european cancer ORGANISATION

A Report from ECO's HPV & Hep B Action Network

Closing the Gaps

THE STATUS OF CERVICAL CANCER SCREENING PROGRAMMES IN EUROPE

Contents

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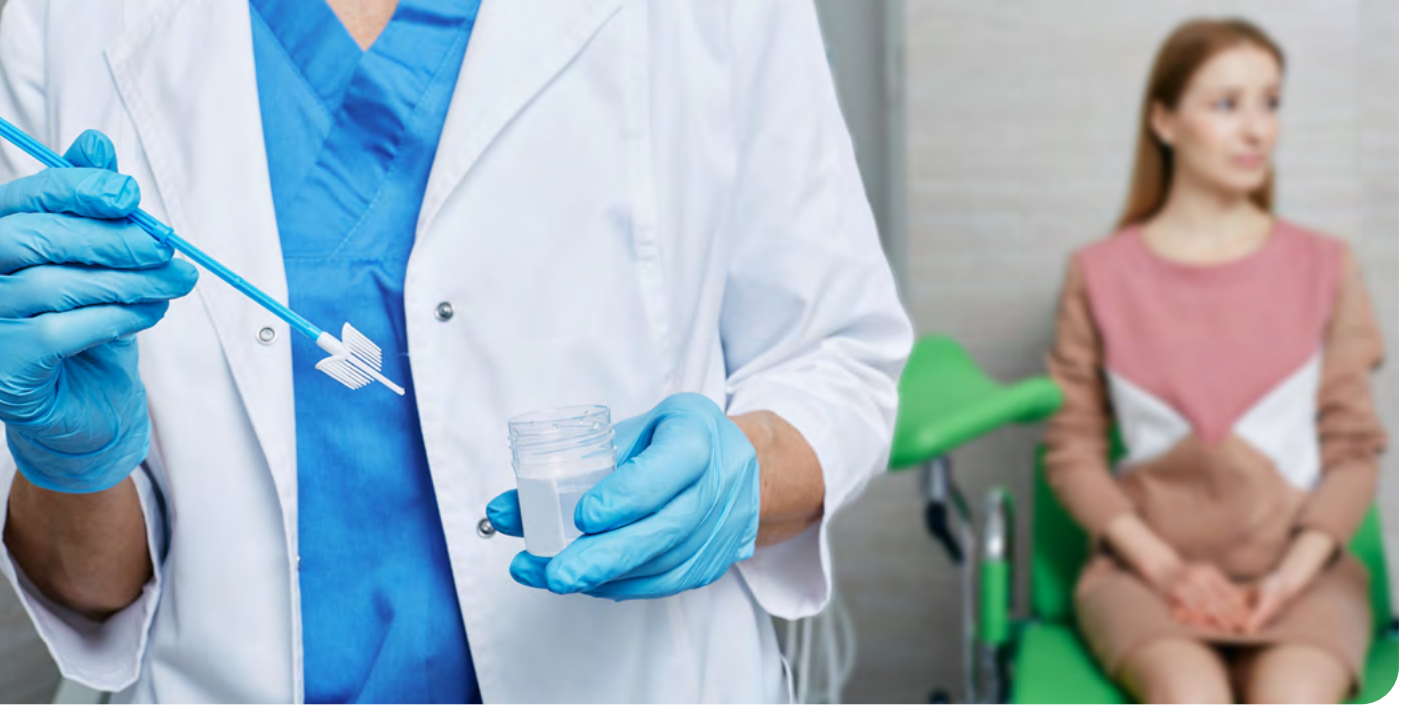


Executive Summary

Cervical cancer remains one of Europe's most preventable cancers, yet more than 58,000 new cases and 27,000 deaths occur each year in the WHO European region. Despite the availability of HPV vaccination and high-quality cervical screening, Europe's progress towards elimination targets is off track, with persistent inequalities across and within countries. This report, Closing the Gaps: The status of cervical cancer screening programmes in Europe, analyses the policy, funding, and implementation landscape across the region and identifies opportunities to strengthen screening systems and equity.

The state of cervical cancer prevention in Europe

While the scientific tools to prevent nearly all cases of cervical cancer exist, their application remains uneven. The shift to primary HPV testing (HPV DNA testing) - the most sensitive and evidence-based screening method - is not yet universal. Only a subset of European countries (e.g., the Netherlands, Sweden, Denmark, and Finland) operate mature, population-based programmes using HPV testing as the primary method. Many others still rely on cytology-based or opportunistic screening, leaving significant portions of the population unprotected.

The introduction of self-collection methods represents a major innovation for reaching under-screened populations. However, their integration into organised call–recall systems is inconsistent, and in lower- and middle-income European countries, self-collection remains limited to pilot projects. Fragmented data systems and the lack of harmonised performance indicators further hinder progress assessment and comparison across countries.

Policy and funding gaps

At the policy level, the European Union has established a robust strategic framework - Europe's Beating Cancer Plan, the EU Council Recommendations on Cancer Screening (2022), and the European Commission Initiative on Cervical Cancer (EC-CvC, 2025) - that provides strong technical direction. Yet, implementation remains nationally fragmented. Many countries continue to operate opportunistic systems despite EU and WHO recommendations for organised, invitation-based programmes with quality assurance. Differences in financing capacity, workforce, and IT infrastructure also explain the persistent east–west divide in outcomes.

While EU4Health and Horizon Europe support pilot projects and data harmonisation through initiatives such as CanScreen-ECIS and PERCH, funding for full national implementation and registry linkage remains limited. Sustainable national investment - beyond short-term EU projects - is essential to build resilient screening systems.

Equity and access

Equity is the defining challenge for cervical cancer elimination in Europe. Women's access to screening remains strongly influenced by income, education, ethnicity, disability, and geography. Coverage rates are lowest in Eastern and South-Eastern Europe,

where opportunistic screening persists and out-of-pocket costs are common. Across Europe, women in deprived areas, migrants, and those with physical or learning disabilities are systematically under-screened. Digital transformation, while promising, risks deepening the digital divide for populations with limited internet access or literacy.

Evidence shows that organised, population-based programmes with call-recall systems achieve higher participation and more equitable outcomes. Strategies such as opt-out self-collection, timed appointments, and community outreach increase uptake among underserved women. Building trust through culturally sensitive communication and engagement with primary care providers is critical to overcoming structural and psychosocial barriers.

Screening pathways and quality

Effective screening depends not only on technology but also on system design. The transition to primary HPV testing, combined with validated triage methods - genotyping, dual-stain cytology, and methylation testing - enables earlier and more precise detection of high-risk cases. However, few EU countries have standardised time-bound pathways for follow-up and treatment. Delays between a positive test and colposcopy remain common and poorly monitored, undermining early detection gains.

Linked national registries are the foundation of quality assurance. Yet only a handful of countries, notably Sweden and Norway, have successfully connected vaccination, screening, and cancer registries. In most Member States, data fragmentation prevents accurate monitoring of coverage, timeliness, and outcomes. Implementation of the European Health Data Space (EHDS) offers an opportunity to harmonise data and enable equity monitoring through standardised indicators.

Momentum and best practice

Several countries illustrate the feasibility and benefits of modernised, organised HPV-based screening. The Netherlands, Sweden, Finland, and Denmark demonstrate how registry-linked, population-based systems achieve high coverage, low incidence, and efficient follow-up. Meanwhile, countries such as Belgium, Estonia, and Spain are actively transitioning toward HPV-based, organised screening. These examples show that even nations starting from opportunistic systems can rapidly align with EU standards when political will, funding, and public trust converge.

The path forward

Europe possesses both the knowledge and the tools to eliminate cervical cancer as a public health problem. Achieving this requires closing the implementation gap - from strategy to delivery. Countries must accelerate the adoption of primary HPV testing, integrate self-collection as a standard option, ensure timely follow-up, and build interoperable data systems linking vaccination, screening, and treatment outcomes.

The EU should reinforce its coordination role through dedicated funding streams for registry linkage, infrastructure development, and equity-focused interventions. By investing in harmonised, high-quality, and inclusive screening systems, Europe can meet the WHO and EU targets for the elimination of cervical cancer and set a model for the prevention of all HPV-related cancers.

"This report makes one message unmistakably clear: Europe has the knowledge and the tools to eliminate cervical cancer, but progress will stall unless we close the persistent gaps in access, data, and programme quality. By shifting to primary HPV testing, investing in robust registries, and embedding equity at every step, Member States can deliver prevention to all - not just to those easiest to reach. Achieving elimination is possible, but only if we deliver screening systems that work for every woman, in every community."

- Daniel Kelly, Co-Chair of ECO's HPV and Hep B Action Network

"Behind every statistic in this report is a woman who may be missed by the system - because of where she lives, her income, her disability, or the language she speaks. Closing the gaps means meeting people where they are: offering self-collection, community outreach, trusted local support, and clear information in every language and format. Cervical cancer elimination will only be achieved when every woman feels seen, heard, and enabled to access the care she deserves."

- Prof. Margaret Stanley, Co-Chair of ECO's HPV and Hep B Action Network

1. Introduction

No woman should die from cervical cancer, yet in Europe it remains a leading cause of cancer-related death each year (Elfström et al., 2021), claiming thousands of lives and placing a significant burden on families, health systems, societies and the economy.

Yet this is suffering which is unnecessary. Thanks to vaccination against the human papillomavirus (HPV) and high-quality cervical cancer screening and HPV testing programmes we have proven means by which we can dramatically reduce the incidence and mortality caused by cervical cancer. Despite these tools, cervical cancer continues to impose a heavy societal and economic burden. Screening coverage, quality, and access vary widely across European countries, leaving many women at risk. Addressing these gaps is critical not only to save lives but also to reduce health disparities and healthcare costs.

Cervical cancer in Europe

Every year over 58,000 new cases of cervical cancer are diagnosed in the WHO European region. More than 27,000 die from this preventable disease. (Ferlay et al., 2024). Cervical cancer ranks as the 9th leading cause of female cancer in Europe, and is the 3rd most common female cancer in women aged 15 to 44 years old (Bruni et al., 2023).

CERVICAL CANCER
in Europe

58,000
new cancer cases per year

27,000
deaths cases per year

9th
leading cause of female cancer

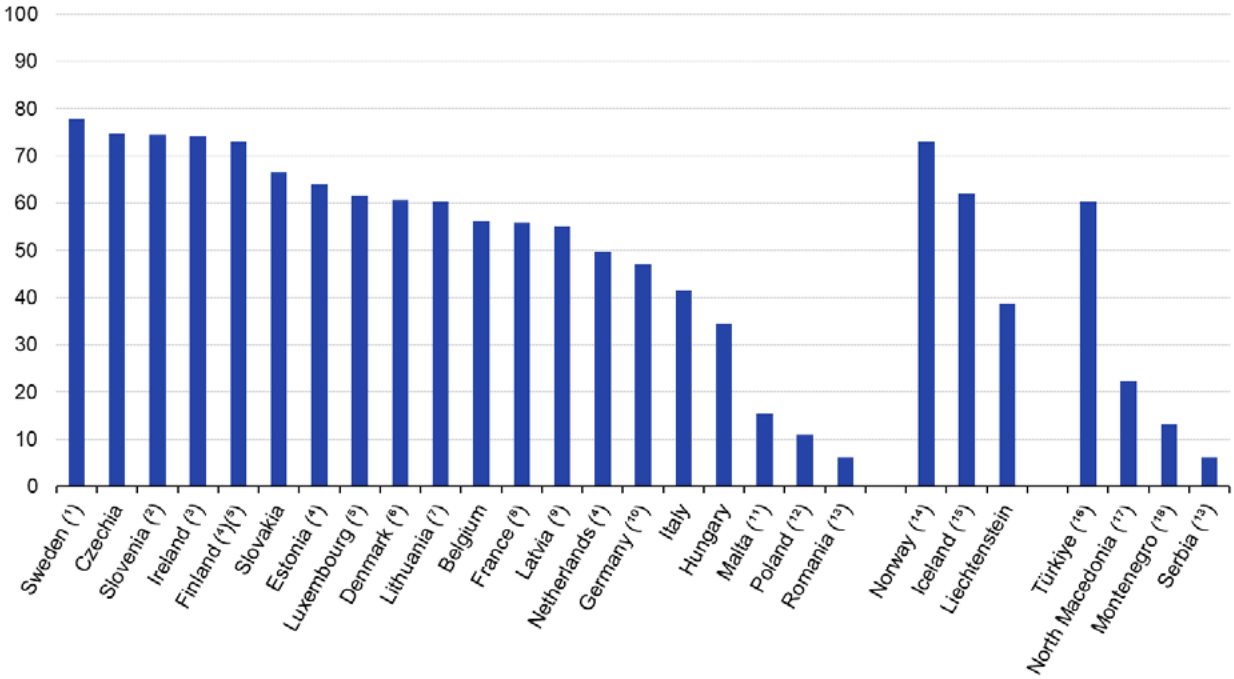
3rd
most common female cancer

Yet incidence varies widely across the region, which also suffers from lack of data transparency on vaccine coverage rates. Uptake of the HPV vaccine is low in countries with the highest incidence of cervical cancer, and screening performance is heterogeneous among European countries (Arbyn et al., 2021).

Age-standard incidence rates in 2020 (ASIR) vary from under 5 per 100,000 women in Malta and Switzerland to over 22 per 100,000 in Romania and Montenegro (Bruni et al., 2023). Regionally, there is a clear divide with an ASIR of <10.5 per 100,000 in Western, Northern and Southern Europe vs 14.5 per 100,000 in Eastern Europe (Bruni et al., 2023), almost double that of Western and Southern Europe.

These differences are not inherent. They reflect the implementation of screening tools, their quality and coverage, and people's access. With over 90% of cervical cancers caused by high-risk HPV (hrHPV) infections, it supports the conclusion that the near total prevention of the diseases through immunisation and screening is possible.

Cervical cancer screening rate, women aged 20–69 years, 2023
(%)



Note: programme-based data. The rate shown is the proportion of women aged 20–69 years who have been screened for cervical cancer within the previous 3 years (or according to the specific screening frequency recommended in each country). This is shown as a proportion of women eligible for an organised screening programme. Bulgaria, Greece, Croatia, Cyprus and Austria: no cervical cancer screening programme. Spain: not available.
(1) Women aged 23–64 years.
(2) Women aged 20–64 years.
(3) Share of women aged 25–65 years screened within the previous 5 years. Provisional.
(4) Share of women aged 30–65 years who received an invite and were screened during the year.
(5) Provisional.
(6) Share of women aged 23–64 years who received an invite and were screened during the year. 2021.
(7) Women aged 25–60 years.
(8) Share of women aged 25–65 years screened within the previous 3 years. Denominator is entire population.
(9) Share of women aged 25–70 years who received an invite and were screened during the year.
(10) Estimate.
(11) Women aged 25–43 years. Denominator is invited women.
(12) Women aged 25–59 years.
(13) Women aged 25–64 years.
(14) Women aged 25–69 years.
(15) Share of women aged 23–65 years screened within the previous 3.5 years.
(16) Women aged 30–65 years.
(17) 2021.
(18) Women aged 30–50 years.
Source: Eurostat (online data code: hlth_ps_prev)

eurostat

Why timely screening and early detection are essential

Cervical cancer develops slowly from a hrHPV strain through precancerous lesions called cervical intraepithelial neoplasia (CIN). Whilst not all lesions develop into cancer, the rate at which invasive cancer develops from CIN is usually slow, typically over decades (Holowaty et al., 1999). 'This long natural history provides the opportunity for screening to effectively detect this process during the preinvasive phase, thus allowing early treatment and cure' (National Cancer Institute, 2025). Through cervical screening, these precancerous lesions can be detected, monitored and treated, before the cancer develops.

mortality rates in the world. By contrast, others with opportunistic poorly resourced screening resources report high incidence rates, and a higher frequency of late-stage diagnoses (Ryzhov et al., 2021). Effective early detection therefore depends not only on advanced screening tools but also on equitable and well-prepared systems, supported by adequate resources, public funding, and stakeholder awareness, that clearly distinguish between screening of asymptomatic women and the clinical investigation of symptoms to avoid missed populations and ensure continuity of care during transitions to HPV-based testing.

WHAT IS CO-TESTING?

Co-testing is the combined use of cytology and HPV testing in cervical screening. EC-CvC recommend against using co-testing for primary screening because it provides only marginal additional benefit over HPV testing alone while substantially increasing resource use and leading to more unnecessary follow-up procedures, such as repeat tests, colposcopies and treatments.

CLINICAL UNMASKING

While the transition to HPV DNA testing offers greater sensitivity and earlier detection of cervical cancer, programmes should be mindful of potential 'clinical unmasking' effects in the post-vaccination era. As vaccine-preventable HPV types decline, infections with non-vaccine types may have more opportunity to persist and progress to precancerous lesions that were previously suppressed or competitively displaced. This reflects a biological shift in the HPV landscape rather than reduced vaccine effectiveness. Improved diagnostic sensitivity further enhances detection, but this should be distinguished from clinical unmasking. Continued, well-calibrated screening using HPV DNA testing remains essential to sustain early detection and public confidence in vaccination programmes.

Scientific evidence demonstrates that HPV DNA testing is a more sensitive methodology than cytology (often referred to as Pap tests) in early detection. Rather than waiting for the cellular change, HPV DNA testing detects the causal agent of cervical cancer directly, hrHPV, rather than waiting for the cellular changes. If hrHPV is detected, further triaging can be applied such as genotyping, cytology, dual stain or methylation to identify those women who can be safely monitored, compared to those who need immediate colposcopy. Comparative to cytology therefore, this makes HPV testing a truer early detection tool because it identifies the risks before precancerous lesions develop. This is reflected in the European Commission's new guidelines (International Agency for Research on Cancer, 2025) which strongly recommends an HPV-based test as the primary method of screening and advises against the initiation of new programmes based on cytology or co-testing.

High-quality organised cervical screening has led to some European countries having some of the lowest cervical cancer incidence and

The outdated pathway and the need for harmonisation

Europe's last complete cervical screening guidelines were established in 2015, (European Commission Directorate-General for Health and Food Safety et al., 2015) and built around cytology and are now outdated. They do not reflect today's standard of care such as primary HPV testing, self-sampling (henceforth referred to as self-collection), advanced triage through genotyping and dual stain) and structured post-treatment surveillance.

Whilst the WHO (2021) and European Commission Initiative on Cervical Cancer (EC-CvC) (2025) have provided updated guidelines on what tools to use, there is no single EU-wide, harmonised pathway with agreed time-standards from invitation through to exit. Countries have therefore taken their own approaches. The Netherlands, Sweden, UK and Finland have organised pathways with primary HPV testing and defined timelines, while others in the region remain opportunistic. The result is a fragmented system with differences in equity

(self-collection, call/recall), timeliness (speed from positive test to colposcopy), quality assurance (QA for validated assays), which makes true comparability across programmes in the region challenging. Most concerning is that women are left with unequal standards of effective prevention depending on their location.

The importance of HPV vaccination and screening

The introduction of the HPV vaccine beginning in 2008 has been transformative in preventing cervical cancer, and other HPV-related cancers. Vaccination is highly effective in protecting against HPV 16 and 18, the causal agent of 70% of cervical cancers. In Denmark, infection with HPV types covered by the vaccine (HPV16/18) has been almost eliminated. Before vaccination, the prevalence of HPV16/18 was between 15–17%, which has decreased in vaccinated women to < 1% by 2021. (Noboe et al., 2025). The nine-valent vaccine additionally prevents more than 90% of precancerous lesions associated with HPV 31, 33, 45, 52 and 58 (ECDC, 2025). Vaccines do not however protect against all hrHPV types. In addition, many women over the age of 25 were never offered vaccination during their adolescence. Cervical screening is therefore essential, not just for unvaccinated cohorts, but 'to ensure that breakthrough cases are detected in vaccinated populations.'

The World Health Organization and the European Union therefore emphasise that vaccination and screening must advance hand in hand. This principle was formally endorsed through the EU Council Recommendations on cancer screening (December 2022) and the Council Recommendation on vaccine-preventable cancers (June 2024), reflecting Member States' shared commitment to accelerate elimination of HPV-related cancers. Whilst vaccination against hrHPV will reduce the future pool of HPV infections, equitable screening programmes ensure that HPV and pre-cancers are detected and treated during the transition before fully vaccinated cohorts reach screening age. As vaccination coverage increases, screening programmes will need to adapt to reflect the lower prevalence of hrHPV infections in vaccinated populations, by re-evaluating starting ages and screening intervals whilst continuing to implement primary HPV testing as the standard approach for programmes. Investing into early detection therefore remains urgent. Screening will ensure that we can protect today's women against cervical cancer, particularly in those countries with suboptimal HPV vaccine coverage or those who have only recently introduced National Immunisation Programmes (NIP), while ensuring that Europe stays on track to achieve the WHO target of eliminating cervical cancer as a public health problem (World Health Organization, 2020), and EU target of elimination all HPV related cancers.

In recent years, Europe has taken steps to do just that. This paper therefore aims to evaluate the overall status of cervical screening in the region; discuss opportunities and barriers to progress and; share best practice and provide policymakers with the latest direction and information in order to improve the quality and coverage of programmes.

A NOTE ON HPV CANCERS

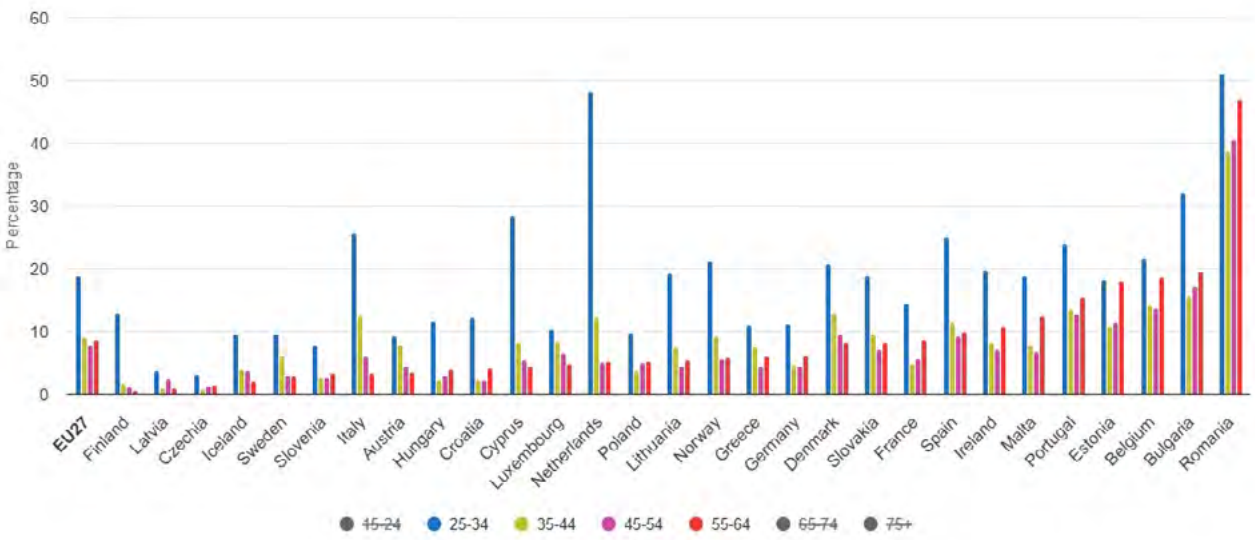
The disease burden associated with HPV extends beyond cervical cancer, and females. HPV is in fact widely acknowledged as the causal agent of 5% of all cancers, and around 90,000 per year in the WHO European region, in addition to genital warts and recurrent respiratory papillomatosis (RRP). While there are currently no population-based screening programmes for the other five HPV-related cancers, targeted screening recommendations have recently been developed for specific high-risk groups. In 2024, the International Anal Neoplasia Society (IANS) issued the first consensus guidelines for anal cancer screening in selected populations, including people living with HIV, men who have sex with men, and, for the first time, women with HPV-related premalignant lesions or cancer.

It remains the position of the European Cancer Organisation that achieving 90% HPV vaccination coverage among both females and males is the essential first step towards the elimination of all HPV-related cancers.

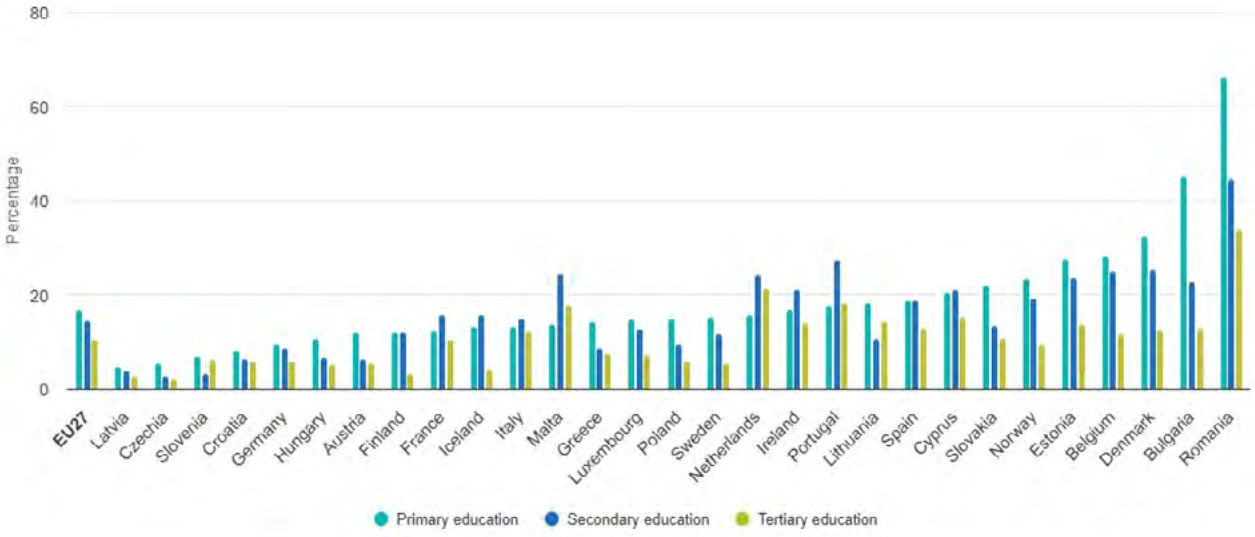
2. Current Landscape of Cervical Cancer and Screening in Europe

Overview of cervical cancer screening data from the European Cancer Inequalities Registry (ECIR)

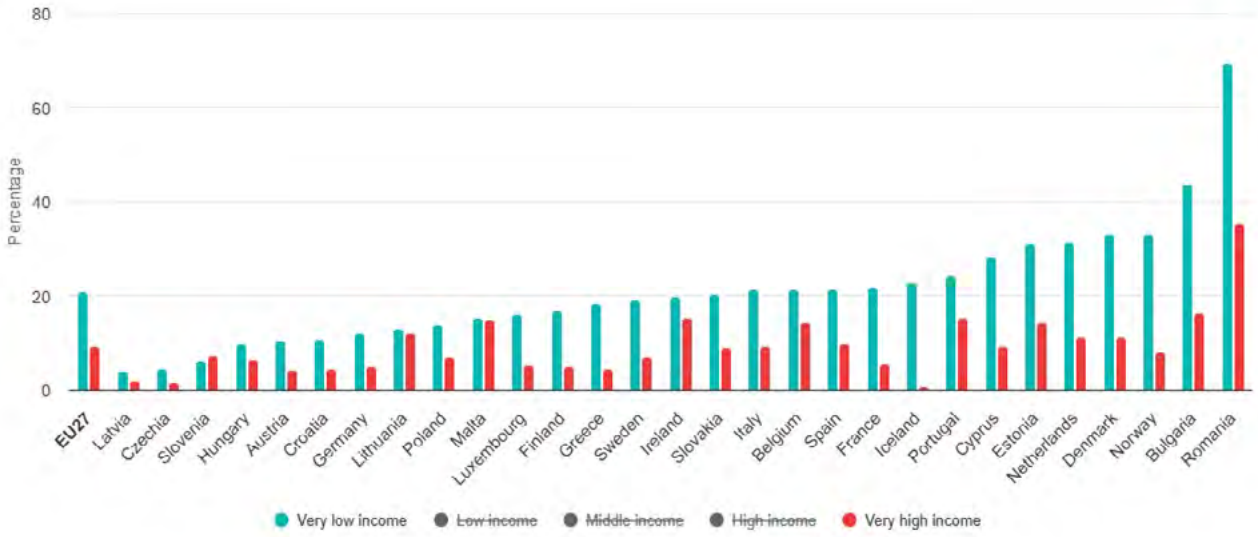
Women that self-reported to have never had cervical smear test by country and age groups (%)



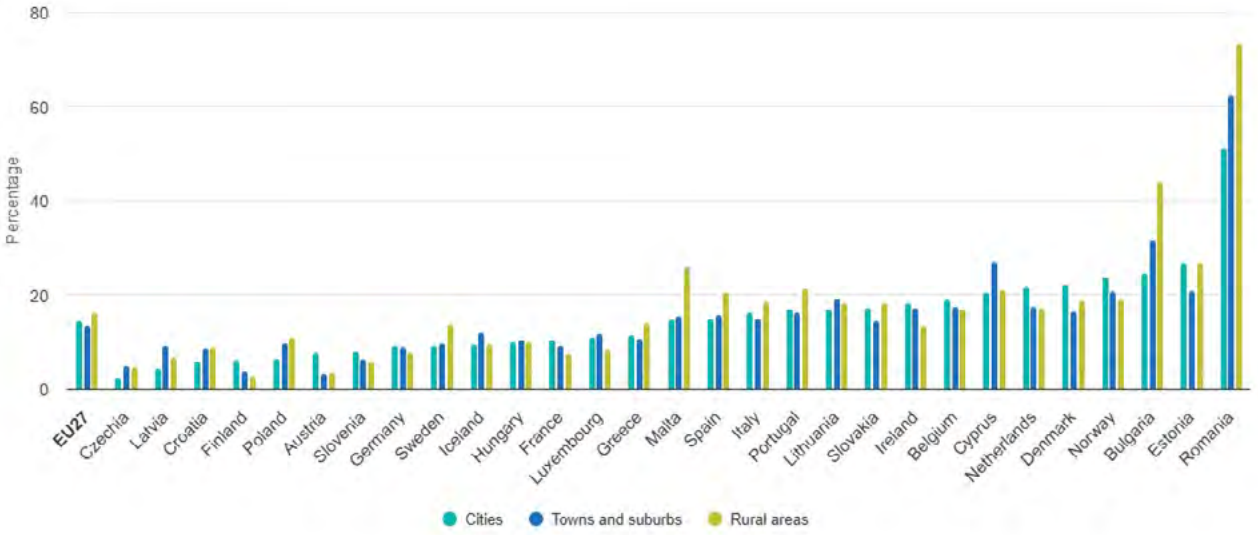
Women that self-reported to have never had cervical smear test by country and education (%)



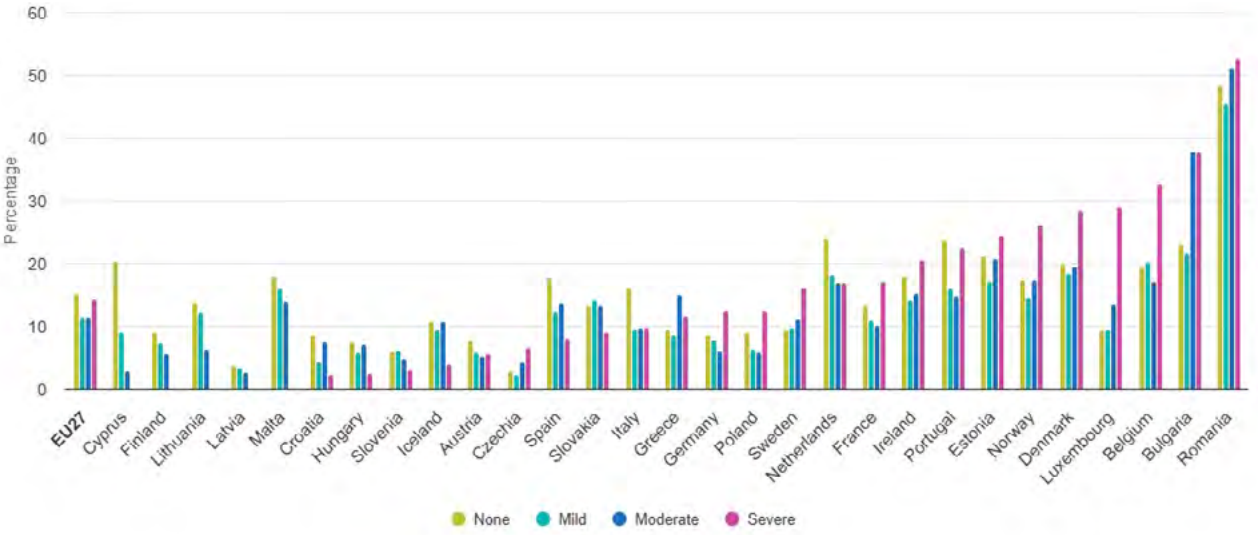
Women that self-reported to have never had cervical smear test by country and income groups (%)



Women that self-reported to have never had cervical smear test by country and degree of urbanisation (%)



Women that self-reported to have never had cervical smear test by country and all disabilities (%)



Evaluation of national screening programmes across EU27 member states and WHO Europe

Source: HPV Prevention Policy Atlas 2025

Countries	Availability of screening programme	Screening organisation	Type of test provided	Availability of self-collection	Screening payment
Albania	Yes	Nascent organized population-based	PAP + HPV; HPV alone	Yes – for all	Free
Andorra	Yes	Opportunistic screening	PAP + HPV; HPV alone	No	Mostly reimbursed
Armenia	Yes	Opportunistic screening	Only PAP	No	Free
Austria	Yes	Opportunistic screening	PAP + HPV; HPV alone	No	Free
Azerbaijan	No	Opportunistic screening	Only PAP	No	Mostly out of pocket
Belarus	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Belgium	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Bosnia-Herzegovina	Yes	Opportunistic screening	PAP + HPV; HPV alone	No	Mostly reimbursed
Bulgaria	Yes	Opportunistic screening	Only PAP	No	Free
Croatia	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Cyprus	Yes	Opportunistic screening	Only PAP	No	Free
Czech Republic	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Denmark	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free
Estonia	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes - for all	Free
Finland	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free
France	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free
Georgia	Yes	Nascent organized population-based	PAP + HPV; HPV alone	No	Free
Germany	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes - partially	Free
Greece	Yes	Nascent organized population-based	PAP + HPV	No	Free
Hungary	Yes	Mature organized population-based	Only PAP	No	Free
Iceland	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Ireland	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Italy	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Kosovo	No	Opportunistic screening	None	No	Free

Countries	Availability of screening programme	Screening organisation	Type of test provided	Availability of self-collection	Screening payment
Latvia	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Lithuania	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Luxembourg	Yes	Opportunistic screening	PAP + HPV; HPV alone	No	Free
Malta	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Moldova	Yes	Nascent organized population-based	PAP + HPV; HPV alone	No	Free
Monaco	Yes	Opportunistic screening	Only PAP	No	Free
Montenegro	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Netherlands	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – for all	Free
North Macedonia	Yes	Nascent organized population-based	Only PAP	No	Free
Norway	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes - partially	Mostly reimbursed
Poland	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Portugal	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free
Romania	Yes	Nascent organized population-based	Only PAP	No	Free
Russia	Yes	Opportunistic screening	PAP + HPV; HPV alone	No	Free
San Marino	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Serbia	Yes	Opportunistic screening	Only PAP	No	Free
Slovakia	Yes	Mature organized population-based	Only PAP	No	Free
Slovenia	Yes	Mature organized population-based	Only PAP	No	Free
Spain	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes - partially	Free
Sweden	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free
Switzerland	Yes	Opportunistic screening	Only PAP	No	Free
Turkiye	Yes	Mature organized population-based	PAP + HPV; HPV alone	No	Free
Ukraine	Yes	Opportunistic screening	PAP + HPV; HPV alone	Yes - for all	Free
United Kingdom	Yes	Mature organized population-based	PAP + HPV; HPV alone	Yes – partially	Free

3. Policy and Funding Landscape

National-level

The majority of European countries now implement cervical cancer screening as part of national cancer plans, laws or ministerial decrees. Despite the EU Council recommendation on cancer screening, opportunistic screening programmes persist in several countries, which are consistently associated with lower coverage and higher late-stage diagnoses (WHO Regional Office for Europe, 2022).

Cervical screening programmes are typically financed by national health or ministry of health budgets which would encompass the workforce, laboratory assays and consumables (e.g. self-collection kits), logistics (mailing, postage), IT infrastructure (registries, dashboards), communications campaigns, in addition to diagnostic and treatment services (such as colposcopy and pathology). Procurement of cervical screening tools is typically undertaken at national level, enabling countries to secure competitive pricing.

Ensuring that these activities are coordinated through strong national screening hubs is crucial, as these bodies oversee day-to-day programme delivery and provide the organisational structures needed to implement EU-level guidance effectively. In several Member States, such coordination hubs are not yet fully established, resulting in fragmented programme delivery and slower alignment with EU recommendations.

EU-level strategies and frameworks

Within the EU, several strategies and frameworks have been adopted to enhance progress towards the goal of eliminating cervical cancer in the region. EU4Health and Horizon Europe's Cancer Mission co-finance pilots and communications; EC-CvC sets technical specifications; and CanScreen-ECIS defines harmonised performance indicators and a submission portal to support comparable evaluations and analysis.

90%

of the EU population who qualify for cervical, breast and colorectal cancer screenings to be offered screening by 2025

Europe's Beating Cancer Plan (EBCP)

Published in 2021, EBCP provides the EU's overarching umbrella strategy to tackle cancer, seeking to reduce the cancer burden across Member states through prevention, early detection, and equal access to high-quality care. For cervical cancer screening, it introduced:

- Under flagship 4, a new EU supported Cancer Screening Scheme to help member states ensure that 90% of the EU population who qualify for cervical, breast and colorectal cancer screenings are offered screening by 2025.
- A commitment to update EU screening guidance and quality assurance (QA), undertaken in 2022, with financial support through EU4Health and Horizon Europe.
- Commitments to monitoring coverage via the European Cancer Inequalities Registry (ECIR) and the Joint Research Centre (JRC)/Eurostat indicator sets.

(European Commission Directorate-General for Health and Food Safety, 2021)

Recommended organised, invitation-based programmes for women aged

30-65

5 years with intervals

EU Council Recommendation on cancer screening

The Council of the EU's updated Recommendations on Cancer Screening (9 Dec 2022, see Amand-Eckhout, 2025) modernised EU guidance for cervical cancer by recommending:

- Primary HPV testing as the preferred screening method over cytology
- Organised, invitation-based programmes for women age 30-65 with 5 years intervals (with the flexibility to tailor by vaccination status for intervals/start ages).
- Emphasising quality assurance and data systems
- Urging equitable access for underserved groups and alignment with WHO elimination targets.

(Amand-Eckhout, 2025)

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evidence-based cancer prevention recommendations

European Code Against Cancer (ECAC)

The European Code Against (ECAC), coordinated by the International Agency for Research on Cancer (IARC), provides 12 evidence-based cancer prevention recommendations for the public as part of its 4th edition (IARC and European Commission, 2014).

In October 2025, the 5th edition was published, expanding to 14 recommendations, and the scope from individual behaviour to include both individual and population-level policy guidance. Specifically for cervical cancer prevention it emphasises:

- Vaccination of girls and boys against HPV
- HPV-based screening (for women aged 30-65 years) at intervals no shorter than five years, with scope for adaptation based on vaccination status and prior screening history.

(IARC and European Commission, 2025)

CanScreen-ECIS

Launched under EU4Health, CanScreen-ECIS was a pilot project coordinated by the International Agency for Research on Cancer (IARC), designed to develop a new cancer screening data management system integrated in to the European Cancer Information System. The project refines performance indicators for cervical cancer (alongside breast and colorectal) and aims to generate comparable Europe-wide data in order to identify inequalities and guide alignment with WHO and EU elimination goals. Specifically, the project:

- Identified and developed key performance indicators for cervical screening to improve programme quality and equity. This included invitation coverage, participation rate, test results, detection rate, compliance with treatment, and crude incidence rate.
- Built a new data submission portal for the collection and visualisation of results of key quality indicators enabling 22 countries to submit and analyse data in pilot testing.
- Hosted webinars and e-learning for data providers for effective data contribution.

(IARC/CanScreen ECIS 2023)

22

countries to submit and analyse data in pilot testing

Primary HPV testing recommended for ages

30–50 years

European Commission Initiative on Cervical Cancer (EC-CvC) & EU QA scheme (2025)

Led by the JRC in collaboration with IARC, the EC-CvC produces evidence-based recommendations to strengthen the quality of cervical screening data and monitoring.

In July 2025, EC-CvC published the first evidence-based EU recommendation detailing:

- Primary HPV testing for a core group of ages 30-50, with an extended range of (25-64) where appropriate.
- No screening prior to age 25, and discontinuation after age 65 unless never/insufficiently screened.
- Co-testing with HPV and cytology are not recommended
- Integration of self-sampling as an effective option for non-attenders.

This provides a clear standard to member states for HPV-based primary screening and advise against cytology or co-testing. In 2025/26 EC-CvC will develop through EU funding a project called "European Cervical Screening QA Update (EUCervScreen_QA)," in order 'to reflect changes in international guidelines, advancements in cervical cancer prevention methods, the widespread implementation of HPV vaccination, and improved methodologies for developing such guidelines.'

The project aims to:

1. Update the European clinical practice guidelines covering cervical cancer prevention from HPV vaccination, cervical screening, diagnosis, and treatment of precancerous lesions

2. Develop a European quality assurance (QA) scheme for the entire cancer care pathway, including rehabilitation, palliative care and surveillance.

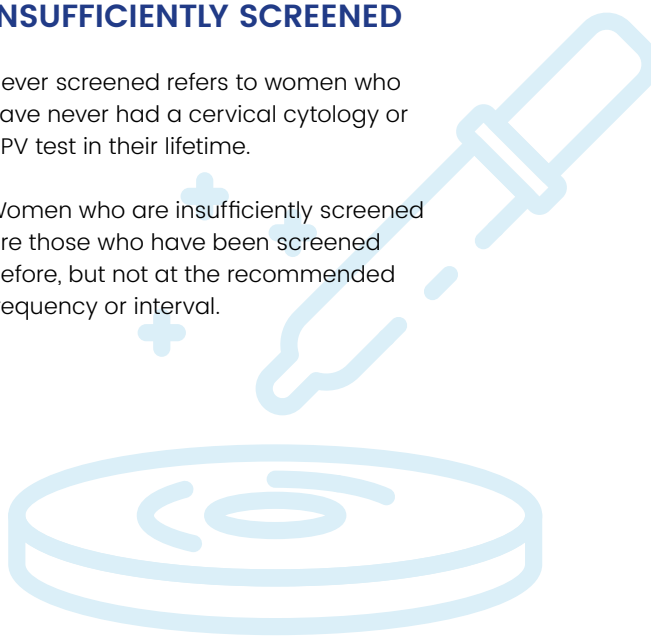
(European Commission Directorate-General for Health and Food Safety, 2023)

Together, these frameworks provide the strategic, scientific and technical scaffolding for Member States to modernise cervical cancer prevention. Yet, implementation and funding capacities still vary widely between countries, underscoring the need for sustained EU coordination and investment.

NEVER SCREENED AND INSUFFICIENTLY SCREENED

Never screened refers to women who have never had a cervical cytology or HPV test in their lifetime.

Women who are insufficiently screened are those who have been screened before, but not at the recommended frequency or interval.



4. Equity and Disparities in Access

Social determinants of health, such as socioeconomic status, education level, ethnicity, immigration status, and access to healthcare, significantly influence participation in cervical cancer and HPV screening and exacerbate health disparities (Choi et al., 2023; Johnson et al., 2020; Lavecchia et al., 2025; Murfin et al., 2019; Wearn & Shepherd, 2024; Adegboyega et al., 2023; Asare et al., 2024; Peterson et al., 2021; Pousette & Hofmarcher, 2024).

In England, incidence of cervical cancer is 65% higher in the most deprived areas vs the least (Choi et al., 2023). Vaccination and screening rates are significantly lower among individuals with lower education levels (Lavecchia et al., 2025; Murfin et al., 2019; Asare et al., 2024), while ethnic minorities and immigrants are less likely to participate in screening due to language and cultural barriers, as well as structural barriers (Johnson et al., 2020; Wearn & Shepherd, 2024; Adegboyega et al., 2023). Furthermore, psychosocial factors such as lack of knowledge, stigma and fear, also negatively impact participation in disadvantaged communities (Johnson et al., 2020; Asare et al., 2024; Peterson et al., 2021).

A 33-study scoping review classified barriers to cervical cancer screening into macro (structural), meso (screening service-related), and micro (individual or community level) factors. Macro level barriers included financial barriers (including lack of insurance coverage, out-of-pocket costs e.g., 'under the table' costs), bureaucracy-related barriers (registering with primary care services and difficulties obtaining required paperwork). Meso (screening programme) level factors can be categorised into themes such as information provision, prompts to participate in screening, screening pathway navigation, screening access options and staff interactions. Finally, micro factors included limited awareness of cervical cancer or its risk factors (Greenley et al., 2023).

A 2019 systematic review examining education, income, and occupation, and their influence on the use of cervical cancer prevention strategies in developed countries, including the United Kingdom, United States, Spain, Germany, and Norway, found that participation remains low due to a lack of knowledge and awareness among those with lower education levels. Women in higher-income groups have advantages in terms of both opportunity and access, but cost, transportation, and time constraints reduce screening participation in lower-income groups. Factors such as working conditions, difficulties obtaining leave, and job insecurity can influence screening participation, and screening rates are generally higher in professional groups. It emphasised that socioeconomic disadvantages often coexist, further reducing participation. Therefore, health policies should be tailored to target disadvantaged groups (Murfin et al., 2019).

Interestingly, data from the European Health Interview Survey (2013-2015), showed patterns of "Extreme under-screening" concentrated among lower-income women in nearly all countries across Europe, while "over-screening" (i.e., screening more often than recommended) is more common among women in higher-income brackets (Quintal et al., 2022). This leads to 'lost opportunity' in lower income strata and waste of resource and even harm in higher income subgroups (Quintal et al., 2022).

SPOTLIGHT ON UNDERSERVED GROUPS: ETHNIC MINORITIES AND MIGRANT POPULATIONS

Ethnic minorities and migrant women consistently have lower cervical cancer screening, potentially due to structural barriers across sociodemographic, healthcare-system, psychological, migration-related, knowledge, language, and cultural domains for cervical screening (Greenley et al., 2023; Marques et al., 2020; Bøje et al., 2024).

Common barriers include a lack of information, the absence of female healthcare providers, poor language skills, and negative emotional responses such as fear, embarrassment, discomfort, past-traumatic experiences such as sexual assault and female genital mutilation, social stigma, and the significant influence of culturally based values. Facilitators often involve active encouragement from healthcare providers and the availability of information in migrants' native languages, highlighting the need for culturally sensitive healthcare approaches (Marques et al., 2020; Marques et al., 2021). Evidence from Europe also shows that, self-collection may be attractive to disadvantaged groups since it offers privacy and flexibility compared to clinical testing. However, low health literacy, language barriers, and digital access issues can still pose significant barriers to the use of self-collection kits (Huntington et al., 2024). A qualitative systematic review of the determinants of routine cervical screening participation in underserved women (2024) confirmed that low income, low education, minority ethnicity, and immigration status are significant barriers to screening participation. Structural barriers such as financial difficulty, transportation costs, and inflexible working hours make it difficult for these groups to attend screening. Language barriers and unfamiliarity with the healthcare system are further restrictive factors for immigrant women (Wearn & Shepherd, 2024).

Out-of-pocket costs and limited social protection have been shown to exacerbate disparities, particularly in Eastern and Southern Europe (de Prez et al., 2021; Quintal et al., 2022) using two-level design with approximately 97,000 25-64-year-old women in 28 European countries from the European Health Interview Survey, showed that a combination of organised screening and high healthcare accessibility or social protection is associated with more equitable cervical cancer screening uptake. This emphasises the need for universal access and free delivery at the point of need (De Prez et al., 2021).

Socioeconomic disparities

People with disabilities

People with physical disabilities have lower participation due to inaccessible facilities/transport, lack of appropriate equipment, (e.g. height adaptable examination tables), inadequate training of healthcare providers, positioning difficulties and negative attitudes from healthcare providers, (Chan et al., 2022; Vinson et al., 2025; Jara-Rosales et al., 2024), the latter factors contributing to discomfort and avoidance of screening (Lin et al., 2011). Self-collection can help but does not fully address the complex physical/logistical/interpersonal barriers this group faces (Royal College of Nursing, 2024) who are often not mentioned in guidance at all (Kuper et al., 2024).

Similarly, people with learning disabilities are screened less often reflecting anxiety, limited accessible information, provider assumption about sexual activity, consent/communication challenges and reliance on carers (Power et al., 2024). These findings reflect a wider pattern of lower cervical screening participation among people with disabilities more generally, and highlight the need for intervention to ensure equity (Kuper et al., 2024).

Age disparities

Among younger women approaching eligibility for screening, awareness is often low, and information materials are not always accessible or well-understood (Taratula-Lyons et al., 2024; Charlton and Rodrigues 2024). Misconceptions persist among some HPV-vaccinated young women that vaccination removes the need for screening, which can further reduce screening uptake (Taumberger et al., 2022). Conversely, older women are often excluded from programmes once they reach 60-65 years, despite ongoing risk of cervical cancer for some individuals. Evidence indicates that women diagnosed after age 60, were previously underscreened and were more often diagnosed at a later stage (Hammer et al., 2019).

Digital Exclusion

Reliance on digital systems can exclude groups with limited digital access. Studies demonstrate that

electronic interventions can improve uptake among those already digitally connected, but people less familiar with these tools are less likely to engage with these offerings (Richardson-Parry et al., 2023).

Regional disparities

East vs West Europe

There are marked regional disparities in cervical cancer screening Europe, with Northern and Western Europe generally achieving higher coverage and more equity-focused policies, while Eastern and Southern regions have lower coverage and higher inequality (Arbyn et al., 2021; Quintal et al., 2022; Mallafré-Larrosa et al., 2023).

A GLOBOCAN based analysis highlights higher incidence and mortality in Eastern Europe, driven by differences in vaccination, early diagnosis, and quality/organisation of screening (Elmadani et al., 2025). Preparedness correlates with income and longstanding organised programmes: higher-income Western/Northern European countries rank highest; lower-income Eastern/Southern countries ranked lowest (Karamousoli et al., 2025). Opportunistic screening persists in parts of Eastern Europe (Huntington et al., 2024), compounded by lower levels of awareness of programmes (Pousette & Hofmarcher., 2024). Comparative studies attribute incidence/mortality gaps to programme quality and coverage rather than HPV prevalence (Mendes et al., 2018; Arbyn et al., 2011).

Urban vs rural areas

Urban-rural disparities also influence screening. Women living in rural areas face more challenges in accessing healthcare services, and therefore cervical cancer screening, than those living in urban areas due to geographic isolation, distance to healthcare facilities, and lack of public transportation (Wearn & Shepherd, 2024). Screening rates are lower for migrants living in rural areas due to difficulties accessing healthcare. At the same time, participation is higher for women living in urban areas due to ease of access to screening centres and greater availability of information resources (Marques et al., 2021). Another important factor to be considered is that participation in self-collection may be higher in urban areas, while access may be more limited in rural areas (Huntington et al., 2024).

EQUITY-FOCUSED RECOMMENDATIONS

Generate evidence regarding barriers to cervical cancer screening

Support multi-country and national initiatives (such as CBIG-SCREEN) to co-design and test targeted interventions to inform policymakers with regards to vulnerable and marginalised groups. Similar initiatives at national and sub-national levels can help develop crucial targeted interventions that may help improve cervical cancer screening among high-risk marginalised groups. (Bøje et al., 2025; Bøje et al., 2024) This replication will provide opportunities for cross-national learning.

Encourage the use of self-collection

HPV self-collection methods and home visits conducted by community-based health workers have been found effective in increasing screening rates among low-income and underserved women (Rees et al., 2018; Arrossi et al., 2015; Mekuria et al., 2023). Programmes should ensure self-collection options are accessible and inclusive, offering alternative approaches such as non-speculum clinician sampling, and involving disabled women in service design to prevent new barriers (Kemp et al., 2025).

Use targeted, multi-channel interventions

Approaches that combine several methods such as letters, educational materials, personal invitations, and mobile clinics, work better than single strategies. Direct contact (in person, by phone, or through community health workers), free screening, transport support, and flexible appointment times help increase uptake. Providing materials in different languages and adapting them to cultural needs also improves participation rates among migrant and minority groups. Key is the adoption of targeted multi-channel strategies, with a focus on combined approaches over a single method (Rees et al., 2018).

The importance of patient-provider relationships

The patient-provider relationship has a significant role in overcoming barriers in cervical screening, offering a potential for positive change (Wearn & Shepherd, 2024). In France, socioeconomically disadvantaged women were less likely to receive smears from gynaecologists, whereas General Practitioner smear rates did not vary by socioeconomic status, suggesting that GPs provide stable access for disadvantaged groups (Druel et al., 2024). Through plain-language counselling targeted reminder and culturally sensitive outreach, primary care can boost vaccination and screening among high-risk groups and reduce inequalities (Munro et al., 2014; Sarıca Çevik et al., 2025; Choi et al., 2023).

Community engagement and trust building with vulnerable groups

A study across 7 European countries (October 2021 to June 2022), found stakeholders prioritise trust-building between vulnerable women and health/social care professionals and community outreach to improve awareness and access. They highlighted tailored services for specific subgroups, free access (from screening to follow-up) and target-population screening registries (Bøje et al., 2024). Consensus also underscored the value of integrated registries, sustained community engagement and outreach, and trust-building between underserved groups and care networks. Overall combining holistic approaches with targeted approaches to address intersectional vulnerabilities is essential to improve Europe's suboptimal screening performance (Bøje et al., 2024; Bøje et al., 2025; Mallafré-Larrosa et al., 2023).

Evidence shows that social and community networks are powerful enablers of screening, particularly among underserved groups. Interventions leveraging peer educators, community connectors or 'positive deviance' approaches, where trusted local actors model successful behaviours, can strengthen trust, cultural competence and access. Programmes such as the UK's CORE20PLUS Connectors illustrate how locally embedded initiatives can effectively support engagement and reduce inequalities in participation (Higgason et al., 2023; Garrett et al., 2013; Attipoe-Dorcoo et al., 2021; Stevenson et al., 2025).

5. Building Effective Screening Pathways

Whilst Europe has the tools for cervical cancer elimination, countries diverge on who is invited on who is invited, who is screened and how often, which test are used, how programmes are monitored and how quickly abnormal results are followed up on. Without harmonisation, women across Europe face unequal standards of prevention.

The EU Council Recommendation of 9 December 2022 set the common direction: HPV-based screening for women roughly 30–65 years at extended intervals in organised programmes.

The 2025 EU Country Cancer Profiles underline why this matters: coverage has declined in many countries post-pandemic, with persistent inequalities by region, education and migration status. Converging on HPV-primary in organised systems, with call–recall and full-pathway quality assurance, is therefore the baseline European agenda.

In July 2025, the EC-CvC Working group published new guidelines on cervical screening and diagnosis with the following recommendations:

…using HPV detection test for primary screening in asymptomatic populations with cervix aged 30–50 years in the context of an organised population-based screening programme

…not using cervical cytology for primary screening in asymptomatic populations with cervix aged 30–50 years in the context of an organised population-based screening programme

…not using co-testing (combination of cervical cytology and HPV detection test) for primary screening in asymptomatic populations with cervix aged 30–50 years in the context of an organised population-based screening programme

The WG also recommends not initiating any new programmes based on cytology or co-testing. Existing cytology and co-testing programmes should transition to HPV-based screening.

(European Commission Joint Research Centre, 2025)

This section examines each step of the cervical screening pathway to highlight current practices, gaps and opportunities for improvement.

Organised vs Opportunistic screening

Organised screening: a centrally run programme that uses population registers to systematically invite eligible women, track participation, and monitor outcomes.

An organised cervical screening programme is run at national or regional level, with a defined target population, regular invitations through a call-recall system, fixed screening intervals, agreed protocols for testing and triage, and central registries to track participation, results and follow-up. This structure is also the EU baseline expectation set in the Council Recommendation on cancer screening (2022), which specifies population registers, call-recall, and integrated information systems. Whilst this requires a one-off investment into registry infrastructure, ongoing costs are low relative to the benefits of improved early detection. Countries with mature call-recall systems such as the UK, Netherlands and Slovenia, achieve higher coverage and lower mortality rates.

Opportunistic screening: testing offered ad-hoc when a woman attends a healthcare provider, with no central coordination, invitations, or follow up.

Opportunistic screening programme relies on women proactively seeking a test or their healthcare provider initiating a test during routine visits without systematic invitations or population monitoring. While opportunistic screening can benefit women already engaged with health services these often lead to gaps in coverage, late diagnoses, and persistent inequalities. In short, reinforcing inequities by missing those least likely to attend screening.

Organised screening programmes are consistently more effective and cost-effective than opportunistic ones, improving coverage, timeliness and follow-up due to greater cancer prevention and fewer missed cases through the use of central registries with call/recall (Arbyn et al., 2010; Anttila et al., 2015). They are also more equitable, because they use registries and call-recall to reach those at highest risk of being missed. By contrast, opportunistic screening programmes in the EU have been found to have higher over-screening rates, greater inequalities and more frequent screening outside guidelines than organised programmes (De Prez et al., 2023).

BEST PRACTICE: SLOVENIA

In Slovenia, ZORA, the National Cervical Cancer Screening Programme maintains the central registry of HPV, cytology, and histopathology results, managing the invitation process as well as monitoring evaluation, and programme improvements. Data is standardised nationally (cytology since 2003, HPV since 2011), digitalised in laboratories and annual reports provide key performance and activity indicators, providing confidential feedback to screening providers with comparison to national averages and peers. Additionally, a fail-safe system alerts gynaecologists to women with abnormal findings lacking follow up. Whilst digitisation created extra work due to non-interoperable IT systems, screening coverage has improved. During the 2021–2024 period, examination coverage again exceeded the 70% target, reaching 72.5% nationwide. ZORA is now developing a new centralised and interoperable system to streamline data entry, and improve invitation processes and monitoring and evaluation processes.

(WHO Regional office for Europe, 2023; Jerman, Ivanuš and Florjančič, 2025)

RECOMMENDATIONS

Transition to organised screening programmes

While 98% of European countries report having a national cervical screening programme a significant portion are still transitioning from opportunistic to organised systems. Screening participation rates remain low in countries with no or only partially organised programmes. Transitioning from opportunistic to organised screening, establishing reminder and invitation systems, and developing outreach strategies for those who do not screen are essential to achieving elimination targets (Karamousouli et al., 2025).

Adopt opt-out strategies

Opt-out invitations, where women are automatically sent HPV self-collection kits to their homes without having to request them, have been shown to be more effective than opt-in strategies, which require women to reach a healthcare provider and request cervical screening actively. Trials and national pilots in Netherlands, Slovenia, Estonia, Italy and Sweden have shown higher uptake among under-screened women (Wong & Wong 2024; Huntington et al., 2024)

SMS reminders

Text messages present an inexpensive means to increase screening uptake. In a study in Northwest London, SMS reminders increased cervical screening participation by around 5%, the equivalent of 13,400 additional screenings (Huf et al., 2020).

Introduce timed (pre-booked) appointments

Sending eligible participants letters with pre-scheduled appointments reduces barriers and increases uptake at low costs. A randomised trial in Norway found that scheduled appointments increased screening across all target ages among women overdue for screening, including those previously never screened (Lonnberg at al., 2016). In the UK STRATEGIC trial, timed appointments were shown to have a high likelihood of cost effectiveness in the NHS (Kitchener et al., 2016).

Chatbot-based cervical cancer screening decision aids

The landscape of health information delivery is evolving, with chatbots emerging as effective tools to provide accessible, personalised, and scalable support. Building on their success in areas like HPV vaccination (Hou et al., 2025) and colposcopy adherence after abnormal Pap test results in women living in underserved urban areas (Wen et al., 2024), a new chatbot-based decision aid is now being developed in France (Le Bonniec et al., 2025) to improve access to cervical screening information, including self-collection, for socioeconomically disadvantaged women.

Screening tool and triage options

HPV testing (HPV DNA testing)

HPV-based screening is now the preferred method for cervical cancer prevention due to its higher sensitivity and longer-lasting protection compared to traditional Pap tests, and is now the only endorsed test per the EC-CvC recommendations. HPV-based screening detects more high-grade cervical lesions and cancers than cytology, offering 60–70% greater protection against invasive cervical cancer (Ronco et al., 2014). In addition, HPV DNA testing with self-collection demonstrates similar sensitivity compared to clinicians or (HCPs) collected samples, although some studies have noted that there may be slight differences in negative predictive value (Huntington et al., 2024). Real-world analyses confirm that HPV-based screening increases detection rates of precancerous lesions and is effective in both high- and middle-income countries (Elfström et al., 2021; Zhao et al., 2021).

Self-Collection

A pivotal moment in the historical and technological timeline from the invention of the speculum to centralised screening systems, national HPV vaccination programmes, and, more recently, self-collection innovations was the endorsement of self-collection by the WHO in 2020. This decision aimed to reach the 70% screening coverage target. This endorsement led to the validation and adoption of multiple methods, such as first-void urine collection, vaginal swab self-collection, and devices like the Evalyn Brush (2012), Diagnostic Tampon (2020), and Teal Wand (2024). These tools are designed to expand access to women who may face logistical, cultural, or psychological barriers to in-clinic screening. Together, these technologies point toward a patient-centred approach for HPV screening, integrating high-sensitivity tests, non-invasive sampling, and digital health systems to track and recall patients (Gomes et al., 2025).

Self-collection is one of the innovative screening tools. With self-collection, women can collect a vaginal sample themselves and transport it to the laboratory, providing significant convenience, especially for women who have difficulty traveling to the clinic or are reluctant to participate in traditional screening. Women mostly find self-collection less embarrassing and more convenient, while some believe that clinician-collected samples are more reliable and accurate (Wearn & Shepherd, 2024). Research also suggests that home self-collection could be more environmentally friendly, than routine screening at a healthcare service, reducing the overall carbon footprint of cervical screening programmes (Whittaker et al., 2024).

Countries with high preparedness for elimination targets offer self-collection to increase screening participation. Conversely, in countries with low preparedness, the lack of home sample collection is a significant shortcoming. The success of screening programmes is affected by factors such as the lack of self-collection and national call/reminder systems, and these countries experience low screening participation rates. This demonstrates that diversifying screening tools and facilitating access are critical for expanding screening coverage (Karamousouli et al., 2025).

EMERGING INNOVATIONS: URINE-BASED HPV TESTING

A recent umbrella review of five meta-analyses and systematic reviews (2024) reported that first-void urine testing showed a sensitivity of 87% (95% CI: 0.74–0.94) and specificity of 89% (95% CI: 0.81–0.93) for detecting any HPV. Notably, non-invasive urine testing is far more acceptable for women, with 95% of participants expressing they were comfortable with the test, and 74% would be willing to self-collect samples at home. This high acceptability suggests urine testing a promising method to increase participation in cervical screening, particularly among women who encounter barriers to clinic-based testing (Miazga et al., 2024).

Triage Tools

In earlier screening models, cytology (the Pap test) was used both to screen and decide who needed colposcopy. This approach missed some precancers and sent many people for unnecessary procedures. With the shift to primary HPV testing, new triage tools are needed to manage the large number of women who test HPV-positive but will naturally clear the infection. These innovations replace cytology alone triage with more precise methods, reducing unnecessary colposcopies while catching more women at real risk.

Genotyping

HPV types 16 and 18 account for ~70% of cervical cancers, and determining the genotype of the virus upon a positive HPV test allows for personalised risk assessment during the screening process. Many modern HPV screening protocols refer individuals directly to further examinations, such as colposcopy, if they carry a hrHPV type. In addition, genotyping is critical not only in determining which patients require urgent colposcopy but also in identifying which patients are at lower risk and can be monitored with less invasive follow-up, an advantage for increasing clinical efficiency and reducing the burden on the healthcare system (Bonde et al., 2019).

There are several validated HPV DNA test kits that provide different levels of information on HPV genotypes. Some offer partial genotyping (PGT) which identifies HPV 16 and 18 individually and reports 12 other hrHPV genotypes collectively. Others provide extended genotyping (XGT), which additionally identifies HPV 31, 45, 51 and 52 individually and reports the remaining eight in three grouped categories. This stratification enables more accurate classification into high- and lower-risk groups, thereby improving cost-effectiveness by reducing unnecessary colposcopies (Chua et al., 2023).

XGT should be considered as a valuable emerging tool for monitoring HPV epidemiology across Europe. By providing more detailed information on circulating genotypes, XGT can inform cervical cancer screening programmes, track the evolving distribution of HPV types following vaccination rollout, and reflect population dynamics such as migration patterns and cross-border variation in HPV prevalence.

As XGT becomes more widely available, health system readiness will be key. Implementation will require appropriate laboratory infrastructure, staff training, quality assurance, and integration into existing screening pathways to ensure consistent follow-up and data reporting.

Dual-stain cytology (p16/Ki-67)

Dual stain (DS) cytology (p16/Ki-67) offers a more accurate triage method for HPV-positive women compared to cytology, thereby avoiding unnecessary colposcopies and biopsies. (Wentzensen et al., 2019). Studies found that DS strategies detected more CIN3+ compared to cytology with a 32% reduction in colposcopies compared with the triage strategy of HPV screening + cytology, therefore providing implications for effectiveness and efficiencies. (Wentzesen et al., 2019).

SPOTLIGHT ON: HPV DNA METHYLATION

HPV DNA methylation is an emerging biomarker that detects chemical changes in HPV DNA linked to progression from transient infection toward precancer and cancer. Unlike cytology, which relies on visual examination of cells under a microscope and can miss disease, methylation provides an objective molecular signal. Meta-analyses report pooled sensitivity of ~68–74% and specificity of ~71–75% for CIN2+, and ~78%/74% for CIN3+, comparable to cytology but applicable directly to self-collected samples (Salta et al., 2023; Hillyar et al., 2022; de Waard et al., 2023).

In a population-based cohort of over 28,000 women in Stockholm, the WID-qCIN methylation test combined with HPV16/18 genotyping detected 93.4% of CIN3 and all invasive cancers, outperforming cytology for predicting incident CIN2+. Crucially, it required fewer women to undergo colposcopy per case detected (2.4 vs 4.1) (Widschwendter et al., 2024). Methylation therefore acts as a more reliable red flag than cytology, reducing subjectivity and unnecessary referrals. Because these assays can also be run on self-collected samples, they are especially promising for programmes aiming to expand self-collection while maintaining high safety and accuracy (Eve Appeal 2024). For now, further validation, assay standardisation and cost-effectiveness studies are needed, but methylation is a high-potential triage innovation that could significantly improve cervical screening pathways.

RECOMMENDATIONS

Adopt HPV DNA testing as the universal standard

All countries should transition to primary HPV testing, in line with EC-CvC 2025, and phase out new cytology-based or co-testing programmes

Integrate self-collection into national programmes

Offer self-collection (opt-out where possible) as part of organised call-recall to reach under-screened groups and increase equity.

Use only clinically-validated assays

Screening should be restricted only to clinically validated HPV tests (ex: VALGENT framework) to ensure accuracy, comparability and patient safety.

Evaluate and scale triage innovations where appropriate

Pilot extended genotyping and dual-stain cytology in settings with adequate QA and colposcopy capacity.

Maintain cytology only as a triage tool

Where cytology remains in use, restrict it to triage of HPV-positive cases rather than primary screening.

Screening intervals

With the transition from cytology to HPV testing, safe screening intervals have lengthened. Cytology-based programmes typically invited women every three years, whereas HPV testing allows intervals of five years between screens when results are negative. The EC-CvC strongly recommends primary screening for women aged 30 – 50, with flexibility to extend to 25-64 depending on national context. Although the EC-CvC has not yet set an official interval, the EU Council Recommendation on Cancer Screening (2022) proposes a five-year interval for HPV-based programmes, a standard now widely adopted across Europe, and in some cases extended up to 10 years depending on age and screening history.

For vaccinated cohorts, modelling studies suggest that a few as two lifetime screens (for example around ages 35 and 45) could provide protection comparable to current five-year schedules (Brisson et al., 2020; Pedersen et al., 2018). These approaches illustrate the long-term potential to tailor intervals by vaccination status.

The key policy challenge is balancing safety, efficiency and public confidence. Shorter intervals increase costs and overtreatment, longer intervals risk missed disease if follow-up systems fail. the EU Council Recommendation on Cancer Screening (2022) underlines that intervals must be set within organised call-recall systems and backed by robust registries to ensure that women with abnormal results are not lost between screens.

RECOMMENDATIONS

Adopt evidence-based screening intervals

Implement primary HPV testing every five years from ages 30-50 with flexibility to extend to 25-64 in line with national context and vaccination coverage.

Plan for risk-stratified intervals in vaccinated cohorts

Prepare for the transition to longer intervals or reduced lifetime screens among fully vaccinated women, but only where coverage and registry systems can ensure safety.

Maintain shorter intervals only where justified

Where three-yearly screening still exists, transition to five-year intervals once primary HPV testing and robust call-recall are in place.

SPOTLIGHT ON: HPV FASTER/EVEN FASTER

HPV FASTER Implement is an EU-funded initiative to prevent cervical cancer faster by vaccinating and screening women who may have already been exposed to HPV but do not yet show disease. It proposes a combined approach to HPV vaccination and HPV screening for women aged 25-45 years, a group often missed by adolescent vaccination and under-screened in many regions. The project will develop a Europe-wide knowledge framework and tools to monitor the evolving needs of at-risk populations. (HPV-FASTER-Implement, 2025).

'HPV Even Faster' in Sweden is a real-world variant of the HPV-Faster concept but targeting a younger adult cohort: women aged 23-30, to reduce HPV reproduction rates. This strategy has two goals: to stop the circulation of HPV as soon as possible and to offer HPV screening to those who may have been infected. By extending invitations nationally, the programme also serves to improve access for under-screened women. It is estimated that approach could lower cervical cancer incidence to below 4 cases per 100,000 in Sweden within 3 years. This strategy is proving successful in Sweden due to its strong infrastructure of 90% vaccination coverage in a school-based programme, national HPV-based screening including self-collection, and well organised call-recall systems. It is therefore a strategy which could be difficult to deliver in settings lacking this infrastructure (Burdier et al., 2025; Dillner et al., 2021).

Follow-up and treatment

Once a woman tests positive for hrHPV, the effectiveness of a cervical screening programme depends on timely, reliable follow up. If triage, referral or treatment are delayed, the benefit of early detection is lost and inequalities widen.

Across Europe, follow-up systems remain fragmented and in many others, no formal standards exists, resulting in wide variations in timeliness and outcomes. Indeed few countries consistently report how long women wait for colposcopy, how quickly CIN2/3 lesions are treated, or whether post-treatment surveillance is completed.

The EC-CvC update clarifies which tools should be used, but does not yet define EU-wide, end-to-end time standards. New quality indicators for colposcopy and treatment are under development, but are not yet embedded. Until these are published it leaves variations across the region as to how fast women move from positive test to colposcopy, treatment and surveillance.

The absence of robust data also masks equity gaps. Migrants, people in rural areas, and those with lower literacy or digital access are less likely to complete follow-up after a positive result. Where registries are incomplete and not linked across primary care, laboratories and colposcopy services, women may be lost in the system and policymakers lack visibility on whether treatment or surveillance was completed (Olthof et al., 2024).

Capacity constraints add further challenges. Too few colposcopists, appointments, or pathology resources create bottlenecks, a weakness exposed during the COVID-19 pandemic when diagnostic backlogs grew. Loss to follow-up after an abnormal results has been shown to worsen outcomes, underscoring the need for systematic recall and safety nets (Martinez-Gutierrez et al., 2023).

Finally, consistent surveillance after treatment is critical. Without guidelines, clinics increase workload and uncertainty for patients through heterogenous practices such as repeated cytology (McGee et al., 2023).

RECOMMENDATIONS

Establish EU-wide time-standards and embed quality indicators.

Establishing follow-up and treatment timeliness would provide a benchmark for safety and equity across countries. In addition, the adoption of EC-CvC colposcopy indicators would enable systematic monitoring of detection rates, treatment adequacy and overtreatment risks.

Integrate registries

Linking laboratory, vaccination, screening and treatment records ensure that abnormal results automatically trigger follow-up and fail-safe alerts for non-attenders.

Expand service capacity

Training nurse-colposcopists, using mobile treatment units and investing in pathology services can reduce bottlenecks in under-resourced regions.

Support vulnerable groups

Navigation support, multilingual information, and community outreach improve adherence and prevent disparities from widening.

BEST PRACTICE: ENGLAND – CLEAR TIMELINESS STANDARDS

In England, national standards set explicit timelines for follow-up after abnormal results. Women with a positive HPV test requiring colposcopy should be seen within 6-8 weeks of referral, targets that are monitored through programme quality indicators. NHS audit and quality assurance reports emphasise that publishing and monitoring against time standards reduces variation in practice, ensures timely follow-up, and strengthens public confidence in programme safety during changes such as the move to extended screening intervals.

(NHS Digital, 2024; UK Government, 2024)

Registries and quality assurance

High quality, linked registries are the lynchpin of successful screening programmes, enabling timely invitations and follow-up, and detailed measurement of programmes by ensuring that women with abnormal results are not lost between services, and allowing countries to track progress towards elimination. Without them, policymakers lack the visibility needed to steer programmes.

Across Europe, registry systems remain uneven. In many countries, data is fragmented across local providers or laboratories with little national coordination, making it difficult to monitor invitations, screening and outcomes (Forsea et al., 2016; Giusti et al., 2024). Not all of the European population is captured with up-to-date, comparable incidence, stage and mortality data within European Network of Cancer Registries (ENCR) and European Cancer Information System (ECIS). This makes the evaluation of immunisation and screening challenging. In addition, vaccination, screening and cancer registries are rarely linked, which prevents countries from assessing the real-world impact of prevention strategies.

Recent findings from the PERCH Joint Action (WP5 Monitoring, 2025) confirm this uneven capacity across Europe. Among 16 participating countries, nearly all (15) can collect individual HPV vaccination data, yet only two – Norway and Sweden – have already linked vaccination, screening and cancer data at national level. Five countries (Croatia, Czech Republic, Germany, Hungary and Slovenia) have the capability and plans to achieve this within the next three years, while others including Lithuania, Poland, Romania and Spain are developing linkage capacity in the medium term. Several Member States, including Belgium, Italy and the Slovak Republic, remain without concrete plans to establish such linkage (Arbyn & PERCH Joint Action Work Package 5 Team, 2025). These data highlight persistent disparities in Europe's ability to integrate vaccination, screening and cancer registries, reinforcing the need for common standards and interoperability under the European Health Data Space.

Reporting is often limited to basic coverage figures, with few programmes publishing quality and safety measures such as HPV positivity, colposcopy compliance or treatment timeliness. Such quality and safety measures, established previously in the 2010 and the second edition, whilst those recommendations from the new EC-CvC (July 2025) are still being embedded.

Due to technical and legal barriers, Vaccination-Screening-Cancer registries are not consistently linked at the individual level. This makes the real-world effectiveness of interventions difficult to assess and limits the ability to benchmark performance across Member States. The new European Health Data Space regulation (since 26 Mar 2025) will facilitate cross-border interoperability within the EU, however non-EU-based health data users and holders are generally excluded unless their country of establishment is recognised as providing reciprocal access to EU-based applicants (Werry et al., 2025).

Finally, even where registries do exist, they often fail to capture equity dimensions. Without the ability to stratify results by deprivation, migration status, disability or gender identity, inequalities remain hidden and unaddressed (Berner et al., 2021; European Institute for Gender Equality, 2024; Marques et al., 2020; European Observatory on Health Systems and Policies, 2025).

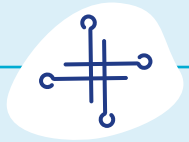
RECOMMENDATIONS

Link data registries

Data sources should be joined up so that programmes can monitor the entire cervical cancer pathway from eligibility, vaccination, screening, triage and treatment, to who developed cancer and the outcome.

Adopt EU-standard indicators with public dashboards

Require all programmes to report against the EC-CvC core set of indicators, publishing results annually in accessible dashboards.



Mandate interoperability through EHDS

Build national systems that comply with the European Health Data Space, so that registries can exchange data securely and support cross-border comparability, drawing on EU benchmarking initiatives such as the PERCH Joint Action (WP5) to monitor progress on registry linkage and maturity.

Commission periodic audits and quality checks

Regular independent audits should assess data completeness, linkage success, timeliness, and accuracy with findings used to direct system improvements.

Build equity analytics into registries by default

Ensure registries can stratify data by age, region, deprivation, migrant status, disability, and where lawful, sex and gender identity, so that inequalities are visible and can be addressed.

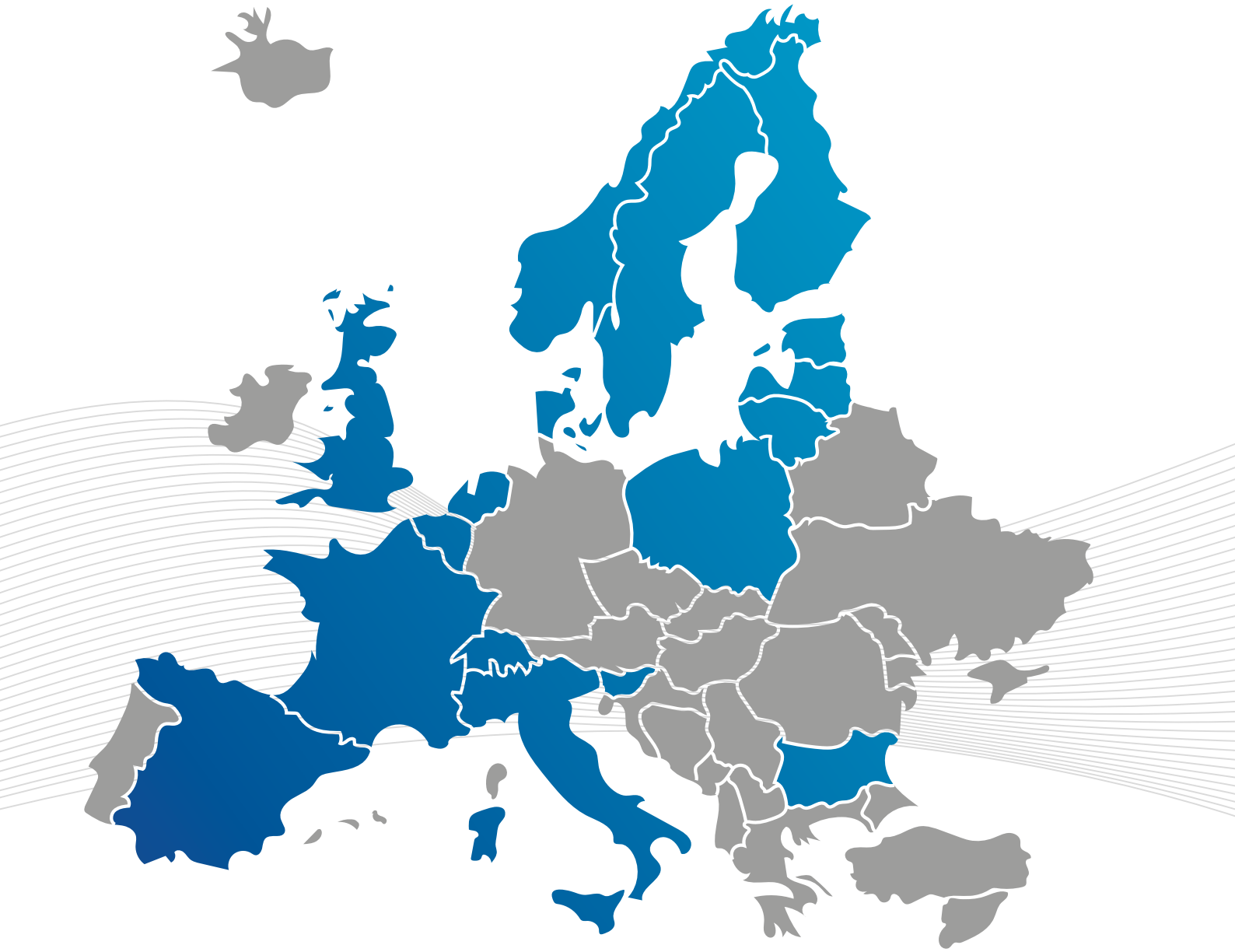
SWEDEN – NATIONAL CERVICAL SCREENING REGISTRY (NKCX)

Sweden's NKCx is a national quality registry that monitors and evaluates the extent, quality, and impact of cervical screening, aggregating individual-level data on all invitations, HPV tests, cytologies and histopathologies, enabling comprehensive pathway tracking and evaluation (Hortlund et al., 2018).

With a standardised set of 13 Quality Indicators to guide programme optimisation and regional benchmarking, this QA loop enables transparent public reporting, and enables support for policy updates (Andersson et al., 2025).

6. Best Practice and National Case Studies

Organised cervical cancer screening programmes in Europe differ in maturity. Some demonstrate high performance through long-standing, registry-based systems, whilst others are in the midst of reform shifting from opportunistic to organised screening programmes or from the use of cytology to primary HPV testing. Some are only beginning this journey.



What high performance looks like

Netherlands

The Netherlands introduced primary HPV testing in 2017, with self-collection as an alternative for women preferring home collection. Initially invitations were issued every five years between ages 30 and 60. Following evaluation in 2022, the schedule was refined: five screening rounds are planned for women with negative results at ages 30, 35, 40, 50 and 60. Women aged 45 and 55 are invited only if they missed the previous round or tested positive, and women aged 65 are invited only if they had a positive HPV result not yet referred to colposcopy.

The programme also adopted limited genotyping, reporting HPV16 and HPV18 separately and pooling the remaining hrHPV types. Women with HPV16/18 and negative cytology, or with non-16/18 HPV and LSIL cytology, are recalled at 12 months, while those with high-grade cytology or HPV16/18 positivity plus abnormal cytology are referred to colposcopy. Each year an external organisation provides reports with programme results, alongside modelling to evaluate reductions in mortality and monitor possible harms such as overdiagnosis (RIVM, 2025).

Sweden

In 2017, Sweden introduced primary HPV testing for women aged 30–70, with cytology retained for ages 23–29 (NKCX). During the COVID-19 pandemic, HPV testing on self-collected samples was extended to all women from age 23, making HPV the sole primary test. Women aged 23–49 repeat screening every five years if HPV-negative, while those aged 50–70 repeat every seven years, with exit only after a negative HPV test post-age 64. Sweden has pioneered extended HPV genotyping, grouping hrHPV types into three tiers (high, intermediate, low) and adapting management by age. This allows deferral of work-up for younger women with HPV types with lower oncogenic capacity, while older women require clinician-collected repeat testing and cytology. The National Quality Registry for Cervical Cancer Prevention (NKCx) produces annual reports, ensuring robust evaluation (NKCx, 2025).

Denmark

Denmark's organised programme invites women aged 23–64, with intervals of three or five years depending on age (Sundhedsstyrelsen, Danish Health Authority, 2025). Pathways use partial genotyping: HPV16/18 positives are referred directly to colposcopy, while other hrHPV positives undergo reflex cytology and repeat testing if cytology is normal. Adherence to follow-up exceeds 90%, ensuring high detection rates of CIN2+/CIN3+ (Lindquist et al., 2024). Quality is underpinned by the Danish Quality Database and linked pathology registries. Coverage has historically been ≥70%, though recent years show slight declines (Njor et al, 2023). To reach under-screened women, Denmark has shifted self-collection from trials into routine practice: in the Central Denmark Region, a self-collection kit is mailed six months after the initial invitation if no attendance occurs. This approach increases participation with good compliance and is now endorsed by the Health Authority (University Research Clinic for Cancer Screening, 2023).

Finland

Finland invites women aged 30–65 every five years, with some wellbeing service counties also inviting at age 25. Primary HPV testing has been recommended since 2019 for ages ≥30, with cytology reserved for triage. By 2023, around 80% of all screening used HPV testing. Participation remains stable at ~70–72%, supported by the Finnish Cancer Registry (FCR), which provides annual reports and quality manuals (Finnish Cancer Registry, Expert Group 4, 2024).

Finland's long tradition of randomised trials and registry evaluations underpins its programme. Studies show that mailed self-collection raises uptake among non-attenders and can be cost-effective, leading to ongoing regional implementations (Niinikoski et al., 2023; Virtanen et al., 2011). Burden is among the lowest in Europe, though gradients by education, language and region persist (European Commission, 2025).

Norway

Norway completed its transition to primary HPV testing in July 2023, applying a five-year interval from ages 25–69. Management is risk-stratified: HPV16/18 positives with abnormal cytology go to colposcopy, while those with normal cytology undergo repeat testing; for other hrHPV types, colposcopy is reserved for high-grade cytology or persistent infection.

Programme participation is high, with public indicators available through CervicalScreen Norway. Efforts to reduce inequalities include self-collection projects for persistent non-attenders and research on biomarker-based triage to prepare for vaccinated cohorts (CervicalScreen Norway (NIPH), 2025; Aasbø et al., 2022).

Slovenia

Slovenia's ZORA programme offers cytology every three years for women aged 20–64. Coverage consistently exceeds 70%, making it one of the strongest in Central and Eastern Europe. Self-collection has been used for non-attenders, and authorities are evaluating a transition to primary HPV testing. Burden is comparatively low for the region, reflecting long-standing programme quality (Institute of Oncology Ljubljana, 2025). In 2025 it was announced the IARC will support in upgrading cervical screening through a shift to testing for HPV infection, based on an evaluation of local capacity, stakeholder engagement, health economic analyses and targeted communication strategies (IARC, 2025).

Making the shift: celebrating progress

Bulgaria

Bulgaria remains one of the highest-burden countries in Europe, with incidence and mortality rates well above the EU average. Until now, screening has been opportunistic and cytology-based, with no fully population-based organised programme. In June 2024, the government announced a nationwide cervical screening initiative for women aged 20–49 regardless of insurance status, signalling intent to move toward organised screening (Euractive, 2024). While many core elements of an organised programme are not yet in place, this marks an important first step toward a structured, population-based approach to cervical cancer prevention.

Spain

Following a 2019 ministerial order, Spain mandated population-based cervical screening across all Autonomous Communities (Ministerio de Sanidad, Consumo y Bienestar Social, 2019). In 2023, recommendations lowered the starting age for primary HPV testing from 35 to 30 and began adapting protocols to vaccination status. Current recommendations define the target population as women aged 25-65 years. For those aged 25–29 years, cytology every three years is recommended for individuals without a complete HPV vaccination series, whereas those with a complete vaccination series should either continue cytology every three years or initiate primary HPV testing at age 30, depending on programmes implementation. For women aged 30–65 years, primary HPV testing is recommended, with a five-year interval following a negative result; if the result is positive, cytology-based triage should be performed, and, when cytology is negative, HPV testing should be repeated after one year (Grupo de trabajo de cribado de cáncer de cérvix de la Ponencia de Cribado Poblacional de la Comisión de Salud Pública, 2024).

While implementation is uneven, most regions are now rolling out organised HPV-based screening, with rapid progress expected in the next few years.

Italy

Italy runs an organised, regionally managed cervical screening programme that uses cytology every 3 years at ages 25–29 and primary HPV testing every 5 years from 30 to 64, a model introduced nationally after the health technology assessment driven policy shift in the National Prevention Plan 2014-2018 (Iossa et al., 2022). When the HPV test is positive, programmes perform reflex cytology on the same sample; women with HPV + and abnormal cytology are referred to colposcopy, whereas those with HPV positive result but negative cytology are recalled at 12 months for repeat HPV testing.

The Office for National Statistics also notes that in line with national recommendations, programmes are beginning to postpone starting screening to age 30 for women fully vaccinated ≤15 years. (ONS, 2024; Bechini et al., 2024) Italy is also piloting and scaling self-collection to reach non-attenders, with several regions offering pharmacy-based pick-up/return under the organised programme (Feltri et al., 2023).

France

France reformed its programme to introduce primary HPV testing every five years for ages 30–65, with cytology for ages 25–29. Self-collection is explicitly endorsed to improve participation and is expanding nationally (Haute Autorité de Santé [HAS], 2024). Yet participation remains only 55.8% (2023), with large territorial gaps, particularly in Seine-Saint-Denis and overseas territories (Santé publique France, 2025). Haute Autorité de Santé (HAS) explicitly recommends self-collection be offered from age 30 to non-screened/underscreened women within the organised programme (Haute Autorité de Santé [HAS], 2024). The National roadmap 2024–2028 includes indicators for the number of women screened via self-collection and pilots for kit distribution. Current programs increasingly use self-collection and targeted outreach to address non-attendance.

Belgium

In 2025, Belgium transitioned to primary HPV testing every five years for women aged 30–64, retaining cytology for ages 25–29. The reform aims to move beyond historic reliance on opportunistic testing, strengthen quality standards, and improve equity. Current coverage is modest (~54%), but the new organised framework aims to standardise quality and improve equity (WHO European Observatory on Health Systems and Policies, 2020; KCE, 2024).

Estonia

Estonia reformed its national programme in 2021, introducing primary HPV testing every five years for women aged 30–65. Self-collection has been tested through randomised mail-out interventions, demonstrating feasibility and increased uptake. While coverage lags behind Nordic levels, these reforms signal a clear shift towards an organised, evidence-based model (Stankūnas et al., 2022).

England

England uses primary HPV testing with reflex cytology. Historically, women aged 25–49 with a negative HPV test were recalled every three years and those aged 50–64 every five years.

Following an evidence review, from July 2025 the interval for women aged 25–49 will also move to five years if HPV-negative, while HPV-positive women follow risk-based recall. Self-collection is in advanced piloting with national roll-out under consideration. Disease burden is low relative to the EU average, but coverage has slipped in recent years (~68–70%), with inequalities by region and deprivation (NHS England, 2025).

Switzerland

Switzerland conducts opportunistic cervical cancer screening rather than a national call–recall programme; participation depends on the initiative of women and clinicians. The Swiss Cancer Screening Committee has issued evidence-graded recommendations to modernise practice: for ages 30–70, primary HPV testing with cytology triage is suggested, while for ages 21–29 cytology remains recommended. The Committee recommends three-year intervals instead of annual testing but also suggests five-year intervals as acceptable (Cancer Screening Committee, 2021).

The same guidance explicitly recognises Switzerland's opportunistic set-up, identifies price and reimbursement of HPV tests as barriers to equity, and highlights self-collection as a quality-assured option that could reach women who do not regularly attend gynaecology visits.

Current burden is relatively low compared with EU averages: the ICO/IARC country fact sheet estimates ~236 new cases and ~100 deaths annually (Stadelmann-Steffen, 2017); GLOBOCAN 2022 also places Switzerland among the countries with the lowest cervical cancer mortality in Europe (Ferlay et al., 2021).

Even so, inequalities in participation are well documented. Population-based analyses show higher odds of never-screening and under-screening among women with lower education and among foreign nationals/migrant groups. National studies converge on education, income, nationality and region as consistent gradients. These findings underpin the Committee's emphasis on equity, reimbursement, and tailored outreach (including self-collection) to raise participation among underserved groups (Burton-Jeangros et al., 2017).

Poland

Poland currently operates a distinctive, country-specific hybrid cervical cancer screening model, combining a publicly funded organised programme (whose participation among the target population remained below 27% in 2006–2024, and did not exceed 13% in the last five years) with a large, privately financed opportunistic sector.

In line with the National Oncology Strategy 2020–2030, since July 2025 the public arm of the Organised Cervical Cancer Screening Programme (OCCSP) has officially introduced primary HPV testing with limited genotyping every 5 years for women aged 25–64, within a basic algorithm without extended genotyping or additional HSIL/CIN2+ risk biomarkers. The previously used primary test, conventional cytology, remains available only as a transitional option for women aged 25–64 and is expected to be phased out by June 2026.

In the private (opportunistic) sector, multiple testing modalities coexist liquid-based cytology, conventional cytology, and a rapidly expanding HPV-based screening practice (in place since 2012). This strategy includes primary HPV and co-testing, limited and extended genotyping, and risk triage using p16/Ki67 dual-stain within an open, extended, risk-based model, most fully embodying the goals of precision prevention. The high quality and performance standards of Liquid Based Screening in the private sector under Polish conditions have been validated. In 2021 national scientific societies recommended a mixed screening model for the private sector during the transitional period, with a clear preference for an HPV-based.

Overall, approximately half of eligible women participate in each sector, yielding an estimated ~70% total screening coverage (survey-based). This hybrid model, with rapid expansion of HPV-based screening, remains a distinctive feature of the Polish system, offering a choice-driven framework for full transition to HPV-based and risk-stratified screening across both arms. It also reflects the exceptionally high acceptance of the fundamental paradigm shift in screening from cytology-based to HPV-based among participants in cervical cancer secondary prevention.

(Ferlay et al., 2021; Polish Ministry of Health, 2025; Michalek et al., 2024; Trzeszcz et al., 2021; Trzeszcz et al., 2023; Jach et al., 2021)

Latvia

Latvia has a high rate of cervical cancer compared with EU averages: the ICO/IARC Fact Sheet estimates ~267 new cases and ~136 deaths annually, with an incidence of ~18.4 per 100,000 women and mortality of ~6.8 per 100,000 (Bruni et al., 2023). Latvia launched its organised cervical cancer screening programme in 2009, offering cytology approximately every three years for women aged 25–70. Since 2022, a new approach has been implemented with primary HPV screening testing replacing cytology for women aged 30 to 70 (for women aged 25-30, cytology remains the primary screening method) (Stasulane et al., 2025).

Women who test negative for hrHPV are scheduled to receive their next screening letter after 5 years. Women who test positive for HPV 16 and/or 18 are referred directly for colposcopy without further triage. For women who test positive for other hrHPV genotypes, cytological triage is performed which if a negative result is returned, a repeat cytology is conducted after 12 months. Should a further negative result be returned, women will return to routine screening (Stasulane et al., 2025).

The National Health Service (NHS) issues invitation letters to screening appointments and from 2025, the invitation interval for HPV testing will be expanded from three to five years in line with updated national guidelines. Screening services are predominantly delivered by gynaecologists, but also by general practitioners and midwives. For both cytology and HPV screening, invitation letters may also be sent electronically upon request, ensuring greater accessibility for participants (OECD & European Commission, 2025).

Lithuania

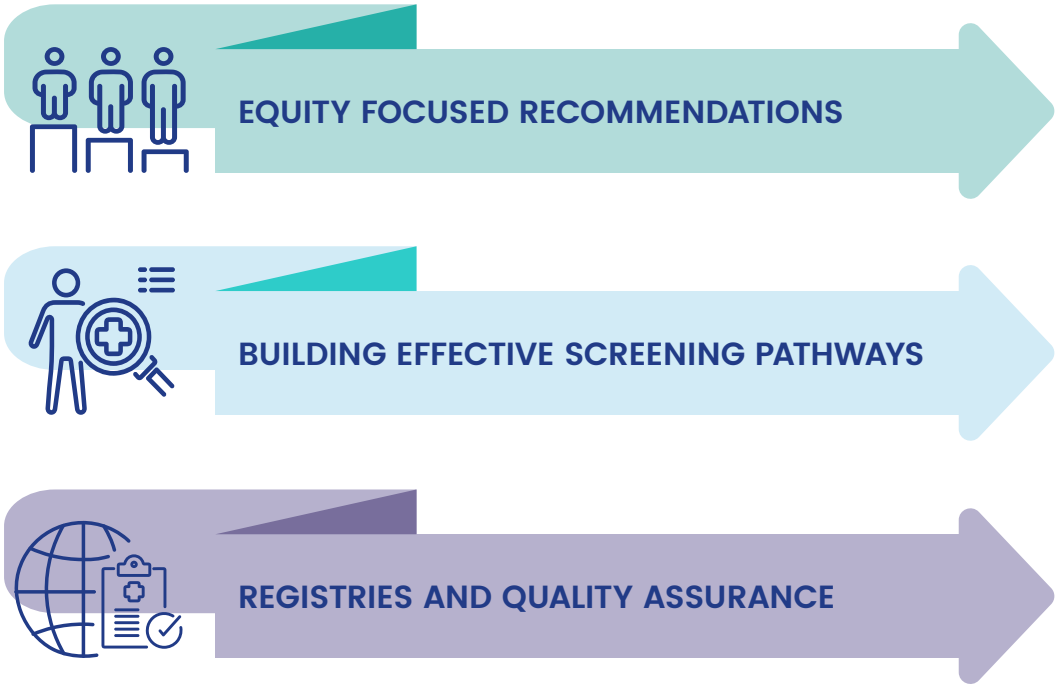
Lithuania established its national cervical screening programme in 2004, offering cytology every three years for women aged 25–60. This was financed by the National Health Insurance Fund under the Ministry of Health and offered a conventional Pap test. Primary healthcare centres were responsible for inviting eligible women and performing tests, and national guidance permits clinics to use a variety of invitation methods including verbal or phone invitations, postal letters or SMS reminders, although in practice personal invitation letters remain rare. As a result, the programme has functioned largely opportunistically, with coverage and participation rates remaining below desired levels (Paulauskiene et al., 2019).

Since 2022, the prevention programme has been expanded to include HPV-based screening with women aged 35 to 60 years invited for a hrHPV test every 5 years. Those who test positive undergo a follow-up cytology test for further evaluation. For women aged 25 to 35 years, the protocol remains unchanged and they continue to receive cytology-based screening test every 3 years (National Health Insurance Fund under the Ministry of Health (Lithuania), 2025). From 2025, Lithuania plans to shift to a population-based approach to boost participation (OECD and European Commission, 2025).

The experiences of these countries illustrate complementary narratives. Firstly, that well-organised, registry-based HPV programmes with built-in equity measures can achieve high coverage and low disease burden. Secondly, that progress itself is a success to be celebrated: as countries move from opportunistic to organised programmes, adopt primary HPV testing for the first time, or trial self-collection they are building the infrastructure necessary for sustainable and equitable screening. These case studies provide tangible models for scaling up across the EU.

7. Policy Recommendations

Cervical cancer remains one of the most preventable cancers in Europe, yet significant inequities persist in screening coverage, access, and outcomes. To close these gaps and align with the goals of the European Code Against Cancer (ECAC5) and the Europe's Beating Cancer Plan, this document outlines comprehensive policy recommendations. These focus on equity, effective screening pathways, robust data systems, and quality assurance across the European region. In order to close the gaps in cervical cancer screening programmes in Europe, the authors call for:

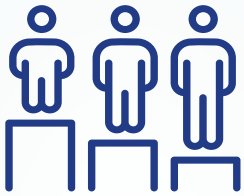


Integrate HPV self-collection

Self-collection of HPV samples should be incorporated into national screening programmes as a practical way to reach under-screened and hard-to-reach women, improving overall participation and equity.

Identify barriers

Understanding the social, cultural, and structural factors that prevent women from accessing or participating in screening is essential. Research should be directed toward identifying these barriers and developing tailored interventions to address them.



Implement targeted outreach

Communication strategies should include multi-channel, audience-specific campaigns that speak to the needs and contexts of different population groups, including those at higher risk or less likely to engage.

Engage communities

Collaborating with NGOs, community organisations, and local leaders is vital to increasing trust, dispelling stigma, and promoting participation within underserved communities.

Strengthen patient–provider relationships

Training healthcare providers in effective communication, empathy, and cultural competence can help build trust and ensure that women feel respected and informed throughout the screening process.

Screening tools and triage options

Primary HPV testing should become the universal standard for screening across Europe, using only clinically validated assays. Self-collection methods must be integrated into national programmes, while new triage technologies should be evaluated and scaled where appropriate. Cytology should be maintained solely as a triage tool rather than as a primary screening method.

Invitation and call–recall systems

Countries should move from opportunistic to organised screening models. This includes adopting opt-out invitation systems, offering pre-booked appointments, and using SMS reminders to increase attendance and follow-up rates.

Screening intervals

Programmes should adopt evidence-based screening intervals, offering primary HPV testing every five years for women aged 30–65. For vaccinated cohorts, risk-stratified intervals should be introduced as evidence evolves, with shorter intervals retained only where clearly justified.

Follow-up and treatment

The EU should establish common time standards and quality indicators to guide follow-up and treatment. Integrated registries are needed to track outcomes, and service capacity must be expanded to meet demand. Special attention should be given to supporting vulnerable and underserved groups to ensure equitable access to care.

Transparency and accountability

EU-wide quality indicators should be standardised and reported through public dashboards, supported by periodic audits and independent quality assessments.

Data linkage and interoperability

National registries should be linked and made interoperable under the framework of the European Health Data Space (EHDS) to allow seamless data exchange and monitoring.

Equity analytics

Registries should include built-in equity measures to monitor disparities and ensure that progress toward fair and inclusive screening is continuously evaluated and improved.

8. Conclusions

Cervical cancer can become the first cancer to be eliminated in Europe, but only if every country delivers on the full promise of HPV-based testing and equitable access to care. More than 27,000 women still die each year from a disease that science has already solved. That persistence is not a failure of knowledge but one of equity and implementation.

The tools for elimination exist, and the pathway is clear. What remains is to ensure these advances reach every woman – regardless of income, geography, disability or migration status. Elimination will only be achieved if prevention is designed for inclusion, not assumption.

To close the gaps, this report calls for action on two fronts.

First, to understand and dismantle the barriers to participation in cervical screening programmes through better evidence, communication and trust between patients and providers. Primary healthcare teams play a central role in this effort, offering continuity, accessibility and trusted relationships that encourage participation. Self-collection should be integrated as a standard offer across all organised programmes, supported by targeted, multi-channel outreach and culturally sensitive communication that makes screening both accessible and acceptable to all.

Second, to build effective and accountable and data-driven screening systems. Countries should complete the transition to organised, population-based screening programmes using primary HPV testing as the universal standard, supported by opt-out or pre-booked invitations, digital reminders, and simplified follow-up pathways to increase uptake and reduce delays. Screening should occur every five years for women aged 30-65, with intervals adapted to vaccination coverage and individual risk. Follow-up and treatment must be timely, guided by EU-wide quality indicators, and underpinned by robust, interoperable registries so that no woman is lost to care.

To ensure accountability, Member States must link vaccination, screening and cancer outcome data, guarantee interoperability through the European Health Data Space, and report EU-standard indicators through transparent, publicly available dashboards and regular independent audits. Equity analytics should be embedded by design – not added later – so that disparities are visible, measurable, and actionable.

The science is ready, the policy framework is in place, and the moral case is undeniable. By acting collectively and investing equitably, Europe can deliver the first continent-wide victory over a preventable cancer and demonstrate the transformative potential of coordinated public health action. The race to elimination is no longer a vision - it is a test of our shared resolve to turn evidence into action.

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Notes

Notes

As the not-for-profit federation of member organisations working in cancer at a European level, the European Cancer Organisation convenes oncology professionals and patients to agree policy, advocate for positive change and speak up for the European cancer community.

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