ARCHIVES OF Health Sciences

Artigo Original

ISSN 2318-3691

DOI: 10.17696/2318-3691.32.01.2026.326

[1] Universidade Federal de Viçosa, Viçosa-MG, Brasil

Association Between Supplementary Health Coverage and Cervical Cancer Screening in Brazil

Associação entre a saúde suplementar e o rastreamento do câncer do colo do útero no Brasil

Wesley Abijaude[1]; Juliana Cantele Xavier[1]; Sophia Guerra Macedo[1]; Tiago Ricardo Moreira[1]; Lilian Fernandes Arial Ayres[1]; Camila Mendes dos Passos[1]

ABSTRACT

Introduction: Globally, Cervical Cancer is the fourth most common malignancy, with the highest incidence rates observed in developing countries. However, there have stood out considerable socioeconomic inequalities in access to preventive exams, including Pap smears. The recent expansion of supplementary health coverage in Brazil may have exacerbated this scenario, widening healthcare access inequalities and undermining health equity. **Objective:** To analyze the association between supplementary health coverage and cervical cancer screening among women in Brazilian capitals in 2020. **Methods:** Data from 10,041 women aged from 25 to 64 years from the VIGITEL were analyzed. Supplementary health coverage was defined as self-reported possession of a health insurance plan. Cervical Cancer screening was considered as having undergone at least one Pap smear in a lifetime or within the last three years. Screening prevalence was estimated for the total population and by socioeconomic variables. Poisson regression models were used to estimate crude and adjusted prevalence ratios, with a 5% significance level. **Results:** Screening coverage (at least one Pap smear) was 87.0%, while adequate screening coverage (Pap smear in the last three years) was 80.1%. Higher screening rates were associated with private health insurance, higher education, living with a partner, and positive self-rated health. After adjustment for sociodemographic variables, both screening indicators remained higher among women with supplementary health coverage, with a 5% increase in screening and a 12% increase in adequate screening. **Conclusion:** Supplementary health coverage is positively associated with higher Cervical Cancer screening rates, highlighting its role in improving access to preventive healthcare services.

Descriptors: Papanicolaou Test; Supplemental Health; Health Status Disparities; Uterine Cervical Neoplasms; Public Health.

RESUMO

Introdução: O câncer do colo do útero é a quarta neoplasia maligna mais comum no mundo, com as maiores taxas de incidência observadas em países em desenvolvimento. No entanto, destacam-se consideráveis desigualdades socioeconômicas no acesso aos exames preventivos, incluindo o teste de Papanicolau. A recente expansão da cobertura da saúde suplementar no Brasil pode ter agravado esse cenário, ampliando as desigualdades no acesso à saúde e comprometendo a equidade. **Objetivo:** Analisar a associação entre cobertura de saúde suplementar e o rastreamento do câncer do colo do útero entre mulheres nas capitais brasileiras em 2020. **Métodos:** Foram analisados dados de 10.041 mulheres entre 25 e 64 anos provenientes do VIGITEL. A cobertura de saúde suplementar foi definida como a posse autodeclarada de plano de saúde. O rastreamento do câncer do colo do útero foi considerado como a realização de pelo menos um exame de Papanicolau na vida ou nos últimos três anos. Estimou-se a prevalência do rastreamento na população total e por variáveis socioeconômicas. Utilizaram-se modelos de regressão de Poisson para estimar razões de prevalência brutas e ajustadas, com nível de significância de 5%. **Resultados:** A cobertura de rastreamento (pelo menos um exame de Papanicolau na vida) foi de 87,0%, enquanto a cobertura adequada (exame nos últimos três anos) foi de 80,1%. Maiores taxas de rastreamento foram associadas à posse de plano de saúde, maior escolaridade, viver com parceiro e autopercepção positiva da saúde. Após o ajuste por variáveis sociodemográficas, ambos os indicadores de rastreamento permaneceram mais elevados entre mulheres com cobertura de saúde suplementar, com aumento de 5% no rastreamento geral e de 12% no rastreamento adequado. **Conclusão:** A cobertura de saúde suplementar está positivamente associada a maiores taxas de rastreamento do câncer do colo do útero, destacando seu papel na ampliação do acesso aos serviços preventivos de saúde.

Descritores: Teste de Papanicolau; Saúde Suplementar; Disparidades nos Níveis de Saúde; Neoplasias do Colo do Útero; Saúde Pública.

INTRODUCTION

Globally, Cervical Cancer (CC) is the fourth most common malignancy, with the highest incidence rates observed in developing countries, where approximately 80% of cases can occur[1]. Due to

Authors' contributions: WA conducted study design, tabulation and organization data, analyses and discussion of findings, and writing of the manuscript. JCX and SGM conducted tabulation and organization datas steps and analyzed data. TRM and LFAA conducted the work final revision. CMP project supervision, study design, writing and final revision of the manuscript.

Corresponding author:
Camila Mendes dos Passos

E-mail:
camilapassos@ufv.br

Conflict of interest statement: No

Funding: Minas Gerais Research Foundation (FAPEMIG), notice no. 001/2021 - UNIVERSAL DEMAND (process APQ-01981-21). Scholarship from the Institutional Scientific Initiation Scholarship Program of the Federal University of Viçosa (PIBIC-UFV), notice PIBIC/Funarbic - 2021/2022, awarded to JCX. Scholarship from the Institutional Scientific Initiation Scholarship Program of the Federal University of Viçosa (PIBIC-UFV), notice PIBIC/CNPq - 2021/2022, awarded to WA.

Received: 27/05/2025
Approved: 06/10/2025

its substantial impact on female morbidity and mortality, CC remains a major global public health concern. Worldwide, an estimated 570,000 new cases arise annually, leading to approximately 311,000 deaths[2]. In Brazil, the National Cancer Institute (INCA) projected around 17,010 new cases for the 2023–2025 period, corresponding to an estimated risk of 15.38 cases per 100,000 women[3].

According to the World Health Organization (WHO), effective preventive and early treatment strategies can reduce CC incidence by up to 90%, significantly impacting mortality rates[2]. The primary preventive measure is HPV vaccination, recommended for girls aged nine to 14 and boys aged 11 to 14[4]. In terms of secondary prevention, the WHO advocates screening, which varies by region but commonly includes Pap smears, molecular tests for viral DNA, mRNA-based viral tests, and, more recently, AI-assisted visual inspection for oncoprotein detection[2].

In Brazil, the Ministry of Health (MoH) recommends cervical cancer screening through Pap smears for women aged 25 to 64, with screening intervals of three years following two consecutive annual tests with normal results[5]. For screening programs to effectively reduce morbidity and mortality, they must attain coverage rates exceeding 85%, comply with national and international quality standards[5,6], and be supported by a well-structured healthcare network that guarantees continuity of care[7, 8].

Despite Brazil's well-established opportunistic CC screening program and a national Pap smear coverage of approximately 80%[9], this has not translated into significant reductions in morbidity and mortality rates[8, 11]. Socioeconomic disparities and limited healthcare access, particularly in geographically vast countries like Brazil, may contribute to these outcomes[7, 12].

Previous studies from both developing[12-14] and developed[15, 16]countries have highlighted considerable socioeconomic inequalities in access to preventive exams, including Pap smears. Private health insurance is associated with higher demand[14] and better access[15, 16] to preventive healthcare services, particularly among women.

Brazil's supplementary health system covers approximately 25% of the population and operates predominantly through private health insurance plans. Despite coexisting with the Unified Health System (SUS), it tends to reproduce socioeconomic inequalities in access to health services[17]. The recent expansion of supplementary health coverage in Brazil[17] may have exacerbated disparities in Pap smear coverage between women with and without health insurance. This situation risks widening healthcare access inequalities and undermining health equity[18]. Therefore, this study aims to analyze the association between supplementary health coverage and CC screening among women aged 25 to 64 residing in Brazil's state capitals and the Federal District in 2020. Understanding this association is crucial for strengthening health policies aimed at tackling this public health challenge. Moreover, national investigations on this subject remain scarce.

METHODS

A cross-sectional, population-based epidemiological study with a quantitative approach was conducted. Data from 10,041 women aged 25 to 64 years residing in the 26 Brazilian state capitals and the Federal District (DF) were obtained from the Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (VIGITEL) in 2020.

VIGITEL is a telephone-based surveillance and monitoring survey implemented by the Ministry of Health (MoH) in 2006. This annually investigates risk and protective factors for non-communicable chronic diseases in the adult population (≥18 years) residing in Brazilian capitals and the DF[19].

VIGITEL's sampling process comprises two stages. The first involves systematic and stratified random selection of telephone lines per city[19]. In the second stage, following eligibility confirmation[20], one adult (≥18 years) per household is randomly selected and invited to participate in the survey. For the 2020 edition, a minimum sample size of 1,000 individuals per city was set, considering the challenges posed by the pandemic while ensuring a 95% confidence level and a maximum margin of error of three percentage points for any risk factor prevalence estimate. Consequently, in 2020, VIGITEL interviewed 27,077 individuals, with a sub-sample of 10,041 women aged 25 to 64 years used for this study[21].

The explanatory variable was self-reported possession of a health insurance plan. The first outcome, "Screening (at least once)," was defined as having undergone a Pap smear at least once in a lifetime. The second outcome, "Adequate screening," was defined as having undergone a Pap smear at least once within the last three years.

A set of sociodemographic and health-related variables were used to adjust the models, including age group (25–44 | 45–64), years of schooling (0–8 | 9–11 | 12 or more), race/ethnicity (white | black or brown), marital status (with partner | without partner), region of residence (North | Northeast | South | Southeast | Central-West), and self-rated health (positive | negative).

Initially, a descriptive data analysis was conducted using absolute and relative frequencies, along with a 95% confidence interval as a measure of dispersion. Screening prevalence rates (at least one Pap smear and adequate screening) were then estimated for the total sample and stratified by sociodemographic variables. The Pearson chi-square test was applied to assess differences in screening coverage across sociodemographic categories. Finally, Poisson regression models were used to estimate crude (PRb) and adjusted (PRa) prevalence ratios, assessing the relationship between supplementary health and screening outcomes. Multivariate models were adjusted for sociodemographic variables (age group, education level, race/ethnicity, marital status, region, and self-rated health). A significance level of 5% was applied in all statistical tests.

Data processing and statistical analysis were performed using Stata software (version 14.2), considering the complex survey design. All estimates were weighted using the rake post-stratification method, aligning the surveyed population distribution with projected sociodemographic and health estimates for the study year.

The data used in this study are publicly accessible from VIGITEL and do not allow for the identification of individual respondents. VIGITEL (http://tabnet.datasus.gov.br/cgi/vigitel/vigteldescr.htm) was approved by the National Research Ethics Committee for Human Subjects (Conep) of the MoH (CAAE: 65610017.1.0000.0008).

RESULTS

In 2020, 10,041 women aged 25 to 64 were interviewed via VIGITEL across all Brazilian capitals and the Federal District (Table 1). Most (57.8%) were aged 25–44 years, had at least nine years of education, self-identified as black or brown (57.7%), resided in the Southeast (43.7%), lacked private health insurance (54.2%), and rated their health positively (65.2%).

Screening prevalence (at least one Pap smear) was highest among women aged 45–64 (94.0%), those with lower education levels (87.9%), single women (93.7%), White women (91.0%), residents of the

South (92.4%) and Southeast (90.7%), those without health insurance (90.5%), and those with a negative self-rated health status (87.5%). Adequate screening was more prevalent among women aged 45–64 (84.6%), those with higher education (83.0%), those living with a partner (87.2%), White women (84.7%), residents of the South (85.6%) and Southeast (85.1%), those with private health insurance (86.8%), and those with a positive self-rated health status (81.9%). Unlike general screening coverage, adequate screening was linked to higher education levels, partnership status, supplementary health insurance, and positive self-rated health (Table 2).

Women with private health insurance had a higher likelihood of undergoing screening. Pap smear coverage was 8% higher among insured women (PRb = 1.08; p < 0.001). Screening prevalence was also higher among older, White, partnered women living in the Southeast and South. After adjusting for sociodemographic variables, the association between health insurance and screening remained, albeit with reduced magnitude (PRb = 1.05; p = 0.011; Table 3).

For adequate screening, women with private health insurance exhibited a 16% higher likelihood of timely screening (PRb = 1.16; p < 0.001). Adequate screening was also more prevalent among older women, those with at least 12 years of education, white women, partnered women, residents of the North, Southeast, and South, and those with a positive self-rated health status. After adjusting sociodemographic factors, the association between health insurance and adequate screening persisted but with reduced effect sizes, showing a 12% higher likelihood (PRb = 1.12; p < 0.001; Table 4).

Table 1. Sociodemografic and health distribution of Brazilian women (25 and 64 years old (n = 10,041). Vigitel, 2020.

Variables	n*	%	95%CI**	
Age (years)				
25 to 44	4,025	57.8	55.8	59.8
45 to 64	6,016	42.2	40.2	44.2
Schooling (years)				
0 to 8	1,960	24.3	22.5	26.3
9 to 11	3,597	38.4	36.4	40.5
12 or more	4,484	37.3	35.2	39.3
Marital status				
With a partner	5,191	49.5	47.4	51.7
No partner	4,824	50.5	48.3	52.6
Skin color				
Black or brown	5,639	57.7	55.5	59.8
White	3,948	42.3	40.2	44.5
Geographic region				
Midwest	1,364	11.9	10.8	13.0
Northeast	3,476	26.2	24.8	27.6
North	2,859	10.3	9.6	11.1
Southeast	1,378	43.7	41.4	46.0
South	964	8.0	7.3	8.7
With a health insurance plan				
Yes	4,986	45.8	43.7	48.0
No	5,033	54.2	52.0	56.3
Self-assessment of health status				
Positive	6,694	65.2	63.1	67.3
Negative	3,317	34.8	32.7	36.9

* sample value, ** 95% confidence interval

Table 2. Prevalence (%) of CC screening (at least once and adequate) by sociodemographic and health variables among Brazilian women (25 a 64 years old). Vigitel, 2020.

Variables	Screening (at least once)			Adequate screening		
	n*	%	p-value**	n*	%	p-value**
Age (years)						
25 to 44	3.384	81.9	< 0,001	3,171	76.8	< 0,001
45 to 64	5.658	94.0		5,082	84.6	
Schooling (years)						
0 to 8	1.758	87.9	0.006	1,520	78.3	< 0,001
9 to 11	3.200	85.8		2,890	78.5	
12 or more	4.084	87.7		3,843	83.0	
Marital status						
With a partner	4.107	80.3	< 0,001	4,541	87.2	< 0,001
No partner	4.913	93.7		3,694	73.0	
Skin color						
Black or brown	5.002	84.1	< 0,001	4,558	77.1	< 0,001
White	3.643	91.1		3,364	84.7	
Geographic region						
Midwest	1.248	84.0	< 0,001	1,121	73.7	< 0,001
Northeast	2.993	80.5		2,723	72.9	
North	2.609	87.2		2,392	80.4	
Southeast	1.277	90.7		1,177	85.1	
South	915	92.4		840	85.6	
With a health insurance plan						
Yes	4.403	84.1	< 0,001	4,359	86.8	< 0,001
No	4.625	90.5		3,885	74.6	
Self-assessment of health status						
Positive	6.077	86.2	0.001	5,660	81.9	< 0,001
Negative	2.940	87.5		2,574	76.8	
Total	**10.041**	87.0		**8.253**	80.1	

* Sample value. ** Pearson's chi-square test. CC, Cervical Cancer; Vigitel, Surveillance System of Risk and Protection Factors for Chronic Diseases by Telephone Survey.

Table 3. Estimates of the crude prevalence ratio (PRc) and adjusted (PRa) for the association between screening (at least once) and possession health insurance plan among Brazilian women (25 to 64 years old). Vigitel, 2020.

Variables	PRc*	95%CI**		p-value***	PRa****	95%CI**		p-value***
Possession health insurance plan	1.08	1.04	1.11	**< 0,001**	1.05	1.01	1.08	**0.011**
Age (45 and 64 years old)	1.15	1.11	1.18	**< 0,001**	1.13	1.10	1.16	**< 0,001**
Schooling (9 and 11 years)	0.98	0.93	1.02	0.258	1.00	0.95	1.04	0.930
Schooling (12 years or more)	1.00	0.96	1.04	0.910	1.03	0.98	1.08	0.241
Skin color (white)	1.08	1.05	1.12	**< 0,001**	1.04	1.00	1.07	**0.036**
Marital status (with a partner)	1.17	1.13	1.21	**< 0,001**	1.14	1.10	1.18	**< 0,001**
Region (Northeast)	0.96	0.91	1.01	0.147	0.98	0.93	1.04	0.579
Region (North)	1.04	0.98	1.10	0.198	1.06	1.00	1.12	**0.051**
Region (Southeast)	1.08	1.02	1.15	**0.011**	1.07	1.01	1.14	**0.018**
Region (South)	1.10	1.04	1.17	**< 0,001**	1.08	1.02	1.14	**0.008**
Self-assessment of health status (positive)	1.01	0.98	1.05	0.446	1.00	0.97	1.04	0.802

* Crude prevalence ratio. ** 95% confidence interval. *** Poisson regression. **** Adjusted prevalence ratio for age, schooling, skin color, marital status, region, and self-assessment of health status

Table 4. Estimates of the crude prevalence ratio (PRc) and adjusted (PRa) for the association between adequate screening and possession health insurance plan among Brazilian women (25 to 64 years old). Vigitel, 2020.

Variables	PRc*	95% CI**		p-value***	PRa****	95% CI**		p-value***
With a health insurance plan	1.16	1.12	1.21	**< 0,001**	1.12	1.07	1.17	**< 0,001**
Age (45 and 64 years old)	1.10	1.06	1.15	**< 0,001**	1.08	1.04	1.13	**< 0,001**
Schooling (nine and 11 years)	1.00	0.95	1.06	0.932	1.00	0.95	1.06	0.924
Schooling (12 years or more)	1.06	1.00	1.12	**0.034**	1.04	0.97	1.10	0.246
Skin color (white)	1.10	1.05	1.14	**< 0,001**	1.03	0.99	1.08	0.164
Marital status (with a partner)	1.20	1.14	1.25	**< 0,001**	1.16	1.11	1.22	**< 0,001**
Region (Northeast)	0.99	0.92	1.07	0.784	1.02	0.95	1.09	0.679
Region (North)	1.09	1.01	1.18	**0.020**	1.11	1.03	1.19	**0.006**
Region (Southeast)	1.16	1.07	1.25	**< 0,001**	1.14	1.06	1.23	**< 0,001**
Region (South)	1.16	1.08	1.25	**< 0,001**	1.13	1.05	1.21	**< 0,001**
Self-assessment of health status (positive)	1.07	1.02	1.12	**0.007**	1.05	1.00	1.10	0.063

* Crude prevalence ratio. ** 95% confidence interval. *** Poisson regression. **** Adjusted prevalence ratio for age, schooling, skin color, marital status, region, and self-assessment of health status.

DISCUSSION

The results showed that most of the women surveyed were of reproductive age, had more than nine years of education, were black or brown, lived in the south-east of the country, had no health insurance, and rated their health positively. Screening coverage was greater than 80.0% for the two indicators analysed – i.e., at least once and in the last three years, with the former being higher. Adequate screening coverage for CC was associated with higher levels of education, living with a partner, having additional health care, and having a positive self-rated health status. After adjustment for sociodemographic variables, there was a 5% increase in screening coverage and a 12% increase in adequate screening among women with supplementary healthcare.

The socio-demographic profile of women found in the study is similar to that of women nationally, according to the latest census, according to age, education, and socio-spatial distribution[21,22], confirming the good national representativeness of the data used in this study.

Regarding cervical cancer screening, 87.0% of the female population reported having been screened at some point in their lives. This is because many women are inappropriately screened, either due to a lack of guidance or the absence of an organised and effective screening policy[8, 23]. The results of the 2013 PNS showed Pap smear coverage of 79.4% over the last three years[9]. However, the higher coverage found in our study may be related to the fact that the survey was conducted only in capital cities, where access to health services is known to be easier[24]. It is also important to note that the Ministry of Health has established a clear national guideline for cervical cancer screening, which, in conjunction with the self-report survey, has set a national target of 85.0% coverage of the target population for 2011-2022. This guideline consists of the definition of the age range, the frequency of the test, its implementation, and the segments of women with abnormal results[5, 9]. It can be seen that, despite the high percentage, there is still some progress to be made to achieve the targets set.

Furthermore, there has been a short reduction in the incidence and mortality of CRC in recent years, especially when compared with developed countries[10, 11]. This may be partly explained by technical differences between screening programmes. In Brazil, opportunistic screening is most used in primary health care (PHC), which relies on the timely enrolment of women in services and performs Pap smears according to spontaneous demand[24]. According to national recommendations, screening for cervical cancer should be carried out in an organised manner, with active targeting of the target population, and at the appropriate time[5, 6]. Opportunistic screening can increase Pap smear coverage, but it won't always meet the MH standards of appropriateness[25] or have an impact on female morbidity and mortality indicators[11].

In this study, adequate screening uptake was higher among white women, those with higher levels of education, those with a partner, those living in the Southeast and South of the country, those with health insurance, and those who rated their health positively,

suggesting socio-demographic differences in screening uptake. A cross-sectional survey using the 2019 PNS described Pap smear coverage as predominantly white, higher socioeconomic class, high school educated, and living in the south and southeast of the country[26]. Meanwhile, other studies have found lower rates of screening among black and brown women, those living in the North and Northeast of the country, those living in rural areas, those without a partner, those with lower economic status, and those with low levels of education[7, 9, 27]. This shows that, despite high coverage, there are still vulnerable groups who experience difficulties in accessing screening, suggesting that little progress has been made in the equity of this service.

When analysed, there was a higher percentage of women who rated their health as positive. This trend was also seen in the historical series by Cobo et al.[28], which showed a higher percentage of positive self-rated health among Brazilian women in 2009 and 2018. In the final research models, there was an increased likelihood of adequate screening among women with positive self-rated health. A cross-sectional study conducted in 2020 showed that women benefiting from a Brazilian cash transfer programme had a lower prevalence of self-rated health[29]. Similarly, there is a correlation between greater socioeconomic power and positive self-rated health, which hampers the provision of quality services and thus screening programmes.

In 1990 and 2016, health insurance coverage in Brazil was 18.2% and 24.9% of the general population, respectively[30]. In 2019, the coverage exceeded 28.5% of the general population[17], representing more than 48 million Brazilians supported by complementary health care. In the descriptive analysis, almost half of the women studied had health insurance. Regarding screening for cervical cancer in this group, an exploratory study conducted in Pará found that 70.38% of the participants reported that they preferred to have their Pap smears done in the private sector[22]. A study using the 2003 PNAD showed that women with health insurance were 26.1% more likely to be screened for cervical cancer than women without supplementary health insurance[31]. At the same time, a study of 150,000 Americans associated health insurance coverage with socioeconomic and demographic inequalities in the distribution and uptake of screening tests, including those for cervical cancer[32].

It has been suggested that the higher prevalence of screening and adequate screening among users of complementary health services is related to the time taken to go to the health unit, the delay in analysis and receiving the result, the lack of acceptance, fear, shame and the quality of care received[23]. Similarly, low adherence to Pap smears was associated with unemployment, low income, and lower education, suggesting that the acquisition of private health insurance is itself influenced by other socio-economic determinants[33]. However, there is a consensus that beneficiaries of supplementary health care have higher protective factors than those who do not have access to the private sector[13,17,29]. This observation was also present in the multivariable analysis, which showed an association between the prevalence of screening and adequate screening for cervical cancer and the prevalence of private healthcare.

Our results indicate difficulties in accessing screening for user groups with more vulnerable socio-demographic characteristics, especially those without health insurance. However, they may also reflect a good coverage of these tests in the Brazilian population, close to the national targets set. Thus, this study contributes to the scientific production on cervical cancer screening by identifying inequalities in coverage and highlighting the existence of groups with barriers to access.

On the other hand, the lower coverage of Pap smears in the last three years, as recommended by national screening programmes, reinforces the need to strengthen clinical guidelines and practices that define a three-year interval as ideal for the target population aged 25-64. As stated in the Strategic Action Plan for Tackling NCDs, in Brazil 2021-2030, regardless of health insurance coverage, it is necessary to improve cervical cancer screening. Moreover, to move from the opportunistic model to an organised model that guarantees the quality of testing, diagnostic confirmation, treatment of precancerous lesions, follow-up according to national guidelines, and referral of confirmed cancers to tertiary care[6], thus reducing the morbidity and mortality of women due to this disease.

Limitations include a possible selection bias since VIGITEL used the fixed telephone registry of the Brazilian state capitals and the Federal District, which was minimised by using weighting and post-stratification weights in each municipality[20]. The fact that the information is self-reported may also introduce bias, although there are validated studies that confirm the reliability and sensitivity of self-reported questions[34]. Similarly, there was similarity between the descriptive analysis and the prevalence ratios estimated in the study and other nationally representative population surveys. Taken together—the rapid implementation of the surveys, their broad population coverage, and their relatively low cost (approximately one-fifth that of a face-to-face household interview)[35]—these factors confirm VIGITEL as an appropriate tool for monitoring and surveillance of health risk and protective indicators in Brazilian health.

CONCLUSION

The conclusion is that there is an association between having health insurance and cervical cancer screening coverage in the population of women aged 25-64 in the 26 Brazilian capitals and the Federal District in 2020. In other words, in the capitals where there is a higher prevalence of women who reported having health insurance, there is a higher uptake of Pap smears. In addition, socio-demographic differences in Pap smear coverage persisted, indicating higher coverage among older women and women living with a partner in more developed regions of the country.

It is important to strengthen the cervical cancer screening programme in Brazil to promote public policies aimed at reducing sociodemographic inequalities, consolidating equity, and reducing cervical cancer morbidity and mortality indicators. The findings of this study also reveal persistent deficiencies in public health coverage, suggesting that, in some contexts, the acquisition of private health insurance becomes a strategy to overcome gaps in access to essential preventive services such as cervical cancer screening. To this end, VIGITEL reaffirms its relevance for professionals and managers in monitoring health indicators. Moreover this is a powerful tool for controlling cervical cancer in Brazil.

REFERENCES

1. Wu J, Jin Q, Zhang Y, Ji Y, Li J, Liu X, et al. Global burden of cervical cancer: current estimates, temporal trend and future projections based on the GLOBOCAN 2022. *J Natl Cancer Cent.* 2025;5(3):322-9. https://doi.org/10.1016/j.jncc.2024.11.006
2. World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. Geneva: WHO; 2021 [access in 2023 Dec 13]. Available from: https://www.who.int/publications/i/item/9789240030824
3. Instituto Nacional de Câncer (INCA). Estimativa 2023: incidência de cancer no Brasil. Rio de Janeiro: INCA; 2022 [access in 2023 Dec 13]. Available from: https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/estimativa-2023.pdf
4. World Health Organization. Human papillomavirus vaccines: WHO position paper. Geneva: WHO; 2022 [access in 2023 Dec 13]. Available from: https://www.who.int/publications/i/item/who-wer9750-645-672

5. Claro IB, Lima LD, Almeida PF. Cervical cancer guidelines, prevention and screening strategies: experiences from Brazil and Chile. Cienc Saude Colet. 2021;26(10):4497-4509. DOI: 10.1590/1413-812320212610.11352021
6. Ministério da Saúde. Secretaria de Vigilância em Saúde. Plano de ações estratégicas para o enfrentamento das doenças crônicas e agravos não transmissíveis no Brasil 2021-2030. Brasília: Ministério da Saúde; 2021 [access in 2023 Dec 13]. Available from: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/svsa/doencas-cronicas-nao-transmissiveis-dcnt/09-plano-de-dant-2022_2030.pdf
7. Santos MR. Iniquidades raciais no acesso a exames preventivos para câncer de colo do útero no Brasil: uma análise a partir da Pesquisa Nacional de Saúde (2013-2019) [dissertation on the Internet]. Rio de Janeiro: Fundação Oswaldo Cruz; 2022 [access in 2023 Dec 13] 60 p. Available from: https://api.arca.fiocruz.br/api/core/bitstreams/e49a86c2-a58e-4b2f-af9c-ef7542903473/content
8. Shpendi, S., Norman, P., Gibson-Miller, J. et al. Identifying the key barriers, facilitators and factors associated with cervical cancer screening attendance in young women: A systematic review. Women's Health. 2025;21. Doi: 10.1177/17455057251324309
9. Azevedo e Silva G, Damacena GN, Ribeiro CM, Alcantara LLM, Souza Júnior PRB, Szwarcwald CL. *Papanicolaou test in Brazil: analysis of the National Health Survey of 2013 and 2019.* Rev Saúde Pública. 2023;57:55. doi:10.11606/s1518-8787.2023057004798
10. Instituto Nacional de Cancer (INCA). Brazilian Cervical Cancer Screening Guidelines. Rio de Janeiro: INCA; 2016 [access in 2023 Dec 13]. 114 p. Available from: https://ninho.inca.gov.br/jspui/handle/123456789/7810
11. Tallon B, Monteiro D, Soares L, Rodrigues N, Morgado F. Trends in cervical cancer mortality in Brazil in 5 years (2012-2016). *Saúde Debate*. 2020;44(125):362-71. DOI: 10.1590/0103-1104202012506
12. Vieira YP, Viero VSF, Vargas BL, Nunes GO, Machado KP, Neves RG, et al. Tendência e desigualdades no rastreamento autorrelatado do câncer de colo de útero nas capitais brasileiras entre 2011 e 2020. Cad Saude Publica. 2022;38(9):. doi: 10.1590/0102-311XPT272921
13. Malta DC, Bernal RTI, Vieira Neto E, Curc KA, Pasinato MTM, Lisbôa RM, et al. Noncommunicable diseases, risk factors, and protective factors in adults with and without health insurance. *Ciênc Saúde Colet.* 2020;25(8):2973-83. DOI: 10.1590/1413-81232020258.32762018
14. Silva SLA, Torres JL, Peixoto SV. Fatores associados à busca por serviços preventivos de saúde entre adultos brasileiros: Pesquisa Nacional de Saúde, 2013. *Ciênc Saúde Colet*. 2020;25(3):783-93. DOI: 10.1590/1413-81232020253.15462018
15. Sabatino SA, Thompson TD, White MC, Villarroel MA, Shapiro JA, Croswell JM, et al. Up-to-date breast, cervical, and colorectal cancer screening test use in the United States, 2021. *Prev Chronic Dis*. 2023;20:E10. http://dx.doi.org/10.5888/pcd20.230071
16. Rolle LD, Chery MJ, Larson M, Lopez-Pentecost M, Calfa CJ, Schlumbrecht MP, et al. The effect of disability and social determinants of health on breast and cervical cancer screenings during the COVID-19 pandemic. *Prev Chronic Dis*. 2024;21:E05. doi:10.5888/pcd21.230234
17. Souza Júnior PRB, Szwarcwald CL, Damacena GN, Stopa SR, Vieira MLFP, Almeida WS, et al. Health insurance coverage in Brazil: analyzing data from the National Health Survey, 2013 and 2019. *Ciênc Saúde Colet*. 2021;26Supl1):2529-41. doi: 10.1590/1413-81232021266.1.43532020
18. Pilotto LM, Celeste RK. The relationship between private health plans and use of medical and dental health services in the Brazilian health system. *Ciênc Saúde Colet*. 2019;24(7):2727-36. DOI: 10.1590/1413-81232018247.24112017
19. Ministério da Saúde. Secretaria de Vigilância em Saúde. Vigitel Brasil 2019: vigilância de fatores de risco e proteção para doenças crônicas por meio de inquéritos telefônicos: estimativas da frequência e da distribuição sociodemográfica de fatores de risco e proteção para doenças crônicas nas capitais dos 26 estados. Brasília, DF: Ministério da Saúde; 2020 [access in 2023 Dec 13]. Available from: https://actbr.org.br/uploads/arquivos/vigitel-brasil-2019-vigilancia-fatores-risco.pdf
20. Ministério da Saúde. Secretaria de Vigilância em Saúde. Vigitel Brasil 2021: vigilância de fatores de risco e proteção para doenças crônicas por meio de inquéritos telefônicos: estimativas da frequência e da distribuição sociodemográfica de fatores de risco e proteção para doenças crônicas nas capitais dos 26 Estados Brasileiros e no Distrito Federal em 2021. Brasília, DF: Ministério da Saúde; 2021 [access in 2023 Dec 13]. Available from: https://repositorio.ufmg.br/server/api/core/bitstreams/2705fb51-3fa2-4f96-a6ec-b2f8a1d90d00/content
21. Instituto Brasileiro de Geografia e Estatística. *Censo Demográfico 2022: População e Domicílios – Primeiros Resultados do Universo.* Rio de Janeiro: IBGE; 2023 [access in 2023 Dec 13]. Available from: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://biblioteca.ibge.gov.br/visualizacao/livros/liv102011.pdf
22. Instituto Brasileiro de Geografia e Estatística - IBGE. Síntese de Indicadores Sociais: uma análise das condições de vida da população brasileira 2019. Rio de Janeiro: IBGE; 2019 [access in 2023 Dec 13]. Available from: https://biblioteca.ibge.gov.br/visualizacao/livros/liv101678.pdf
23. Nascimento JKS, Lima RCR, Souza CS. Factors that influence the low adhesion of the Papanicolau Exam in Basic Health Units in the Municipality of Redenção-PA. *Res Soc Dev*. 2022;11(8):e16611830642. https://doi.org/10.33448/rsd-v11i8.30642
24. Cerqueira RS, Santos HLPC, Prado NMLB, Bittencourt RG, Biscarde DGS, Santos AM. Control of cervical cancer in the primary care setting in South American countries: systematic review. Rev *Panam Salud Publica*. 2022;46:e107. doi: 10.26633/RPSP.2022.107
25. Viana JN, Moysés RPC, Espir TT, Souza GA, Barcellos JFM, Alves MGP. Determinantes sociais da saúde e prevenção secundária do câncer do colo do útero no Estado do Amazonas, Brasil. *Medicina (Ribeirão Preto Online)*. 2019;52(2):110-20. https://doi.org/10.11606/issn.2176-7262.v52i2p110-120
26. Schäfer AA, Santos LP, Miranda VIA, Tomasi CD, Soratto J, Quadra MR, et al. Regional and social inequalities in mammography and Papanicolaou tests in Brazilian state capitals in 2019: a cross-sectional study. *Epidemiol Serv Saúde*. 2021;30(4):e2021172. https://doi.org/10.1590/S1679-49742021000400016
27. Lago KS, Silva AA, Santos CS, Santos RC, Rodrigues RN, Oliveira F, et al. Perfil dos exames citopatológicos do colo do útero de mulheres residentes no estado de Minas. HU Rev. 2022;48:1-9. DOI: 10.34019/1982-8047.2022.v48.35591
28. Cobo B, Cruz C, Dick PC. Gender and racial inequalities in the access to and the use of Brazilian health services. *Ciênc Saúde Colet.* 2021;26(9):4021-32. doi: 10.1590/1413-81232021269.05732021
29. Carvalho QH, Sá ACMGN, Bernal RTI, Malta DC. Distribution of indicators for chronic non-communicable diseases in adult women beneficiaries and non-beneficiaries of the Bolsa Família Program—Vigitel 2016–2019. *Rev Bras Epidemiol.* 2021;24(Supl1):e210011. doi: 10.1590/1980-549720210011.supl.1
30. Campoy LT, Ramos ACV, Souza LLL, Alves LS, Arcoverde MAM, Thaís Zamboni Berra TZ, et al. Spatial distribution and temporal trend of National Health System and Supplemental Health Sector human resources, Brazil, 2005-2016. *Epidemiol Serv Saúde.* 2020;29(2):e2018376. doi: 10.5123/s1679-49742020000200020
31. Moraes JR, Guimarães PV, Paula FL, Ferreira MLP, Guimarães RM, Luiz RR. Relação entre plano de saúde e a realização do exame Papanicolaou: uma aplicação de escore de propensão usando um inquérito amostral complexo. *Rev Bras Epidemiol.* 2011;14(4):589-97. https://doi.org/10.1590/S1415-790X2011000400006
32. Zhao G, Hsia J, Town M. Health-related behaviors and health insurance status among US adults: findings from the 2017 behavioral risk factor surveillance system. *Prev Med.* 2021;148:106520. doi:10.1016/j.ypmed.2021.106520
33. Moraes SZO, Sauthier AC, Correia AS, França MLF, Moraes AJP. Exame Papanicolau: comparação de fatores de risco e proteção em relação a variáveis sociodemográficas e de saúde por meio de inquérito telefônico. *Rev Epidemiol Control Infec.* 2019;9(3):234-40. https://doi.org/10.17058/reci.v9i3.12793
34. Lorem G, Cook S, Leon DA, Emaus N, Schirmer H. Self-reported health as a predictor of mortality: a cohort study of its relation to other health measurements and observation time. *Sci Rep.* 2020;10(1):4886. https://doi.org/10.1038/s41598-020-61603-0
35. Silva LES, Gouvêa ECDP, Stopa SR, Tierling VL, Sardinha LMV, Macario EM, et al. Data resource profile: Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey for adults in Brazil (VIGITEL). *Int J Epidemiol.* 2021;50(4):1058-63. DOI: 10.1093/ije/dyab104