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Technical, legal and ethical framework of cancer audit in cervical screening – Summary of best practices for organised programmes delineated through an expert group consultation

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Abstract

Efficient and well-organised cervical screening programmes have significantly reduced both the incidence and mortality rates of cervical cancer in the population. For optimal performance, such programmes need to incorporate essential quality assurance measures. The International Agency for Research on Cancer (IARC/WHO) organised an expert consultation to delineate best practices in auditing cancers in a cervical screening programme, the legal and ethical frameworks governing such audits, and communicating audit outcomes. As a best practice, every programme should have a well-documented policy and process framework for cancer audits. The TWGs agreed that the primary goal of programmatic cancer audits is to assess the programme's effectiveness in lowering cervical cancer incidence and minimising screening-related risks. Using audit results, informed decisions can be made to enhance service delivery, including professional training, adopting improved screening tests, strengthening fail-safe mechanisms, reducing delays, and minimising inequalities. Legal complexities in cervical screening stem from its inherent limitations and risks, and differentiating cases of negligence from inevitable and non-negligent errors where an abnormality is not detected but actually exists is crucial. TWGs suggested that determining whether a screening error was serious enough to be categorised as negligent and/or to entitle the patient to compensation should reflect the inherent limitations of cervical screening. Data obtained while performing screening tests and subsequent diagnostic tests or treatments are sensitive and need to be safeguarded. The best practice document drafted through expert consultation will help cervical screening programmes standardise practices related to cancer audits and address associated legal and ethical issues.

Where authors are identified as personnel of the International Agency for Research on Cancer/World Health Organization, the authors alone are responsible for the views expressed in this article, and they do not necessarily represent the decisions, policy, or views of the International Agency for Research on Cancer/World Health Organization.

The members of Technical Working Group are mentioned in Appendix A.

KEYWORDS
cancer audit, cervical cancer screening, communication, ethics, legal

What's New?

There have been increasing litigations against cervical screening programmes centred around cancer audits. This manuscript provides a comprehensive framework for conducting cancer audits in cervical screening programmes, addressing legal and ethical challenges, and ensuring effective outcomes. The framework incorporates best practices informed by a review and expert consultations, aiming to provide guidance for cancer audit protocols across screening programmes. By integrating technical, ethical, and legal considerations, this work led by the International Agency for Research on Cancer (IARC/WHO) enhances the quality and equity of cervical cancer prevention, supporting global efforts toward improving screening outcomes and fostering trust in public health initiatives.

1 | INTRODUCTION

Efficient and well-organised cervical screening programmes have demonstrated a significant reduction in both incidence and mortality rates of cervical cancer within the population. To attain optimal performance, cervical screening programmes must incorporate essential quality assurance measures. These encompass achieving widespread coverage in the target population while minimising inequalities, establishing a robust linkage between screening and the subsequent investigation of screen-positive women, ensuring timely and appropriate treatment of precancers and cancers, and maintaining high-quality of services throughout the screening process.

Since 2019, there have been several legal cases in Ireland seeking compensation brought by cervical cancer patients who participated in the cervical screening programme following a routine audit of cytology smears.[1] Cancer audit in Ireland revealed discrepancies between original Pap smear diagnosis and reviewer's interpretation at audit, and many women were offered financial compensation by the court for perceived 'failure' of the programme. This highlights the adverse consequences of limited understanding of the nature and value of cancer audits among various stakeholders. Deficiencies in effective communication further complicated the Irish situation.

Such gaps may ultimately result in a decline in trust and a significant drop in participation in cancer screening programmes in any country. The consequential confusion and stress among the health professionals and managers associated with the screening programme may damage their morale and ultimately impact the quality of services. The Irish problem is at least partly attributed to the absence of a well-defined technical, ethical, and legal framework governing cancer audits and a guidance on how to transparently communicate discrepant review results to affected women as well as other stakeholders.

In 2022, the International Agency for Research on Cancer (IARC/WHO), France, initiated an expert consultation to delineate best practices in the audit of cancers in a cervical screening programme, the legal and ethical framework governing such audits, and communicating outcomes of the audit in a non-judgmental and sensitive manner. Based on the expert consultation, IARC/WHO published the Working Group Report[2] on current best practices in the following aspects of a cervical screening programme, which are infrequently discussed in the scientific literature or dealt with in any international guidelines:

1. Audit of cancers and communicating audit outcomes to patients and other stakeholders.
2. Legal and ethical frameworks to safeguard the interests of screening participants, health professionals, and programme managers associated with cervical screening and related services.[2]
3. Effective and transparent communication with target populations and other stakeholders.
4. Developing workforce competencies in communication about cervical screening.

In the present manuscript, we described the methodology of developing such best practices and the key best practice recommendations related to topics one (audit of cancer) and two (legal and ethical framework) listed above. A summary of the recommended best practices in other areas will be published separately. The recommendations are primarily in the context of organised screening programmes with an appropriate level of organisation and resources to be able to perform cancer audits.

2 | METHOD

Technical working groups (TWGs) consisting of 27 global experts on cancer screening, public health, colposcopy, cervical pathology, legal and judicial systems, health communication, ethics in health as well as patient advocates and representatives were convened by IARC/WHO to address the following aspects of an organised cervical screening programme:

- Defining audit of cervical cancers and describing best practices to conduct such audits and communicate outcomes.
- Establishing legal and ethical frameworks to safeguard the interests of screening participants, health professionals and programme managers.
- Communicating benefits, risks and limitations of cervical screening effectively and transparently to the target populations and other

stakeholders (includes building workforce competencies in communication).

The detailed methodology of constituting the TWGs (three in number) and how the TWGs functioned was described in the IARC/WHO Technical Report.[2] At the outset, the members identified key questions related to the areas of interest to be addressed by the TWGs. This was followed by a rapid review of related literature by IARC scientists to prepare responses to those questions along with the supporting evidence base. The review included journal publications, reports published on the web, national and international guidelines, protocols, and ongoing surveys within Europe.[3]

TWG members were requested to share any relevant documents published by them. The responses and the supporting evidence were reviewed and deliberated upon by members of the corresponding TWGs through multiple online meetings facilitated by the chairs (AM, PS and MA). A virtual meeting of all TWG members was held in November and December 2022 to arrive at a consensus.

The best practice consensus statements were presented to a group of stakeholders in Ireland who were identified through a mapping exercise and included those from the micro, meso, and macro levels. The process and outcomes of this stakeholder engagement are described elsewhere.[2] The views and preferences of the stakeholders were recorded and presented to the TWG members. The outputs from the stakeholders provided context and were taken into consideration when the best practices were finalised.

IARC/WHO scientists drafted the best practice document with the help of the TWG chairs. The document was circulated among all experts for their edits and comments. The TWG chairs approved the final version.

3 | RESULTS

Key contents of the best practice document related to cancer audit and legal and ethical framework are presented below. The complete document is available at the National Library of Medicine and IARC/WHO website.[2]

3.1 | Section I: Definition of audit of cancers, its objectives and guiding principles

The TWGs accepted that in the context of a population-based cervical screening programme, incorporating cancer audit in programmatic quality assurance protocol is a best practice. Ideally, cancer audit should involve an in-depth review of the screening pathway for all women diagnosed with cervical cancer in the population targeted by the programme. These women could be classified into three groups: those not participating or inconsistently participating in screening, those identified with abnormal screening results (subsequent investigations did not show any cancer), and those with normal screening results but later diagnosed with cervical cancer. The members also suggested that findings from the audit of cancers should direct further investigations into programmatic practices related to screening invitation, quality assurance of tests, call-recall, and further management that target improvement rather than blaming an individual professional or an organisational entity for perceived errors or negligence. A systematic audit will support continuous learning and development of the health professionals involved in the programme and may identify some of the good practices that need to be promoted.[4,5]

As a best practice, the TWG suggested that a well-documented policy and process framework for cancer audit is required for programmes aiming to incorporate such audits. A process framework for cancer audit as part of programmatic quality assurance encompasses three key stages. In the planning stage, performance indicators (e.g., percentage of cytology slides reviewed that contain missed abnormalities, or percentage of cases not managed according to national guidelines, incidence of interval cancers) are selected, and performance standards relevant to the indicators are agreed upon. How to communicate audit outcomes and recommended improvements to all stakeholders is an essential part of this planning stage. The next stage is systematic data collection to measure performance against set standards to identify service gaps as well as good practices. In the third stage, stakeholders will review outcomes, devise strategies to address gaps, disseminate best practices, and enhance quality. The process needs to be repeated for continual quality improvement.

The TWGs agreed that the audit of cancers in a programme is distinct from individual case review. While the primary goal of the former is to assess a programme's effectiveness in lowering cervical cancer incidence and minimising screening-related risks (such as false negative, overtreatment, treatment complications), the latter seeks to understand the specific circumstances leading to an individual developing cancer despite participating in screening. Using the audit results, informed decisions are to be made to enhance various aspects of service delivery, including professional training, adopting improved screening tests, strengthening fail-safe mechanisms, reducing delays, and minimising inequalities. The focus of the cervical cancer audit is on evaluating the overall programme or system, and not the performance of individual health professionals or the experience of a specific participant. A programme may offer an individual case review to any woman who develops cancer and requests such a review. Since an individual case review can be initiated by a patient (or her representative), her consent is needed, and the results must be disclosed to her (or her representative).

The TWGs also recommended a harmonised definition of interval cancer, since measuring interval cancer rates is an important component of programmatic audit. Accordingly, an interval cervical cancer was defined as any cancer (including microinvasive cancer [stage IA]) diagnosed in a woman between her most recent screening episode and her next screening round, at an interval stipulated by the programme, showing either no abnormal screening test result or an abnormal screening test result but a negative triage test result or diagnostic procedure. The experts agreed that besides operator errors,

interval cancers can result from various factors, including but not limited to fast-growing tumours that could not be detected through screening at the specified interval or an inherent inability of the test to detect the disease (e.g., small proportion of cervical cancers would be negative on HPV test).

In view of the experts, although every screening programme should aim to achieve a low interval cancer rate, it is impossible to achieve zero-error screening in standard practice and there are no universally accepted benchmarks for interval cancer rates. Rates of interval cervical cancer reported from different population-based cervical screening programmes ranged between 1.4 and 10.2 per 100,000 women-years in cytology-negative women.[6–9] In addition to differences in programmatic performance, the wide variability in interval cancer rates could be due to different background incidences of cervical cancer, different methods of estimation, or whether microinvasive cancers were included or not. The experts opined that a rate of <10 interval cervical cancers per 100,000 women-years would be acceptable in a cytology-based programme, though a stringent benchmark of <4 interval cervical cancers per 100,000 women-years (the WHO cervical cancer elimination target) would be desirable with HPV detection-based screening.

Considering that the reviewers of cytology slides in an audit may have 'hindsight bias' as they are aware that the slides were obtained from cervical cancer patients, the TWG members provided some guidance on how to adjust for such bias. They proposed that slides from at least 100 controls per age group (e.g., 100 controls aged 20–49 years and 100 controls aged 50–69 years) and at least one age-matched control per case are required for the review. The TWGs also recommended including slides from a sample of women with false-positive cytology reports. In addition to reviewing screening tests, cancer audit requires a review of the downstream management for all interval cancers with a positive screening test result. For each case included in the cancer audit, it is a good practice to review data from colposcopic examinations and associated management predating the index referral by up to 5 years. Following the same principles of reviewing cytology slides, the histopathology slides from interval cancer cases should also be reviewed if such slides are available. Hindsight bias is applicable in the review of colposcopy images and histopathology slides also.

The TWGs observed that despite the human papillomavirus (HPV) detection test being fast replacing cytology as the primary screening test, experience with cancer audits in such programmes is quite limited. The principles of the audit of cancers in cytology-based screening may not be applicable to screening based on HPV testing because the cervical specimens collected during a screening interval before a cancer diagnosis may not be available for retesting. Therefore, the TWGs recommended that the original laboratory data storage should be reviewed. Additionally, WHO recommends the use of validated HPV assays to ensure specimen adequacy and acceptable assay performance as a quality assurance measure, which should also be considered in the review.[10] This approach enhances the credibility and effectiveness of screening programmes while safeguarding the quality of test results and outcomes. The triage cytology slides should be reviewed using the same principles followed for reviewing cytology slides obtained at primary screening.

The TWG experts listed best practices for the disclosure of audit outcomes to patients. When an audit is performed in an anonymised way and all patient data is deidentified, it is not possible to contact an individual patient for the disclosure of findings. The TWGs favoured anonymised cancer audit due to the following advantages: (i) the patient's privacy is protected, (ii) health information can be used and shared when it is not practical to obtain consent from each participant, (iii) avoids bias in audit findings as discussed later, and (iv) health professionals attached to the programme will be more supportive of the audit process. Another key consideration for the TWGs to support non-disclosure of results was that the knowledge of audit outcomes does not change patient management and does not provide any health benefit to the patient. In fact, learning about a discrepant result may cause psychological upset to the patient.

Even if programmes follow anonymised audit and the principle of non-disclosure, the option of individual case review should be kept open for the cancer patients seeking such an investigation. Obtaining consent and disclosure of results is mandatory when a patient requests a case review.

Despite the arguments against obtaining individual consents and routine disclosure, some programmes may require disclosing results, especially if a discrepancy is detected. Such disclosure should be made by a trained senior clinician who can answer questions about all aspects of the screening process. Support should be made available to patients before, during, and after meetings where discordant results are discussed, because this situation can be traumatic for them.

3.2 | Section II: Legal and ethical frameworks to safeguard the interests of screening participants, health professionals, and programme managers

The TWG observed that cervical screening, like screening for other cancers, has unique features as a medical intervention that bring in certain complexities from legal and ethical perspectives. Most legal and ethical frameworks in healthcare are developed in the context of the diagnosis and treatment of diseases. Screening tests, making a presumptive diagnosis of cancer in apparently healthy individuals, do not fit into this conventional model. Every screening test has inherent false positivity and false negativity, and a zero-error rate is impossible to achieve, especially in subjective diagnostic evaluations like cytology or colposcopy. The principle of non-maleficence, a fundamental principle of medical ethics, is challenged by screening because physical and psychological harms resulting from false positive tests, overtreatment, and treatment complications are anticipated outcomes of the intervention. Since most women are apparently healthy and asymptomatic, the threshold of tolerance for complications is low. Taking these into account, TWGs recommended best practices in informed consenting, legal liability for errors in cervical screening, and data protection and privacy issues.

Just as any other medical intervention, informed consent is required before screening. Though the programmes adopt various

means to ensure high participation to achieve population benefit, the participation of an individual woman is always voluntary. They can make an informed decision to participate provided the nature of interventions, benefits, risks and limitations of screening, and risks of taking no action are explained to her. Information sharing needs to be comprehensive and at the same time tailored to the background and needs of an individual woman. According to the TWGs, informed consent, which may be written or verbal depending on local regulations, is a best practice requirement for cervical screening.

The TWGs deliberated at length on the requirement of obtaining informed consent from women for participating in the programmatic audit of cancers. They recommended that for the cancer audit to be reliable, the entire population needs to be represented and not the consenting women alone. Analyses based only on consenting women are likely to introduce bias and be misleading.[11] The members of the TWGs concluded that not obtaining individual informed consent at the time of a programmatic audit is justified as the societal benefit of reviewing all cancers and the obligation to deliver a high-quality screening programme outweigh potential individual risks (due to breach of data and privacy) associated with participating in an audit. However, every woman invited to a screening programme should be informed at the time of invitation and/or screening about the possibility of her samples and data being incorporated in an audit. If a woman denies consent to the audit, the same should be documented in her case note, and the audit team should remove her personal data at the time of the audit to ensure anonymisation.

The TWG members agreed that legal complexities in cervical cancer screening stem from its inherent limitations and risks, and differentiating cases of negligence from the inevitable and non-negligent errors, where an abnormality is not detected but actually exists, is crucial. Accepting the fact that a complete immunity would conflict with the fundamental principles of most national legal systems, members of the TWGs proposed that while assessing a claim for negligence with respect to cervical screening, the standards applied by courts should accommodate and reflect the reality of screening, including hindsight bias in an audit of cancers. The legal proceedings should take into cognizance the fact that finding discrepancies (may be up to 40% in cytology reviews) on review of slides or colposcopy images from known cancer patients does not imply that the same diagnoses would have been made under routine programme conditions where the workload is much higher. The issue of 'hindsight' bias needs to be considered while making a judgement of error. Due to the subjective nature of the tests, there is necessarily some variation in how properly qualified and trained health-care providers would read a particular slide on cytology or histopathology or interpret changes seen on colposcopy. Successful claims for negligence should concern errors that are not merely inevitable consequences of the limitations of the screening process.

Issues related to protection of data and privacy, especially in the context of cancer audit, was also dealt with in the best practice document. The TWG observed that data obtained while performing screening tests and subsequently various diagnostic tests or treatment is sensitive data that need to be safeguarded for every screening participant. Data protection laws have been introduced or updated in various jurisdictions – General Data Protection Regulation (GDPR) in the European Union being an example.[12] Such laws apply only to personal data defined as 'any information relating to an identified or identifiable natural person' in the GDPR. Information that is irreversibly anonymous is not personal data and does not come under the purview of such laws. The TWGs recommended that screening programmes must clearly identify the legal basis for the processing of data – explicit consent constituting an adequate legal basis. The request for consent for the processing of data (different from the consent obtained for participating in screening) must specifically describe how the participant's data will be processed. This should include audit of cancers, if such an exercise is included in quality assurance protocol.

Some of the regulations (e.g., GDPR) provide a potential legal basis for an audit alternative to consent, which is the processing of data in the public interest to ensure high standards of quality and safety of health care. However, such alternative bases require suitable and specific safeguards that the programme managers need to be aware of.

4 | DISCUSSION

The World Health Organization (WHO) defines best practice as 'a technique or methodology that, through experience and research, has proven to reliably lead to a desired outcome'.[13] This best practice should not be construed as a guideline that requires more rigorous methodological approach. While not necessarily the best solution or gold standard, best practices involve learning from others, avoiding common mistakes, and crafting tailored solutions for similar health issues in diverse contexts. The litigations against the Irish cervical screening programme centred around cancer audit[14] and their negative programmatic impact motivated us to develop the best practices. However, the TWG experts crafted the practice recommendations to be relevant to any cervical (and to some extent for other cancer sites) screening programme that has incorporated cancer audit in quality improvement protocol. It is crucial to note that best practices are dynamic, subject to change with emerging evidence and evolving experiences.

Any well-organised cervical screening programme strives to significantly reduce cancer incidence and enable early detection for effective treatment. Conducting cancer audits in a screened population is essential to explore further opportunities for prevention or early detection by enhancing service quality. WHO recognises audits as a crucial function for health organisations, offering impartial assurance of their integrity and credibility.[15] Quality issues may affect some of the best organised, long-standing cervical screening programmes, and a regular programmatic audit can unearth such issues and their underlying causes. As an example, Sweden, having population-based screening since 1960s, observed a steep rise in early cervical cancers even in adequately screened women starting from 2014.[16] Further investigation revealed that the missing of a significant number of high-grade precursor lesions on cytology was the root cause. Recognising its programmatic values, many screening programmes have incorporated cancer audits in quality improvement protocols. However, practices are highly heterogeneous. This was

revealed in a survey in which 17 population-based screening programmes from high-income countries participated.[3] Even the few programmes performing cancer audits only focus on cancers occurring in women with normal screening tests, do not include controls, and perform only unblinded reviews – none of which are best practices according to the IARC/WHO expert group. Moreover, most programmes performing audits do not have clear policies for disclosure. We expect this best practice document to guide standardization of cancer audit protocols, making them more harmonised and evidence-based.

Cancer audits require the technical capabilities of the programme to systematically collect data across population registers, screening registers, and cancer registers (preferably population-based). Such good quality data collection and linkage permitted Sweden to conduct possibly the first comprehensive audit of a nationwide programme including the entire population targeted by screening for the period from January 1, 1999, through December 31, 2001.[17] Each case subject was matched by year of birth to five control subjects randomly selected from the National Population Register who were not detected to have cervical cancer until the date of diagnosis of the corresponding case. The audit observed that compared with the women screened in the interval, the unscreened women had more than twice the risk of cervical cancer. Among the screened women with an abnormal smear, the risk was more than seven times higher compared with those having a normal smear. Besides confirming the effectiveness of screening, the Swedish audit highlighted the importance of evaluating the entire screening pathways, including the practice of obtaining biopsies.

Technical capabilities alone, without a documented ethical and legal framework, will not permit the programmes to conduct audits effectively. The ethics review board of the Swedish cancer audit study exempted the study from obtaining individual consents. Our TWG members deliberated extensively on the pros and cons of obtaining consent from cancer patients regarding their participation in cancer audits and decided that the 'best practice' would be to inform all women at the time of offering cervical screening about the possibility of including their data in the audit, and to include all cancer cases irrespective of whether a consent has been obtained or not for the sake of greater public health benefit. Such a practice would require anonymisation of all data being submitted to auditing and preclude disclosure of results. If programmes opt for non-anonymised audit and routine disclosure of audit results (such as in England), there should be a carefully thought-out communication plan.[18] The IARC/WHO document has described best practices in such communications as well.

Programmes opting for anonymised audit without any plan for 'routine disclosure' of audit results to the women need to keep the option of 'individual case review' open for any patient developing cervical cancer despite undergoing screening. This may be an ad-hoc decision based on request from an individual patient (or their relatives) or may be offered to women at a certain interval (such as once a year). Communication of results following an individual case review needs to be led by a health professional appropriately trained to handle such sensitive discussions.

The TWG members found addressing legal issues in screening may be a big challenge due to the high variability of legal systems between the countries. They made an attempt to explain the subtle distinction between negligence in service and errors happening due to the inherent nature of the test, interobserver variations, and specific practice situations in a screening programme. However, legal interpretation of the difference between screening and other diagnostic interventions requires further deliberations in the context of the domestic legal framework. Minimising harms to the women participating in screening and protecting their best interests remains at the core of any such framework.

It is true that the present document provides guidance applicable primarily to well-organised screening programmes having robust information systems with appropriate linkages to be able to register all the cervical cancers and differentiate those detected through screening from those detected through self-referral. While well-organised screening programmes with capabilities for cancer audits are predominantly implemented in higher-resourced settings, programmes in limited-resourced settings are also aspiring to establish foundational quality assurance measures. With higher investments in strengthening cancer registries and building screening information systems leveraging lessons learned during the COVID-19 pandemic, low- and middle-income countries (LMICs) are also improving the organisation of cervical screening programmes.[19] They may selectively adopt the best practices enlisted in the document that align with their specific capabilities, aiming to build up quality assurance measures incrementally. Given the constraints in data availability and infrastructure, audits can be based on existing screening data to gain insights into programme effectiveness. An incremental implementation approach, beginning with retrospective reviews of cervical cancer cases to identify major gaps and inform targeted improvements before advancing to systematic programmatic audits, is recommended. This phased strategy allows for resource optimisation while progressively strengthening quality assurance. As a next step, IARC researchers plan to review elements of organisation and quality assurance that contribute to improved screening outcomes. By identifying key organisational and quality assurance components that drive better outcomes, this effort will support LMICs and other resource-constrained settings in making informed decisions about prioritising incremental improvements in their screening programmes.

Until recently, most of the well-organised cervical screening programmes were cytology-based, and the best practices primarily focus on such programmes. However, the basic principles remain relevant as the programmes switch to HPV detection-based screening with or without cytology triage. To conclude, our best practice document aims to offer a flexible framework that programmes can tailor to their specific resources, infrastructure, and context. By adopting elements of these best practices, even programmes in early stages of development can take incremental steps toward strengthening quality and equity in cervical cancer prevention. This ensures that the guidance presented here remains relevant and actionable for diverse programmatic contexts worldwide. It is also crucial to acknowledge the dynamic nature of cancer screening practices. As new tests and approaches are introduced, current recommendations should be adapted to align with new practices. Moreover, these adaptable best

practices are not confined to a single cancer type. They can be tailored for various cancer sites to enhance and refine screening practices, fostering a more comprehensive and effective cancer screening approach. In the near future, dedicated guidelines on the technical, ethical, and legal aspects of performing cancer audits in a screening programme from international organisations like the WHO and other international recommending agencies will be highly valued.

AUTHOR CONTRIBUTIONS

Arunah Chandran: Conceptualization; methodology; writing – original draft; writing – review and editing. **Anne Mackie:** Conceptualization; writing – review and editing; writing – original draft. **Peter Sasieni:** Writing – review and editing; writing – original draft. **Marc Arbyn:** Writing – review and editing; writing – original draft. **Andre L. Carvalho:** Conceptualization; writing – review and editing; writing – original draft. **Clement Chauvet:** Conceptualization; writing – review and editing; writing – original draft. **Walter Prendiville:** Conceptualization; writing – review and editing; writing – original draft. **Elisabete Weiderpass:** Conceptualization; writing – review and editing; writing – original draft. **Partha Basu:** Conceptualization; methodology; writing – original draft; writing – review and editing.

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DATA AVAILABILITY STATEMENT

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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APPENDIX A: LIST OF TECHNICAL WORKING GROUP EXPERTS

- Peter Saseini, King's College London, United Kingdom
- Anne Mackie, UK National Screening Committee, United Kingdom
- Marc Arbyn, Unit of Cancer Epidemiology, Belgian Cancer Centre, Belgium
- Silvina Arrossi, CEDES/CONICET, Argentina
- Christine Bergeron, French Society of Colposcopy and Cervicovaginal Pathology, France
- Mame-Yaa Bosomtwi, World Health Organization, Switzerland
- Julia Brotherton, The University of Melbourne, Australia
- Joakim Dillner, Karolinska University Hospital and Head of Unit, Center for Cervical Cancer Prevention, Sweden
- Mary Donnelly, Law School, University College Cork; Director of Law School Staff Development and Welfare; Associate Editor of the International Journal of Law and Psychiatry, Ireland
- Sarah Fitzgibbon, National Screening Service, Ireland
- Gráinne Gleeson, National Screening Service, Ireland
- David Keegan, Clinical Professor of Ophthalmology and Retina (University College Dublin); Consultant Ophthalmic Surgeon (Mater University and Mater Private Hospitals); Honorary Consultant (Temple Street Children's University Hospital), Ireland
- Rachel Kitonyo Devotsu, McCabe Centre for Law and Cancer, based in Nairobi, Kenya
- Ondřej Májek, Institute of Health Information and Statistics of the Czech Republic, Czechia
- Caroline Mason Mohan, National Screening Service, Ireland
- Kirsten McCaffery, School of Public Health, The University of Sydney, Australia
- Dearbhail McDonald, Eisenhower Fellow; Author of Bust: How the Courts Have Exposed the Rotten Heart of the Irish Economy (Penguin, 2010)
- Raúl Murillo, Javeriana Oncology Center, San Ignacio University, Colombia
- Fiona Ness, National Screening Service, Ireland
- Groesbeck Parham, Department of Obstetrics and Gynecology, University of North Carolina, USA
- Philippa Pearmain, NHS England and NHS Improvement, United Kingdom
- Linda Rabeneck, Professor of Medicine and Professor at Dalla Lana School of Public Health, University of Toronto, and Senior Scientist at ICES, Canada
- David Ritchie, Association of European Cancer Leagues, Belgium; International Agency for Research on Cancer, Lyon, France
- Vasco Rosa Dias, Instituto de Saúde Pública da Universidade do Porto, Portugal
- Nóirín Russell, National Screening Service, Ireland
- Robert Smith, Cancer Screening, American Cancer Society, USA
- Cherian Varghese, Department of Noncommunicable Diseases, World Health Organization, Switzerland