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Barriers to Accessing Cervical Cancer Screening and Treatment in the Amazon Region – A Systematic Review

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INTRODUCTION

Review question / Objective According to the PICO framework: P (Population): women of any age who permanently reside in the Amazon Region, including urban and rural areas of the countries that comprise it, with or without a diagnosis of cervical cancer and who have been the target of screening or treatment programs. I (Intervention): services, programs, and policies aimed at cervical cancer screening—such as Pap smear, cytopathology, and HPV-DNA testing—as well as interventions related to treatment. C (Comparison): not directly applicable; however, comparisons across population subgroups may be considered, including race/ethnicity, income level, urban versus rural residence, and country. O (Outcome): barriers to access, including geographical, socioeconomic, cultural, linguistic, organizational, and health system–related factors, as well as analyses of intersectionality and combined vulnerabilities that influence screening behaviors and adherence to treatment.

Rationale The Amazon Region spans over 7 million square kilometers, corresponding to approximately 6% of the Earth's surface. It is a transboundary biome that spans eight countries, encompassing more than 40% of South America's surface area. Despite its vast resources, this region has historically undergone various human interventions, culminating in complex issues such as low social and economic indicators, poor quality of basic public services, and difficulties in accessing healthcare.

Although populations in the Amazon Region face compounded barriers, existing studies are fragmented and confined to local contexts, and a systematic review addressing the topic is still lacking. By systematically synthesizing evidence across the countries and states of the Amazon Basin, this review aims to generate an integrated understanding of the barriers women face in accessing cervical cancer screening and treatment, and to identify actionable strategies for improving equity in cancer prevention and care.

Condition being studied Cervical cancer (CC) ranks fourth among cancers diagnosed in women. The epidemiology of CC varies considerably across countries and even within national borders, and much of this variation reflects uneven access to screening programs, treatment, and vaccination. In the literature, researchers have found that CC incidence and mortality may reach levels up to eight times higher in low-income settings.

In places with limited resources, gaps in primary care and consistent screening continue to obstruct successful cancer treatment. In this review, access is defined as the ability to seek and receive appropriate healthcare when individuals recognize a need. It is shaped by a mix of factors, including individual and family circumstances, social and geographic conditions, and the organization and performance of health systems and providers. In most developed societies, access to quality healthcare is widely regarded as a fundamental right.

Since more vulnerable populations face the most significant barriers to early detection and treatment, low levels of education and income have been associated with CC development in the literature. Various other factors can hinder screening and treatment, including a lack of knowledge about the disease and the necessary tests, as well as insufficient professional training.

METHODS

Search strategy This systematic literature review followed the PRISMA 2020 Guidelines. A literature search was performed on the following databases: PubMed/MEDLINE, Web of Science, and SciELO. There are no language or date restrictions for each search in the mentioned databases. Other studies were identified through contacting authors or experts and by checking the reference lists (backward citation searching). The search was conducted using a structured combination of MeSH terms, keywords, and free-text terms. This systematic review included quantitative studies, such as population surveys, analyses of screening coverage or adherence data, and observational designs (cross-sectional, case–control, or cohort studies); qualitative studies, including semi-structured interviews, focus groups, ethnographies, and other approaches exploring women's perceptions, experiences, and attributed meanings; and mixed-methods studies that combine quantitative and qualitative approaches. In addition, only original articles published in peer-reviewed journals were included.

The search strategy was developed using controlled vocabulary and free-text terms, adapted for each database. For PubMed, the search combined five groups of terms: (1) cervical cancer descriptors, including "Uterine Cervical Neoplasms," "cervical cancer," "cervical neoplasm*," "cervix cancer," and similar variants; (2) screening and treatment-related terms, such as "Mass Screening," "Early Detection of Cancer," "Papanicolaou Test," "HPV DNA Tests," "Pap smear," "cytopathology," "colposcopy," "visual inspection with acetic acid," "self-sampling," and a wide range of treatment terms (surgery, conization, LEEP, radiotherapy, chemoradiotherapy); (3) access- and equity-related descriptors, including "Health Services Accessibility," "Healthcare Disparities," "Patient Compliance," "barriers," "access," "inequities," "delay," "time to diagnosis," "out-of-pocket costs," and "health literacy"; (4) population descriptors, including "women," "female," and "human*"; and (5) geographical terms referring to the Amazon Region, such as "Amazon Region," "Amazon Basin," "Amazonia," "Legal Amazon," and "Amazonas." These five groups were combined using the Boolean operator AND to form the final PubMed query.

For Web of Science, the search strategy followed the same conceptual structure, using equivalent terms. The cervical cancer group included expressions such as "Uterine Cervical Neoplasms," "cervical cancer," and "cervical neoplasm*." The screening and treatment group comprised terms including "Mass Screening," "Early Detection of Cancer," "Papanicolaou Test," "self testing," "HPV DNA Tests," "Pap smear," "cytolog*," "colposcop*," "self-sampling," "treatment," "surgery," "hysterectomy," "LEEP," and "radiotherapy." The access-related group included terms such as "Health Services Accessibility," "Healthcare Disparities," "barrier*," "access*," "delay*," "distance," "transportation," and "coverage." The population group included "women," "female," "woman," and "Human*," while the geographical group included "Amazon Region," "Amazon Basin," "Amazonia," "Legal Amazon," and "Amazonas." These components were combined with Boolean logic to form the final Web of Science search.

For SciELO, terms were adapted to include English, Portuguese, and Spanish variations. Cervical cancer–related terms included "Uterine Cervical Neoplasms," "cervical cancer," "câncer de colo de útero," "neoplasia cervical," and "cáncer de cuello uterino." Screening and treatment terms included "Mass Screening," "Early Detection of Cancer," "Papanicolaou Test," "HPV DNA Tests," “Pap smear,” “cytolog*,” “colposcop*,” “self-sampling,” “tratamento,” “cirurgia,” and “radioterapia.” Access-related terms included “Health Services Accessibility,” “Healthcare Disparities,” “barreiras,” “acesso,” “desigualdades,” “custo,” “delay,” and “uptake.” Population terms incorporated “women,” “female,” “mulher,” “mulheres,” “hembra,” and “feminino.” Geographic terms included “Amazon Region,” “Amazon Basin,” “Amazonia,” “Legal Amazon,” “Amazônia,” and “Amazonas.” As in the other databases, all groups were combined with AND to retrieve studies addressing cervical cancer screening or treatment barriers among women living in the Amazon Region.

Participant or population Women of any age group, permanently residing in the Amazon Region (urban and/or rural areas of the countries that make up the Amazon Basin).

Intervention Services, programs, and policies aimed at cervical cancer screening (e.g., Pap smear, cytopathology, HPV-DNA testing) or treatment.

Comparator Not directly applicable.

Study designs to be included Quantitative studies, including population surveys, analyses of screening coverage or adherence data, and observational studies (such as cross-sectional, case-control, or cohort studies); Qualitative studies, including semi-structured interviews, focus groups, ethnographies, and other approaches that explore women's perceptions, experiences, and attributed meanings; Mixed-methods studies combine quantitative and qualitative approaches.

Eligibility criteria Studies that met all of the following criteria were included:
- Studies conducted on women of any age group, permanently residing in the Amazon Region (urban and/or rural areas of the countries that make up the Amazon Basin).
- Studies conducted in any country or administrative subdivision that is part of the Amazon Region, according to a widely accepted geopolitical and/or ecological definition.
- Studies addressing cervical cancer screening (Pap smear, HPV-DNA testing, cytopathology, etc.) and/or treatment.
- Studies describing at least one barrier to accessing cervical cancer screening or treatment, including geographical, socioeconomic, cultural, linguistic, organizational, or health system-related barriers.

Studies presenting any of the following characteristics were excluded:
- Narrative reviews, systematic reviews, or meta-analyses (these will only be consulted for manual search of additional references).
- Case reports or case series, letters to the editor, editorials, comments, conference abstracts, and gray literature that is not peer-reviewed.
- Studies were conducted with participants who are not permanent residents of the Amazon Region.
- Studies conducted exclusively with health professionals, managers, and policymakers, without collecting primary data from the target female population.
- Studies that do not present results related to barriers to accessing cervical cancer screening/diagnosis or treatment.
- Research conducted in regions not included in the geopolitical or ecological definition of the Amazon.

Information sources A literature search was performed on the following databases: PubMed/MEDLINE, Web of Science, and SciELO. Other studies were identified through contacting authors or experts and by checking the reference lists (backward citation searching).

Main outcome(s) Barriers to access (geographical, socioeconomic, cultural, linguistic, organizational, and health system-related), including analysis of intersectionality and combined effects on screening behaviors and treatment adherence.

Data management All references identified through the database searches were transferred to Rayyan (https://rayyan.ai/; accessed November 7, 2025), a widely recognized platform that supports the management of systematic, scoping, and narrative reviews. The software was used to organize and structure the screening workflow, enabling blinded and independent evaluation of titles and abstracts according to the predefined inclusion criteria. The platform automatically detected potential duplicate records; these were reviewed by the research team and removed to avoid redundancy in the dataset.
Screening and selection of studies were conducted independently by two reviewers, who evaluated titles, abstracts, and full texts using predefined eligibility criteria. An agreement between the two reviewers was required for a study to be included. Any discrepancies were resolved through discussion or, when necessary, adjudicated by a third reviewer until consensus was achieved. This approach ensured methodological rigor, minimized

selection bias, and maintained consistency in decision-making.

Data extraction was likewise performed independently by two reviewers using a standardized extraction form. Extracted information included study characteristics, population details, screening and treatment barriers, and key outcomes. Divergences between the two extracted datasets were reconciled through iterative comparison and consensus. When essential information was missing or unclear, the study authors were contacted to clarify methodological details or provide additional data.

Quality assessment / Risk of bias analysis Risk of bias was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies, the JBI Critical Appraisal Checklist for Qualitative Research, the Newcastle–Ottawa Scale (NOS), and the Mixed-Methods Appraisal Tool (MMAT). Two independent authors assessed the risk of bias across specific domains. Each domain was rated as low, high, or moderate, and the overall risk of bias for each study was similarly classified.

Strategy of data synthesis A table was created to systematically present key information from each study, including: first author and year of publication, study title, country, setting of the data source, Amazon context, study objective, study design, data collection tools, population or participants, type of service addressed (screening, treatment, or both), screening method, type of treatment, categories of barriers, facilitators identified, study limitations, and main conclusions. Barriers to access were categorized as geographic, socioeconomic, cultural, communication, organizational, and health system–related, and were analyzed separately for each outcome (screening and treatment). A narrative synthesis was conducted to summarize the results of the included studies.

Subgroup analysis Not directly applicable.

Sensitivity analysis To increase confidence in the synthesized results, sensitivity analyses were conducted by excluding studies of lower methodological quality. Confidence in the body of evidence was assessed qualitatively, prioritizing consistency across studies and the potential for reporting bias. Owing to the limited number of studies from the Amazon Region and the heterogeneity in study designs and outcome measures, a meta-analysis was not feasible. Therefore, the data were examined using a descriptive approach.

Language restriction There are no language restrictions.

Country(ies) involved Brazil and Portugal.

Keywords Cervical cancer; Cervical cancer screening; Cervical cancer treatment; Barriers to care; Barriers to treatment; Equity in healthcare access.

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