

Survey of current policies towards widening cervical screening coverage among vulnerable women in 22 European countries

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Background: This study aimed to investigate the status of cervical cancer screening (CCS) implementation in Europe by investigating national or regional policies towards broadening coverage of CCS amongst vulnerable subgroups of the population at high risk for CC. **Methods:** A web-based survey was conducted between September 2021 and February 2022 with CCS programme managers and experts to identify and rank six population subgroups at high risk considered most vulnerable to CC and to map existing policies that addressed the coverage of CCS towards population sub-groups at risk. **Results:** A total of 31 responses were received from experts covering 22 European countries. The results of this survey suggest that whilst many countries identify lower coverage of CCS amongst population subgroups at high risk of CC as a public health problem, few countries have developed dedicated policies towards broadening coverage among these subgroups. The six countries who reported having done so were concentrated in the Northern or Western European regions, suggesting the existence of geographical disparities within the continent. A key challenge in this respect is the difficulty to categorize subgroups of the target population; many individuals are burdened by intersectionality thereby resting in multiple categories, which may hinder the effectiveness of interventions targeted to reach specific subgroups. **Conclusion:** A greater clarity on the conceptualization of vulnerability can help countries to develop and subsequently implement strategies to increase coverage to subgroups of the target population currently underserved with regards to CCS.

Introduction

Cervical cancer (CC) is an almost entirely preventable disease. It is also curable if detected early and adequately treated. Yet, CC remains a leading cause of death in women globally: in 2020 alone, an estimated 66 821 new cases were diagnosed and the disease claimed over 30 608 lives in the WHO Europe region.¹ By 2030, the yearly European burden is projected to increase up to 68 135 cases and 32 725 deaths, respectively.² The projected increase calls for action to promote the 90–70–90 Strategy of the World Health Organisation (WHO) to Accelerate Elimination of Cervical Cancer as a Public Health Problem globally.³ The European Union (EU) has reinforced this Strategy through Europe's Beating Cancer Plan (EBCP), which aims to offer cervical cancer screening (CCS) to 90% of the qualifying population by 2025.⁴

As the natural history of the disease involves a detectable and treatable precancerous state lasting over 10–20 years,⁵ CC is particularly amenable to screening. Widely used methods for CCS include visual inspection with acetic acid (VIA), conventional (Papanicolaou smear) or liquid-based cytology and Human Papillomavirus (HPV) DNA or mRNA testing.⁶ CCS delivery approaches are rapidly evolving, such as introduction of HPV self-sampling, which has been demonstrated to be nearly as accurate when compared to clinician-sampled cervical specimens and has demonstrated to be highly

acceptable to the women improving their participation to screening.^{7,8} A recent meta-analysis observed that offering self-sampling devices directly to underscreened women in communities generated greater than 75% uptake.⁹ Moreover, a cross-sectional study in England reported that self-sampling was the preferred option by eligible women included in the study.¹⁰

The proposal of the European Commission to replace Council recommendation (2003/878/EC) of 2 December 2003 on cancer screening¹¹ calls on EU Member States to organize CCS, in accordance with quality assurance guidelines,^{12,13} by testing for HPV for women aged 30–65 with an interval of 5 years or more, and to consider adapting ages and intervals to risk based on the HPV vaccination history of the individuals.¹¹ Preferentially, CCS should be delivered in an organized, programmatic framework in order to increase the potential for providing more equitable services to reduce disparities in coverage, access and uptake, and minimize the harms of screening related to over-screening.^{14,15}

Taking due account of the specific needs of population subgroups at higher cancer risk is especially important for the organization of CCS. The burden of CC falls disproportionately on women with limited access to healthcare, and it is closely associated with socio-economic inequalities.¹⁶ Recent estimates suggest 90% of CC deaths occur in Low- and Middle-Income Countries,¹⁷ and the Human Development Index (HDI) and poverty rates have been shown to

account for over 52% of global variance in mortality.¹⁸ Moreover, comorbidity and intersectionality with other risk factors further aggravates CC burden among certain subgroups; for instance, women living with HIV have a 6-fold higher risk of developing CC relative to their counterparts without HIV.¹⁹ While the average incidence of CC among the WHO Europe region stands at 10.1 per 100 000 women,¹ it is estimated to be at 66 per 100 000 (95% CI 57–77) among women living with HIV.²⁰

Whilst CCS programmes have managed to reduce CC mortality,⁶ profound disparities in terms of coverage exist among EU countries: in 2019, 2.6% of women in Czechia self-reported to have never had cervical smear test, while the figure amounted to 47.4% in Romania.^{21–23} Moreover, there remains considerable gaps in coverage within countries with CCS inaccessible to subgroups at risk of CC, such as sex workers, Roma populations, illicit drug users, migrants and homeless communities.^{24–28} Consequently, such groups can be considered as being currently underserved by CCS. The ongoing CBIG-SCREEN project aims to tackle inequality in coverage and access by developing a knowledge framework around barriers to CCS in Europe, leading to coherent, evidence-based recommendations to decision-makers outlining measures to broaden coverage amongst those underserved by CCS.

The sub-study of CBIG-SCREEN reported in the present manuscript aimed to add to knowledge in the literature on the status of CCS implementation by investigating policies in European countries towards broadening screening coverage among subgroups in the target population at high risk of CC thereby considered to be vulnerable to developing the disease.

Methods

Conducting a survey

A web-based survey was conducted to map the approaches that were in place (at national, regional or local level) within the health system to identify population subgroups at heightened risk, thus considered vulnerable to developing CC and typically underserved in respect of CCS. The survey was conducted between 24 September 2021 and 28 February 2022.

A 47-item survey was designed and structured into six domains related to CCS: (i) identification of vulnerable women; (ii) policies; (iii) financing; (iv) monitoring and evaluation; (v) programme invitation strategies; and (vi) activities towards raising awareness and eliminating access barriers. Several items, notably those measuring barriers to access CCS services, were adapted from the Barriers to Effective Screening Tool (BEST), which had been previously validated in European setting.²⁹ Final questionnaire items underwent an iterative revision process by the co-authors before pre-testing with professionals from partner organizations in the CBIG-SCREEN project consortium. Subsequently, the draft questionnaire was shared with experts external to the project in three countries (Cyprus, Denmark and Slovenia) to review the legibility and relevance of questions, feasibility to respond and provide the requested data, and to identify gaps, inconsistencies or duplication of items.

The survey was administered using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at the International Agency for Research on Cancer (IARC).^{30,31} REDCap is a secure, web-based software platform designed to support data capture for research studies, providing an intuitive interface for validated data capture, audit trails for tracking data manipulation and export procedures.

Target participants for the survey

In terms of geographical coverage, all 27 EU member states were included in the scope along with Iceland, Norway, Switzerland and the UK, totalling 31 countries.

Personal invitations to complete the survey were extended to the target participants, who were programme coordinators or managers of CCS programmes. In countries with several regional and local programmes, the targeted participants were professionals involved in nationwide oversight, monitoring or evaluation of the programmes either through a network of screening coordinators or through a national/federal agency. For countries without an existing CCS programme, experts in CC prevention were invited to participate.

A snowball sampling method was used whereby initial contacts either responded to the survey or referred to CCS-related stakeholders in governmental, academia or civil society settings. Both recruitment and periodic reminders were conducted via email correspondence.

Statistical analysis

Results were provided as crude data for all responses. Descriptive analyses (relative frequencies) were performed by country and geographic region (North, South, Central Eastern and West Europe according to EuroVoc).³² When multiple responses were obtained from one country, a consensus response was generated to allow for comparison amongst countries: one author pooled the responses per country; responses in agreement were accepted; and if there was a difference in response, the level of governance (regional/national) was taken into account, whereby the national one was prioritized upon a second author validation.

A qualitative inductive thematic analysis was performed for open-ended questions. Two investigators analyzed the content of the interview transcriptions and systematically coded items into conceptually related categories, for review by a third investigator. Discrepancies were agreed upon through a verbal consensus amongst investigators.

Results

Coverage of targeted countries

A total of 31 representatives from 22 European countries responded to the survey. This represents a coverage of 70.97% of the 31 countries originally targeted by the survey. Coverage was higher in Central and Eastern Europe ($n=7/8$; 87.50%), followed by Western Europe ($n=7/9$; 77.78%), Southern Europe ($n=4/6$; 66.67%) and Northern Europe ($n=4/8$; 50.00%). Details of CC incidence, mortality and screening programme from the respondent countries are described in table 1.

Nine countries did not respond; four of these (Austria, Cyprus, Greece and Luxembourg) do not offer a nationally or regionally organized CCS programme, whilst the remaining five countries (Croatia, Iceland, Latvia, Lithuania and Sweden) have a programme of some description.

Descriptive analysis of survey results by domain

Identification of vulnerable women

A total of 20 respondent countries (90.91%) recognized the presence of vulnerable populations in their territory who were underserved by the CCS programme (the respondent for Estonia was unsure, and Hungary denied its presence).

The three most commonly identified groups as such were 'women living in poverty in socially deprived areas' ($n=18$; 81.82%), 'migrants from high HPV prevalence areas living in deprived areas' ($n=15$; 68.18%) and 'homeless people' ($n=13$; 59.09%). Nevertheless, when asked to rank the categories for vulnerability, 'homeless people' was most often ranked first ($n=6$; 27.27%). The group for which data were more commonly available, so that specifically targeted interventions could be designed, was 'women living in poverty in socially deprived areas' ($n=7$; 31.82%), followed by 'women attending HIV/STI clinics', 'prison inmates' and 'migrants

Table 1 Survey respondent details including country, EUROVOC region, amount of responses and scope of coverage, presence of a population-based cervical cancer screening (CCS) programme,²¹ cervical cancer (CC) age-standardized incidence rate (ASR), CC mortality and Human Development Index (HDI)¹

Country	Region	No. of responses	Coverage	Population-based CCS programme ^a	CC incidence ASR per 100 000 women (estimates 2020)	CC mortality ASR per 100 000 women (estimates 2020)	HDI
Belgium	Western Europe	2 ^b	National and Regional	Yes—regional	7.7	2	0.92
Bulgaria	Central and Eastern Europe	7 ^c	National	No programme	18	7.1	0.82
Czechia	Central and Eastern Europe	1	National	Yes—national	9.3	3.6	0.89
Denmark	Northern Europe	1 ^d	Regional	Yes—national	10.2	2.2	0.93
Estonia	Northern Europe	1	National	Yes—national	18.5	4.3	0.88
Finland	Northern Europe	1	National	Yes—national	5.2	1.1	0.93
France	Western Europe	1	National	Yes—regional	7	2.2	0.89
Germany	Western Europe	1	National	Yes—national ^h	7.6	2.2	0.94
Hungary	Central and Eastern Europe	1	National	Yes—national	17.2	4.9	0.85
Ireland	Western Europe	1	National	Yes—national	10.7	2.8	0.94
Italy	Southern Europe	1	National	Yes—national	6.9	1.6	0.88
Malta	Southern Europe	1	National	Yes—national	3.7	1.1	0.89
Norway	Northern Europe	1	National	Yes—national ⁱ	12	1.7	0.95
Poland	Central and Eastern Europe	1	National	Yes—national	12.3	5.9	0.87
Portugal	Southern Europe	2 ^e	Regional	Yes—regional	10.7	3.2	0.85
Romania	Central and Eastern Europe	1	National	Yes—national	22.6	9.6	0.82
Slovakia	Central and Eastern Europe	1	National	No—planning national ^j	16.6	5.3	0.86
Slovenia	Central and Eastern Europe	1	National	Yes—national	6.7	2.4	0.9
Spain	Southern Europe	1 ^f	National	No—population-based programme	5.4	1.6	0.89
Switzerland	Western Europe	1	National	No—population-based programme ^k	3.4	1	0.95
The Netherlands	Western Europe	1	National	Yes—national	6.9	1.4	0.93
UK	Western Europe	2 ^g	National	Yes—national	9.9	1.9	0.92

a: These data do not derive from the survey, but from the EUSR17 reference 21.

b: Response represents the region of Flanders.

c: Responses submitted by Bulgarian representatives of the Government ($n = 2$), Academia ($n = 3$), WHO ($n = 1$) and UNFPA ($n = 1$).

d: Response represents the region of Central Denmark.

e: Responses represent the regions of Lisbon area and Central Zone.

f: Responses represent the regions of Catalonia and Basque Country.

g: Response represents the region of North Ireland.

h: As of 1 January 2020, Germany started rolling out nationwide population-based CCS programme.²¹

i: As reported by the Cancer Registry of Norway. Data are not available in reference 21.

j: As reported by the National Oncology Institute of Slovakia. Data are not available in reference 21.

k: As reported by Burton-Jeangros et al. (33). Data not available in reference 21.

from high HPV prevalence areas living in deprived areas' (each having a frequency of three; 13.64%). Descriptive analyses of populations of women identified as vulnerable for CCS in the European region are shown in table 2.

CCS policies

When asked about the existence of a documented policy for CCS delivery to any of the abovementioned vulnerable populations in their country, only six respondents (27.27%) confirmed its presence (see table 3). The target population varied by country: Romania included 'ethnic minority, unemployed, uninsured, women recently released from penitentiary, low education level, low income, women in the social protection system'; Hungary reported 'women in the target age range: between 25–30 years and 30–65 years'; Estonia focused on 'women without health insurance' as of 2021; the UK included 'all underserved, mostly socio-economically deprived, with learning disabilities and prison inmates'; Ireland focused on LGBTQI+ and issued some guidance for primary healthcare providers; and France targeted 'women who are unscreened or not regularly screened'. Two respondents (Estonia and France) provided specific performance indicators regularly monitored for the abovementioned populations, which included both invitation and screening coverage.

CCS financing

The most common sources of financing for screening, colposcopy referral, biopsy and treatment services, included either a total or partial coverage by the health insurance system ($n = 14$; 63.64% and $n = 9$; 40.91%, respectively). Two countries reported complete out-of-pocket payment by the service users (Bulgaria and Poland).

CCS monitoring and evaluation

The institutions most commonly in charge of CCS monitoring included national health authorities ($n = 11$; 50.00%), national cervical cancer screening organizations ($n = 11$; 50.00%) and regional or municipal health authorities ($n = 10$; 45.45%). Notably, none of the respondents reported a lack of monitoring of CCS in their territory. Nevertheless, only five (22.73%) included separate monitoring for vulnerable populations, through population registers ($n = 2$), health insurance registers ($n = 2$), screening registers ($n = 2$) and primary care registers ($n = 1$). Variables collected included ethnicity, sex, age, income, occupation, disability, religion, language, geographic area and education.

Strategies to invite eligible women

A total of 17 countries reported having CCS programme invitation strategies in place (77.27%), out of which five had specific ones for

Table 2 Categories and ranking of vulnerable women for cervical cancer screening (CCS) as identified by respondents in $n = 22$ countries classified by EuroVoc region

Countries by EUROVOG region	Central and Eastern Europe ($n = 7$)	Northern Europe ($n = 4$)	Southern Europe ($n = 4$)	Western Europe ($n = 7$)	Total ($n = 22$)
Category	n (%)	n (%)	n (%)	n (%)	n (%)
Proportion of vulnerable groups					
Women living in poverty in socially deprived areas	6 (85.71)	3 (75.00)	2 (50.00)	7 (100.00)	18 (81.82)
Women attending HIV/STI clinics	2 (28.57)	0 (0.00)	0 (0.00)	4 (57.14)	6 (27.27)
Drug or alcohol addicted women attending drop-in centres	3 (42.86)	1 (25.00)	2 (50.00)	4 (57.14)	10 (45.45)
Sex workers	2 (28.57)	1 (25.00)	2 (50.00)	5 (71.43)	10 (45.45)
Migrants from high HPV prevalence areas living in deprived areas	2 (28.57)	3 (75.00)	3 (75.00)	7 (100.00)	15 (68.18)
Prison inmates	2 (28.57)	0 (0.00)	3 (75.00)	4 (57.14)	9 (40.91)
Homeless people	4 (57.14)	1 (25.00)	2 (50.00)	6 (85.71)	13 (59.09)
Indigenous populations	1 (14.29)	1 (25.00)	0 (0.00)	3 (42.86)	5 (22.73)
Women with disabilities	0 (0.00)	0 (0.00)	1 (25.00)	4 (57.14)	5 (22.73)
LGBTQI+ populations	0 (0.00)	0 (0.00)	0 (0.00)	3 (42.86)	3 (13.64)
Other ^a	5 (71.43)	1 (25.00)	2 (50.00)	3 (71.43)	11 (50.00)
Ranking of vulnerable groups					
First place	Women living in poverty in socially deprived areas	<i>Tie between:</i> Women living in poverty in socially deprived areas	Prison inmates	Homeless people	Homeless people
Second place	Homeless people	<i>AND</i> Sex workers <i>AND</i> Migrants from high HPV prevalence areas living in deprived areas	Migrants from high HPV prevalence areas living in deprived areas	Migrants from high HPV prevalence areas living in deprived areas	<i>Tie between:</i> Women living in poverty in socially deprived areas <i>AND</i> Migrants from high HPV prevalence areas living in deprived areas
Third place	Drug or alcohol addicted women attending drop-in centers	Migrants from high HPV prevalence areas living in deprived areas	<i>Tie between:</i> Homeless people <i>AND</i> Women with disability	Women living in poverty in socially deprived areas	<i>AND</i> Migrants from high HPV prevalence areas living in deprived areas

Notes: Percentages are calculated as per the total of EuroVoc responses indicated in the column headings

HPV, human papillomavirus; HIV, human immunodeficiency virus; STI, sexually transmitted infection.

a: Respondents reported as 'other' in an open field text, including ethnic minorities (including Roma populations), older women, women suffering from mental health disease, women living in rural areas or low access to primary healthcare centres, and victims of gender-based violence.

Table 3 Stratified analysis of survey domains by EuroVoc region, presence of population-based cervical cancer screening programme, cervical cancer incidence and Human Development Index

	Presence of vulnerable groups (VG) (Q1) n (%)	Existence of a policy for VG (Q7) n (%)	Dedicated CCS M&E among VG (Q6.1) n (%)	Invitation strategy for VG (Q9.1) n (%)	Awareness raising governmental (Q12) n (%)	Awareness raising non-governmental (Q13) n (%)	Client-directed interventions (Q14) n (%)
EuroVoc Region (total category)							
Central and Eastern Europe ($n = 7$)	6 (85.71)	2 (28.57)	2 (28.57)	1 (14.29)	4 (57.14)	3 (42.86)	5 (71.43)
Northern Europe ($n = 4$)	3 (75.00)	1 (25.00)	0 (0.00)	0 (0.00)	1 (25.00)	2 (50.00)	3 (75.00)
Southern Europe ($n = 4$)	4 (100.00)	0 (0.00)	1 (25.00)	2 (50.00)	3 (75.00)	0 (0.00)	3 (75.00)
Western Europe ($n = 7$)	7 (100.00)	3 (42.86)	2 (28.57)	2 (28.57)	5 (71.43)	4 (57.14)	5 (71.43)
Presence of a population-based programme ^a							
Yes ($n = 18$)	16 (88.89)	5 (27.78)	4 (22.22)	5 (27.78)	12 (66.67)	7 (38.89)	14 (77.78)
No ($n = 4$)	4 (100.00)	1 (25.00)	1 (25.00)	0 (0.00)	1 (25.00)	2 (50.00)	2 (75.00)
Cervical cancer incidence (median 9.6)							
Below median ($n = 11$)	11 (100.00)	1 (9.09)	2 (18.18)	2 (18.18)	6 (54.55)	3 (27.27)	7 (63.64)
Above median ($n = 11$)	9 (81.82)	5 (45.45)	3 (27.27)	3 (27.27)	7 (63.64)	6 (54.55)	9 (81.82)
Human development index							
High (0.8–0.9) ($n = 12$)	10 (83.33)	4 (33.33)	4 (33.33)	4 (33.33)	7 (58.33)	5 (41.67)	10 (83.33)
Very high (≥ 0.9) ($n = 10$)	10 (100.00)	2 (20.00)	1 (10.00)	1 (10.00)	6 (60.00)	4 (40.00)	6 (60.00)
Total ($n = 22$)	20 (90.91)	6 (27.27)	5 (22.73)	5 (22.73)	13 (59.09)	9 (40.91)	16 (72.73)

CCS, cervical cancer screening; M&E, monitoring and evaluation; VG, vulnerable group; Q, question item.
a: The presence of a population-based program does not derive from the survey, but from the EUSR17.²¹

vulnerable groups (29.41%). Such targeted strategies included letters (France, Hungary and Italy), phone calls (Portugal), prison or institution visits by health workers (Italy) and dedicated screening campaigns by a mobile team (Hungary). Target groups were identified from a variety of sources, included population registries ($n = 2$), lists from primary healthcare providers ($n = 1$), list of insurance companies ($n = 1$) and prison inmates registries ($n = 1$).

When inquired about strategies to maintain women in follow-up and further assessment, 14 (63.64%) countries reported having such for the general population, and none did so separately for pre-identified vulnerable groups.

Activities aiming at CCS awareness raising

When asked about ongoing or planned initiatives to create awareness about CCS and increase participation among vulnerable populations, 13 (59.09%) countries mentioned its organization by the governmental bodies and 9 (40.91%) additionally by non-governmental organizations (NGOs), research institution and civil society. Activities included mass and small media campaigns, group education, one-on-one education, dedicated websites and social media platforms. Detailed results derived from a qualitative analysis of a dedicated open question can be found in [Supplementary Material 1](#).

Activities to overcome barriers to CCS access

Moreover, different client-directed interventions were reported to increase community access to CCS, including: self-sampling ($n = 11$; 50.00%); provision of alternative screening centres (distance problem) ($n = 7$; 31.82%); assisting through the healthcare system (patient navigation) ($n = 6$; 27.27%); access to screening in mobile units ($n = 5$; 22.73%); provision of transportation to the screening centre ($n = 5$; 22.73%); scheduling screening out-of-hours ($n = 5$; 22.73%); and reduction of out-of-pocket costs through reimbursement, voucher distribution or increased third party payment for cancer screening ($n = 4$; 18.18%). Self-sampling was offered either in the entire programme ($n = 2$) or as a pilot ($n = 9$). Women could self-collect samples most-commonly at home ($n = 8$). Some programmes offered a choice of collecting samples either at a clinic or at home ($n = 2$).

The results for each of the survey domains were stratified according to CC incidence (dichotomised as above or below 9.6/100,000, as per the median of the sample), Human Development Index (HDI), presence of population-based CCS programme and EuroVoc region, in respect of each of the 22 countries covered by the survey ([table 3](#)).

Discussion

This study investigated existing policies towards broadening coverage of CCS in Europe for subgroups of the target populations at high risk of CC and, therefore, vulnerable to this disease.

Overall, 31 responses were received from data providers representative of 22 European countries. The results indicated that whilst majority of the respondents acknowledge the necessity of addressing subgroups vulnerable to CC, few countries have developed a distinct policy about broadening coverage of CCS amongst such subgroups. Four of the six countries with such a policy were in the Northern or Western European regions, which suggest that geographical disparities persist in Europe. These results are aligned with the unequal CCS coverage in the general population,^{21,23} leading to increased inequity among vulnerable populations. This underpins the need to advance the design and implementation of policies for vulnerable subgroups, as the European Commission's proposal of September 2022 to update the 2003 European Council screening guidelines recommends¹¹ in alignment with the WHO CC elimination strategy and ECBP goals.^{3,4}

Five of the six countries whose respondents reported the presence of a policy also reported specific measures (such as dedicated

monitoring and evaluation of CCS delivery to vulnerable populations).³⁴ As reported elsewhere,²¹ these countries have population-based screening programme, which may be a positive contributing factor to the organization and delivery of dedicated strategies to implement the policy towards vulnerable groups. This reinforces the positive impact that population-based programmes have upon cancer screening health outcomes as discussed by Zhang et al.¹⁵

Likewise, five out of six countries with a dedicated policy had CC incidence above the European median incidence, which indicates that a relatively high CC burden can act as a motivation for developing policies to vulnerable subgroups.¹⁷ Additionally, two-thirds of countries in which awareness-raising activities by NGOs were reported, are countries with high CC incidence. This emphasizes the importance that civil society organizations have for the active engagement with subgroups in those countries with greater CC incidence,³⁵ and reinforces the need for cross-sector involvement in the pursuance of the WHO and ECBP related targets.^{3,4}

Although the survey results demonstrate a widespread acknowledgment that addressing low coverage of CCS is an important public health issue, respondents differed in their interpretation of vulnerability. The lack of consensus on how to identify subgroups considered vulnerable to CC appears to be an obstacle to implementing strategies to broaden coverage. In countries not having an organized nationwide CCS programme not yet in place (e.g. Bulgaria), all women and people with a cervix in the target population should be considered vulnerable due to the lack of access to quality-assured screening, and this was accepted by the Bulgarian respondent. In other instances, respondents preferred to focus on the settings or environments themselves, such as prisons and incarcerated women, sex workers, homeless populations, etc., as the key defining factor of vulnerability.

In many cases, common categories of population subgroups were identified by respondents. These were typically subgroups considered to be at elevated risk of CC, for which considerable gaps in CCS coverage have been described in the literature.^{24–28} Frequently, the issue of intersectionality was identified as a barrier to broadening coverage. Intersectionality refers to the co-existence of multiple categories for an individual, e.g. incarcerated women, women living with HIV, low socio-economic status, HPV unvaccinated, migrant women from fragile states, etc.^{20,36} Respondents noted that as many women underserved by CCS can be categorized according to multiple, intersecting identities, it becomes complex to develop targeted interventions. To reduce the complexity, defining vulnerable subgroups could focus on actionable, identifiable factors, for example, concentrating on location or factors documented in an accessible registry such as country of origin, or vaccination status.

Several important limitations with this study should be acknowledged. Despite the best efforts of authors to achieve responses from all countries, nine are not covered by the survey. For some of these countries, such as Cyprus, experts were not able to respond to the survey due to the lack of a CCS programme in the country. Correspondence from the experts from Sweden, who did not complete the survey, noted that fewer than 0.01% of the target group for CCS are long-term non-attenders. These individuals are sent directly an HPV self-sampling kit. Although this result could not be included for direct comparison it indicates the importance of self-sampling as an intervention to broaden coverage.^{9,10}

Whilst efforts were taken to invite the most suitable experts, data reported in this survey rely on the opinion and judgement of the respondents and, therefore, care should be taken with generalizing the findings beyond the scope of this study. Additionally, data on the existence of a population-based CCS programme are derived from the Cancer Screening in the EU report published in 2017.²¹ Therefore, data from recent years are not likely to be captured.

This study has reported that whilst many countries identify lower coverage of CCS amongst population subgroups at high risk of CC as a public health problem, few countries have developed policies dedicated towards broadening coverage among these subgroups. The

complexity of categorizing subgroups of the target population considered to be vulnerable to developing CC is compounded by the intersectionality of individuals amongst the subgroups. Greater clarity on the conceptualization of vulnerability can help countries to develop and subsequently implement interventions to increase coverage amongst subgroups currently underserved with regards to CCS. Promoting a value-based approach to CC prevention with pragmatic policies ensuring access, equity, quality, performance, efficiency and productivity (optimized allocation of resources) will help European countries minimize the inequalities that currently exist between and within the countries.³⁷

Supplementary data

Supplementary data are available at *EURPUB* online.

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Data availability

Upon request to authors.

Key points

- Insights into dimensions of vulnerability among women for cervical cancer screening (CCS) and its intersectionality;
- Pan-European mapping of CCS policies towards subgroups of the population at high risk for cervical cancer (including 22 countries);
- Contribution to equity and reducing inequalities towards World Health Organisation global strategy to eliminate cervical cancer as a public health problem.

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