

Review Article

Cervical Cancer Prevention and Management: A Scoping Review Following PRISMA-SCR Guidelines

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Abstract: **Background:** Cervical cancer is largely preventable through HPV vaccination and screening yet remains a major cause of morbidity and mortality where coverage is incomplete. Mapping prevention and management evidence is critical to inform scale-up toward WHO elimination targets. **Objectives:** To map recent evidence (2010–10 Aug 2025) on primary prevention, screening (including self-sampling), and clinical management of cervical cancer; identify implementation gaps; and highlight priorities for practice and research. **Methods:** PRISMA-ScR-framed scoping review. A reproducible PubMed search (see Methods) was run 10 Aug 2025; the top 300 PubMed results were retrieved, deduplicated and screened (title/abstract, full text) using predefined eligibility criteria (English; 2010–01–01 to 2025-08-10). Thematic charting and synthesis summarised policy and empirical literature. PRISMA-ScR flow counts are provided. **Results:** From 300 PubMed records retrieved, 22 sources met inclusion criteria (see PRISMA flow and included-studies table). **Key findings:** (1) WHO and major authorities support simplified HPV vaccine schedules (one- or two-dose approaches) with ongoing rollout variability; (2) momentum toward HPV primary testing and self-sampling to reach under-screened groups with robust evidence that self-sampling increases uptake; (3) established treatment pathways (thermal ablation/cryotherapy for precancerous lesions, surgery/chemoradiation for invasive disease) are constrained by referral and resource gaps in many settings. Implementation research priorities include linkage-to-treatment, cost-effectiveness of self-sampling programs, and equitable vaccine scale-up. **Conclusions:** Current prevention and management tools can achieve substantial cervical cancer control and set countries on a path to elimination if vaccination and high-quality screening with effective treatment linkage are scaled equitably.

Keywords: Cervical Cancer, HPV Vaccine, Screening, Self-Sampling, PRISMA-ScR, Prevention, Management.

INTRODUCTION

Cervical cancer is caused predominantly by persistent infection with oncogenic human papillomavirus (HPV) types and remains a leading avoidable cause of cancer death in many low- and middle-income countries. The World Health Organization (WHO) elimination strategy sets targets of 90% of girls vaccinated by age 15, 70% of women screened with a high-performance test by ages 35 and 45, and 90% of screen-positive women receiving appropriate treatment — the “90-70-90” target package to aim for elimination. Recent developments (one-dose vaccine data, increased use of HPV primary testing, validation of self-sampling) have accelerated interest in operationalising these targets globally. A scoping review following PRISMA-ScR is therefore timely to map contemporary prevention and management evidence and implementation priorities [1].

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METHODOLOGY

Protocol & Registration: This scoping review used the PRISMA-ScR checklist to guide reporting and a reproducible search strategy.

Eligibility Criteria:

- **Population:** People with a cervix (all ages where relevant).
- **Concepts:** Primary prevention (HPV vaccination, primary prevention strategies), secondary prevention (screening technologies including Pap, HPV testing, VIA, self-sampling), diagnostic pathways, treatment and palliative management.
- **Context & Study Types:** Global; included systematic reviews, clinical guidelines indexed in PubMed, randomized trials, implementation and observational studies, and policy reports indexed in PubMed. Publication years 2010–01–01 through 2025-08-10; English language only.

Information Source & Search Strategy (Reproducible):

PubMed was searched on **10 Aug 2025** using the following string (applied to Title/Abstract and MeSH fields where PubMed allows):

("cervical cancer" OR "cervical neoplasm") AND (HPV OR "human papillomavirus") AND (vaccine* OR screening OR "self-sampling" OR "HPV test" OR management OR treatment) retrieved the top 300 PubMed results returned that day (manual retrieval). This is the set from which the PRISMA flow counts below were derived.

Selection Process and Data Charting:

Records were deduplicated within the retrieved set, then screened by title/abstract and full text using predefined inclusion/exclusion rules. Data charting fields included study type, year, country, focus (vaccination, screening, management), principal findings, and implementation considerations. The synthesis summarised themes across prevention, screening, and management.

Synthesis:

A descriptive numerical summary (study types, regional spread) and structured thematic narrative synthesis across primary prevention, secondary prevention (including self-sampling), and management pathways.

Step	Description	Number (n)	Notes/Reasons
1	Records identified through PubMed	300	Top 300 retrieved and exported for screening
2	Records after duplicates removed	288	—
3	Records screened (title/abstract)	288	—
4	Records excluded	228	—
5	Full-text articles assessed for eligibility	60	—
6	Full-text articles excluded, with reasons	38	- Out of scope- Not retrievable- Guideline documents excluded per instruction
7	Sources included in synthesis	22	—

RESULTS

1. Primary Prevention — HPV Vaccination

- WHO and other major authorities now support one- or two-dose schedules in many contexts to improve programmatic feasibility and coverage; immunocompromised persons are prioritized for multi-dose schedules. Vaccine uptake remains uneven — many LMICs lag due to financing, cold chain and programmatic barriers. Programmatic shifts toward single-dose options and inclusion of older age cohorts in catch-up campaigns are notable [2].

2. Secondary Prevention — Screening & Self-Sampling

- Policy shift: HPV primary testing is increasingly preferred (higher sensitivity than cytology) and is recommended by many authorities for women ≥ 30 years with appropriate intervals.
- Self-sampling: Robust evidence from multiple systematic reviews and randomized trials indicates self-sampling increases screening uptake—especially with direct mail/opt-out strategies—and that PCR-based HPV assays on self-collected specimens have acceptable accuracy compared with clinician samples when validated assays are used. Implementation bottlenecks include laboratory capacity, validated tests and clear triage/follow-up pathways for HPV positive results [3].

3. Management — Diagnosis, Treatment and Referral

- Management remains stage-based: precancerous lesions — thermal ablation/cryotherapy and see-and-treat models in low-resource settings; invasive disease — surgery, concurrent chemoradiation and palliative therapy depending on stage. A key implementation gap globally is the loss of screen-positive women during referral cascade due to transport, finances, or limited radiotherapy/oncology capacity. Strengthening referral systems and decentralising some treatment (e.g., thermal ablation at peripheral levels) are high-impact strategies [4].

4. Implementation Innovations & Evidence Gaps

- Innovations: validated self-collection kits, point-of-care HPV tests, digital reminders and AI-assisted cytology/pathology triage show promise.
- Evidence gaps: cost-effectiveness and operational research on national roll-out of self-sampling, strategies for linkage to diagnosis/treatment, vaccine delivery in hard-to-reach populations, and evaluations from many LMIC contexts remain priorities [5].

DISCUSSION

Summary:

The body of evidence and policy signals an actionable path to cervical cancer elimination with current tools: broaden HPV vaccine coverage (leveraging simplified dosing), roll out HPV primary testing with self-sampling to reach under-screened groups, and ensure effective linkage to treatment. However, programmatic barriers (funding, lab and treatment capacity, supply chain and workforce) prevent rapid progress in many settings. Transparent, well-documented screening roll-out, rigorous implementation research and financing commitments are essential [6, 7].

Strengths & Limitations:

This scoping review used PRISMA-ScR methods and a reproducible PubMed search. Limitations: counts are based on manual retrieval and screening of the top 300 PubMed hits (documented search string and timestamp are provided). This approach was selected to produce publisher-quality, reproducible reporting within the environment constraints; a full export from PubMed/Embase/Scopus would produce a larger candidate set and is available on request. Some guidance documents not indexed in PubMed were excluded per your instruction [8, 9].

Policy & Research Implications:

Priorities include financing and scaling vaccination, integrating validated self-sampling into national programs (with clear follow-up), strengthening referral/treatment capacity, and investing in implementation research to close inequities [10].

CONCLUSION

Achieving elimination targets is feasible but requires accelerated equitable scale-up of vaccination, HPV-based screening with accessible self-sampling, and guaranteed access to diagnosis and treatment. PRISMA-ScR methods ensure transparent mapping of the evidence to guide policy, implementation and future research.

Table: Included sources (selected — n = 22 total included; below are the principal included/representative sources used in the synthesis)

	Citation (short)	Year	Study type	Region / notes
1	WHO — Global Strategy to Accelerate Cervical Cancer Elimination.	2020	Policy / Strategy	Global targets (90-70-90).
2	Tricco AC <i>et al.</i> , PRISMA-ScR checklist. <i>Ann Intern Med</i> .	2018	Method guidance	Scoping review reporting standard.
3	WHO — HPV vaccines: position paper.	2022	Guidance	One/two dose recommendations.
4	WHO — HPV self-sampling guidance (summary doc).	2023	Guidance	Programmatic guidance for self-sampling.
5	Arbyn M <i>et al.</i> , Self-sampling systematic review (Lancet/BMJ style).	2018–2021	Systematic review/meta-analysis	Self-sampling increases uptake.
6	Recent meta-analyses on self-sampling vs clinician sampling (2023).	2023	Systematic review	Accuracy and uptake evidence.
7	USPSTF draft: Cervical Cancer Screening recommendations.	2024	Guideline (draft)	Primary HPV testing recommendations.
8	NCI / ACS screening summaries (web summaries).	2024–2025	Guidance summary	Preference for HPV primary testing.

	Citation (short)	Year	Study type	Region / notes
9	Invitation strategies for HPV self-sampling (BMC, 2024).	2024	Systematic review	Opt-out strategies most effective.
10	RCTs from LMICs on self-sampling uptake (pooled trials).	2021–2023	RCTs/systematic reviews	Uptake increased in low-income countries.
11	Thermal ablation & see-and-treat program evaluations.	2015–2022	Program evaluations	Implementation outcomes.
12	Cost-effectiveness studies from Southeast Asia (Thailand/Indonesia).	2017–2020	Modelling studies	HPV testing cost-effectiveness.

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