ORIGINAL ARTICLE

SOUTH AMERICA AND THE WORLD HEALTH ORGANIZATION'S GOALS FOR THE ELIMINATION OF CERVICAL CANCER

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Highlights: (1) First-dose vaccination coverage targets were met in Ecuador and Brazil. (2) Screening rates exceed 70% in Argentina, Uruguay, Paraguay, Colombia, Chile, Peru. (3) The highest cancer incidence rates were recorded in Bolivia, Paraguay, and Guyana.

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SOUTH AMERICA AND THE WORLD HEALTH ORGANIZATION'S GOALS FOR THE ELIMINATION OF CERVICAL CANCER

ABSTRACT

The World Health Organization (WHO) has established strategic targets to eliminate cervical cancer by 2030. This study evaluates the progress of South American countries toward meeting these targets. Population estimates for South American countries were obtained from the WHO website, the HPV and Cancer Information Center of the Catalan Institute of Oncology (ICO), and the International Agency for Research on Cancer (IARC). In terms of vaccination coverage, Guyana, Colombia, and Suriname reported the lowest first-dose coverage rates, while Guyana, Colombia, Paraguay, and Suriname had the lowest second-dose coverage. Screening coverage exceeded 70% in Argentina, Uruguay, Paraguay, Colombia, Chile, and Peru over the past 5 yr. In terms of treatment, the highest incidence-to-mortality ratios were observed in Suriname (0.62), Uruguay (0.58), Venezuela (0.57), and Argentina (0.56). The findings highlight significant challenges, particularly in Suriname and Venezuela, emphasizing the urgent need for effective public policies and international support to help these countries meet the 2030 targets through strategic and financial interventions.

Keywords: Cervical cancer; HPV vaccine; Public health; Screening programs

INTRODUCTION

Cervical cancer remains a leading cause of morbidity and mortality worldwide,[1] with over 85% of cases and deaths occurring in low- and middle-income countries.[2] The highest morbidity and mortality rates are observed in regions with low human development indices.[3] As of 2018, South America accounted for approximately 10% of global cervical cancer diagnoses.[4]

To combat this public health challenge, the World Health Organization (WHO) introduced a comprehensive strategy aimed at eliminating cervical cancer by 2030. The initiative focuses on three key targets: (a) achieving 90% HPV vaccination coverage among adolescents, (b) ensuring at least 70% of women undergo cervical screening twice in their lifetime, and (c) providing treatment to 90% of individuals diagnosed with pre-invasive or invasive cervical cancer.[5] However, despite these efforts, the incidence and

mortality rates in many South American countries remain significantly above the WHO-recommended threshold, underscoring the persistent burden of the disease.[6]

In response to disparities in HPV vaccination coverage and cervical cancer prevalence between high-income and low- and middle-income countries, the WHO proposed an alternative single-dose HPV vaccination schedule in December 2022. This policy shift aims to enhance vaccine accessibility and improve public health outcomes globally.[7]

This study evaluates the progress of South American countries toward achieving the WHO's 2030 targets, focusing on the three fundamental pillars: vaccination, screening, and treatment.

METHODS

This ecological study utilized data on the female population aged 15 yr or older, cervical cancer incidence and mortality, year of HPV vaccine introduction, target population, first- and second-dose vaccination coverage, screening coverage in the past 5 ys, screening methodologies, referral pathways, and availability of treatment services. The data were retrieved from the WHO's Profile of Countries with Cervical Cancer database, the HPV and Cancer Information Center of the Catalan Institute of Oncology (ICO), and the International Agency for Research on Cancer (IARC). The study focused on females aged 15 yr and older, as they are classified as the population at risk for cervical cancer according to the WHO.

Data were extracted into Excel® spreadsheets (Version 2306 Build 16.0.16529.20100). All datasets were publicly accessible and fully available. Descriptive analysis was performed using tabular representations and thematic mapping to illustrate findings.

RESULTS

Vaccination coverage

Vaccination coverage data for 2020 were analyzed. Notably, no data were available for Venezuela. The highest first-dose vaccination were observed in Ecuador

(99%), Argentina (94%), and Brazil (89%). In contrast, Guyana (34%), Colombia (57%), and Suriname (63%) exhibited the lowest coverage rates.

For second-dose coverage, Ecuador (78%), Peru (76%), and Chile (72%) recorded the highest rates, while Guyana, Colombia, Paraguay, and Suriname reported the lowest coverage rates (Figure 1).

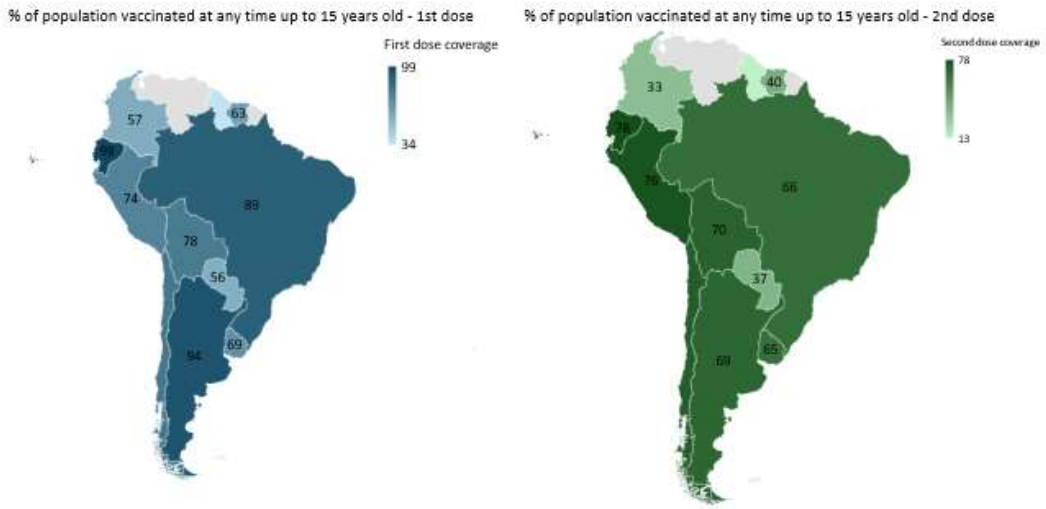

Figure 1. Vaccination coverage of the first and second doses in South American countries (2020). Source: World Health Organization (WHO), HPV and Cancer Information Center of the Catalan Institute of Oncology (ICO), and International Agency for Research on Cancer (IARC)

Screening

Screening rates in Argentina, Chile, Colombia, Paraguay, Peru, and Uruguay have surpassed the 70% cervical cancer screening target. Conversely, Guyana, Suriname, and Venezuela exhibit the lowest screening rates, all below 45%.

Table 1. Population and screening data for South American countries (2020)

Country	Female population over 15 yr (2021)	Screening in the last 5 yr (2019) (%)	Screening at least once (%)	Primary screening test
Argentina	22,940,000	82	89	HPV test
Bolívia	5,733,000	53	63	Cytology
Brazil	107,300,000	41	58	Cytology
Chile	8,100,000	79	91	Cytology
Colombia	20,800,000	74	81	Cytology/IVA/HPV test
Ecuador	6,700,000	55	70	Cytology/HPV test
Guiana	282,685	18	22	IVA
Paraguay	2,410,000	84	86	Cytology
Peru	12,300,000	75	89	Cytology/IVA
Suriname	213,731	30	40	—s
Uruguay	1,440,000	71	93	Cytology
Venezuela	10,300,000	45	54	Cytology

Source: World Health Organization (WHO) and International Agency for Research on Cancer (IARC).
Note. VIA, visual inspection with acetic acid.

Treatment

Cervical cancer treatment efficacy is reflected in mortality rate reductions. Bolivia (34.1 per 100,000 women), Paraguay (33.5), and Guyana (30.9) report the highest incidence rates. In contrast, Uruguay (15.2), Chile (15.5), and Brazil (16.4) exhibit the lowest rates. However, Suriname (0.62), Uruguay (0.58), Venezuela (0.57), and Argentina (0.56)report the highest incidence-to-mortality ratios, whereas Brazil (0.52)

and Guyana (0.52) have the lowest. Notably, Guyana, Paraguay, and Venezuela lack structured early detection programs.

Table 2. Incidence of cervical cancer, mortality, and early detection programs in South America (2020)

Country	Cervical cancer incidence per 100,000 women	Incidence-to-mortality ratio	Early detection program/guidelines
Argentina	19.8	0.56	Yes
Bolívia	34.1	0.53	Yes
Brazil	16.4	0.52	Yes
Chile	15.5	0.53	Yes
Colombia	18.3	0.53	Yes
Ecuador	17.4	0.53	Yes
Guyana	30.9	0.52	No
Paraguay	33.5	0.55	No
Peru	25.7	0.54	Yes
Suriname	26.7	0.62	Yes
Uruguay	15.2	0.58	Yes
Venezuela	25.7	0.57	No

Source: World Health Organization (WHO), HPV and Cancer Information Center of the Catalan Institute of Oncology (ICO), and International Agency for Research on Cancer (ICO/IARC).

DISCUSSION

To eliminate cervical cancer as a public health concern, the WHO aims to achieve 90% HPV vaccination coverage among girls by age 15.[7] Notably, the WHO's endorsement of a single-dose HPV vaccine—validated through observational studies, ecological analyses, and a randomized clinical trial[8]—could enhance accessibility while mitigating logistical and financial challenges.

In South America, the implementation of a single-dose vaccine could significantly increase the vaccinated population. This approach has enabled Ecuador, Argentina, and Brazil to meet the vaccination target for individuals up to 15 yr of age, with coverage rates of over 90% in Ecuador and Argentina and 89% in Brazil. Notably, Brazil expanded its vaccination program to include boys in 2017 to enhance herd immunity.[9]

However, the requirement for a second dose presents a more challenging scenario, as no country in the region meets the target. Ecuador has the highest second-dose coverage at 76%. The lowest first-dose vaccination rates were observed in Guyana (34%), Colombia (57%), and Suriname (63%). The second dose poses an even greater challenge, with Guyana (13%), Colombia (33%), Suriname (40%), and Paraguay (37%) all reporting coverage below 50%.[9]

Identifying barriers to vaccination is crucial for improving coverage rates. Guyana, which introduced its HPV vaccination program in 2017, has the most recent initiative in this region. However, program longevity does not necessarily correlate with higher vaccination rates, as Colombia, despite launching its program in 2012, has struggled with low uptake.[9] Suriname introduced school-based HPV vaccination for girls aged 10 to 12 in 2013, a strategy[10] generally associated with higher coverage. Colombia has the largest vaccination target population (9–17 yr), followed by Guyana (9–16 yr), which may contribute to lower coverage rates despite higher absolute numbers of vaccinated individuals.

The WHO's screening targets emphasized two key objectives: vaccinating over 70% of the population and transitioning to HPV DNA testing. Equitable access to screening programs remains a significant challenge in South America, where no country has an organized screening system with active invitations. Over the past 5 yr, Argentina,

Uruguay, Paraguay, Colombia, Chile, and Peru have achieved screening coverage above 70%, collectively representing 34.25% of South America's population over 15 yr of age. Conversely, Ecuador, Brazil, Bolivia, Suriname, Guyana, and Venezuela have failed to meet this benchmark. Bolivia, despite its vaccination coverage of 78% for the first dose and 70% for the second, highlights the potential for primary prevention efforts. In contrast, Ecuador and Brazil achieved high first-dose coverage (99% and 89%, respectively), but their second-dose rates dropped to 78% and 66%, potentially undermining the impact of their vaccination programs.

Guyana, one of the poorest countries in the Western Hemisphere, faces significant challenges, with 35% of its population living in absolute poverty.[11] The country has the lowest vaccination rates for both doses (34% and 25%) and an extremely low cervical cancer screening rate (18%) over the past 5 yr. Guyana's national screening program relies on visual inspection with acetic acid (VIA), targeting women aged 30–49 yr.[11] Suriname, where cervical cancer remains a leading cause of cancer-related deaths in women, lacks an official cancer registry. Available data from the International Agency for Research on Cancer (IARC)[10] suggest that cervical cancer rates have remained stagnant since 1990, likely due to the absence of organized prevention programs. The country's first-dose vaccination coverage is 63%, but second-dose coverage falls to 40%, and only 30% of the target population has undergone screening in the past 5 yr, raising concerns about its ability to meet WHO targets.[9]

Venezuela presents one of the most alarming cases, as it lacks an evaluation and monitoring system for its National Cancer Control Program. The country has no official cancer data, making it difficult to assess the disease's epidemiology in recent years.[12]

The recognition of human papillomavirus (HPV) as the primary cause of cervical cancer has led to the adoption of the HPV DNA test, which offers greater sensitivity in detecting preneoplastic lesions and enables safer screening intervals.[13] Among South American countries, only Ecuador (for women aged 30 and above) and Colombia have integrated HPV DNA testing into their screening programs. Colombia's 2018 resolution mandates Pap smears for women aged 25–30, HPV testing for women aged 30–69, and VIA for remote populations with limited healthcare access.[3]

The disease burden can be assessed by incidence and mortality rates, which depend on early diagnosis and treatment accessibility. The WHO aims to ensure treatment for 90% of affected individuals, but this goal is hindered by inadequate infrastructure in several countries. Guyana, Paraguay, and Venezuela lack guidelines for strengthening early detection. Additionally, Venezuela and Paraguay have no defined referral system from primary to tertiary care. Bolivia, Paraguay, and Guyana report the highest cervical cancer incidence rates (>30 cases per 100,000 women), while mortality rates are highest in Guyana, Suriname, and Venezuela.[9] Despite this, Suriname has comprehensive cancer care services. In contrast, Guyana and Venezuela lack pathology and radiotherapy services, limiting access and increasing treatment costs due to cross-border travel.[9]

The highest HPV vaccination coverage rates in South America are found in Ecuador, Argentina, and Brazil. Regarding screening, Argentina, Uruguay, Paraguay, Colombia, Chile, and Peru have surpassed the 70% target. However, Bolivia, Paraguay, and Suriname report cervical cancer incidence rates above 30 per 100,000 women, while Suriname, Uruguay, and Venezuela exhibit the highest incidence-to-mortality ratios.

A major limitation of this study is data reliability, as it relies on multiple databases, raising concerns about accuracy.

CONCLUSION

South America's progress toward WHO vaccination and screening targets is uneven. Venezuela presents the most concerning case due to the absence of reliable data. Guyana, Colombia, and Suriname have the lowest vaccination rates and require urgent policy interventions to strengthen primary prevention efforts. Screening results are particularly poor in Guyana, Suriname, and Venezuela, indicating failures in both primary and secondary prevention. Additionally, Suriname and Venezuela report some of the highest cervical cancer incidence-to-mortality ratios, highlighting deficiencies in early diagnosis and access to treatment. Bolivia, Guyana, Suriname, and Venezuela have the highest cervical cancer incidence rates per 100,000 women.

The urgent need for effective public health policies and international support is evident. To meet the 2030 targets, these countries require strategic and financial assistance to enhance HPV vaccination coverage, improve screening programs, and

ensure timely treatment access. Strengthening these efforts will be essential to reducing HPV transmission and cervical cancer cases.

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