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Cervical cancer guidelines, prevention and screening strategies: experiences from Brazil and Chile

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Abstract *This article analyzes cervical cancer control policies and actions in Brazil and Chile, focusing on prevention and screening. We adopted a comparative approach to identify similarities and differences in guidelines and cervical cancer prevention and screening strategies between the two countries. We used the following data collection techniques: analysis of official documents and secondary data, consultations with experts, government officials and program coordinators, and literature review. The findings show that Chile has a well-structured program with centralized decision-making and a system that permits monitoring of actions. Brazil on the other hand faces ongoing issues with lack of coordination and shortcomings in the follow-up of women with abnormal test results. The following challenges to consolidating cervical cancer screening stand out in Brazil: lack of active tracking of the target population; absence of a test quality assurance system; and inadequate follow-up of women with abnormal test results. Both countries need to increase coverage and implement organized screening.*

Key words *Cervical cancer, Screening, Public policy, Health systems*

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Introduction

Cervical cancer is a global public health problem, with approximately 570,000 cases and 311,000 deaths from the disease occurring worldwide in 2018[1]. Between 87 and 90% of the deaths caused by the disease occurred in low and middle-income countries, illustrating the social inequality issues associated with this type of cancer[2]. However, international experiences show that it is possible to reduce the number of deaths by 80%[3].

To this end, the Pan American Health Organization (PAHO) proposed the creation of national cervical cancer prevention and control programs encompassing primary prevention actions and services, early detection and treatment, and palliative care[4]. Most Latin American countries have been implementing these programs since 1980, without achieving the same success achieved by high-income countries[3,5]. Factors related to access to quality care and the socioeconomic status of women have been highlighted as barriers to the control of cancer in the region[6].

This article aims to analyze Brazil and Chile's cervical cancer prevention and control programs, focusing on national guidelines, prevention strategies and screening. The aim of cervical cancer screening is to reduce mortality and disease incidence through the systematic testing of asymptomatic populations to identify, confirm and treat precursor lesions[7,8]. Countries that have implemented organized screening programs have managed to reduce incidence to less than 10 cases per 100,000 women/year[9]. In contrast, incidence rates in countries without screening programs can exceed 70 cases per 100,000 women/year[1,10]. It is important to highlight that prevention and screening interventions are strongly conditioned by social inequalities[11] and require well-structured and organized health systems in order to ensure adequate access to health services[5].

Chile and Brazil began to implement national cervical cancer prevention and control programs in 1987 and 1998, respectively. Despite similarities between the programs, they have been developed in specific contexts conditioned by the different of configurations of the countries' respective health systems[12,13]. This article therefore analyzes Chile and Brazil's cervical cancer prevention and screening guidelines and strategies, discussing challenges and the results of the actions implemented by each country.

Besides the magnitude of the cervical cancer problem in Latin America, this study is justified by the need to promote critical reflection in order to improve actions and design effective strategies for the timely diagnosis and treatment of precursor lesions, thus reducing preventable deaths, especially among socially disadvantaged women.

Method

We conducted an exploratory multiple case study using the comparative method to analyze Brazil and Chile's cervical cancer prevention and screening guidelines and strategies[14,15], seeking to identify similarities and differences in the actions developed by the two countries. We also sought to highlight the effects of contextual features and the configuration of the countries' respective health systems[16] on the occurrence of common specific problems and results of the actions implemented in each country.

Brazil and Chile were chosen because they have the lowest cervical cancer incidence and mortality rates in South America, are pioneers in the development of national cervical cancer prevention and control programs, Papanicolaou (Pap) testing, clinical guidelines, and nationwide actions, and are members of the Network of National Cancer Institutes of Latin America's Cervical Cancer Operating Group.

We used the following data collection techniques: analysis of official documents and secondary data, consultations with experts, government officials and program coordinators, and literature review. Official documents (normative instruments) on national cervical cancer prevention and control programs were obtained from searches of official government sites. We also used socioeconomic and health indicators made available by the International Agency for Research on Cancer (IARC) (https://gco.iarc.fr/), United Nations Economic Commission for Latin America and the Caribbean (CEPAL in Portuguese) (https://www.cepal.org/pt-br), Organization for Economic Cooperation and Development (OCDE) (http://www.oecd.org/), World Health Organization (WHO) (https://www.who.int/es), and World Bank (https://www.worldbank.org/), and from Brazil and Chile's health information systems (http://datasus1.saude.gov.br/ and https://www.minsal.cl/, respectively). In both countries, the consultations with experts, ministry of health officials responsible for the coordination of national actions and professionals responsible for program coordination at the regional and local level were held in 2019.

Searches were also performed of the following databases: MEDLINE® (Medical Literature Analysis and Retrieval Sistema Online); LILACS®

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(Latin American & Caribbean Health Sciences Literature); Scopus®; and the Theses and Dissertations Catalog of the Coordination of Improvement of Higher Education Personnel (CAPES).

The study protocol was approved by the research ethics committee.

Results

National cervical cancer prevention and control program guidelines

Brazil and Chile established national guidelines for the prevention and control of cervical cancer, defining the target age group, screening intervals, and clinical procedures for the treatment and follow-up of women with abnormal test results. The guidelines aim to reduce cervical cancer incidence, morbidity and mortality, improve the quality of life of women with cervical cancer, and provide a sound and up-to-date scientific basis for health teams on aspects related to prevention, early diagnosis and treatment[12,13].

The first organized cervical cancer prevention strategies in Brazil date back to 1984, within the scope of the Comprehensive Women's Health Care Program (PAISM, acronym in Portuguese), with the promotion of routine collection of material for the cytopathology test at *gynecological consultations*[13]. In 1986, the Ministry of Health initiated the Expansion of the Prevention and Control of Cervical Cancer project, enabling the expansion of the material collection network, increasing the capacity of cytopathology laboratories across the country, and establishing screening frequency and the target age group[13]. In 1998, after the evaluation of the Expansion project, the Ministry of Health created the National Program for Combating Cervical Cancer (PNCCCU, acronym in Portuguese), coordinated by the National Cancer Institute (NCI), better known as the *Programa Viva Mulher*[17]. This term gradually went out of usage, being replaced by the National Cervical and Breast Cancer Control Program and, further down the line, by cervical cancer and breast control actions[18], developed within the realm of primary health care, mainly through the expansion and strengthening of the Family Health Program.

In Chile, efforts to promote the early detection of cervical cancer began in 1966, under an agreement with the University of Chile School of Medicine with support from the PAHO. The agreement enabled the progressive expansion of cytology laboratories and training of human resources at the three levels of care. After an evaluation of the results in 1987, the program was reformulated following PAHO recommendations, giving rise to the National Cancer Research and Control Program. The Pap testing interval was set at once every three years and the target age group was defined as women aged between 25 and 64 years. Strategies were tested through a pilot project implemented in the Metropolitan Region between 1988 and 1994, which was expanded after an evaluation to the rest of the country[19].

Chart 1 shows the main milestones in the control of cervical cancer in Brazil and Chile.

Precursor lesion prevention, diagnosis and treatment strategies

Prevention strategies in Brazil and Chile include vaccination against the human papillomavirus (HPV). Vaccination was incorporated into the countries' national immunization schedules in 2014, is free of charge and has been available to both boys and girls since 2019. Vaccination is mandatory in Chile and performed in schools, following international recommendations for adolescents. In Brazil, vaccination is performed in primary care facilities. In 2019, second dose vaccination coverage for girls in Chile and Brazil was 79.6% and 47.4%, respectively. In both countries, factors such as lack of public knowledge about the vaccine, inadequate medical prescription, and misinformation about the safety of the vaccine contribute to vaccine refusal[20,21].

The screening method used in Brazil since 1998 is conventional cytology (Pap test), which should be performed once every three years[13]. In Chile, since 2015, there are two guidelines for specific population groups: conventional cytology screening once every three years for women aged between 25 and 64 years and DNA HPV testing at five-year intervals (where available) for women aged between 30 and 64 year[12]. Unlike countries with active recruitment strategies, screening in Brazil and Chile is generally opportunistic or spontaneous, with services being provided to women who request it or who are already in a health facility for other services.

In Brazil, since 2001, laboratories outsourced by the country's national health service (the Unified Health System or *Sistema Único de Saúde* - SUS) must undergo an external quality assessment. However, in 2019, only 10 of the country's 27 states provided information on external quality monitoring (EQM) to the SUS's Outpatient Information System (http://datasus1.saude.gov.

br/). In Chile, EQM is coordinated by Chile's Public Health Institute (PHI), which has been implementing an external quality assessment program encompassing the countries public and private laboratories since 1993, thus assuring the quality and reliability of public system test results.

Chart 1. Main milestones in the prevention and control of cervical cancer in Brazil and Chile.

Brazil	Chile
Launch of the Comprehensive Women's Health Care Program, focusing on the prevention of cervical and breast cancer (1984).	Start of national cervical cancer control actions (1966).
Creation of the Oncology Program (Pro-Onco) by the National Cancer Institute/Ministry of Health, focusing on the four most common types of cancer, including cervical cancer (1986).	Reformulation of the National Cervical Cancer Program (1987).
Creation of the SUS by the Federal Constitution (1988).	Implementation of a pilot project in the Metropolitan Region (1988).
Development of a pilot of the National Cervical Cancer Control Program (1995).	Investment in secondary and tertiary care facilities (1993).
Implementation of the pilot project "Viva Mulher" in six locations (Curitiba, Brasília, Recife, Rio de Janeiro, Belém and the state of Sergipe) (1997).	Publicity campaigns (1993).
Creation of the National Program for Combating Cervical Cancer (1998).	Creation of the National Cytopathology Referral Laboratory (1993).
Creation of the Cervical Cancer Information System – SISCOLO (1999).	National expansion of new program strategies (1994).
Second phase of the intensification of the Programa Viva Mulher (2002).	Computerization of cytology laboratories (1996).
Creation of the National Oncology Care Policy, including the control of cervical breast cancer as a core component (2005).	Radiotherapy provided free-of-charge on the public system (1997).
Development of the Control of Cervical and Breast Cancer Action Plan 2005-2007 (2005).	Publication of updated methodological guidelines for the program (1998).
Indicators and state and municipal targets included in the Health Pact with the aim of improving the performance of cervical cancer control actions (2006).	National Consensus Conference on the Treatment of Invasive Cancer (1999).
Creation of a working group to evaluate the National Cervical Cancer Control Program (2010).	Funding of chemotherapy and radiotherapy under the public system (2001).
Launch of a national plan to strengthen the cancer prevention, diagnosis and treatment network by President Dilma Rousseff, prioritizing the control of cervical cancer (2011).	Study on the situation of cervical cancer diagnosis and treatment (2001).
Launch of a strategic action plan to tackle non-communicable chronic diseases, 2011-2022 (2011).	Cervical Cancer Resources and Care Study (2002).
Publication of an updated version of the Brazilian Guidelines for Cervical Cancer Screening by the NCI (2011).	Publication of Clinical Guidelines on Cervical Cancer (2002).
Publication of the Cytopathology Laboratory Quality Management Manual (2012).	Inclusion of cervical cancer in the Pilot AUGE Program, ensuring compliance with maximum intervals for diagnosis, treatment and follow-up (2003).
Creation of the National Cancer Prevention and Control Policy in the Health Care Network for People with Chronic Diseases within the SUS (2013).	Update and national unification of nomenclature for cytology reports (2005).
Launch of the Cancer Information System (SISCAN), a digital platform integrating the cervical and breast cancer information systems (SISCOLO and SISMAMA, respectively) (2013).	Modernization of the cervical cancer care network (2005).
Publication of the QualiCito policy directive defining quality standards and Pap test quality assessment in the SUS (2013)	Introduction of the Universal Access with Explicit Health Guarantees (AUGE) health scheme (2005).
	Updated version of clinical guidelines for cervical cancer screening (2006).
	Publication of the AUGE Clinical Guide– Cervical Cancer (2006)
	Publication of an updated version of the AUGE Clinical Guide– Cervical Cancer (2010).
	HPV vaccine included in the annual immunization program for girls aged between 9 and 13 years (2013).
	Implementation of pilot project under the External Quality Assessment Program (PEEC). All public and private laboratories invited to participate in the certification of the analytical quality of Papanicolaou test diagnosis methodologies (2014).
	Vaccination against HPV expanded to include girls aged up to 13 years (2015).

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Chart 1. Main milestones in the prevention and control of cervical cancer in Brazil and Chile.

Brazil	Chile
Publication of a ministerial order creating the Referral Service for the Diagnosis and Treatment of Cervical Cancer Precursor Lesions (SRC) (2014).	Publication of an updated version of the AUGE Clinical Guide– Cervical Cancer (2015).
HPV vaccination campaign for girls aged between 11 and 13 years under the National Immunization Program (PNI) (2014).	Authorization of HPV DNA testing for women aged 30 years and over (where available) (2015).
Publication of the second edition of the Brazilian Guidelines for Cervical Cancer Screening (2016).	Pilot study in the Valdívia Region to test the implementation of DNA HPV screening (2016).
Publication of the second edition of the Cytopathology Laboratory Quality Management Manual (2016).	Publication of the National Cancer Plan 2018 – 2028 (2018)
	Introduction of DNA HPV screening in 15 health services across the country; nationwide implementation forecast for 2020 (2020).

Source: Authors' elaboration based on the documents analyzed by this study.

Created in 2013, Brazil's nominal cancer information system (SISCAN) enables the monitoring and follow-up of women who take the Pap test. The system also records, archives and synthesizes test information and selects samples for external monitoring, facilitating the creation of a quality management program. However, the system has yet to be fully implemented across the country. Chile uses two information systems for program monitoring: "Cito-Expert", which records test data on an online platform, where authorized professionals are able to check whether the service user has been screened according to the intervals established in the national guidelines; and SIGGES, designed to monitor performance against the goals set by the Ministry of Health.

Brazil faces persistent challenges related to information on follow-up of women with abnormal test results. In 2010, only 23% of women diagnosed in the previous year had a follow-up recorded in the information system. In Chile, the mandatory registration of patients in primary care facilities and establishment of deadlines for testing and complementary treatment facilitates follow-up. In addition, program management is highly centralized in Chile, facilitating coordination, unlike in Brazil, where management is decentralized, with actions being implemented by municipal and state governments.

The main features of the two countries' cervical cancer prevention and screening strategies are summarized in Chart 2.

Discussion

Brazil and Chile are characterized by stark social and economic inequalities, and social policies and actions are more limited in scope than in the majority of middle and high-income countries. This is reflected in poorer indicators in areas such as education, security, employment, housing and access to health services[22,23]. Social inequalities have a direct impact on the magnitude the problem, meaning that cervical cancer continues to be a major public health concern in both countries[24,25], resulting in disparities in incidence, epidemiological profile, survival rates and quality of life after diagnosis[26]. Chart 3 shows some selected socioeconomic and health funding indicators in the two countries.

In Brazil, public health services are provided by the SUS, the country's universal health care system. In Chile, to access the country's public health system (*Fondo Nacional de Salud* - FONASA), workers and pensioners must make a mandatory contribution of 7% of their taxable income[27]. Strategies to promote timely access to cervical cancer screening in Chile are restricted to the health guarantees included in the AUGE Scheme, which defines priority health problems treated on the public health system. In other care schemes, patient flows differ, resulting in generally longer appointment wait times. Nevertheless, the AUGE Scheme, created during Chile's health system reform in 2005, has led to an increase in access and established active monitoring of goals[27,28].

Chart 2. Cervical cancer prevention and screening strategies in Brazil and Chile, 2020.

Components	Brazil	Chile
Clinical guidelines	Brazilian Guidelines for Cervical Cancer Screening, 2016	Cervical Cancer Clinical Guidelines, 2015
Target population	Women aged between 25 and 64 years	Women aged between 25 and 64 years
Method and Interval	Conventional cytology (Papanicolaou test) once every three years after two negative , annual tests	Pap test for women aged between 25 and 64 years once every three years; primary screening of women aged 30 to 64 years, with HPV detection and Pap test or HPV 16/18 genotyping in five-year intervals (when available)
HPV vaccine	Included in the SUS' national immunization schedule in 2014. Currently targeted at girls and boys aged between 9 and 14 years	Included since 2014 and provided free of charge by the Ministry of Health to girls aged between 11 and 12 years. Currently provided to girls and boys.
Coverage target	80% of the target population	80% of the target population
Information system	Cancer Information System (SISCAN)	Information System for the Management of Explicit Health Guarantees (SIGGES)

Source: Authors' elaboration based on the literature.

In both countries, regional inequalities are barriers to accessing health care. In Brazil, populations living in remote rural areas, especially in the country's North and Northeast regions, face greater difficulties accessing health services, particularly specialist services[29]. In addition to regional disparities and the centralization of care in metropolitan areas, barriers to access in Chile include mandatory financial contributions and spending on medications, doctor's appointments and examinations in the form of copayments[30]. In both countries, areas isolated from large urban centers have the highest incidence and mortality rates.

Despite an increase in screening coverage and access to treatment of precursor lesions, incidence and mortality rates have not decreased at the same rate as high-income countries[1]. In 2018, the estimated incidence of cervical cancer in both countries was 12.2 per 100,000 women, making cervical cancer the fourth and sixth most common cancer among women in Brazil and Chile, respectively[1]. Figure 1 depicts trends in cervical cancer mortality rates in Brazil and Chile, showing that differences narrowed considerably between 1980 and 2010. In 1980, Chile's mortality rate was almost three times greater than that of Brazil (14.85 per 100,000 women versus 5.20 per 100,000 women). The considerable reduction in cervical cancer mortality in Chile (more than 50%), was partially a result of significant changes in prevention and treatment policies. Other important factors include a decrease in the percentage of the population living below the poverty line (from 38.4% in 1990 to 14.4% in 2011) and an increase in Gross Domestic Product (GDP) in recent decades[31].

Both countries set a national target of 80% coverage of the target population, considered to be the necessary coverage to ensure a significant reduction in incidence and mortality. In Chile, coverage is calculated based on data from the nominal information system and has remained stable at around 70%. In Brazil, coverage is estimated at 80%, based on self-reported information from national surveys, since the country's information system has yet to be fully implemented. The two programs face difficulties in meeting the coverage target and reaching women from the target population who have never done the test or have done it outside the recommended interval. Both countries have yet to implement an organized population-based screening program that provides for direct contact with women through letters or telephone messaging.

Nominal information systems are the *sine qua non* of organized screening[32,33]. In Brazil, the effective implementation of the SISCAN is vital to structuring an organized program that enables follow-up of women with abnormal test results and monitoring of coverage indicators. A marked difference between Chile and Brazil is that the former has a fully implemented nominal information system, thus facilitating follow-up.

Furthermore, the existence of preset goals and strong ministerial control over the procedures performed under the Explicit Health Guarantees makes it mandatory for health services to promote active tracking of women with abnormal test results in order to meet deadlines and ensure the provision of appropriate treatment. In Brazil, opportunistic screening, combined with quality issues related to information system records and low adherence to national protocols, hamper monitoring and evaluation and the effective organization of cervical cancer actions[34]. Furthermore, inconsistencies between test results and the clinical procedures set out in the national

Chart 3. Socioeconomic and health funding indicators in selected years. Brazil and Chile, 2016 to 2020.

Indicators		Year	Brazil	Chile
Socioeconomic	Population (million)[a]	2020	212.559	19.116
	Female population (million)[a]	2020	108.124	9.691
	Life expectancy at birth (women)[b]	2016	77.80	83.10
	Adult population literacy rate[c]	2017	93.08%	96.40%
	Smoking prevalence among women[c]	2016	10.1%	34.2%
	Parity (average number of children born per woman)[c]	2017	1.73	1.67
	Gross Domestic Product per capita[c]	2018	15,820	24,190
	Population coverage (public system)	2019	100%	76.01%[b]
	Population coverage (private system)	2019	24.20%	17.97%[e]
Funding	Overall expenditure on health as a proportion of GDP[d]	2017	9.47%	8.98%
	Public expenditure on health as a proportion of GDP[d]	2017	3.96%	4.50%
	Public expenditure on health as a proportion of overall health spendingd	2017	42%	50%
	Public expenditure on health per capita in US$[d]	2017	795.66	1,190.55
	Out-of-pocket expenditure as a proportion of overall expenditure on health[d]	2017	27.46%	33.55%

Sources: a. United Nations DESA/Population Division. World Population Prospects 2017. Available at: https://esa.un.org/unpd/wpp/Download/Standard/Population/. Accessed on 12/11/2019. b. OECD. Stat. Available at: http://stats.oecd.org. Accessed on 12/11/2019. c. World Bank. GNI per capita, PPP (current international $). Available at: https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD?name_desc=false. Accessed on 12/11/2019. d. WHO. Global Health Expenditure. Database. Available at: http://apps.who.int/nha/database/ViewData/Indicators/es. Accessed on 03/03/2020. e. Chile. Health Superintendency. http://www.supersalud.gob.cl/664/w3-propertyvalue-6059.html.

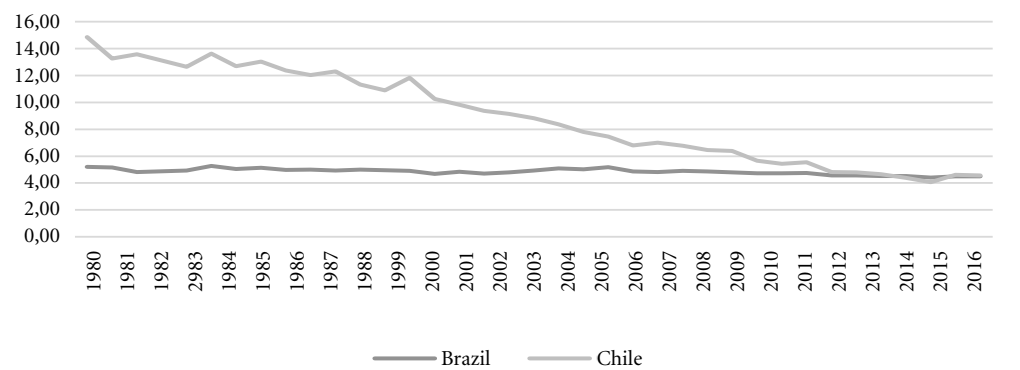

Figure 1. Trends in world population age-adjusted mortality cervical cancer rates. Brazil and Chile, 1980-2016.

Source: Ferlay J et al. (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available at: https://gco.iarc.fr/today, accessed [03 May 2020].

guidelines and poor coordination of care services lead to treatment interruptions and delays[35].

Assuring Pap test quality is another critical issue in cervical cancer screening[36,37]. Studies show that most Brazilian laboratories do not meet the quality criteria established by the Ministry of Health[37]. In Chile, monitoring seems to be reflected in the positivity rate, a benchmark that shows the sensitivity of testing in detecting lesions. In 2018, the positivity rate in Chile was 3.62%, compared to 2.76% in Brazil, which is below the national parameter of equal to or greater than 3%[37]. In Chile, the centralized coordination of EQM facilitates organization and helps ensure the quality of planning of a set of integrated activities in association with University of Chile, whose laboratory is accredited by the College of American Pathologists, one of the world's most stringent international assessment systems.

Brazil's Family Health Program is the cornerstone of primary care and the country's health system, playing a pivotal role in the organization of cervical cancer prevention through the promotion of health education, vaccination and screening[13]. However, a census of the country's primary care centers revealed that only half had appropriate facilities to carry out preventive screening and only 30% of teams showed adequate screening practices, indicating a lack of equipment and supplies, thus restricting the scope of actions and signaling barriers to access to good-quality screening[38]. Lack of coordination between levels of care is another problem constantly mentioned by studies of Brazil's health system, resulting in shortcomings in follow-up[39]. Chile on the other hand stands out from Brazil for the effective institutionalization of instruments designed to strengthen the coordination of care and development of protocols by the Ministry of Health[40]. Despite having one of the region's most unequal health systems[41,42], the situation of cervical cancer and the other priority health problems listed in the AUGE Scheme are exceptions in the Chilean context.

In Brazil, since the creation of the program to the present day, the responsibility for coordinating the program has shifted between the NCI and departments of the Ministry of Health in Brasília, generating instability. These changes and the lack of definition of coordinating roles at the federal level compromise follow-up and monitoring and evaluation. This situation is aggravated by difficulties in structuring and retaining program management health teams in both tate and municipal government health departments. Program management has posed *"an ongoing challenge to the sustainability of actions, affecting planning and agreement processes, staff training and development policy and the continuity of care* (p.9)[28]. Finally, the findings show that lack of coordination and wide-scale systematic monitoring of actions and results across different levels of management has been an ongoing problem in the Brazilian context.

When comparing the two countries, certain key factors responsible for program shortcomings stand out in Brazil: lack of active tracking of the target population; absence of a test quality assurance system; and inadequate follow-up of women with abnormal test results[43]. In addition, the partial implementation of the SISCAN, precluding the monitoring of screening received by the target population, the lack of a nationwide quality control system, and shortcomings in the follow-up of women with abnormal test results aggravate the situation in Brazil.

Chart 4 synthesize some of the main features of public health policy and cervical cancer control strategies and guidelines in Brazil and Chile.

Final considerations

This analysis of actions to promote the early detection of cervical cancer in Brazil and Chile highlights the importance of ensuring the quality of Pap testing and effective follow-up, including timely confirmation of diagnosis and treatment. Program organization, including well-defined coordination and consolidated, nationwide evaluation and monitoring mechanisms also warrant highlighting.

The main features of the Chilean program include centralized management, continuity of staff, standardization of protocols, and continuous nationwide monitoring of goals and performance indicators. The Chilean program stands out from the Brazilian program in terms of coordination and synthesis of clinical procedures. Unlike Chile, Brazil lacks clear lines of coordination for results-based monitoring and evaluation and a clear definition of the responsibilities of federal entities, particularly state governments, which weakens the national program.

In both countries, incidence and mortality rates are highest among vulnerable groups, demonstrating that higher risk of cervical cancer is indicative of poor access to health services. Although cancer prevention and control programs can reduce barriers arising from social inequal-

ities, they do not eliminate them. It is therefore important to promote strategies designed to increase coverage, including interventions targeting vulnerable groups. In this regard, both Brazil and Chile need bolder actions to reach women in the target age group on the margins of screening.

In countries with organized screening programs and universal health services and actions, socioeconomic inequalities have less impact on the results of screening strategies[44,45]. Although Brazil has a universal health system in which early detection should be promoted across the country by health teams under the Family Health Program, screening is predominantly opportunistic. Prevention and control measures do not include active tracking and recruitment of women in the target age group, health education and follow-up[46], repeating a pattern that results in greater screening coverage among educated women. In turn, in addition to not having a universal health system, Chile has still not managed to implement an organized program, insofar as there is no system for recruiting women in the target age group within the recommend screening interval.

Unlike countries where screening actions have yet to be implemented due to lack of funding, infrastructure, human resources, equipment and supplies, and monitoring and surveillance,

Chart 4. Health system and cervical cancer prevention and control policy and actions in Brazil and Chile, 2020.

Dimension	Brazil	Chile
Context and components of the public health system	Federal Constitution provides that health care is a right for all and the duty of the State. Universal public health system with comprehensive coverage. Around 24% of the population have private health insurance, resulting in dual coverage. No legal barriers to accessing the public system. The government is the main regulator and, as well as defining macro-processes, also establishes mechanisms to direct health care. With regard to funding, 9.47% of Gross Domestic Product (GDP) is allocated to health. The Ministry of Health is responsible for developing regulations and parameters for structuring the SUS and providing financial incentives for the state and municipal spheres. At state level, health planning is regional and based on municipalities' needs. Municipal governments are responsible for planning, organizing, executing and monitoring local health actions, prioritizing the management of primary care, with technical and financial support from the state and federal government. Regional inequalities are barriers to access to health care. Difficulties retaining specialists and staff shortages in remote areas lead to gaps in health care. Services and actions are delivered through a regionalized, hierarchical network. Three-tiered organization with single command and control governance structure and autonomy of each sphere of government.	National Constitution states that the government is responsible for overseeing the execution of health actions and services. Dual system based on health insurance. Public health system with broad coverage. Public system (FONASA) and private system (ISAPRES) cover around 76% and 14% of the population, respectively. Mandatory contribution of 7% of taxable income to fund the public health system. The government is the main regulator and, as well as defining macro-processes, also establishes mechanisms to direct health care. With regard to funding, 8.98% of Gross Domestic Product (GDP) is allocated to health. The Ministry of Health proposes policies, formulates health programs, defines lines of action and parameters for each activity, and is responsible for resource allocation. Policies are adapted at regional level by regional secretariats. All policies, plans and projects should be in line with the National Health Plan. Municipal governments are autonomous, but services should be managed and delivered in accordance with the policies formulated by the Ministry of Health. The main barriers to access are the mandatory contribution, centralization of medical care in the Metropolitan Region, and spending on medications, doctor's appointments and examinations in the form of copayments. Public health services are coordinated by the National Health Services System (SNSS). Service networks are decentralized to regional and sub-regional levels.

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Brazil and Chile have cervical cancer prevention and control programs and a complex network of services. However, to achieve more significant reductions in cervical cancer incidence and mortality, both countries need to develop the capacity to address the problems and limitations identified above. Brazil needs to step up efforts to ensure testing quality and timely confirmation of diagnosis and treatment, as our findings show that Chile outperforms the country in terms of laboratory quality, scope of the information system and organization of referral networks. In both countries, cervical cancer remains a major public health problem and the strategies employed to address this issue point to the structuring of organized screening with the aim of increasing coverage among the target age group and guaranteeing follow-up of women with abnormal test results.

Chart 4. Health system and cervical cancer prevention and control policy and actions in Brazil and Chile, 2020.

Dimension	Brazil	Chile
Cervical cancer control strategies and guidelines	Conventional cytology screening once every three years after two negative annual exams for women aged between 25 and 64 years. Opportunistic screening program without a system for recruiting women from the target age group. Quality assurance program not fully implemented. Population-based information system (SISCAN) not fully implemented. Difficulties implementing organized screening due to the lack of a nationwide population-based information system. Lack of coordination and wide-scale systematic monitoring of actions and results at different levels of management. Some program indicators published by the NCI on a periodic basis through the Early Detection Newsletter, providing information on cytology testing received from states and regions, and an overview of program actions. Screening performed in primary care; confirmation of diagnosis and treatment of precursor lesions performed in secondary care; and treatment of cervical cancer performed in tertiary care. Poor communication between levels of care and shortage of procedures, especially in secondary care, lead to treatment interruption and delay.	Conventional cytology screening once every three years for women aged between 25 and 64 years and DNA HPV testing at five-year intervals (where available) for women aged between 30 and 64 year. Opportunistic screening program without a system for recruiting women from the target age group. Quality assurance program since 1993. Nationwide population-based information system (SIGGES). Transition to organized screening facilitated by the existence of a population-based information system and mandatory registration in primary care facilities in order to access the public health system. Strong ministerial control over preset goals results in active tracking and follow-up of women with abnormal test results. Program results publicized via an annual evaluation report analyzing effectiveness in relation to detection, diagnosis, staging and treatment, and identifying gaps in compliance with explicit health guarantees, thus informing decision-making and resource allocation. Screening performed in primary care; confirmation of diagnosis and treatment of precursor lesions performed in secondary care; and treatment of cervical cancer performed in tertiary care. Monitoring of the health guarantees defined in the AUGE Scheme establishes deadlines for each action.

Source: Authors' elaboration based on the literature.

Collaborations

IB Claro contributed to study conception and design, data analysis and interpretation, and to writing and critically revising the article and approving the final version to be published. LD Lima contributed to study conception and design, data analysis and interpretation, and to writing and critically revising the article and approving the final version to be published. PF Almeida contributed to writing and critically revising the article and approving the final version to be published.

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