.2 Stakeholder participation in primary prevention ..... 20
3.3 Policy agenda and global alignment ..... 21
4. Secondary prevention through screening ..... 23
4.1 Infrastructure for monitoring and evaluation in secondary prevention ..... 24
4.2 Stakeholder participation in secondary prevention ..... 25
4.3 Policy agenda and global alignment ..... 26
5. Tertiary prevention through treatment and management ..... 28
5.1 Infrastructure, monitoring and evaluation in tertiary prevention ..... 28
5.2 Stakeholder participation in tertiary prevention ..... 30
5.3 Policy agenda and global alignment ..... 31
6. A call to action: Cervical cancer elimination roadmap for Romania ..... 32
6.1 Strengthen operational capacity and infrastructure ..... 34
6.2 Transition to nationally organized population-based screening ..... 35
6.3 Ensure equity and translate knowledge into action ..... 36
Conclusion ..... 37
References ..... 38

# Summary

Romania continues to experience one of the highest cervical cancer burdens in the EU. This reflects a combination of long-lasting systemic challenges, including limited funding, evolving monitoring and evaluation mechanisms, unequal access to services, and historically low emphasis on prevention. Despite this, recent years have seen important progress. Romania passed key legislative advances in HPV vaccination, supported by the comprehensive vaccination framework, as well as in cancer screening, there recently approved national screening methodology follows the latest EU guidelines and recommendations.

Building on this momentum, this document aims to further support Romania in translating the growing political commitment into sustainable action that will pave the way for achieving the targets of its National Cancer Control Plan. The present white paper outlines a strategic, evidence-driven roadmap, developed in consultation with Romanian experts, aligned with the objectives of the European Beating Cancer Plan and the WHO 90-70-90 strategy. Three strategic pillars form the core of the proposed policy actions:

- **Strengthening operational capacity and infrastructure.**
  Laying the system foundation is crucial to support sustainable cervical cancer elimination efforts. Robust data and monitoring systems need to be in place to track the country's progress towards its goals and inform decision-making and resource allocation. Cross-sectoral collaboration with actors such as schools, healthcare providers, the private sector and European bodies, will further support awareness-raising and capacity-building initiatives. Enhancing outreach to underserved areas will also enable equitable access to services across the country.
- **Transitioning to nationally organized cervical cancer screening.**
  An organized population-based screening program is imperative for the early detection and effective management of cervical cancer. Key elements of such programs include a national screening registry that will collect disaggregated data and support targeted interventions, and an invitation system that will call and recall all eligible women to screening. Moreover, screening needs equitable implementation across the country, including measures that target hard-to-reach populations. Healthcare provider capacity needs enhancement as they play an integral role in informing the public and promoting screening uptake.
- **Ensuring equity and translating knowledge into action.**
  Reducing disparities across the continuum of care for cervical cancer will ensure that no one is left behind. Interministerial and cross-sectoral partnerships are integral so that cervical cancer elimination efforts happen in a comprehensive way across multiple settings, such as schools and workplaces. Involving diverse actors in communication campaigns will help develop targeted, culturally sensitive communication materials that can be more effective. Establishing national pathways for screening, diagnosis and treatment, collecting and publishing disaggregated data, as well as addressing delays in the availability of modern treatments, will all contribute to timely and equitable access to innovation.

Achieving cervical cancer elimination is possible. However, it will require that the present political commitments translate into sufficient operational support, robust data systems, and valuable partnerships that will drive change towards a common national goal. The actions presented in the roadmap can bring Romania close to the leaders in Europe.

# Abbreviations

| | |
|---|---|
| AIS | Adenocarcinoma in situ |
| ASR | Age-standardized rate |
| CCEI | Cervical cancer elimination initiative |
| CIN | Cervical Intraepithelial Neoplasia |
| CNAS | Romania's National Health Insurance House |
| CT | Computed tomography |
| DALYs | Disability-adjusted life years |
| EBCP | Europe's Beating Cancer Plan |
| ECDC | European Centre for Disease Prevention and Control |
| EFPIA | European Federation of Pharmaceutical Industries and Associations |
| EMA | European Medical Agency |
| EML | Essential Medicines List |
| ESGO | European Society of Gynaecological Oncology |
| ESMO | European Society for Medical Oncology |
| ESP | European Society of Pathology |
| ESTRO | European Society for Radiotherapy and Oncology |
| EU | European Union |
| EU-27 | EU member states |
| HCPs | Healthcare professionals |
| HPV | Human papillomavirus |
| HR-HPV | High-risk human papillomavirus |
| INSP | Romania's National Institute of Public Health |
| LGBTIQ | Lesbian, gay, bisexual, transgender, intersex and queer people |
| MDT | Multidisciplinary team |
| MoH | Ministry of Health |
| MRI | Magnetic resonance imaging |
| NCCP | National Cancer Control Plan |
| NGOs | Non-Governmental Organizations |
| Pap smear | Papanicolaou smear |
| Patients W.A.I.T. Indicator | Patients Waiting to Access Innovative Therapies Indicator |
| PC | Palliative care |
| PCP | Primary care physician |
| PET-CT | Positron emission tomography–computed tomography |
| PHC | Primary health care |
| PVFLP | Present Value of Future Lost Productivity |
| RENV | Romania's National Electronic Vaccination Registry |
| ROI | Return on Investment |
| VCR | Vaccination coverage rate |
| WHO | World Health Organization |
| YLD | Years lived with disability |
| YLL | Years of life lost |

# 1. Introduction

## 1.1 Cervical cancer: The most preventable HPV-related cancer

Human papillomavirus (HPV) is one of the most common sexually transmitted viral infections worldwide, with more than 200 known genotypes (1). Of these, 14 are considered high-risk (HR-HPV) and can cause multiple cancers. Low-risk HPV types cause genital warts. While cervical cancer contributes to the largest part of HPV-related disease in Romania, the virus also contributes to other cancers and conditions affecting both women and men; HR-HPV types are also causally linked to anal, vulvar, vaginal, penile, and head and neck cancers[1] (2).

Cervical cancer is a type of cancer that develops in the cervix, in the lower part of the uterus (3). It usually begins with abnormal changes in the cells lining the cervix called precancerous lesions. If these changes are not detected and treated timely, they can develop into a tumor. The main cause of cervical cancer is persistent infection with certain types of HPV. In early stages, cervical cancer often causes no symptoms. When symptoms do appear, they may include abnormal vaginal bleeding (i.e., bleeding after sex, between menstrual periods or after menopause) (4). Because of its well-understood cause and predictable natural history, cervical cancer serves as the flagship disease in the global fight against HPV.

The good news is that cervical cancer is almost entirely preventable. Vaccines with favorable safety profiles protect against the most common HR-HPV types. When delivered through gender-neutral vaccination programs targeting adolescents, these vaccines can greatly reduce the prevalence of HPV within populations and subsequently the future burden of disease (5).

Although HPV vaccination protects against the most common HR-HPV types, it does not protect against all possible subtypes. Moreover, not everyone has had—or currently has—the opportunity to be vaccinated, therefore, secondary prevention through screening and treatment of precancerous lesions remains essential. High-performance HPV testing, the recommended method of screening by the European Union (EU) guidelines, allows for early detection of precancerous changes. When coupled with accessible triage and management, cervical cancer can be prevented or treated in early stages.

Eliminating cervical cancer as a public health problem thus represents a key milestone toward the broader goal of HPV elimination. The same tools that enable cervical cancer prevention, primarily vaccination, also forms the foundation for reducing the incidence of all HPV-related cancers over time.

## 1.2 Global and European momentum towards elimination

Eliminating cervical cancer requires a coordinated multi-stakeholder and multi-sectoral approach; from public health authorities to civil society. Global momentum is already underway, and in 2020, the World Health Organization (WHO) launched the Cervical Cancer Elimination Initiative (CCEI) which sets benchmarks across three key pillars — vaccination, screening, and treatment and management. Building on this, Europe's Beating Cancer Plan

[1] The link between HPV and these cancers is supported by the epidemiological evidence. Inclusion of this information is not intended to reference vaccine use, indications, or prevention of penile or head and neck cancers.

(EBCP) introduced a year later, in 2021, explicitly commits to eliminating cervical cancer and other HPV-related cancers in Europe, see Figure 1.

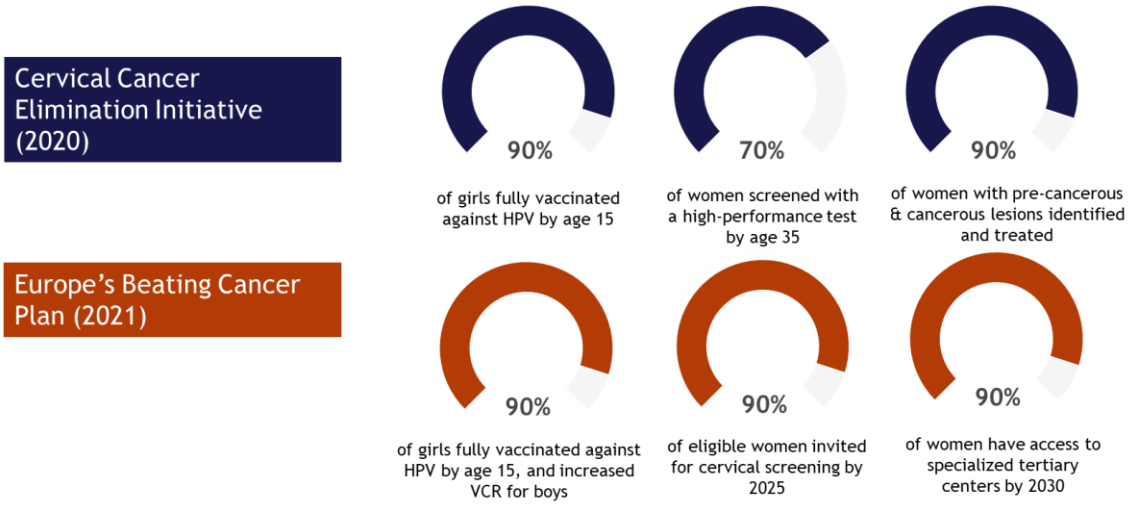



**Figure 1: Cervical Cancer Elimination Initiative and Europe's Beating Cancer Plans targets for cervical cancer.**

## 1.3 White paper: Objectives and process

The objective of this white paper was to outline and co-design a policy roadmap for cervical cancer elimination in Romania. The process combined collaboration with leading experts and a targeted review of the evidence, as well as validation of evidence and recommendations to ensure scientific and contextual accuracy and feasibility.

The white paper contributes to the Romanian elimination effort by outlining a roadmap based on three interdependent pillars: primary prevention through HPV vaccination, secondary prevention through screening, and tertiary prevention through timely treatment and management of precancerous and cancerous lesions, see Figure 2. While the primary focus of the paper is on cervical cancer elimination, it should be read as the first step towards a broader milestone of HPV-related cancer control.

Moreover, the roadmap emphasizes cross-cutting themes critical to success: robust infrastructure for evaluation and monitoring, including data systems, broad stakeholder participation, and strong policy alignment. Above all recommendations are grounded in equity, ensuring that prevention and care are equally accessible to all segments of the population.

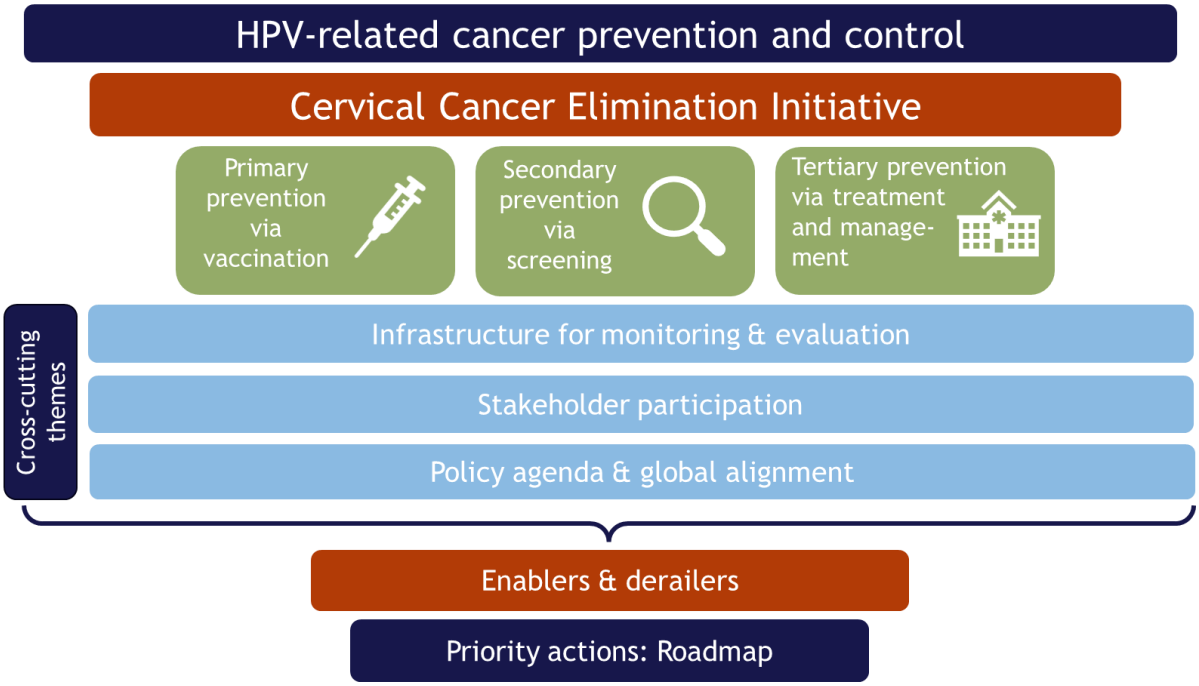



**Figure 2: Cervical Cancer Elimination rests on three pillars.**

# 2. Cervical Cancer in Romania

Cervical cancer contributes to a substantial disease burden in Romania. In 2024, it was the third most common cancer among women of all ages, accounting for 8.3% of all new cancer cases[2]; the age-standardized rate (ASR) estimated at 36 cases per 100,000, was almost three-times above the EU-27 average of 11.7 (6), see Figure 3.

Despite progress and a 10% decline in cervical cancer mortality between 2001 and 2016, Romania continues to experience a high proportion of cervical cancer deaths in the EU, accounting for 17% and 15% in 2001 and 2016, respectively (7). Geographic disparities are also evident: between 2001 and 2019, rural areas of Romania saw a larger decline in deaths (20%), compared to urban areas (5%) (7), but nonetheless, rural regions still represented 46% of the country's cervical cancer deaths in 2019 (7). More recent data show that between 2020 and 2024, the mortality rate in urban areas decreased from 12.7 to 11.4 deaths per 100,000, whereas rural areas saw a larger decline, from 13.4 to 10.4 deaths per 100,000. Therefore, urban areas in the country had a slightly higher cervical cancer mortality rate than rural areas in 2024. The highest mortality rate was noted in the Sud-Est region (13.8 deaths per 100,000), whereas the București-Ilfov region recorded the lowest mortality rate (8.5 deaths per 100,000)[3].

These statistics place cervical cancer as the fourth leading cause of cancer death among women of all ages in Romania (around 8% of all cancer deaths[1]), after breast, colorectal and lung cancer (6), see Figure 3. The ASR for mortality in 2024 was 17.2 deaths per 100,000, more than three times higher than the EU-27 rate of 5.1, see Figure 3 (6). Romania therefore has the highest cervical cancer mortality rate in the EU-27.

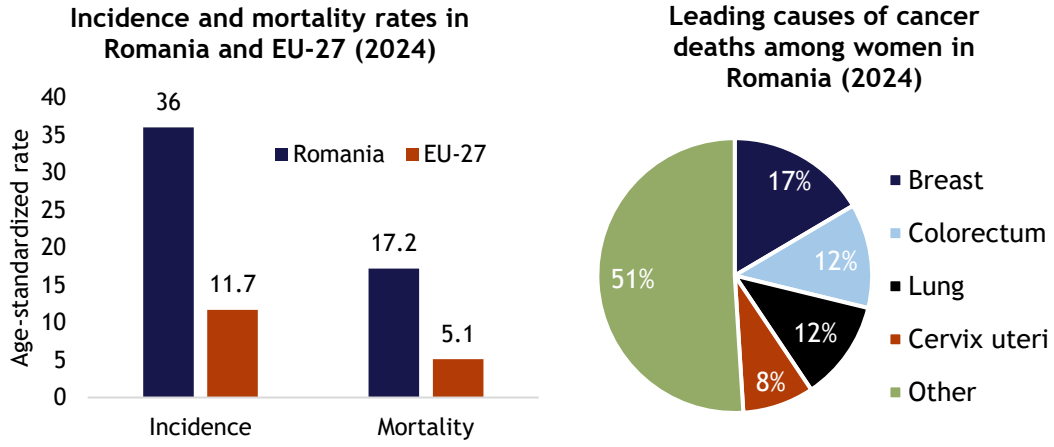



**Figure 3: Age-standardized incidence and mortality (per 100,000) of cervical cancer in Romania and EU-27 in 2024 & Leading causes of cancer deaths among women in Romania in 2024.**

Source: (6).

Monitoring the trends over time is key to evaluation and understanding of the epidemiological picture. At present, Romania lacks a centralized national cancer registry, which makes con-

[2] Refers to all cancer sites but non-melanoma skin cancer.

[3] These data were provided at the aggregate levels by the experts at the Institute for Public Health

tinuous evaluation and comparison between regions challenging. In the absence of nationwide data, insights from locally based registries provide important insights.

Data from the Cluj county cancer registry indicate that the incidence of cancer decreased from 35.5 in 2008 to 27.3 per 100,000 women in 2016, see Figure 4 (8). Mortality trends show a static rate, with a gradual decline since 2013 that brought 2016 mortality rates close to those observed in 2011 (8). For the period 2010-2014, the 5-year survival rate for cervical cancer was 65%, similar to the 64% survival rate across the EU-27 (9). However, more recent, granular and nation-wide data are needed for a comprehensive epidemiological picture.

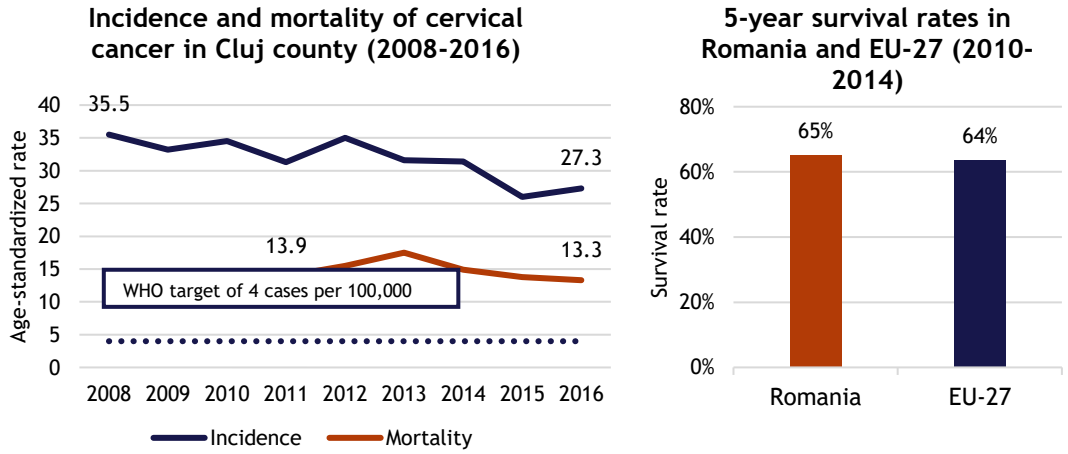



**Figure 4: Age-standardized incidence and mortality of cervical cancer in Cluj County, Romania from 2008 to 2016 & 5-year cervical cancer survival rates in Cluj County and EU-27 for 2010-2014.**
Sources: (8), (9).

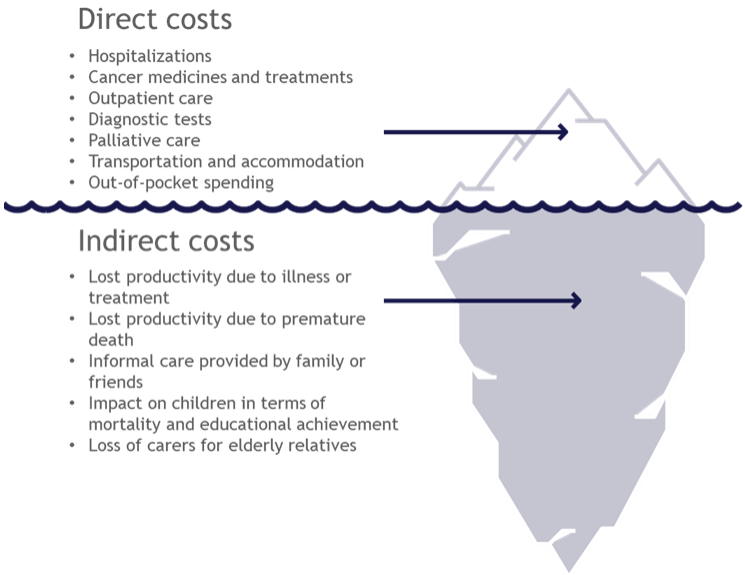
## 2.1 Societal and economic burden

Cervical cancer carries a significant social and economic burden, and investment in prevention offers one of the highest returns in public health. In the context of fiscal pressures and competing priorities, prevention represents a cost-saving, productivity-enhancing strategy rather than an added expense. According to WHO estimates, each US$1 invested through 2050 can generate an average return of US$3.20, primarily by enabling women to remain healthy, active, and productive in the workforce (10). By strengthening preventive services now, Romania can reduce long-term treatment costs, ease pressure on the health system, and promote sustainable economic growth.

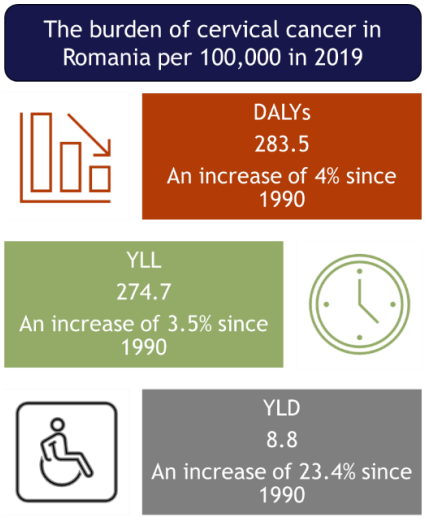
Even though data on the direct economic burden of cervical cancer in Romania are scarce, a recent Europe-wide report estimated that the direct costs of cancer accounted for 7.7% of the total health expenditure in 2023, above the EU-27 average of 6.9% (11). The costs associated with a disease can be divided into three main categories; see Table 1.

**Table 1: Components of the economic burden of cancer.**

| | |
|---|---|
| **Direct costs** | These are the costs of disease-related resource consumption. They include public and private expenditure for services within the health care system, such as diagnostic procedures, surgeries, radiation therapy, and medicines. Expenditure on social support services outside of the health care system are also direct costs. Expenditure by patients for travelling to receive treatment is also a direct cost. |
| **Indirect costs (productivity losses)** | These are the costs of patients' productivity loss arising from the inability to participate in the economy due to the disease. They consist of the temporary or permanent inability to work in the formal labor market (called morbidity) and from premature death (called mortality) of working-age patients. |
| **Informal care costs** | These costs represent the value of the time spent by family members and friends providing unpaid care, such as transportation to a health care facility or assistance with household chores. |




Recent estimates show that the direct healthcare costs due to cervical cancer in Romania were €10.7 million, inflated to 2024 (12). Among nine Central and Eastern European countries, Romania reported the largest present value of future lost productivity (PVFLP) due to HPV-related cancers, standing at €44.5 million (13).




**Info box 1. Cancer stage and treatment costs**

The stage of disease when diagnosed often plays an important role in treatment costs. Data from Western Romania indicate that the highest costs results from treating stage II and III cervical cancer, compared to early stages of the disease (14). This further highlights the importance of investing in early prevention through vaccination, and early detection through screening and management of precancerous lesions to avoid higher costs later on.

**Figure 5: The burden of cervical cancer in Romania per 100,000.**

Abbreviations: DALYs = Disability-adjusted life years; YLL = Years of life lost; YLD = Years lived with disability.
Source: (15).

These figures highlight that the burden of cervical cancer is not only an important contributor to premature mortality, but also a major driver of economic and societal burden in Romania. Romania currently offers a broad framework for the reimbursement of HPV vaccination; by promoting prevention and ensuring adherence to national recommendations, as well as the sustainability of the program, the country can reduce the economic burden that cervical cancer is currently posing.

## 2.2 Cervical cancer patient pathway

International standards, guidelines, patient care algorithms for cervical cancer prevention and treatment are well-established. Given that cervical cancer is among the most preventable cancers, effective control begins with HPV vaccination, followed by screening, and timely treatment of precancerous lesions or cancer. Figure 6 below shows the continuum of prevention, control, and treatment, structured around the three key pillars: vaccination, screening and treatment. These pillars align with the WHO's global elimination targets and the EBCP, which aims to significantly reduce the burden of HPV-related cancers. The subsequent chapters of this white paper will examine each pillar in detail, highlighting opportunities to strengthen Romania's response.

**Info box 2. The value of investing in prevention**

Investment in preventive measures is a valuable tool for relieving disease and economic burden from HPV-related cancers. However, investment in immunization is suboptimal in the EU; about three-quarters of the member states spend less than 0.5% of their healthcare expenditure on immunization and only two member states spend more than 1% (16).

Studies have quantified return on investment (ROI) of prevention:

- Every dollar invested in prevention, early detection, and treatment of cervical cancer yields 3 - 8 times its value in economic benefit (17).
- Childhood immunization can return up to 44 times the cost invested (18).
- The returns of adult immunization programs reach up to 19 times their initial investment, when benefits beyond the healthcare system are taken into account (19).
- Investment in preventive interventions yields a median return of €14 for every €1 invested (20).
- Health protection and legislative interventions, as well as those implemented at national level, such as vaccination, generally yield higher ROI (20).
- In Switzerland, 90% HPV vaccination coverage rate (VCR) in both sexes and all eligible groups would result in CHF834 million in healthcare cost savings, CHF218 million in societal gains from averted deaths, and CHF181 million from prevented morbidity (21). Every CHF1 invested is estimated to yield CHF1.5 in societal returns and 1.2 in fiscal returns.
- Achieving the WHO cervical cancer elimination target (4 cases per 100,000 women) in Romania by 2059 would prevent 52,703 cervical cancer cases and USD243 million in healthcare costs (22).

As underlined by the evidence, investment in primary prevention, including HPV vaccination, will be essential to reducing the high economic and societal burden caused by preventable diseases such as cervical cancer in Romania. Though the ROI is not immediate, over time such investments can result in better health outcomes, as well as societal and economic gains, contributing to the alleviation of the national budget deficit.

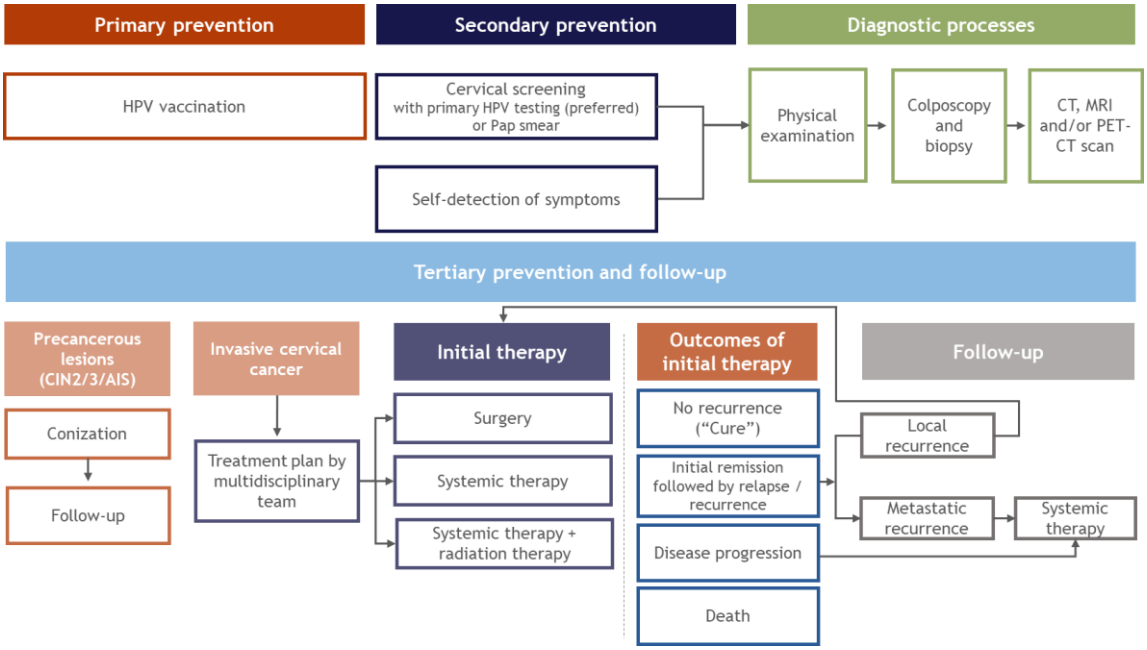
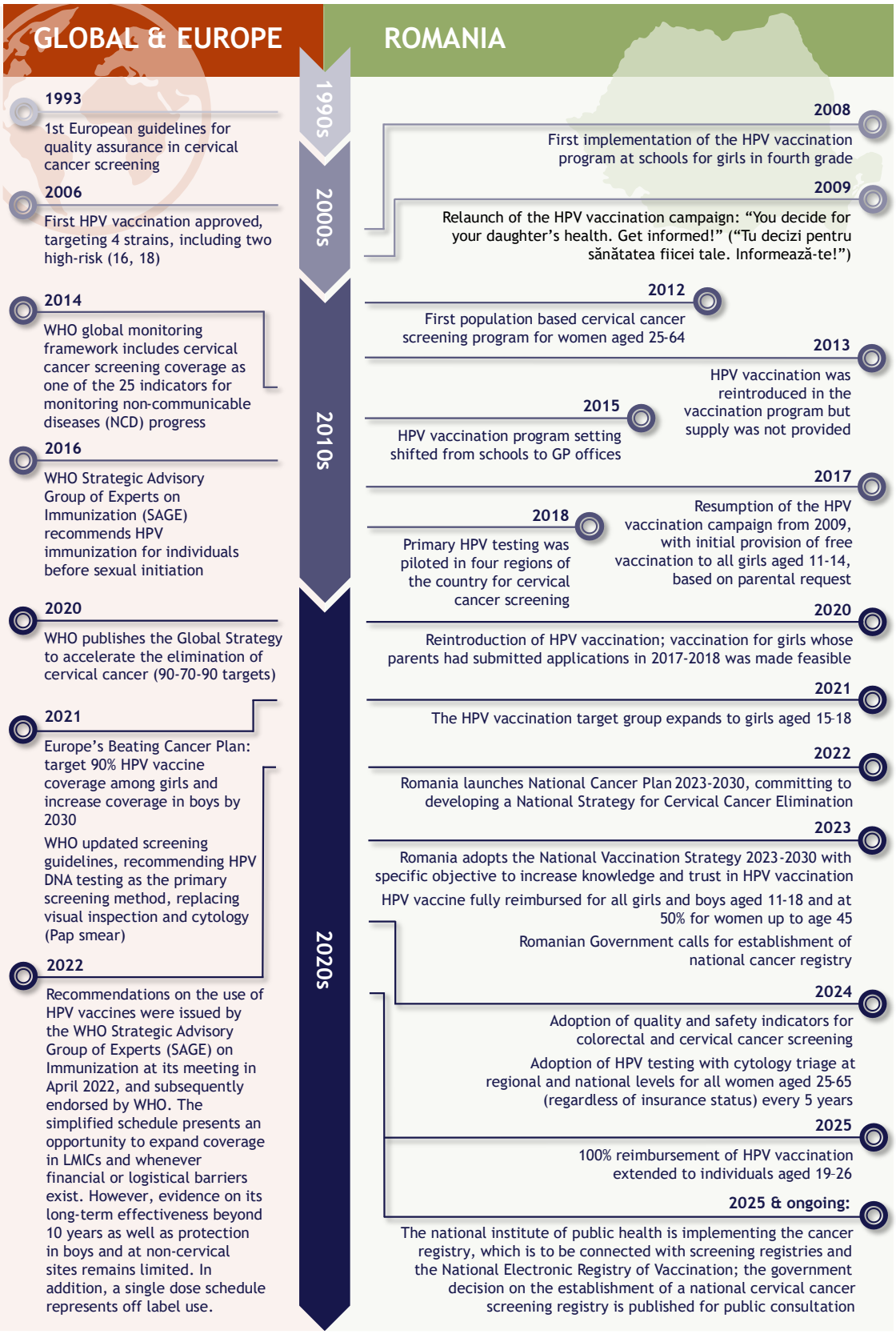



**Figure 6: Cervical cancer pathway.**

Note: based on ESMO and ESGO/ESTRO/ESP guidelines (23, 24). Abbreviations: CIN = Cervical intraepithelial neoplasia; AIS = Adenocarcinoma in situ; HPV = Human papillomavirus; Pap smear = Papanicolaou smear; CT = Computed tomography; MRI = Magnetic resonance imaging; PET-CT = Positron emission tomography-computed tomography.


GLOBAL & EUROPE
ROMANIA
1990s
2000s
2010s
2020s
1993
1st European guidelines for quality assurance in cervical cancer screening
2006
First HPV vaccination approved, targeting 4 strains, including two high-risk (16, 18)
2014
WHO global monitoring framework includes cervical cancer screening coverage as one of the 25 indicators for monitoring non-communicable diseases (NCD) progress
2016
WHO Strategic Advisory Group of Experts on Immunization (SAGE) recommends HPV immunization for individuals before sexual initiation
2020
WHO publishes the Global Strategy to accelerate the elimination of cervical cancer (90-70-90 targets)
2021
Europe's Beating Cancer Plan: target 90% HPV vaccine coverage among girls and increase coverage in boys by 2030
WHO updated screening guidelines, recommending HPV DNA testing as the primary screening method, replacing visual inspection and cytology (Pap smear)
2022
Recommendations on the use of HPV vaccines were issued by the WHO Strategic Advisory Group of Experts (SAGE) on Immunization at its meeting in April 2022, and subsequently endorsed by WHO. The simplified schedule presents an opportunity to expand coverage in LMICs and whenever financial or logistical barriers exist. However, evidence on its long-term effectiveness beyond 10 years as well as protection in boys and at non-cervical sites remains limited. In addition, a single dose schedule represents off label use.
2008
First implementation of the HPV vaccination program at schools for girls in fourth grade
2009
Relaunch of the HPV vaccination campaign: "You decide for your daughter's health. Get informed!" ("Tu decizi pentru sănătatea fiicei tale. Informează-te!")
2012
First population based cervical cancer screening program for women aged 25-64
2013
HPV vaccination was reintroduced in the vaccination program but supply was not provided
2015
HPV vaccination program setting shifted from schools to GP offices
2017
Resumption of the HPV vaccination campaign from 2009, with initial provision of free vaccination to all girls aged 11-14, based on parental request
2018
Primary HPV testing was piloted in four regions of the country for cervical cancer screening
2020
Reintroduction of HPV vaccination; vaccination for girls whose parents had submitted applications in 2017-2018 was made feasible
2021
The HPV vaccination target group expands to girls aged 15-18
2022
Romania launches National Cancer Plan 2023-2030, committing to developing a National Strategy for Cervical Cancer Elimination
2023
Romania adopts the National Vaccination Strategy 2023-2030 with specific objective to increase knowledge and trust in HPV vaccination
HPV vaccine fully reimbursed for all girls and boys aged 11-18 and at 50% for women up to age 45
Romanian Government calls for establishment of national cancer registry
2024
Adoption of quality and safety indicators for colorectal and cervical cancer screening
Adoption of HPV testing with cytology triage at regional and national levels for all women aged 25-65 (regardless of insurance status) every 5 years
2025
100% reimbursement of HPV vaccination extended to individuals aged 19-26
2025 & ongoing:
The national institute of public health is implementing the cancer registry, which is to be connected with screening registries and the National Electronic Registry of Vaccination; the government decision on the establishment of a national cervical cancer screening registry is published for public consultation

# 3. Primary prevention through HPV vaccination

Romania currently uses the nonavalent HPV vaccine, with two recommended doses for individuals aged 11-14 years at initiation, and three doses for those aged 15 and older. Although access to HPV vaccination is broad, coverage rates remain below European and global targets, despite strong evidence of the vaccine's effectiveness and long-standing public health recommendations.

HPV vaccination uptake in Romania remains modest but shows gradual progress. Through the first program, launched in 2008, only around 2.6% of the eligible girls were vaccinated (27). Subsequent years have brought incremental increases, and data from Romania's National Electronic Vaccination Registry (RENV) indicate that by 2022, 5% of girls aged 11–14 and 6% of those aged 15–18 had been vaccinated (28).

However, the picture is not complete. National data for the years 2020-2024 indicate that the average VCR among all cohorts of eligible girls (born in 2003-2013) was 12.5% (29). The highest vaccination uptake was seen among girls born in 2008 (19%) and the lowest among those born in 2013 (2%). National coverage data for boys are not yet available due to their recent inclusion as a target group for HPV vaccination.

On the other hand, WHO estimates that 17% of eligible girls and 1% of eligible boys received the last-dose of the HPV vaccine in 2024 (30). For the same year, HPV vaccination coverage by age 15 was estimated at 23% among girls, reflecting important progress; see Figure 7.

**Evolution of the HPV vaccination program in Romania**

Romania's HPV vaccination program has undergone several phases of development, reflecting both challenges and progress in public health implementation.

The initial campaign was launched in 2008, followed by reintroductions in 2009 and 2013. Despite these efforts, vaccination uptake remained low. Until 2015, HPV vaccination was available at schools and was since moved to GP offices (25). In 2017, the Ministry of Health (MoH) relaunched the HPV vaccination initiative, targeting girls aged 11–14, based on parental request. However, due to operational and logistical barriers, actual vaccination of girls whose parents had submitted requests in 2017 and 2018 only became feasible in 2020.

An important advancement happened in September 2021, when the MoH expanded the program to include catch-up cohorts for girls aged 15–18. Data from the National Immunization Program in 2022 indicated a positive trend in demand for HPV vaccination, signaling growing public awareness and acceptance.

In December 2023, Romania reached a major milestone: HPV vaccination became fully reimbursed for both sexes (gender-neutral vaccination) for individuals aged 11–18, and 50% reimbursed for women aged 19–45. In addition, the HPV vaccine became available through doctor prescription, mainly GPs, with procurement from community pharmacies. This replaced the previous procedure under which the vaccine was provided by the MoH through the county's public health authority. This policy shift significantly accelerated Romania's efforts to combat cervical cancer and laid the groundwork for its potential elimination.

Further progress followed a legislative update: starting October 1, 2025, 100% reimbursement was extended to individuals aged 19–26, according to the amendments to Law no. 95/2006 on health reform (26). This expansion strengthens the national framework for cancer prevention and reinforces equitable access to vaccination across age groups.

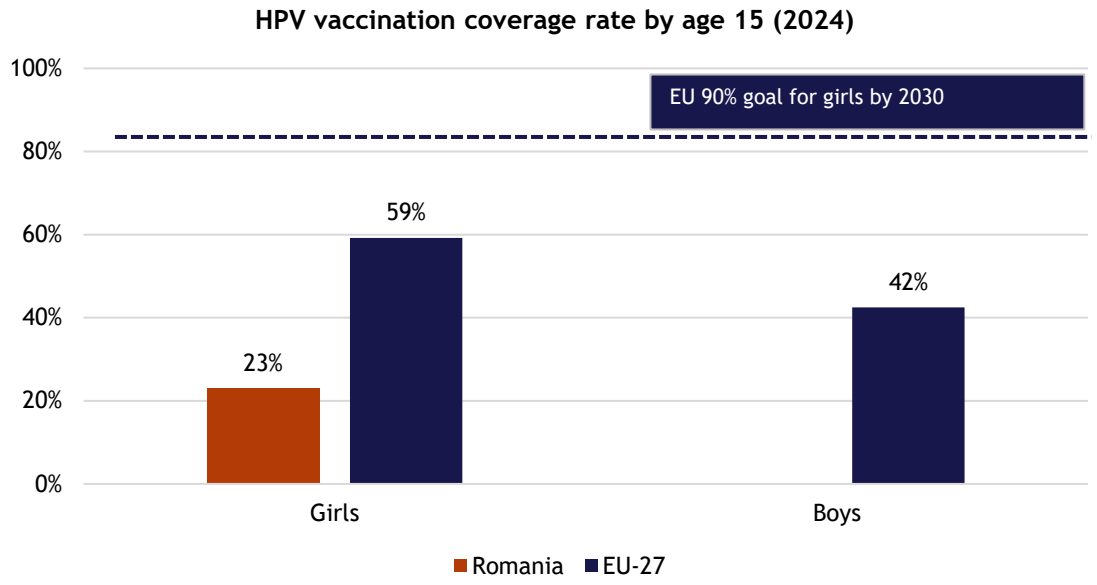



**Figure 7: HPV vaccination coverage of girls and boys by age 15 in Romania and EU-27 in 2024.**
Note: HPV vaccination coverage rate (VCR) refers to last-dose coverage by age 15 in 2024. A weighted average of EU-27 was estimated. Source: (30).

The prescription and administration of the HPV vaccine in Romania is a multidisciplinary process that involves several health specialties. Measures that provide incentives for performance, related to vaccination targets, should be considered in order to improve the promotion and implementation of vaccination from relevant healthcare providers.

- **Prescription**: All medical specialists who are contracted with the National Health Insurance House (CNAS) can provide a prescription for the free HPV vaccine.
- **Administration**: Family doctors, epidemiologists, infectious disease specialists, and pediatricians. Physicians from other specialties who hold a certification in vaccinology (e.g., gynecology, dermatology).

### Regional disparities in HPV vaccination

HPV vaccination uptake varies across Romania with some counties seeing a higher VCR than the national average, while others remain far below, see Figure 8. During the period 2020-2024, Cluj county reached the highest vaccination coverage among Romanian counties, at 30%, and was followed by Ilfov and Bucharest, both with a VCR of around 29% (29). On the other hand, the lowest VCRs were noted in Botoșani (6.5%), Suceava (5.3%) and Neamț (4.2%). Ensuring equitable access and uptake of vaccination is important in order to make progress towards the elimination of cervical cancer in the whole country. This effort can be supported by targeted interventions, such as tailored information campaigns or deployment of mobile units offering vaccination in underserved areas.

**Info box 3. The case for school-based & school-assisted HPV vaccination[4]**

Embedding HPV vaccination within schools enables systematic outreach, minimizes logistical barriers, and supports higher and more equitable vaccination rates compared to primary care or facility-only-based programs (31). To achieve the desired outcomes, namely high VCR, it is important that there is strong collaboration between the Ministry of Health and Ministry of Education, as well as strong engagement between school staff and healthcare workers. While the school-based vaccination programs take time to establish, a stepped and well-planned approach can begin by improving health education, including on HPV and vaccination for students and parents. In Romania, HPV vaccination was provided through schools until 2015. Due to several administrative and logistical difficulties HPV vaccination has since moved to GP offices (25). Nonetheless, schools in Romania can still play an important role, in the short-term, they may act as key conduits of knowledge and awareness, while in the long-run, they may again be able to deliver school-based vaccination programs.

Best practice examples from abroad can offer valuable insights for Romania:

- Sweden: HPV vaccination has been part of the school-based vaccination program for girls since 2012 and extended to boys from 2020 (32). All girls and boys in the fifth grade are offered vaccination via school health services (33). Sweden's strategy relies on an "organized" and school-based program that offers free and seamless vaccination with minimal logistical barriers for parents.

- Poland: Poland's school-based vaccination program is very young and has operated since August 2024. The primary school-based vaccination program has already recruited 40% (5,207 schools) of schools in 2024/2025 (34). Though regions show varying uptake, where successful, the program relies on strong public health and school collaboration, and ongoing campaigns that target parents and adolescents.

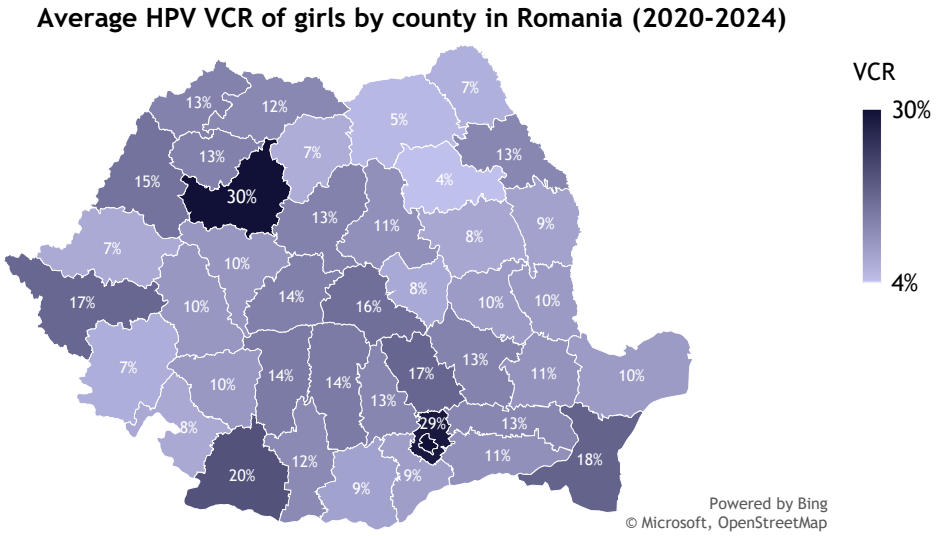



**Figure 8: HPV vaccination coverage of girls born in 2003-2013 by county in Romania in 2020-2024.**

Note: Not visible in the chart are the VCRs of Ilfov, 29%, and Bucharest, 29%. Source: (29).

Local experts noted that while national legislation provides a solid foundation for HPV and cervical cancer prevention, clarity and consistency in regional implementation remain limited. Strengthening local execution mechanisms is essential to ensure that all regions benefit equally from national policies and that progress toward elimination is not uneven. Initiatives such as developing primary health care (PHC) networks at the community level can play a key role in translating national commitments into effective local action.

[4] Internationally, the term "school-based vaccination" is widely used to describe programs delivered directly within the school setting. In Poland, HPV vaccination is primarily administered through outpatient clinics, with schools serving as a secondary point of engagement that supports and facilitates the process (information, consent procedures, coordination, and the school also serves as the vaccination venue, with administration performed by a clinic team).

## 3.1 Infrastructure for monitoring and evaluation in primary prevention

Scaling up HPV vaccination requires robust systems for monitoring and evaluation. In Romania, legislation mandates that vaccinating physicians enter data on administered vaccines in real time into RENV (35). Local experts highlighted that all healthcare providers are mandated to report vaccinations regardless of the person's age, vaccination setting (public/private) or acquisition mechanism (reimbursed, out-of-pocket, national stockpile).

Romania made important progress in monitoring HPV vaccination implementation. Initially this process was carried out using standard forms according to the legislation in force. RENV allowed registering HPV vaccination data from 2020, as well as information about past vaccinations based on vaccination proof in order to achieve complete vaccination history for children. As HPV vaccination was reimbursed based on RENV reports, GPs were encouraged to register vaccination data. In addition, even if data were not publicly available these were utilized and included in reports and communication with MoH/WHO and have been available upon request. The publication of the Annual Report on HPV Vaccination Trends in Romania and the Evaluation of the Impact of Vaccination Policies on HPV Vaccine Uptake (2020–2024) (29) demonstrates a growing commitment to evidence-based oversight. Additionally, Romania's National Institute of Public Health (INSP) now publishes quarterly vaccination data

However, data gaps persist. Key sociodemographic variables such as ethnic or cultural background, insurance coverage, or socioeconomic background are not systematically collected nor linked, thus limiting the ability to design targeted interventions for underserved populations.

To address this, the development of an HPV Dynamic Dashboard could serve as a valuable next step. Such a digital tool would enable real-time, territorial-level monitoring of vaccine uptake, facilitating the early detection of geographic disparities, tracking of progress over time, and timely adjustment of strategies. Beyond improving responsiveness and resource allocation, a dynamic dashboard would also strengthen coordination between national and local health authorities, support public communication, and enhance policy evaluation.

**Info box 4. Best practice example: HPV dashboard**

An HPV Dynamic Dashboard is a valuable tool to support the monitoring and evaluation of HPV vaccination. Some countries already use such tools in their decision-making. Most commonly, national institutes for public health have become the owner of such platforms, thus ensuring reliability, credibility, and sustainability of such important infrastructures.

Slovakia and Poland are two countries where the HPV Dashboard is available and regularly updated, providing disaggregated vaccination data. For example, in Slovakia vaccination data are updated twice per year with high granularity; they are disaggregated by sex, year of birth, territory of residence and number of doses. Released data have informed decisions, such as the extension of reimbursement to more age cohorts, the sending of automized vaccination calls/recalls, and the expansion of best practices, such as the mass vaccination campaign in Bratislava, to more municipalities.

To achieve this, several steps needed to be taken, which can inform the design of interventions in other countries, including Romania. Understanding the local context with its limitations and opportunities and identifying relevant stakeholders to secure necessary resources for the first actions. Once the consensus is built, it is important to define the metrics of success and the key actions to be undertaken. Ensuring sustainability with continuous stakeholder engagement is key to achieving progress and improvement over time.

Finally, active invitation systems may help boost vaccination uptake. While RENV currently sends SMS reminders to parents for other vaccines (36), HPV vaccination is not yet included. Local experts noted that a pilot project is being developed to test the cost-effectiveness and

impact of integrating HPV vaccination reminders into the system, potentially offering a scalable, low-cost mechanism to improve participation rates.

## 3.2 Stakeholder participation in primary prevention

Effective implementation of HPV vaccination as a primary prevention strategy depends on the active engagement and coordination of diverse stakeholders, including health authorities, clinicians, educators, patient organizations, and community leaders.

Although HPV vaccination in Romania has historically faced hesitancy, growing awareness and increasing acceptance indicate a clear positive shift. Recent surveys show that 79% of adults have heard about HPV, and more than half consider the vaccine safe (57%) or believe it should be mandatory (54%) (42). Initiatives such as the *ReThinkHPVaccination* project, supported by the European Commission, have strengthened communication, countered misinformation, and promoted vaccine literacy. Sustaining these efforts, particularly through school-based health education, is key to maintaining progress.

Healthcare professionals (HCPs) remain a key source of information and vaccine advocacy efforts. A recent study of adolescents from underprivileged backgrounds showed that the majority of them, 64%, would get vaccinated if their doctor recommended it (43). Clinicians are also an important source of information for parents; however, they often lack the resources to effectively communicate the benefits and risks of vaccination (44, 45). Local experts highlighted the importance of involving HCPs and further equipping them with tools to promote health literacy and primary prevention to educate the public regarding HPV primary prevention. In line with that, a training course for HCPs addressing the new developments in HPV

**Ongoing communication and awareness efforts related to HPV elimination in Romania**

Awareness campaigns: Starting in 2018, an increasing number of awareness campaigns have been conducted around key observance days such as Cervical Cancer Awareness Month, HPV Awareness Day, European Immunization Week, and the Global Day for Cervical Cancer Elimination (28).

- **ReThinkHPVaccination program (2023-2025):** Focused on creating a vaccination knowledge center, training courses, communication strategies, and guidelines to combat misinformation. Partners include the Renasterea Foundation and the Centre for Innovation in Medicine.
- **HPV Action Romania Stakeholders Meeting (2023):** Organized by the European Cancer Organization, launching a campaign to promote gender-neutral vaccination (ages 11–18), expand HPV testing (including self-sampling), and increase public awareness.
- **WHO Romania Conference (2023, 2024):** Brought together health professionals, academics, civil society, and professional associations to advance HPV vaccination and cervical cancer screening.
- **HPV Free Cities (2025):** The "*HPV Free Cities*" initiative is designed to increase community engagement and improve HPV vaccination coverage rates. It is part of a broader community-driven public health communication initiative, designed to deliver a scalable "plug-and-play" toolkit—including a guide, visual assets, and educational materials—that other counties can begin adopting starting in Q3 2025 and continuing throughout 2026. The first city in the rollout is Cluj, with the Coalition having been launched also in Timișoara. The next city is Bucharest (October 2025), followed by Craiova.
- **University and medical society efforts (2017-2024):** Several initiatives have been organized by the University of Medicine and Pharmacy of Craiova, where students and teachers, together with health professionals, informed the public about HPV infection and prevention on different occasions (37-39). In 2017, the National Society of Family Medicine developed informational materials regarding HPV, cervical cancer and the prevention of HPV-related diseases, which were sent to physicians' offices (40). In addition, they planned for the development of electronic materials that would assist physicians when communicating with their patients regarding HPV prevention. Furthermore, the Romanian Society of Obstetrics and Gynecology and the National Society of Family Medicine continued recommending the HPV vaccine during the COVID-19 pandemic and highlighted the possibility for simultaneous administration of both vaccines (41).

vaccination policy, access to vaccine and communication, was held between January and February 2025 in Romania. The course was organized within the framework of the PERCH project and was attended by 2,280 health professionals from several disciplines (46). Post-training assessment revealed a significant improvement in knowledge and communication skills among participants (47). Ensuring that clinicians have the confidence, tools, and updated guidance to communicate effectively about HPV prevention, supported by continuous coordination between the INSP, MoH, and vaccinators, will be essential to further boost vaccination confidence and coverage.

Strengthening support for effective communication is essential to improving HPV vaccine confidence and uptake. Tailored messaging that reflects the audience's needs and cultural context is known to be more effective. In Romania, evidence shows that urban women more often cite medical concerns, while rural women tend to decline vaccination for moral or religious reasons, highlighting the need for context-specific approaches (48, 49).

Public awareness and health literacy are important social determinants of health, including uptake of preventative measures. Strengthening communication campaigns should therefore focus on providing clear, evidence-based information in accessible language through trusted channels, such as digital platforms and schools. Promoting the broader value of prevention, which was identified by local experts as a persistent challenge, and enabling peer-to-peer, or parent-to-parent dialogue through school-based sessions could further improve awareness, confidence, and vaccination intent.

**Info box 5. Best practice example: Walk-in HPV vaccination sessions**

In March 2024, the Institute of Public Health of Vojvodina in Serbia launched the "Open door" walk-in vaccination sessions, when the HPV vaccine can be administered without prior appointment (50). "Open door" sessions are implemented three times per year and last for a week. Educational content and information about the sessions are shared through media (TV, radio, social media), as well as in collaboration with school principals, with information about the timing and setting of the sessions communicated to parents through SMS or Viber messages. The initiative has been associated with increased HPV vaccination uptake, with vaccination peaks during the weeks of "Open door" implementation.

In addition to the ongoing activities in Romania, such "Open door" initiatives could further complement the efforts of raising awareness and participation in preventative behaviors.

Among youth, more knowledge and awareness means higher willingness to vaccinate (43, 51). On the other hand, common reasons for vaccination refusal include costs, and safety and effectiveness concerns. Age-appropriate awareness campaigns can clarify these topics by providing updated and evidence-based information and dispel persistent myths.

## 3.3 Policy agenda and global alignment

International frameworks, such as the WHO Global Strategy, set ambitious benchmarks aimed at eliminating cervical cancer as a public health problem, while Europe's Beating Cancer Plan outlines concrete timelines and coverage targets in its ambition to address HPV-related disease burden. The Romanian National Cancer Control Plan (NCCP) sets a specific VCR goal to be achieved by 2030, as well as measures that will support the work towards cervical cancer elimination. Table 2 highlights the milestones at global, European, and Romanian level.

**Table 2: Key objectives for primary prevention worldwide, the EU and Romania.**

| Key objectives | |
|---|---|
| World  | • 90% coverage of HPV vaccination in girls by 2030 in the Global strategy to accelerate the elimination of cervical cancer as a public health problem (10). |
| EU  | • Under Europe's Beating Cancer Plan, the EU has set a goal to vaccinate 90% of girls in the target population against HPV and significantly increase the vaccination of boys by 2030 (52).<br>• By 2025, every European country's cancer control plan should set out concrete measures to implement population-based, gender-neutral HPV vaccination, where such programs are not yet established (53).<br>• By 2030, all European countries should have fully operational gender-neutral HPV vaccination programs. The aim is to achieve at least 90% complete coverage among adolescents of both sexes and across all demographic groups (53).<br>• The Council Recommendation adopted in June 2024 supports Member States by providing a common framework to strengthen HPV vaccination program, improve monitoring and data systems, promote equitable access, and share best practices, with EU-level support through the EU4Health program, Horizon Europe, and European Centre for Disease Prevention and Control (ECDC) coordination under the European Health Union (54). |
| Romania  | • The Romanian NCCP sets the aim of achieving HPV vaccination coverage of 30% among eligible populations by 2025 and 40% by 2030 (55).<br>• Additionally, it aims to develop a national strategy for the elimination of cervical cancer based on the WHO objectives and adapted to the Romanian context.<br>• Lastly, it outlines introduction of HPV-related informational materials across all levels of education. |

# 4. Secondary prevention through screening

Early detection through cervical cancer screening remains a critical tool to reduce disease incidence and mortality, by recognizing precancerous and cancerous lesions early. Romania introduced several cervical cancer screening interventions and pilot programs, however, there is currently no nationally organized population-based screening program.

Participation in cervical cancer screening in Romania remains suboptimal and below the EU averages. During the 2012-2017 national program, coverage reached 13.6% of the eligible population (56). Eurostat program data indicate a screening rate of just 6.2% in 2023; similar to the levels observed in 2013, 5.7% (58), see Figure 9. However, self-reported data from a 2019 survey suggest that 37% of women in Romania aged 20-69 had been screened for cervical cancer in the past three years (59). The variation and discrepancies reflect the lack of systemically collected and centralized data, which is a challenge when it comes to monitoring and evaluation.

**Evolution of cervical cancer screening in Romania**

Romania's cervical cancer screening program has undergone several phases of development, reflecting both challenges and progress in public health implementation. The first attempt at establishing a national screening program for cervical cancer occurred between 2012 and 2017, which targeted women aged 25-64. Through the program, around 14% of the target population was screened (56).

After analysis of its performance in 2018, the screening program was restructured. A pilot program of combined HPV testing and Pap smears was implemented in four regions, i.e. Centru, Nord-Est, Nord-Vest and Muntenia Sud regions, for women 25-64 years old. However, the COVID-19 pandemic disrupted the pilot program and recovery since has been slow.

Cervical cancer screening in Romania remains largely opportunistic, without a centralized invitation system for eligible women. According to the national methodology approved on 28 June 2024, the target population is women aged 25-65 years, asymptomatic for cervical cancer (57). Screening is based on primary HPV testing, followed by cytology triage when indicated, and is offered regardless of insurance status.

- Ages 25-29: Routine screening every 3 years for women with a negative HPV test.
- Ages 30-65: Routine screening every 5 years for women with a negative HPV test.
- Follow-up: Women with a positive HPV test and negative cytology repeat HPV testing after 12 months.

Family doctors can issue referrals for eligible women and gynecologists perform the tests. Based on the adoption of the methodology for cervical cancer screening in 2024, Romania is presently working on an updated strategy for national and regional rollout of cervical cancer screening and introduction of quality and safety indicators to improve program effectiveness.

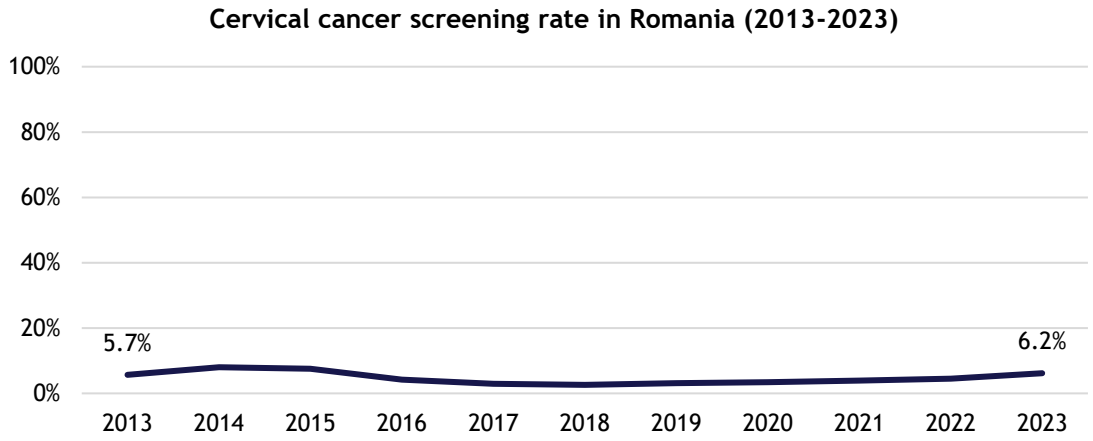



**Figure 9: Cervical cancer screening rate (program data) in Romania from 2013 to 2023.**
Source: (58).

### Socioeconomic and geographic disparities

Despite national efforts to expand cervical cancer screening, access remains uneven. Screening participation in Romania shows significant inequalities linked to ethnicity, with most Romanian women screened at public hospitals and minority women from Russia, Hungary, and Ukraine screened by mobile units (63). Moreover, Roma women report lower attendance rates and experiences of discrimination in healthcare, which further reduce their willingness to seek care or participate in screening in the future (64).

Disparities between rural and urban populations are also present; only 30% of rural women report screening participation in the past three years, compared to 47% in major cities (65). The experts noted that screening attendance is particularly challenging for the rural populations who would need to travel to a larger city or regional centers and incur additional costs. Education is another important determinant; just 19% of women with lower secondary education self-report having been screened, compared to 53% of those with tertiary education (59).

**Info box 6. Reducing inequity in access through mobile units**

One way to address geographic barriers and disparities is by using mobile units for delivering healthcare services. So far, their use in Romania showed promise; over half, 55%, of women screened through mobile units reported that they would not otherwise have participated (60). Following the conclusion of the first national screening program in 2017, eight mobile units were purchased to extend access to underserved areas (56). However, bureaucratic and financing challenges limited their use, and they were deployed mostly in urban and semi-urban settings rather than rural areas, where the most pressing needs are. Local experts reported that previous initiatives with mobile units were mainly deployed by non-governmental organizations (NGOs), while recent legislation changes that allow for their financing could enable further action in collaboration with hospitals. However, sources of funding are yet to be identified.

Other countries already utilize mobile units to increase participation in cancer screening. In France, the “mammobile” is a fully-equipped mobile unit that aims to offer free breast cancer screening to women from underserved communities (61). In Ireland, mobile units for breast cancer screening are also deployed under “BreastCheck”, the country’s breast screening program (62).

Gaps are also observed in lesbian, gay, bisexual, transgender, intersex and queer (LGBTIQ) populations; the self-reported rates for screening were relatively high of LGBTIQ individuals, up to 41%, however, they were still lower than the EU average of 64% among those aged 25-39 and 74% among those 40-55 in the EU (28).

## 4.1 Infrastructure for monitoring and evaluation in secondary prevention

Just as robust information systems are essential for vaccination monitoring and evaluation, so are they for screening and identifying gaps, as well as guiding evidence-based policy. Currently, Romania lacks a dedicated screening registry, making it difficult to retrieve accurate and comparable data on screening participation rates. The absence of reliable data on screening patterns across regions and population groups limits the ability to design and implement targeted interventions. Moreover, absence of a screening registry means that the eligible population for cervical cancer screening is not precisely defined and invited to screening, creating missed opportunities to capture more eligible women.

As part of the pilot programs, a cervical cancer screening registry, alongside the registries for other cancers have been established (28). In 2024, these registries were undergoing quality checks, and legislation on national screening registries was under way (28). The Romanian NCCP includes in its objectives the creation of a national cancer registry with sub-registries for

regions. This will include the development of a database that will be used to extract information on non-attenders and target specific audiences with relevant informational material. The aim is to have a fully established and interoperable national cancer registry by the end of 2025 (28). Local experts reported an important challenge in the development and implementation of the screening registry pertaining to the heterogenous interpretation of the GDPR by various institutions. These inconsistencies make data linkages and interoperability with the population database difficult, hindering the implementation of a call/recall system. In December 2025, a project on cervical cancer screening, funded by ESF+ through the Health Program, was approved and contracted. The project will focus on cervical cancer screening with focus on organization, planning, training of over 500 HCPs, and will target 217,000 women from underserved groups, while it will also allow for the development and implementation of the screening registry.

**Info box 7. How digital data infrastructure matters in cervical cancer elimination as well**

Robust digital data infrastructure underpins effective monitoring and evaluation, prerequisites for successful national cervical cancer elimination strategies. This includes tracking HPV vaccination coverage, screening participation, follow-up, diagnosis, treatment, and long-term outcomes.

In Romania, fragmented information systems, variable interpretations of GDPR, unclear data stewardship responsibilities, and reliance on monolithic, vendor-specific IT solutions have historically limited the ability to generate timely and actionable insights. As a result, answering questions such as: Who is being reached? Who is being missed? Where are the bottlenecks?, is hard.

Even though lack of mature data infrastructure has been a challenge, it also represents a strategic opportunity. Countries like Romania can move toward next-generation, vendor-neutral data architectures that are designed for interoperability, sustainability, and public value.

Such approaches as those based on open standards like openEHR, separate health data from specific software applications, allowing data to be captured once, remain consistent over time, and be reused securely for multiple purposes, including clinical care, program monitoring, cancer registries, research, and policymaking. Importantly, such architectures support privacy by design, enabling permissioned data sharing while keeping stewardship and control with trusted public institutions.

Transitioning to this model represents a significant paradigm shift, requiring new governance models and skills, however, the long-term benefits are substantial: such data infrastructure embodies the principles of a patient-centered health system, where individuals are visible across the continuum of care, data follows the patient rather than the institution, and national programs are equipped with the evidence needed to achieve cervical cancer elimination.

For example, many vendors supporting the Nordics (Norway, Sweden, and Finland) are already operating on open standards, however, even south and eastern Europe is catching up, with Slovenia being the most recent example of passing the law to support this type of digitalization on a national level in 2025 (66, 67).

## 4.2 Stakeholder participation in secondary prevention

In order to increase cervical cancer screening participation, it is important to raise awareness of the program in the target populations. Research shows that most women in Romania were not aware of the 2012-2017 screening program, despite the women's high educational background and urban residence (68). Moreover, limited health literacy and poor knowledge of HPV and cervical cancer, reported in almost 50% of women surveyed, further compromises participation rates in cancer screening (69). Only one in four women reports having received information about screening from healthcare providers (69). Local experts highlighted the lack of information on screening as prevalent in both the public and private healthcare settings, noting that the screening pathway is sometimes unclear even to physicians. Thus, in addition to raising awareness among the target women populations, it is crucial that initiatives also involve HCPs and additional healthcare professionals and equip them with the necessary tools to inform the eligible population and promote cervical cancer screening. Professional associations need to be involved in these efforts, both in terms of training HCPs, as well as in ensuring that national consensus on the methodologies and guidelines for screening, diagnosis and treatment is

reached, ensuring compliance with quality standards, and performing clinical audits. In 2024-2025, 8 HPV laboratories, 8 automatic cytology lines and electrosurgery equipment for 46 hospitals were purchased and installed through a WB loan. In addition to the recently contracted ESF+ project, a common curriculum in colposcopy has been developed through the EUCAN Screen project funded by EU4Health (70).

Perceptions about health and prevention affect the screening uptake. Many unscreened women report that in the absence of symptoms, they feel healthy and do not seek screening as a priority (69), whereas awareness of the benefits of early detection and fear of illness are key motivators for participation (68). These findings highlight the need to educate eligible women about cervical cancer, available screening options, and the importance of early detection. Coordinated advocacy can enhance awareness and clarify the logistics of screening, including perceived financial barriers that persist (60). Similar perceptions may also be prevalent among HCPs; as underlined by local experts, clinicians may overlook key aspects of population-based screening and treat it as a unique testing event. This makes awareness-raising initiatives that focus on quality assurance and the cervical cancer care pathway important steps to improve detection and diagnosis of cervical cancer.

Just as with primary prevention, barriers for screening differ by sociodemographic groups. Roma women often face additional challenges, including uncertainty about their eligibility due to insurance status and previous experiences of discrimination (64, 73). Despite this, many expressed willingness to participate when provided with adequate information. For example, participation was significantly higher when Roma women were informed in advance about mobile screening unit visits and the importance of testing, compared to low turnout when mobile units arrived unannounced (60). Culturally and linguistically adapted communication that reflects the diversity of the Romanian population is key to ensuring equity.

**Info box 8. The role of civil society**

Women's Center Milica is a national patient organization in Serbia and a member of the ENGAGE network, providing support and advocacy for women affected by breast and gynecologic cancers. Its representatives have completed a structured Patient Navigator Training Program implemented within the Oncologic-Social Navigation System project in cooperation with gynecologic and oncologic specialists and with institutional support from the Ministry of Health. Trained patient navigators provide person-centered support to newly diagnosed women, facilitating navigation of the healthcare system and support throughout treatment within a national network of support centers.

In parallel, the organization implements awareness-raising and prevention campaigns aligned with Europe's Beating Cancer Plan, such as "Daj pedalu raku" and "Not Without Her" ("Ne Bez Nje") (71, 72). A central digital platform (www.nebeznje.com) supports these campaigns by providing reliable information on breast and cervical cancer prevention and diagnosis, as well as by collecting data on women's awareness and barriers to screening implementation in Serbia.

Key learnings from this example include the important role of multi-stakeholder collaboration and the involvement of patient organizations in advocacy and patient support initiatives. Patient Navigation programs and awareness-raising campaigns should focus on collaboration among sectors, both in design and implementation phases, for a more holistic approach that involves patient voices and accounts for their needs.

## 4.3 Policy agenda and global alignment

Secondary prevention through screening is an important component for the elimination of cervical cancer, for which specific targets have been set at both International and EU level. The Romanian National Health Strategy 2023-2030 and the NCCP, set several general and specific objectives that are pertinent to screening, see Table 3.

**Table 3: Key objectives for secondary prevention worldwide, EU and Romania.**

| Key objectives | |
|---|---|
| World  | • By 2030, 70% of women screened using a high-performance test by the age of 35, and again by the age of 45 (10). |
| EU  | • Under Europe's Beating Cancer Plan it was set that by 2025, 90% of the target population should be offered cervical cancer screening (52).<br>• By 2025, every EU country should aim to include measures to achieve at least 70% screening coverage, particularly at ages 35 and 45, using high-precision HPV tests (53).<br>• By 2030, the target is that at least 70% of women have had an HPV test in the past five years as part of organized programs<br>• The EBCP calls for 90% of the target population to receive invitations for screening by 2025 (52). |
| Romania  | • By 2030, the National Health Strategy 2023-2030 aims to strengthen health prevention through screening and early detection, reaching at least 50% of the eligible population (74).<br>• The NCCP aims to develop national screening and update them on a per need basis (55), and adoption of the government decision establishing and operationalizing the National Screening Registry (went through public consultation at the end of 2025; adoption should follow in 2026)<br>• Decrease cervical cancer mortality by 5% through measures such as establishing the patient pathway, organizing regional networks for the three prevention pillars, as well as establishing and reimbursing the standard of care.<br>• Streamline the national screening program, via the introduction of HPV testing, the creation of a single screening network in each county, and better financing of the program. It also aims to increase the involvement of family doctors and gynecologists and implement awareness campaigns.<br>• Under the goal of cervical cancer elimination, the NCCP aims to improve the screening program's performance by using innovative methods and technologies, considering socioeconomic determinants and individual behavior. |

# 5. Tertiary prevention through treatment and management

Cervical cancer can either be detected when women notice symptoms themselves or through screening before symptoms appear (see secondary prevention). Detecting precancerous lesions early and timely management of cervical intraepithelial neoplasia (CIN) can interrupt the disease process (75), avoiding the need for more complex and costly treatments. However, when cervical cancer develops, comprehensive treatment strategies become essential to achieve cure or control of the disease.

Cervical cancer diagnosis is confirmed by colposcopy and biopsy (23, 24). MRI, PET, or CT scans may also be used. Management of cervical cancer should be guided by a multidisciplinary team (MDT) (24), including oncologists, surgeons, radiologists, pathologists, and oncology nurses to ensure the most appropriate care for each patient.

The stage at diagnosis determines therapeutic options. Standard treatment typically involves surgical removal of the tumor and often the entire uterus, radiation therapy, and systemic cancer medicines, alone or in combination depending on the stage (24, 76). The updated WHO Essential Medicines List (EML) from September 2025, includes immunotherapy as a first-line monotherapy for metastatic cervical cancer (77).

## 5.1 Infrastructure, monitoring and evaluation in tertiary prevention

Despite strong political will and progress in cervical cancer treatment, the country still requires a comprehensive cancer registry with data on treatment, as well as further investments in holistic services and palliative care (PC).

**Data and guidelines.** Romania currently lacks the detailed clinical registries needed to monitor progress toward the WHO CCEI and EBCP goal of managing and treating 90% of women with precancerous lesions or cancer. As a result, there are no nationally representative data on cervical cancer incidence, mortality, or treatment outcomes. The absence of standardized diagnostic and treatment pathways, as well as uniform guidelines for imaging, pathology interpretation, and handling of biological material, leads to variability in quality across centers and can result in care that is not aligned with the standard protocols (56).

Adherence to international standards is inconsistent, with larger oncology centers generally complying, while smaller facilities lack formal clinical guidelines (28). Although prescribing protocols for reimbursed cancer medicines are available, broader implementation of national clinical and data standards is needed to ensure consistency.

**Challenges in diagnosis and treatment.** Diagnostic and treatment services in Romania remain unevenly distributed, leading to disparities in access, quality, and outcomes. Cancer care is provided in both public and private facilities (56), but services are concentrated in three major oncological institutes—Bucharest, Iași, and Cluj-Napoca—with other hospitals (Craiova, Timișoara) often acting only as important intermediaries (28, 56). While the availability of diagnostic equipment improved, for example, CT scanners more than doubled (9 to 24 per 100,000) and MRI scanners tripled (4 to 15 per 100,000) between 2011–2022, radiation therapy capacity remains below the EU average, and over half of counties (24/42) lack comprehensive radiotherapy centers (28). Oncological surgery, mainly provided in university hospitals,

continues to face variability in quality and inequities in access (56).

Financial barriers further constrain access, as most diagnostic procedures outside screening are not reimbursed, and out-of-pocket spending still represents 21% of total health expenditure (28, 56). Local experts highlighted that the country made significant progress, but although the EU funding covers services for uninsured women with positive screening results, systemic gaps in reimbursement and regional service distribution, as well as citizen's awareness all contribute to persistent inequalities. In 2025, early cancer diagnostic health services were approved for reimbursement. These address early diagnosis in a standardized manner by providing diagnostics, evaluation and staging of disease investigations for each type of cancer, including cervical cancer. The services are available free of charge to all women regardless of insurance status.

**Info box 9. Local champions in advancing equitable access to treatment**

To address some of these challenges, locally led initiatives are beginning to take place. For example, the Regional Oncology Institute in Iași has established a hotel for patients that have to travel from outside the city, which is financed through hospital resources (28, 56). Local experts highlighted further comprehensive and holistic approaches that include innovative approaches such as social prescribing, as well as psychological approaches at the "Sf Nectarie" hospital in Craiova.

Social prescribing refers to the systematic referral of patients to non-medical, community resources, with the aim of addressing social determinants of health and alleviating demand on patients and the healthcare system.

Experts mentioned that other recently adopted provisions of the national health insurance contract, which include paid leave of caregivers of cancer patients, psychological counseling services for cancer patients and their relatives, and improved rehabilitation and palliative services, including home-based care, are meant to further reduce barriers for cancer patients.

**Access to medicines.** According to the European Federation of Pharmaceutical Industries and Associations (EFPIA) Patients W.A.I.T. (Waiting to Access Innovative Therapies) Indicator Survey, the reimbursement rate for novel cancer medicines approved by the European Medicines Agency (EMA) between 2020 and 2023 was 20% in Romania as of January 5, 2025, below the EU average of 50% (78), see Figure 10. The availability rate has declined over the years from 35% to 30%, based on the 2019 and 2022 W.A.I.T Indicator Survey data (79, 80). The average time from EMA approval to local reimbursement in Romania is among the longest in the EU as well. It takes an average of 762 days (25 months) for new cancer medicines to be reimbursed, compared to the EU average of 586 days (20 months) (78). Although Romania's timeline is still significantly longer than the EU average, the situation has improved compared to previous data. Earlier surveys indicated that the average time of reimbursement was around 32 months (964 days) according to the 2021 Survey, and 33 months (991 days) in 2022, nearly twice the EU average at the time, of around 18 months (80, 81).

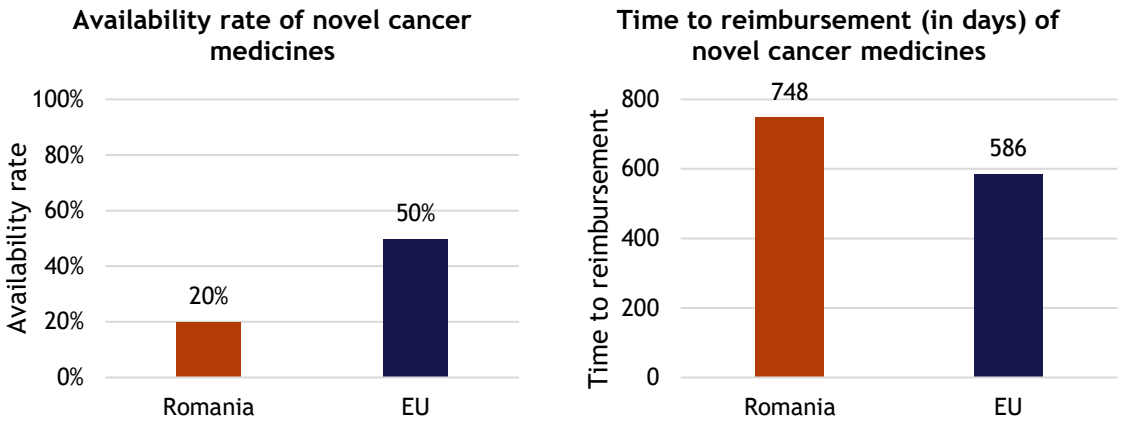



**Figure 10: Availability rate & time to reimbursement (in days) of EMA-approved novel cancer medicines in Romania as of January 5, 2025.**

Source: (78).

## 5.2 Stakeholder participation in tertiary prevention

Romania's overall health workforce is broadly sufficient, however, specialist shortages and uneven distribution of workforce persist. Overall supply of physicians and nurses is broadly aligned with EU averages, with 694 physicians and 1,548 nurses per 1,000 new cancer cases (28). However, the distribution of specialists remains uneven: in 2022, nearly half of counties (19/42) had fewer than two oncologists per 100,000 inhabitants, and some regions reported only one per 200,000 (56). Shortages are particularly acute in rural areas, where around 500,000 people lacked a family doctor in 2020 (28, 83). The aging profile of primary care physicians (PCPs), with only 32% under age of 45 compared to 63% among other specialists further threatens future capacity (83).

Retention challenges also affect the public sector, especially for medical physicists, who are not formally recognized as healthcare professionals (Ordonanţa 18/2021, art. 942) and are difficult to retain in radiotherapy services (56). Authorities have introduced incentives such as salary increases, facility modernization, and expanded residency slots to mitigate attrition (83). However, persistent training gaps, including the absence of formal specialization in oncology nursing or radiotherapy, risk resulting in high variability in care quality and limited use of multidisciplinary tumor boards (MDT) (28, 56).

**Info box 10. Best practice examples in palliative care**

The integration of palliative care in European healthcare systems varies by country. Several countries provide good examples of practice that can advance palliative services (82).

- In Sweden, PC is a priority service, as outlined in the general Health care law, at the same level as acute emergency care.
- Austria's system includes day hospices and volunteer hospice palliative care teams, available across the country, which are legally part of the Austrian specialized Hospice and Palliative Care services.
- In Norway, immediate-release oral morphine (in liquid and tablets form) is universally available in both urban and rural PHC facilities, ensuring equitable access to pain management.
- In some countries, e.g. Austria, Finland, France, Ireland, Lithuania, Moldova and the UK, all medical and nursing schools include compulsory teaching in PC.
- In Switzerland, there is a nationally recognized specialist medical qualification (Schwerpunkt) in palliative medicine. Other health professionals, such as nurses, can take a certificate (entry qualification to work in palliative care), diploma, or Masters (only in the German speaking region) in Advanced Studies in Palliative Care.

For effective and patient-centered care, psycho-social and palliative support are also important. In recent years, psychological support services for cancer patients have become increasingly utilized, however unmet needs persist due to the scarcity of many services, which are limited to oncology centers of excellence (56).

Palliative care (PC) services lack sufficient organization and are subsequently underutilized. Pre-pandemic data from 2018 show that only about 18% of patients in need of palliation received it (56), and just 5% accessed at-home care, largely through NGOs or private providers (28). Financial and geographic barriers persist, with over one-third of inpatient palliative services requiring co-payments and 11 counties lacking palliative care beds (28, 56).

## 5.3 Policy agenda and global alignment

The WHO Global Strategy calls for 90% of women identified with cervical disease to receive treatment by 2030—both for precancer and invasive cancer (10). The EU adds specific targets: by 2030, 90% of women with Grade 3 precancerous lesions should be treated within three months, and 90% of invasive cervical cancers should be appropriately managed. Romania's NCCP outlines several specific objectives related to cervical cancer treatment. Achievement of the goals will require strong cross-sectoral collaboration; see Table 4.

**Table 4: Key objectives for tertiary prevention worldwide, EU and Romania.**

| Key objectives | |
|---|---|
| World  | • By 2030, 90% of women identified with cervical disease to receive treatment (90% of women with pre-cancer treated and 90% of women with invasive cancer managed) (10). |
| EU  | • By 2030, 90% of women with Grade 3 precancerous lesions should be treated within three months (52).<br>• Additionally, 90% of invasive cervical cancer cases should be detected and managed appropriately. |
| Romania  | • NCCP General objective: develop a functional cancer registry and national guidelines for diagnosis and treatment, introduce a period of 60 days from first symptom to treatment initiation, and develop a standardized operation of MDTs (55).<br>• NCCP specific objectives:<br>  ○ decrease cervical cancer mortality by 5% through several measures (see in Table 3 for more details).<br>  ○ establish key performance indicators for the therapeutic process, compliant with medical guidelines and protocols,<br>  ○ provide further training in gynecologic oncology and oncological surgery<br>  ○ include the endowment of 8-10 accredited national centers for treatment<br>  ○ increase the implementation rate of minimally invasive surgery to 20% of cases, in at least 5 centers.<br>• Finally, the NCCP aims to ensure access to treatment in line with the EBCP. |

# 6. A call to action: Cervical cancer elimination roadmap for Romania

Romania is facing important challenges in cervical cancer prevention and control, but it is equally important to recognize the significant steps forward made in recent years. Since 2020, HPV vaccination has become increasingly accessible, and uptake is showing a positive trend. Still, reaching national and European targets requires continued and coordinated efforts. Protecting more people from HPV-related risks will demand sustained collaboration among healthcare professionals, policymakers, and communities. Even though screening is offered nationwide, it remains largely opportunistic, and treatment pathways, while guided by national protocols, still miss opportunities for early detection at the primary care level. Gaps in data integration and monitoring make it difficult to track progress or target interventions effectively.

The following roadmap outlines actions that will strengthen vaccination coverage, promote transition to organized screening, ensure more equitable access to treatment, and embed these measures within a comprehensive national cervical cancer elimination plan, aligned with WHO's 90–70–90 targets and the latest EU recommendations. The policy actions are grouped into three main pillars:

**Strengthening operational capacity and infrastructure**

**Transitioning to nationally organized cervical cancer screening**

**Ensuring equity and translating knowledge into action**

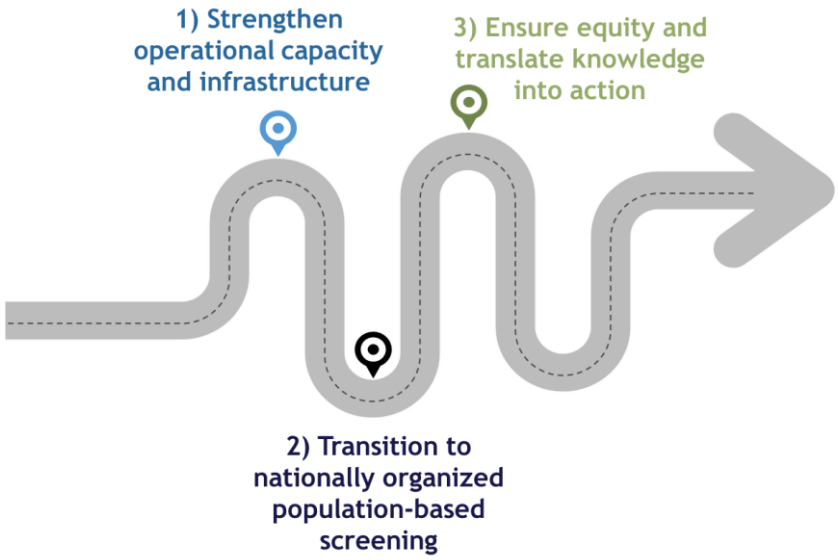



**Figure 11: Policy roadmap for cervical cancer elimination in Romania.**

The three pillars address a broad set of challenges that span population-, provider-, and system-level challenges that slow down the progress toward elimination goals. These barriers range from geographic and cultural obstacles affecting individuals, to capacity constraints among healthcare providers, and structural shortcomings in program design and monitoring. Table 5

summarizes the main categories of challenges that must be addressed to ensure equitable and sustained progress.

**Table 5: Summary of Romania's challenges towards cervical cancer elimination.**

| | Primary prevention | Secondary prevention | Tertiary prevention |
|---|---|---|---|
| **Population-level** | Access barriers & disparities (geographical, logistical, financial) | | |
| | Low health literacy & lack of awareness (e.g. limited knowledge, misinformation) | | |
| | Cultural norms (e.g. lack of preventive mindset) | | |
| **Provider-level** | Workforce shortages and uneven distribution of HCPs | | |
| | Overburdened providers (e.g. high clinical and administrative workloads) | | |
| | Lack of awareness on the patient pathways | | |
| | Lack of preventive mindset and suboptimal promotion of preventive services | | |
| **System-level** | Limited investment in prevention and uneven distribution of resources and financial allocation between regions | | |
| | Suboptimal monitoring (lack of cancer/screening registries, lack of monitoring & evaluation mechanisms and targets) | | |
| | Lack of reminder systems for vaccination, screening | | |
| | | | Lack of pathways and national guidelines for diagnosis and treatment |
| | | Uneven adoption of new practices (e.g. HPV testing) across regions | |
| | Suboptimal initiatives to increase access (e.g. mobile units, HPV self-sampling test) | | |
| | | | Low reimbursement rate and long time to reimbursement of cancer medicines<br><br>Lack of standardized education for important specialties in cancer care |

## 6.1 Strengthen operational capacity and infrastructure

**Overarching objective:** Build the systems, partnerships, and workforce to support sustainable prevention, screening, and treatment efforts.

### Develop Key Performance Indicators (KPIs) for continuous monitoring

- Track progress toward National Cancer Control Plan (NCCP) or future cervical cancer elimination targets and monitor vaccination and screening coverage.
- Link quality of healthcare services to financial incentives and pay-for-performance mechanisms, enhancing accountability and engagement.

### Invest in robust data infrastructure

- Implement the HPV Dynamic Dashboard for real-time, territorial-level monitoring of vaccine uptake, screening, and disparities.
- Develop a national cancer registry and ensure interoperability with the HPV Dashboard and screening databases. Utilize data to inform resource allocation, budgeting, and evidence-based policy decisions.
- Deploy a digital call/recall system for vaccination reminders, ensuring eligible populations are reached.

### Develop a stepwise plan for the implementation of school-based HPV vaccination program

- Learning from the past, include strategies to liaise the school staff with the health-care providers, and introduce education initiatives for parents and adolescents at schools, as well as better training for the educators to provide health information.

### Strengthen partnerships for operational sustainability

- Establish cross-sectoral collaboration, coordinate with European funding bodies, and leverage private-sector partnerships to support program implementation.

### Empower healthcare professionals in prevention

- Equip HCPs with communication tools to educate patients effectively and help patients with lower health literacy.
- Establish regular feedback mechanisms between public actors and HCPs (e.g., via national coalitions) to capture field experience and needs.
- Actively involve healthcare professionals from multiple specialties (e.g., gynecologists, obstetricians, oncologists, and other specialists) in HPV vaccination efforts, recognizing their critical role in recommending and reinforcing vaccination across different points of care.
- Integrate pharmacists into national HPV vaccination strategies and protocols, recognizing community pharmacies as trusted and accessible settings for vaccination delivery.

### Expand access in underserved areas

- Leverage the new legislation and increase the use of mobile units in remote and underserved areas.
- Continue partnering with NGOs to strengthen trust, provide regular vaccination and screening outreach in remote regions.

## 6.2 Transition to nationally organized population-based screening

**Overarching objective:** Ensure a transition to a nationally organized population-based cervical cancer screening program that reaches all eligible women.

### Develop a national screening registry

- Ensure all regional systems are interoperable with the national registry and employ a mutual digital backbone.
- Disaggregate data by age, region, and socioeconomic status to identify gaps and target interventions effectively.

### Implement a centrally triggered invitation and recall system

- Co-design and use culturally tailored invitations to increase participation.
- Automatically send an invitation when no test result is detected in a specified time-range, and record individual preferences on the type of invitation (e.g. digital or paper).

### Update screening recommendations and methodologies to be in line with the EU recommendations

- Scale up HPV pilot programs and transition to primary HPV testing, with cytology triage, on a national level.
- Adapt screening guidelines to individual vaccination history, so that vaccinated women can begin screening later (e.g. at 30 years)
- Offer HPV vaccination at the first cervical screening visit to individuals who are not yet vaccinated.
- Introduce HPV self-sampling, particularly for hard-to-reach populations.

### Enhance healthcare provider capacity for secondary prevention

- Ensure that healthcare providers are aware of the latest guidelines and recommendations and are equipped with information for the target population for screening.
- Introduce performance-based incentives to encourage high screening rates and effective patient engagement.

## 6.3 Ensure equity and translate knowledge into action

**Overarching objective:** Reduce disparities and ensure all populations equally benefit from cervical cancer prevention, early diagnosis, and treatment.

### Develop sustainable models for interministerial and cross-sectoral collaboration

- Partner with the Ministry of Education to develop age-appropriate health education programs and embed health literacy in early education.
- Partner with Ministries beyond Education, such as for Labor and Social Affairs in order to develop strategies that incentivize employers and cultural, sports, and media organizations to support prevention and health.
- Engage healthcare providers, patient advocacy groups, and social services to build trust and coalitions that will promote primary prevention, healthy behaviors, and participation in national programs.
- In the long-term, strengthen the collaboration between the Ministry of Health and the Ministry of Education beyond information provision and explore de-novo implementation of a school-based vaccination program.

### Develop targeted, community-led programs

- Engage adolescents, parents, educators, and insure diversity and inclusion of all populations in co-designing communication materials and campaigns relevant to HPV vaccination, screening, and cervical cancer treatment.
- Leverage local community and religious leaders to develop culturally sensitive messaging and secure endorsement from institutions beyond healthcare.

### Ensure timely, equitable access to innovation and latest technologies across all regions

- Define national citizen and patient pathways for screening, diagnosis, and treatment aligned with NCCP objectives and make them accessible to aid navigation and understanding of the system.
- Based on the KPIs, publish and share disaggregated data and findings on vaccination, screening, and treatment outcomes.
- Address delays in reimbursement and access to innovative therapies, and high out-of-pocket costs.

# Conclusion

Romania has made significant strides toward cervical cancer elimination, but achieving national and EU targets requires coordinated, evidence-driven action across multiple fronts. The roadmap presented here identifies priority actions that build on existing initiatives, international best practices, and expert consultations.

Key lessons highlight that: multistakeholder partnerships and cross-sectoral collaboration support sustainable program implementation; robust data systems and infrastructure enable program monitoring and guide targeted interventions; strengthening the role of healthcare providers promotes both patient education and navigation through the system; tailoring interventions to local and cultural needs more effectively reaches the target populations and enhances equity to accessing information and services.

By leveraging these enablers and continuing to advocate for supportive policy changes, stakeholders can ensure that cervical cancer elimination in Romania becomes a sustainable reality and a catalyst for broader HPV-related disease control, while also generating substantial economic returns through reduced healthcare costs, higher productivity, and fewer years of life lost.

# References


1. European Cancer Organisation. The Impact of HPV. [Sept 24, 2025]. Available from: https://www.europeancancer.org/content/the-impact-of-hpv.html.

2. World Health Organization. Human papillomavirus and cancer. 2024 [Oct 3, 2025]. Available from: https://www.who.int/news-room/fact-sheets/detail/human-papilloma-virus-and-cancer.

3. American Cancer Society. What Is Cervical Cancer? [Sep 8, 2025]. Available from: https://www.cancer.org/cancer/types/cervical-cancer/about/what-is-cervical-cancer.html.

4. National Cancer Institute. Cervical Cancer Symptoms. [Sep 8, 2025]. Available from: https://www.cancer.gov/types/cervical/symptoms.

5. Bergman H, Henschke N, Arevalo-Rodriguez I, Buckley BS, Crosbie EJ, Davies JC, et al. Human papillomavirus (HPV) vaccination for the prevention of cervical cancer and other HPV-related diseases: a network meta-analysis. Cochrane Database Syst Rev. 2025;11(11):Cd015364.

6. European Cancer Information System (ECIS). 2024 Estimates. [Jan 27, 2026]. Available from: https://ecis.jrc.ec.europa.eu/data-explorer#/estimates.

7. Furtunescu F, Bohiltea RE, Neacsu A, Grigoriu C, Pop CS, Bacalbasa N, et al. Cervical Cancer Mortality in Romania: Trends, Regional and Rural–Urban Inequalities, and Policy Implications. Medicina. 2021;58(1):18.

8. European Cancer Information System (ECIS). Incidence/mortality trends by period. [Aug 1, 2025]. Available from: https://ecis.jrc.ec.europa.eu/data-explorer#/historical.

9. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Nikšić M, et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. Lancet. 2018;391(10125):1023-75.

10. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: 2020.

11. Manzano A, Svedman C, Hofmarcher T, Wilking N. Comparator Report on Cancer in Europe 2025 - Disease Burden, Costs and Access to Medicines and Molecular Diagnostics. Lund, Sweden: IHE, 2025.

12. Asc Academics. The economic burden of HPV-related diseases: Romania. 2024.

13. Sabale U, Karamousouli E, Popovic L, Krasznai ZT, Harrop D, Meiwald A, et al. The indirect costs of human papillomavirus-related cancer in Central and Eastern Europe: years of life lost and productivity costs. Journal of Medical Economics. 2024;27(sup2):1-8.

14. Petre I, Negru ȘM, Buleu F, Moleriu RD, Mercioni MA, Petre I, et al. Evaluating the Cost-Effectiveness of Cervical Cancer Screening and Treatment in Western Romania. Current Oncology. 2025;32(6):336.

15. Todorovic J, Stamenkovic Z, Stevanovic A, Terzic N, Kissimova-Skarbek K, Tozija F, et al. The burden of breast, cervical, and colon and rectum cancer in the Balkan countries, 1990–2019 and forecast to 2030. Archives of Public Health. 2023;81(1):156.

16. Faivre P, Benčina G, Campbell R, Quilici S, Dauby N, Tešović G, et al. Immunization funding across 28 European countries. Expert Review of Vaccines. 2021;20(6):639-47.

17. Manzano A, Košir U, Hofmarcher T. Bridging the gap in women's cancers care: a global policy report on disparities, innovations and solutions. Lund, Sweden: IHE, 2025.

18. Ozawa S, Clark S, Portnoy A, Grewal S, Brenzel L, Walker DG. Return On Investment From Childhood Immunization In Low- And Middle-Income Countries, 2011-20. Health Aff (Millwood). 2016;35(2):199-207.

19. El Banhawi H, Chowdhury S, Neri M, Radu P, Besley S, Bell E, et al. The Socioeconomic Value of Adult Immunisation Programmes. Office of Health Economics, 2024.

20. Masters R, Anwar E, Collins B, Cookson R, Capewell S. Return on investment of public health interventions: a systematic review. J Epidemiol Community Health. 2017;71(8):827-34.

21. Kotsopoulos N, Connolly MP, Nur S, Daniels V, Pavelyev A, Sabale U, et al. Increasing HPV vaccination coverage in Switzerland: a return-on-investment analysis. Journal of Medical Economics. 2025;28(1):1168-82.

22. Tiozzo G, Gurgel do Amaral GS, Kwiatkiewicz R, Postma MJ. HPV's Economic Burden: Unmasking the benefits of HPV prevention. Asc Academics, 2024.

23. ESMO. eUpdate - Cervical Cancer Treatment Recommendations. 2020 [Aug 7, 2025]. Available from: https://www.esmo.org/guidelines/eupdate-cervical-cancer-treatment-recommendations.

24. Cibula D, Raspollini MR, Planchamp F, Centeno C, Chargari C, Felix A, et al. ESGO/ESTRO/ESP Guidelines for the management of patients with cervical cancer - Update 2023. Int J Gynecol Cancer. 2023;33(5):649-66.

25. Digi24.ro. Vaccinarea elevilor nu se mai face în cabinetele şcolare, ci doar la medicii de familie. [cited Jan 15, 2026]. Available from: https://www.digi24.ro/magazin/stil-de-viata/viata-sanatoasa/vaccinarea-elevilor-nu-se-mai-face-in-cabinetele-scolare-ci-doar-la-medicii-de-familie-375271.

26. Cronica Română. Timișoara lansează Coaliția pentru prevenția infecției cu HPV Timișoara. Un apel la prevenție, solidaritate și acțiune comunitară. 2025 [Sep 3, 2025]. Available from: https://cronicaromana.net/2025/08/26/timisoara-lanseaza-coalitia-pentru-preventia-infectiei-cu-hpv-timisoara-un-apel-la-preventie-solidaritate-si-actiune-comunitara/.

27. Colzani E, Johansen K, Johnson H, Pastore Celentano L. Human papillomavirus vaccination in the European Union/European Economic Area and globally: a moral dilemma. Euro Surveill. 2021;26(50).

28. OECD/European Commission. EU Country Cancer Profile: Romania 2025. Paris: OECD Publishing, 2025.

29. Centrul Naţional de Supraveghere şi Control al Bolilor Transmisibile. Rezultatele evaluării impactului politicilor de vaccinare asupra absorbției vaccinării împotriva virusului papilloma uman (HPV) în România.

30. World Health Organization. Human Papillomavirus (HPV) vaccination coverage. [Aug 25, 2025]. Available from: https://immunizationdata.who.int/global?topic=&location=.

31. Felsher M, Shumet M, Velicu C, Chen YT, Nowicka K, Marzec M, et al. A systematic literature review of human papillomavirus vaccination strategies in delivery systems within national and regional immunization programs. Hum Vaccin Immunother. 2024;20(1):2319426.

32. Folkhälsomyndigheten. Vaccination against human papillomavirus. [Sept 25, 2025]. Available from: https://www.folkhalsomyndigheten.se/smittskydd-beredskap/vaccinationer/vaccinationer-i-sverige/humant-papillomvirus-hpv/.

33. 1177. Vaccination mot HPV. [Oct 3, 2025]. Available from: https://www.1177.se/undersokning-behandling/vaccinationer/vaccination-mot-hpv/#section-11297.

34. Ministerstwo Zdrowia. Inauguracja Parlamentarnego Zespołu ds. Przeciwdziałania wirusowi HPV – podsumowanie pierwszego roku realizacji szczepień w szkołach. 2025.

35. Centrul Național de Supraveghere și Control al Bolilor Transmisibile. Raport privind evoluția vaccinării împotriva papilomavirusului uman (HPV), România, 1 decembrie 2023 – 31 decembrie 2024.

36. UNICEF Romania. Romania together with Bosnia and Herzegovina exchange best practices on immunization. 2023 [cited Nov 7, 2025]. Available from: https://www.unicef.org/romania/stories/romania-together-bosnia-and-herzegovina-exchange-best-practices-immunization.

37. Universitatea de Medicină și Farmacie Craiova. Ai grijă de fiica ta! Campanie de informare și educare UMF Craiova. [cited Jan 16, 2026]. Available from: https://www.umfcv.ro/ro/cercetare/departamentul-de-cercetare/proiecte-comunitare/ai-grija-de-fiica-ta-campanie-de-informare-si-educare-umf-craiova.

38. Universitatea de Medicină și Farmacie Craiova. UMF Craiova at "Frații Buzești" College. [cited Jan 16, 2026]. Available from: https://www.umfcv.ro/ro/cercetare/departamentul-de-cercetare/proiecte-comunitare/ai-grija-de-fiica-ta-campanie-de-informare-si-educare-umf-craiova/umf-craiova-la-colegiul-fratii-buzesti.

39. Universitatea de Medicină și Farmacie Craiova. An act of prevention = A life under Protection. [cited Jan 16, 2026]. Available from: https://umfcv.ro/ro/stiri/un-act-de-preventie-o-viata-sub-protectie.

40. Asociația Societatea Națională de Medicina Familiei/Medicină Generală (SNMF). Societatea Națională de Medicina Familiei susține campania „Protejează-i aripile! [cited Jan 16, 2026]. Available from: https://snmf.ro/2017/10/30/societatea-nationala-de-medicina-familiei-sustine-campania-protejeaza-i-aripile-2/.

41. Asociația Societatea Națională de Medicina Familiei/Medicină Generală (SNMF). POZIȚIA SOCIETĂȚII DE OBSTETRICĂ ȘI GINECOLOGIE DIN ROMÂNIA (SOGR) ȘI A SOCIETĂȚII NAȚIONALE DE MEDICINA FAMILIEI (SNMF) FAȚĂ DE VACCINAREA ANTI-COVID-19 ȘI ANTI-HPV. [cited Jan 16, 2025]. Available from: https://snmf.ro/2021/06/15/pozitia-societatii-de-obstetrica-si-ginecologie-din-romania-sogr-si-a-societatii-nationale-de-medicina-familiei-snmf-fata-de-vaccinarea-anti-covid-19-si-anti-hpv/.

42. ReThinkHPVaccination. National survey: Analysis of perceptions and attitudes regarding HPV vaccination in Romania. 2024 [cited Oct 6, 2025]. Available from: https://rethink-hpv.eu/en/national-survey-analysis-perceptions-attitudes-hpv-vaccination-romania/.

43. Achimaș-Cadariu T, Pașca A, Nicoară D, Dumitrașcu DL. Exploring Vulnerable, Ethnic Minority, and Low Socioeconomic Children's Knowledge, Beliefs, and Attitudes Regarding HPV Vaccination in Romania. Healthcare. 2025;13(16):2010.

44. Strickland CJ, Horney JA. Healthcare provider and medical student impressions of vaccine hesitancy in Romania. Public Health in Practice. 2022;3:100261.

45. Craciun C, Baban A. “Who will take the blame?”: Understanding the reasons why Romanian mothers decline HPV vaccination for their daughters. Vaccine. 2012;30(48):6789-93.

46. PERCH - PartnERship to Contrast HPV. [cited Jan 16, 2026]. Available from: https://www.projectperch.eu/.

47. Moise-Pețu M, Băbălău AM, Enciu B, Ungurean C, Furtunescu FL, editors. HPV vaccination - attitudes and training needs of medical personnel. The "Partnership for HPV Control (PERCH)" project. A XVIII-a Conferință Națională de Microbiologie și Epidemiologie; 2025; Timișoara.

48. Pop CA. Cervical cancer narratives: invoking ‘God's will’ to re-appropriate reproductive rights in present-day Romania. Culture, Health & Sexuality. 2015;17(1):48-62.

49. Dumitra GG, Dogaru CA, Alexiu SA, Sănduțu D, Berbecel C, Curelea M, et al. HPV vaccine-related myths encountered in Romanian clinical practice: a cross-sectional survey of family doctors. Germs. 2025;15(1):37-55.

50. Štrbac M, Ukropina S, Nikolić N, Mašić K, Rajčević S, Čanković D, et al. Impact of health promotion strategies on HPV vaccination uptake: A descriptive epidemiological study (2019-2024). PLoS ONE. 2025;20(9):e0331592.

51. Iova CF, Badau D, Daina MD, Șuteu CL, Daina LG. Evaluation of the Knowledge and Attitude of Adolescents Regarding the HPV Infection, HPV Vaccination and Cervical Cancer in a Region from the Northwest of Romania. PPA. 2023;Volume 17:2249-62.

52. European Commission. Europe's Beating Cancer Plan (ECBP): Communication from the commission to the European Parliament and the Council. 2021.

53. Baker P, Kelly D, Medeiros R. Viral Protection: Achieving the Possible. A Four Step Plan for Eliminating HPV Cancers in Europe. Brussels: European Cancer Organisation, 2020.

54. Council of the European Union. Council Recommendation on vaccine-preventable cancers (legal basis proposed by the Commission : Article 168(6) TFEU) - Adoption. 2024 Contract No.: 2024/0024(NLE)

55. Parlamentul României. LEGE nr. 293 din 3 noiembrie 2022 pentru prevenirea și combaterea cancerului. [cited Oct 7, 2025]. Available from: https://legislatie.just.ro/Public/DetaliiDocumentAfis/261246#:~:text=Articolul%205%20%281%29%20Planul%20na%C8%9Bional%20de%20prevenire%20%C8%99i,S%C4%83n%C4%83t%C4%83%C8%9Bii%20%C8%99i%20Casa%20Na%C8%9Bional%C4%83%20de%20Asigur%C4%83ri%20de%20S%C4%83n%C4%83tate.

56. Ministerul Sănătății. Planul Național de Combatere și Control al Cancerului. 2023.

57. Ministerul Sănătății. ORDIN nr. 3.735 din 28 iunie 2024 - privind aprobarea Metodologiei de screening pentru cancerul de col uterin. [cited Dec 12, 2025]. Available from: https://legislatie.just.ro/Public/DetaliiDocumentAfis/285271.

58. Eurostat. Preventive cancer screenings - programme data [hlth_ps_prev]. [Aug 12, 2025]. Available from: https://ec.europa.eu/eurostat/data/database.

59. Eurostat. Self-reported last cervical smear test among women by age and educational attainment level [hlth_ehis_pa8e]. [Sep 3, 2025]. Available from: https://ec.europa.eu/eurostat/data/database.

60. Simion L, Rotaru V, Cirimbei C, Gales L, Stefan D-C, Ionescu S-O, et al. Inequities in Screening and HPV Vaccination Programs and Their Impact on Cervical Cancer Statistics in Romania. Diagnostics. 2023;13(17):2776.

61. Association Montpellier Hérault pour le Dépistage du Cancer du Sein (AMHDCS). Le dépistage du cancer du sein de l'Hérault [cited Nov 14, 2025]. Available from: https://www.mammobile.com/.

62. Health Information and Quality Authority. BreastCheck (The National Breast Screening Programme). [cited Nov 14, 2025]. Available from: https://www.hiqa.ie/areas-we-work/health-information/data-collections/breastcheck-national-breast-screening-programme.

63. Ilisiu MB, Hashim D, Andreassen T, Støer NC, Nicula F, Weiderpass E. HPV Testing for Cervical Cancer in Romania: High-Risk HPV Prevalence among Ethnic Subpopulations and Regions. Annals of Global Health. 2019;85(1):89.

64. Andreassen T, Melnic A, Figueiredo R, Moen K, Șuteu O, Nicula F, et al. Attendance to cervical cancer screening among Roma and non-Roma women living in North-Western region of Romania. International Journal of Public Health. 2018;63(5):609-19.

65. Eurostat. Self-reported last cervical smear test among women by age and degree of urbanisation [hlth_ehis_pa8u]. [Sep 3, 2025]. Available from: https://ec.europa.eu/eurostat/data/database.

66. EY. How innovative infostructure can power the purpose of integrated care systems. 2022.

67. Hrzic R. Digital Public Health in Slovenia. European Journal of Public Health. 2023;33(Supplement_2).

68. Todor RD, Bratucu G, Moga MA, Candrea AN, Marceanu LG, Anastasiu CV. Challenges in the Prevention of Cervical Cancer in Romania. IJERPH. 2021;18(4):1721.

69. Covaliu BF, Forray AI, Tomic M, Vlad C, Cadariu PA, Ungurean C, et al. Understanding Cervical Cancer Screening Attendance: Barriers and Facilitators in a Representative Population Survey. Cancers. 2025;17(4):706.

70. EUCanScreen. Implementation of cancer screening programmes (EUCanScreen). [cited Jan 27, 2026]. Available from: https://eucanscreen.eu/.

71. Daj pedalu raku. [cited Jan 27, 2026]. Available from: https://www.nebeznje.com/pedala-raku-info.

72. Ne Bez Nje. [cited Jan 27, 2026]. Available from: https://www.nebeznje.com/.

73. Andreassen T, Weiderpass E, Nicula F, Suteu O, Itu A, Bumbu M, et al. Controversies about cervical cancer screening: A qualitative study of Roma women's (non)participation in cervical cancer screening in Romania. Social Science & Medicine. 2017;183:48-55.

74. Ministerul Sănătății. STRATEGIA NAȚIONALĂ DE SĂNĂTATE 2023 2030 „Pentru sănătate, împreună". 2023.

75. World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. 2021.

76. Marth C, Landoni F, Mahner S, McCormack M, Gonzalez-Martin A, Colombo N, et al. eUpdate - Cervical Cancer Treatment Recommendations. Ann Oncol. 2020;28(suppl_4):iv72-iv83.

77. World Health Organization. WHO updates list of essential medicines to include key cancer, diabetes treatments. 2025 [Oct 14, 2025]. Available from: https://www.who.int/news/item/05-09-2025-who-updates-list-of-essential-medicines-to-include-key-cancer--diabetes-treatments.

78. European Federation of Pharmaceutical Industries and Associations. EFPIA Patients W.A.I.T. Indicator 2024 Survey. 2025.

79. European Federation of Pharmaceutical Industries and Associations. EFPIA Patients W.A.I.T. Indicator 2019 Survey. 2020.

80. European Federation of Pharmaceutical Industries and Associations. EFPIA Patients W.A.I.T. Indicator 2022 Survey. 2023.

81. European Federation of Pharmaceutical Industries and Associations. EFPIA Patients W.A.I.T. Indicator 2021 Survey. 2022.

82. Garralda E, Tripodoro VA, Ling J, Brennan J, Montero Á, Bastos F, et al. EAPC Atlas of Palliative Care in the European Region 2025. Pamplona: EUNSA, 2025.

83. Zapata T, Blidaru TC, Rafila A, Comsa R, Azzopardi Muscat N, Andersen Y, et al. Mitigating health workforce migration in Romania: policy lessons for Europe. Hum Resour Health. 2025;23(1).

ihe.se

IHE REPORT 2026:5