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Special report

Systematic literature review of primary and secondary cervical cancer prevention programs in South America

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ABSTRACT

Objective. To identify the 2022 recommendations made by ministries of health in the 13 countries and areas of South America for human papillomavirus (HPV) vaccination and cervical cancer screening.

Methods. A systematic review of scientific literature and official documents was conducted between July 7 and October 17, 2022. The review included an initial search on official websites (e.g. ministries of health, national cancer institutes and health departments) of South American countries to identify current guidelines or recommendations for HPV vaccination and cervical cancer screening.

Results. Recommendations for HPV vaccination were found for 11 countries, with the exceptions of French Guiana and the Bolivarian Republic of Venezuela. Recommendations were found for cervical cancer screening in official documents from 11 countries, with the exceptions of the Bolivarian Republic of Venezuela, where one article was found that was not an official recommendation, and Suriname, for which no documents were found on websites or in other publications. A total of 12 countries use cytology to screen for cervical cancer. Four countries (Bolivia [Plurinational State of], Colombia, Guyana and Peru) use visual inspection with acetic acid and the screen-and-treat strategy. Six countries (Argentina, Chile, Colombia, Ecuador, Paraguay and Peru) are transitioning from cytology to HPV testing.

Conclusions. No documents were found about a national HPV vaccination program in French Guiana and Venezuela, and no official guidelines for cervical cancer screening were found for Suriname and Venezuela; thus, it will be difficult to eliminate this public health problem in these countries. Countries in South America must update their guidelines for HPV vaccination and cervical cancer screening as new evidence emerges. Official websites with information about HPV vaccination and cervical cancer screening are important sources that can be accessed by health professionals and the population.

Keywords Uterine cervical neoplasms; papillomavirus vaccines; mass screening; South America.

Cervical cancer (CC) is the fourth most common cancer in women and the fourth leading cause of death from cancer in women worldwide. In 2020, there were an estimated 604 000 new cases and 342 000 deaths due to the disease worldwide (1). In South America, in 2020 there were an estimated 41 734 new cases of CC and 22 221 deaths related to it (2). Most cases of CC occur in middle-aged women, especially in countries with fewer resources (3).

In 2020, the World Health Organization (WHO) launched a global initiative to eliminate CC as a public health problem (4). This strategy proposes a threshold of 4 cases per 100 000 women-years and the implementation of the triple intervention

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strategy (known as 90-70-90), consisting of vaccinating 90% of girls against human papillomavirus (HPV) by the age of 15 years, screening 70% of women with a high-performance test at the age of 35 years and again at age 45, and treating 90% of identified precancerous lesions and invasive cancers (4).

Successful implementation of primary and secondary prevention measures has reduced CC morbidity and mortality. Primary prevention includes HPV vaccination, and secondary prevention comprises CC screening with the Pap test, visual inspection with acetic acid (VIA), HPV testing, and treatment of precancerous cervical lesions (3, 4). In low- and middle-income countries, a combination of HPV vaccination and screening programs has proven to be a cost-effective strategy for preventing CC (5).

There are three safe and effective HPV vaccines. The first HPV vaccine was approved in 2006 and was the quadrivalent Gardasil® (Merck), which prevents infection with HPV types 6, 11, 16 and 18. In 2009, the bivalent Cervarix® vaccine (GlaxoSmithKline Biologicals) was approved, which prevents infection with HPV types 16 and 18. More recently, in 2014, the 9-valent Gardasil 9® vaccine (Merck) was approved, and this prevents infection with HPV types 6, 11, 16, 18, 31, 33, 45, 52 and 58 (6).

The Pap test reduces CC incidence and mortality in low- and middle-income countries. However, the method has limitations, such as low sensitivity, which requires repeated tests; the dependence on laboratory infrastructure and trained professionals; the high possibility of loss to follow up; and difficulties in implementing the rigorous, necessary quality control procedures (7).

TABLE 1. Inclusion and exclusion criteria using the PICO (population, interventions, comparators, outcomes) framework and other criteria for documents about human papillomavirus screening and vaccination and cervical cancer screening, South America, 2022

Category	Criteria	
	Inclusion	Exclusion
Population	• Women and girls eligible for HPV vaccination and screening for CC • Boys eligible for HPV vaccination program	• Pregnant women • Women who had a hysterectomy • Women with HIV • Postmenopausal women • Women with altered Pap test results • Females ineligible for the screening program (e.g. infants and children)
Intervention	• HPV vaccination program • CC screening strategies	• Women with a diagnosis of CC and treatment for other types of cervical disease
Comparators	NA	NA
Outcomes	• Year of introduction of the HPV vaccine (girls and boys) • Current age for initiation of screening or vaccination and number of vaccine doses (girls and boys) • Specific population receiving HPV vaccination, ages for vaccination and number of vaccine doses • Type of HPV vaccine used • Country income classification • Screening guidelines available and year published • Type of screening (cytological, VIA or HPV test, or a combination) • Target population for screening • Screening interval	• Information that does not meet the research objective
Country or area scope (South America)	• Argentina • Bolivia (Plurinational State of) • Brazil • Chile • Colombia • Ecuador • French Guiana • Guyana • Paraguay • Peru • Suriname • Uruguay • Venezuela (Bolivarian Republic of)	• Countries not listed in the inclusion criteria
Documents	• Manuals • Guidelines • Recommendations • Clinical practice guides • Standards • Laws • Government regulations • Review articles	• Observational studies (cohort studies, case–control studies, cross-sectional studies) • Editorials • Letters • Randomized controlled trials • All other types of documents not listed under inclusion criteria
Language	• All	• No exclusion based on language

CC: cervical cancer; HPV: human papillomavirus; NA: not applicable; VIA: visual inspection with acetic acid.
Source: Table prepared by the authors.

VIA has become an alternative in places with limited resources that do not have access to Pap testing and HPV testing because both of those tests require laboratory infrastructure and trained staff. VIA is the only screen-and-treat test that requires no laboratory infrastructure and delivers immediate results. However, its disadvantages are the subjective nature of the test, the need for staff training and the high false-positive rate (8).

HPV testing is promising, especially due to the limitations of the Pap test and VIA (4, 9). Compared with other screening tests, the HPV test is more objective as its processing is automated, and the results do not require subjective interpretation (9). However, the economic challenges faced by some countries are the main factors restricting its implementation throughout South America. While implementing the HPV test may require higher initial costs for supplies and equipment, this alternative is more cost effective in the long run than VIA or the Pap test (9).

Few studies of CC have taken place in South America, which indicates the need to strengthen research on this continent (10). To achieve better disease outcomes, it is essential to understand how vaccination programs against HPV and how CC screening programs are carried out in South America. This review aimed to identify the 2022 recommendations for HPV vaccination and CC screening from ministries of health in South America.

METHODS

Study design and search strategy

A systematic review of the scientific literature and official documents was guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (11). The search was conducted from July 7 to October 17, 2022. Since the review does not meet some prerequisites needed for registration with the International Prospective Register of Systematic Reviews (PROSPERO), it has not been registered.

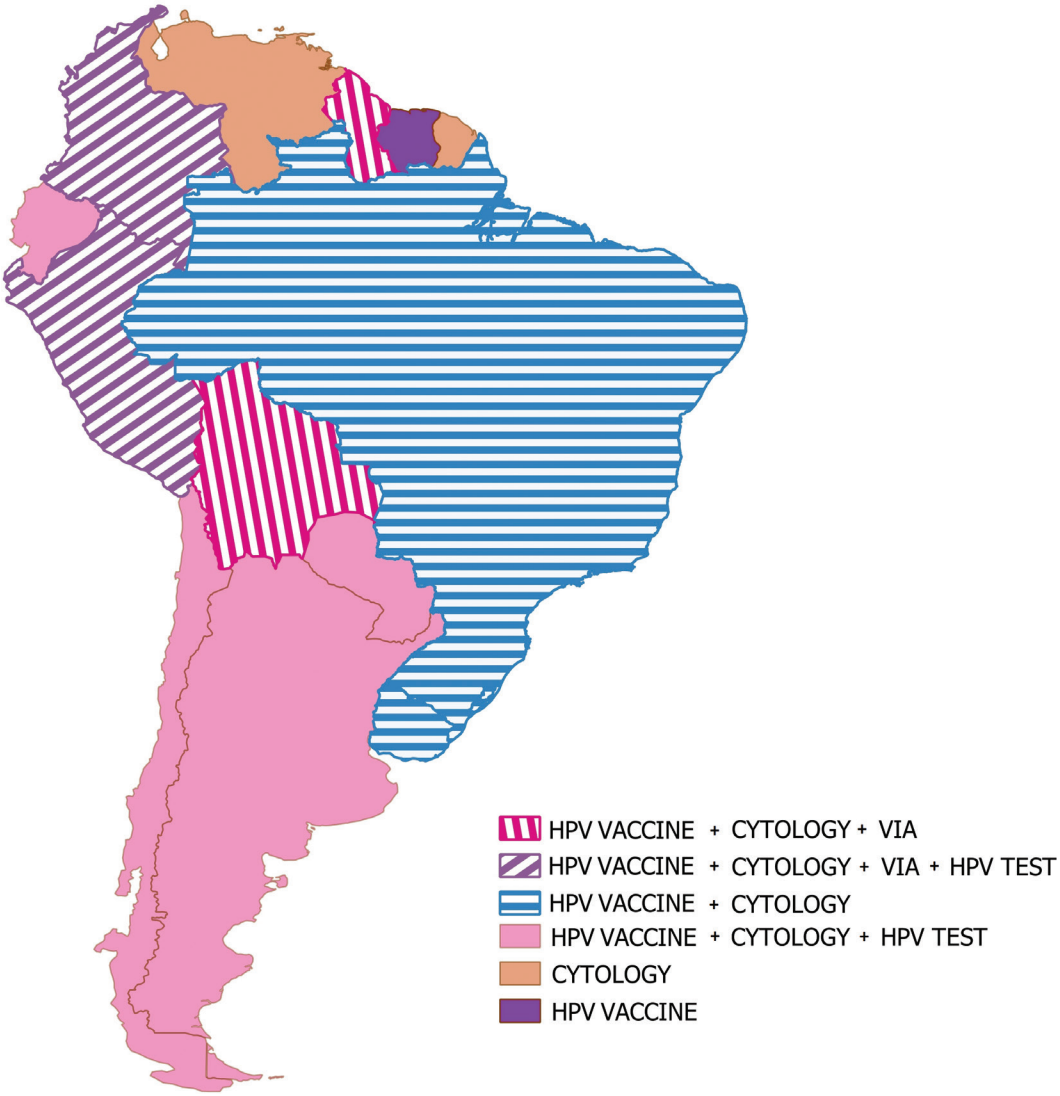
The review included an initial search of official websites (e.g. ministries of health, national cancer institutes and health departments) for the 13 countries and areas of South America

TABLE 2. Search strategy used for Ministry of Health websites, national health departments and national cancer institutes, by country or area, South America, 2022

Country or area	Website	Search terms	
		HPV vaccination	Screening
Argentina	https://www.argentina.gob.ar/	• Vacuna contra el VPH	• Tamizaje • Cáncer cervicouterino • Test de VPH
Bolivia (Plurinational State of)	https://www.minsalud.gob.bo/es/	• Vacuna contra el Virus del papiloma humano, VPH	• Tamizaje • Cáncer cérvico uterino • Cáncer de cuello uterino
Brazil	https://www.gov.br/inca/pt-br	• Vacina contra o HPV	• Rastreamento do câncer do colo do útero • Câncer do colo do útero
Chile	https://www.minsal.cl/	• Vacuna contra el VPH • Vacunación contra el virus del papiloma humano, VPH	• Cáncer Cervicouterino
Colombia	https://www.minsalud.gov.co	• Vacuna tetravalente contra el VPH	• Cáncer de cuello uterino • Detección temprana del cáncer de cuello uterino
Ecuador	https://www.salud.gob.ec/	• Vacuna contra el virus del papiloma humano	• Cáncer cervicouterino • Cáncer de cuello uterino • Cáncer de cérvix
French Guiana	https://www.guyane.ars.sante.fr/	• Vaccination contre l'HPV	• Cancer du col de l'utérus • Dépistage du cancer du col de l'utérus
Guyana	https://www.health.gov.gy/ https://dpi.gov.gy/	• Human papillomavirus (HPV) vaccine • HPV vaccination	• Cervical cancer
Paraguay	https://www.mspbs.gov.py/index.php	• Vacunación contra VPH	• Cáncer de cuello uterino • Test de VPH • Prueba del VPH
Peru	https://www.gob.pe/minsa	• Vacuna VPH • Vacuna contra el VPH	• Cáncer de cuello uterino
Suriname	https://gov.sr/ministeries/ministerie-van-volksgezondheid/	• Humaan papilloma virus	• Baarmoederhalskanker • Preventie en Controle van Baarmoederhalskanker
Uruguay	https://www.gub.uy/ministerio-salud-publica/home	• Vacunación contra el virus del papiloma humano • Vacuna tetravalente contra el VPH	• Cáncer de cuello uterino • Tamizaje de cáncer de cuello uterino
Venezuela (Bolivarian Republic of)	http://mpps.gob.ve/	• Vacunación contra el virus del papiloma humano • Vacuna VPH • Vacuna contra el VPH	• Cáncer cervicouterino • Cáncer de cuello uterino • Tamizaje de cáncer de cuello uterino

HPV: human papillomavirus; VPH: virus del papiloma humano (human papillomavirus).
Source: Table prepared by the authors.

FIGURE 1. Recommendations for primary and secondary prevention of cervical cancer, by country, South America, 2022



HPV: human papillomavirus; VIA: visual inspection with acetic acid.
Source: Figure prepared by the authors based on published data.
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(Argentina, Bolivia [Plurinational State of], Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela [Bolivarian Republic of]) to identify current guidelines or recommendations, or both, for HPV vaccination and CC screening. Additionally, if documents were not found on the official websites of national health authorities, a systematic search was performed in PubMed, without year or language restrictions, using a combination of medical subject heading (i.e. MESH) terms and keywords relevant to HPV vaccination ("HPV vaccine") and CC ("cervical cancer" AND "screening" AND "cervical cancer screening") for each country.

Eligibility criteria

To be eligible for inclusion in the review, documents had to describe in detail official national recommendations for HPV vaccination and CC screening; documents could be manuals, guidelines, recommendations, clinical practice guides, standards, laws or government regulations, or review articles. For analysis purposes, countries without identifiable official recommendations were considered to have no HPV vaccination and CC screening programs.

The PICO (population, interventions, comparators, outcomes) criteria and other eligibility criteria are shown in Table 1. Search strategies for each ministry of health's website are shown in Table 2. Since this is a review study, ethical approval was not required.

Data extraction and synthesis

Documents were assessed by four reviewers (MLSG, NSM, LCM, RRS) with language skills appropriate to the studies and guidelines. The reviewers searched the websites of the national health authorities in each country according to their respective

language skills (i.e. Dutch, French, Portuguese or Spanish). A Microsoft Excel spreadsheet was used for data extraction. Extracted data included information about the HPV vaccination program (i.e. year of vaccine introduction for boys and for girls, target ages for vaccination, number of doses, specific populations targeted, and which HPV vaccine was currently used); classification of each country by income level, using the 2021 World Bank classifications (12); information about the CC screening program (whether a guideline existed and year of publication, type of test [cytology, VIA, HPV], eligible ages for screening and screening intervals).

The data were categorized and analyzed thematically to identify recurring relationships by HPV vaccination program, the availability of a guideline and type of test (cytology, VIA or HPV test), and to facilitate synthesis of the information.

RESULTS

Of the 13 countries and areas in South America, 8 (61.5%) were classified as upper-middle income, 2 (15.4%) as high income, 2 (15.4%) were not classified, and 1 (7.7%) was classified as lower-middle income. Recommendations for HPV vaccination were found for 11 countries or areas, with the exceptions of French Guiana and Venezuela. Recommendations for CC screening were found in official documents for 11 countries, except in Venezuela, where one article was found that was not an official recommendation (13), and in Suriname, for which no documents were found (Figure 1). Detailed information is available in Tables 3 and 4.

HPV vaccination

The HPV vaccine was initially introduced for girls in 2011 in Argentina and Peru, and then in 2012 in Colombia; in 2013 in Paraguay, Suriname and Uruguay; in 2014 in Brazil, Chile and Ecuador; and in 2017 in Bolivia and Guyana. Only five countries include HPV vaccination for boys: boys were added in 2017 in Argentina and Brazil and in 2019 in Chile, Guyana and Uruguay. The inclusion of vaccination for boys guarantees the rights of both genders since HPV is transmitted by both

TABLE 3. Human papillomavirus vaccination in national immunization programs, by country or area, South America, 2022

Country or area (reference)	Year HPV vaccine introduced	Current age for girls/ no. of doses	Current age for boys/ no. of doses	Specific populations/age/ doses	Current HPV vaccine
Argentina (14)	Girls: 2011 Boys: 2017	11 years/2 doses	11 years/2 doses	HIV-positive, organ transplant recipient/11–26 years/3 doses	Quadrivalent
Bolivia (Plurinational State of) (15)	Girls: 2017	10 years/2 doses	NR	NR	Quadrivalent
Brazil (16)	Girls: 2014 Boys: 2017	9–14 years/2 doses	9–14 years/2 doses	HIV-positive, person living with AIDS, organ transplant recipient, cancer patient, immunocompromised people/9–45 years/3 doses	Quadrivalent
Chile (17)	Girls: 2014 Boys: 2019	9–13 years/2 doses 14–17 years/ 3 doses	9–13 years/2 doses	HIV-positive, person living with AIDS, recipient of hematopoietic stem cell transplant, organ transplant recipient, survivor of sexual violence/9–26 years/3 doses	Quadrivalent
Colombia (18)	Girls: 2012	9–17 years/2 doses	NR	Girls: HIV-positive, organ transplant recipient, cancer patient, immunocompromised people/ ≥9 years/3 doses	Quadrivalent
Ecuador (19)	Girls: 2014	9 years/2 doses	NR	NR	Quadrivalent
French Guiana	NR	NR	NR	NR	NR
Guyana (20)	Girls: 2017 Boys: 2019	9–16 years/2 doses	9–16 years/2 doses	NR	Quadrivalent
Paraguay (21)	Girls: 2013	9–14 years/2 doses	NR	Girls: HIV-positive, organ transplant recipient, recipient of hematopoietic stem cell transplant	Quadrivalent
Peru (22)	Girls: 2011	9–13 years/2 doses	NR	HIV-positive women aged <20 years with negative HPV test	Quadrivalent
Suriname (23)	Girls: 2013	9–13 years	NR	NR	NR
Uruguay (24)	Girls: 2013 Boys: 2019	11–26 years/2 doses	11–26 years/ 2 doses	HIV-positive people, immunocompromised people/9–26 years/3 doses	Quadrivalent
Venezuela (Bolivarian Republic of)	NR	NR	NR	NR	NR

HPV: human papillomavirus; NR, not reported.
Source: Table prepared by the authors based on published data.

TABLE 4. National cervical cancer screening programs, by country or area, South America, 2022

Country or area (reference)	Country income classification[a]	Screening guideline available (year)	Cytological screening[b]	Visual inspection with acetic acid	HPV test
Argentina (25, 26)	Upper middle	Yes (2015)	Age: 25–29 Interval: 1-1-3	NR	Age: 30–64 years Interval: 5 years
Bolivia (Plurinational State of) (27)	Lower middle	Yes (2013)	Age: 25–64 Interval: 1-1-3	Age: 25–64 Interval: 1-1-3	NR
Brazil (28)	Upper middle	Yes (2016)	Age: 25–64 Interval: 1-1-3	NR	NR
Chile (29)	High	Yes (2015)	Age: 25–64 Interval: 1-3-3	NR	Age: 30–64 years Interval: 5 years
Colombia (30)	Upper middle	Yes (2018)	Age: 25–29 Interval: 1-3-3	Age: 30–50 Interval: 1-3-3	Age: 30–65 years Interval: 5 years
Ecuador (31)	Upper middle	Yes (2017)	Age: 21–65 Interval: 1-3-3	NR	Age: 30–65 Interval: 5 years
French Guiana (32, 33)	Not classified	Yes (2020)	Age: 25–65 Interval: 1-3-3	NR	NR
Guyana (34)	Upper middle	Yes (2013)	Age: sexually active women Interval: NR	Age: 30–49 Interval: NR	NR
Paraguay (35)	Upper middle	Yes (2015)	Age: sexually active women Interval: 1-1-3	NR	Age: ≥ 30 years Interval: 5 years
Peru (36)	Upper middle	Yes (2019)	Age: 25–64 Interval: 1-2-2	Age: 30–49 Interval: 1-2-2	Age: 30–49 Interval: 5 years
Suriname	Upper middle	NR	NR	NR	NR
Uruguay (37)	High	Yes (2014)	Age: 21–69 Interval: 1-1-3	NR	NR
Venezuela (Bolivarian Republic of) (13)	Not classified	NR	Age: 25–64 Interval: 1-1-3	NR	NR

NR: not reported.
[a] Country income based on 2021 World Bank classifications (12).
[b] Intervals are reported as every 3 years after two consecutive annual normal results (1-1-3) or every 3 years after one negative test (1-3-3) or every 2 years after one negative test (1-2-2).
Source: Table prepared by the authors based on published data.

women and men and is associated with cancer incidence in both genders.

HPV vaccination starts at age 9 years in Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru and Suriname; at 10 years in Bolivia; and at 11 years in Argentina and Uruguay. Chile organized catch-up vaccination schedules for girls aged 14 to 17, using a three-dose schedule. No information about HPV vaccination was available for French Guiana and Venezuela (both of which were not classified according to income).

Ten countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru and Uruguay) use the quadrivalent vaccine and have adopted the two-dose schedule, with a minimum interval of 6 months (i.e. 0-6). For Suriname, the type of vaccine used and the number of doses were not found.

As an additional strategy, seven countries (Argentina, Brazil, Chile, Colombia, Paraguay, Peru and Uruguay) conduct vaccination in specific populations (e.g. people living with HIV or AIDS, people who have had organ transplants, cancer patients, immunocompromised patients, survivors of sexual violence, or patients who have had a hematopoietic stem cell transplant), adopting the three-dose scheme (i.e. 0-2-6) and varying the age of the first dose. Documents from only Paraguay and Peru did not make clear the indications related to age and number of doses for vaccinations in specific populations.

Cytological screening

No official guidelines for CC screening were found for Suriname (an upper-middle-income country), and only one document was found for Venezuela (income level not classified) (13). Twelve countries or areas use cytology for CC screening. The initiation of cytological screening is recommended for women at age 25 years in Argentina, Bolivia, Brazil, Chile, Colombia, French Guiana, Peru and Venezuela; at age 21 years in Ecuador and Uruguay; and with the onset of sexual activity in Guyana and Paraguay. The upper age limit for cytological screening ranged from 29 years (Argentina and Colombia) to 64 years (Bolivia, Brazil, Chile, Peru and Venezuela) to 65 years (Ecuador and French Guiana) and to 69 years (Uruguay).

The interval between cytological testing in Argentina, Bolivia, Brazil, Paraguay, Uruguay and Venezuela is every 3 years after two consecutive annual normal results (i.e. 1-1-3). Chile, Colombia, Ecuador and French Guiana have adopted the 3-year interval after one negative test (1-3-3), and Peru screens

every 2 years after one negative test (1-2-2); Guyana does not have a recommended interval for CC screening.

Visual inspection with acetic acid

VIA is performed in only four countries: Bolivia, Colombia, Guyana and Peru. The recommended age to begin VIA was 25 years in Bolivia and age 30 in Colombia, Guyana and Peru. The upper age limit was 64 in Bolivia, 50 in Colombia and 49 in Guyana and Peru. The VIA screening interval in Bolivia is every 3 years after two normal consecutive annual tests (1-1-3); in Colombia it is every 3 years after one normal test (1-3-3); in Peru it is every 2 years after one normal test (1-2-2); and in Guyana no interval is defined.

Screen-and-treat strategy

Four countries (Bolivia, Colombia, Guyana, Peru) use the screen-and-treat strategy (data not shown). In Bolivia, acetowhite lesions that meet certain requirements must be treated by cryotherapy at that visit. In Colombia, VIA and visual inspection with Lugol's iodine are recommended for women living in areas with dispersed populations and who may have difficulty accessing health care and cryotherapy treatment services. VIA and visual inspection with Lugol's iodine can be performed only by physicians or nurses trained and certified to deliver immediate treatment with cryotherapy. In Guyana, the Ministry of Health offers free VIA and cryotherapy treatment performed by trained professionals for people diagnosed with lesions. In Peru, women with a positive VIA must undergo colposcopy within 30 days and, if this is not feasible, ablative therapy must be performed by a physician qualified by the Ministry of Health.

HPV testing

Among the six countries transitioning from cytological screening to HPV testing, five are upper-middle income (Argentina, Colombia, Ecuador, Paraguay and Peru), and one is high income (Chile). In all these countries the recommended age for initiation of HPV screening is 30 years. The upper age limit for testing ranged from 49 years in Peru to 64 years in Argentina and Chile and to 65 years in Colombia and Ecuador; Paraguay does not have a defined age limit. The interval between testing in these countries was 5 years after a negative result. Of these countries, only Argentina uses self-sampling for HPV for women older than 30 years (i.e. as a way to increase screening), focusing on those without a history of screening (i.e. women who do not use the health system regularly).

DISCUSSION

Of the countries and areas in South America, only French Guiana and Venezuela did not have information about HPV vaccination, and no guidelines were found for CC screening in Suriname and Venezuela (in Venezuela one publication was found that did not have official recommendations) (13). The lack of well-structured HPV vaccination programs and CC screening raises concerns about the possibility of eliminating this disease. Only 37.5% of low- and middle-income countries have introduced HPV vaccination compared with 78.6% of high-income countries (38).

In France, HPV vaccination is opportunistic as there is no national vaccination program, whether in school or otherwise (39). However, in 2019, French Guiana, which follows French recommendations for CC screening, and the Grand Est region of France began a 3-year experiment implementing HPV vaccination in schools. The interventions included training health professionals and conducting school vaccination campaigns (33). In French Guiana, where CC is the second most frequent cancer among women, there are areas where screening for it remains challenging (40). Because of the early onset of sexual activity in French Guiana, the French national health authority recommended that the starting age for CC screening be lowered to 20 years compared with the threshold of 25 years used in France (33).

Information from the Venezuelan Ministry of Health's website reveals concerns about introducing the HPV vaccine into the regular schedule and training physicians for CC screening (41, 42). However, no official CC screening guideline was found on the Ministry's website, and only one study addressed the subject (13). Implementing new guidelines that follow international recommendations for HPV vaccination and CC screening in Venezuela is necessary to eradicate the disease (43). Although Suriname is classified as an upper-middle-income country, it does not provide clear information about CC screening. However, the Ministry of Health is trying to launch a strategic plan for the prevention and control of CC (23).

Only six countries in South America (Argentina, Chile, Colombia, Ecuador, Paraguay and Peru) are transitioning from cytological screening to HPV testing. In Argentina, in 2011, a pilot project to introduce the HPV test in the province of Jujuy began; in middle-income countries it is possible to verify that the introduction of the HPV test increases the detection of lesions compared with cytological screening, improves pragmatic indicators (e.g. starting screening at age ≥ 30 years, detecting CC during screening, detecting CC by following up HPV-positive women with negative cytology, ensuring referral to colposcopy) and reduces the CC burden (44). After good results were obtained in Jujuy, the policy has been extended to other jurisdictions. The gradual implementation of HPV testing as primary screening in Argentina is planned for 22 cities by the end of 2022 (26).

In early 2019, Chile began incorporating HPV testing for women aged 30 to 64 years, with the aim of reaching 29 health care services by 2021, and the test has already been incorporated into 13 of these services (45). During the implementation process, the test was incorporated into 133 of the 148 districts of the 13 health services participating in the first stage of implementation, representing 90% geographical coverage of implementation (46). In Paraguay, the HPV test is not included in the national CC screening program, is limited to private patients and is available at one of the reference public gynecological health centers (47).

HPV DNA tests identify the DNA of one or more oncogenic HPV types without prior DNA amplification. Other detection tests amplify a viral DNA fragment using polymerase chain reaction (PCR) to obtain copies, both conventionally and in real time. HPV genotyping identifies specific viral types (usually 16 and 18). Messenger RNA (mRNA) tests identify the expression of HPV E6 and E7 oncoproteins (9). Many HPV DNA tests have been developed. However, only a small number detect viral mRNA. Only clinically validated HPV tests should be used for CC screening (48). HPV test samples can be collected by a health care professional or by the woman herself (self-sampling). It is not acceptable to use self-sampling for mRNA detection (48).

It is important for countries in South America to update their guidelines as new evidence becomes available. No information about implementing the HPV test nationally was found for Bolivia, Brazil, French Guiana, Guyana, Suriname, Uruguay and Venezuela, despite the test being useful for primary CC screening. According to the American Cancer Society's 2020 guideline update, it is recommended that women begin CC screening at age 25 and undergo primary HPV testing every 5 years until the age of 65 years; if primary HPV testing is not available, then individuals aged 25 to 65 years should be screened with co-testing (i.e. HPV testing in combination with cytological screening) every 5 years or with cytological screening alone every 3 years, which is considered acceptable (49).

WHO recommends using HPV DNA detection as the primary screening test rather than VIA or cytological testing for screening and treatment among both the general population of women and women living with HIV. Programs using cytological screening as the primary test should continue until the transition to HPV testing has been fully operationalized. It should be noted that Guyana has a CC screening program based on VIA, and WHO recommends that programs using VIA as the primary screening method should make a quick transition due to difficulties in quality assurance (50).

The limitations of this study include possible failures in identifying relevant materials or data that have not yet been published. However, reviewers with appropriate language skills assessed searches and conducted analytical readings of the material and references retrieved, ensuring that the data collection process was systematic and thorough. It should be noted that data from research or documents are subject to their own biases. Nonetheless, this is the first study that evaluates official documents about HPV vaccination and CC screening in South America. The results of this review can be used to advance CC prevention campaigns and global CC elimination strategies.

Conclusions

No information about a national HPV vaccination program was found for French Guiana and Venezuela, and in Suriname and Venezuela, official guidelines for CC screening were not found, thus making it difficult to eliminate CC as a public health problem in these countries. Only six countries are transitioning from cytological screening to HPV testing.

Countries in South America must update their guidelines for HPV vaccination and CC screening as new evidence emerges. National, official websites with information about HPV vaccination and CC screening are important sources that can be accessed by health professionals and the population. In addition, well-developed national HPV vaccination programs and screening registries are critical to evaluating and improving HPV vaccination and CC screening programs in these countries.

Supplementary materials are available from the corresponding author upon request.

Authors' contributions. MLSG, NSM, LCM and RRS contributed to the study's conception and design, and the selection, analysis and interpretation of data. BGSS, IRR, LBFS and MOBO contributed to the study's conception, design, and data analysis and interpretation. All authors contributed to the drafting of the manuscript, its critical revision, and approved the final version.

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Revisión bibliográfica sistemática de los programas de prevención primaria y secundaria del cáncer cervicouterino en América del Sur

RESUMEN

Objetivo. Determinar las recomendaciones formuladas en el 2022 por los ministerios de salud de los 13 países y zonas de América del Sur en materia de vacunación contra el virus del papiloma humano (VPH) y detección del cáncer cervicouterino.

Métodos. Entre el 7 de julio y el 17 de octubre del 2022 se llevó a cabo una revisión sistemática de publicaciones científicas y documentos oficiales. La revisión comprendió una búsqueda inicial en los sitios web oficiales (por ejemplo, de los ministerios de salud, los institutos nacionales del cáncer y los departamentos de salud) de los países de América del Sur, para determinar las directrices o recomendaciones actuales relativas a la vacunación contra el VPH y la detección del cáncer cervicouterino.

Resultados. Se encontraron recomendaciones sobre la vacunación contra el VPH en 11 países, excepto Guayana Francesa y República Bolivariana de Venezuela. Se encontraron recomendaciones sobre la detección del cáncer cervicouterino en documentos oficiales de 11 países, excepto República Bolivariana de Venezuela, donde se encontró un artículo que no era una recomendación oficial, y Suriname, para el cual no se encontraron documentos ni en sitios web ni en otras publicaciones. En 12 países se utiliza la citología como método para la detección del cáncer cervicouterino. En cuatro países (Bolivia [Estado Plurinacional de], Colombia, Guyana y Perú) se utiliza la inspección visual tras la aplicación de ácido acético y la estrategia de detección y tratamiento. En seis países (Argentina, Chile, Colombia, Ecuador, Paraguay y Perú) se está llevando a cabo un proceso de transición, de la citología a la realización de pruebas de detección del VPH.

Conclusiones. No se encontraron documentos sobre un programa nacional de vacunación contra el VPH en Guayana Francesa y República Bolivariana de Venezuela, y tampoco se encontraron directrices oficiales para la detección del cáncer cervicouterino en Suriname y Venezuela. En consecuencia, la eliminación de este problema de salud pública en dichos países será una tarea difícil. Los países de América del Sur deben actualizar sus directrices sobre la vacunación contra el VPH y el tamizaje del cáncer cervicouterino a medida que surja nueva evidencia al respecto. Los sitios web oficiales con información sobre la vacunación contra el VPH y la detección del cáncer cervicouterino son fuentes importantes de información que pueden consultar los profesionales de la salud y la población.

Palabras clave Neoplasias del cuello uterino; vacunas contra papillomavirus; tamizaje masivo; América del Sur.

Revisão sistemática da literatura sobre programas de prevenção primária e secundária do câncer do colo do útero na América do Sul

RESUMO

Objetivo. Identificar as recomendações para 2022 dos ministérios da saúde de 13 países e áreas da América do Sul referentes à vacinação contra o papilomavírus humano (HPV) e o rastreamento do câncer do colo do útero.

Métodos. Uma revisão sistemática da literatura científica e de documentos oficiais foi realizada entre 7 de julho e 17 de outubro de 2022. A revisão incluiu uma pesquisa inicial em sites oficiais (por exemplo, de ministérios da saúde, institutos nacionais de câncer e departamentos de saúde) de países sul-americanos para identificar diretrizes ou recomendações atuais para a vacinação contra o HPV e o rastreamento do câncer do colo do útero.

Resultados. Foram encontradas recomendações de vacinação contra o HPV em 11 países; as exceções foram a Guiana Francesa e a República Bolivariana da Venezuela. Foram encontradas recomendações de rastreamento do câncer do colo do útero em documentos oficiais de 11 países, com exceção da República Bolivariana da Venezuela, onde foi encontrado um artigo que não era uma recomendação oficial, e do Suriname, para o qual não foram encontrados documentos em sites nem em outras publicações. No total, 12 países usam citologia para rastreamento do câncer do colo do útero. Quatro países (Bolívia [Estado Plurinacional da], Colômbia, Guiana e Peru) usam inspeção visual com ácido acético e a estratégia de "Ver e Tratar". Seis países (Argentina, Chile, Colômbia, Equador, Paraguai e Peru) estão fazendo a transição da citologia para a testagem de HPV.

Conclusões. Não foram encontrados documentos sobre nenhum programa nacional de vacinação contra o HPV na Guiana Francesa e na Venezuela, e não foram encontradas diretrizes oficiais de rastreamento do câncer do colo do útero no Suriname e na Venezuela; portanto, será difícil eliminar esse problema de saúde pública nesses países. Os países da América do Sul precisam atualizar suas diretrizes de vacinação contra o HPV e de rastreamento do câncer do colo do útero à medida que surjam novas evidências. Os sites oficiais com informações sobre a vacinação contra o HPV e o rastreamento do câncer do colo do útero são fontes importantes que podem ser acessadas pelos profissionais de saúde e pela população.

Palavras-chave Neoplasias do colo do útero; vacinas contra papillomavirus; programas de rastreamento; América do Sul.