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Impact of COVID-19 on Cancer Screening and Diagnosis Trends in Mexico: A Regional Analysis of Cervical and Breast Cancer

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Impacto del COVID-19 en las tendencias de Detección y Diagnóstico de Cáncer en México: Un Análisis Regional del Cáncer Cervicouterino y de Mama

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Abstract

Objective: To analyze the impact of the COVID-19 pandemic on cervical and breast cancer screening and diagnosis trends in Mexico, focusing on regional disparities and screening modalities. *Methods:* In a retrospective observational study, data from the National Center for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM) were analyzed. Data from 2013 to 2023 for women aged 25 to 69 were analyzed, focusing on breast and cervical cancer detection and diagnosis rates by region. Annual differences in screening incidence were assessed using the Pearson T-test. Relationships between diagnostic and screening incidence were assessed using Pearson's correlation. *Results:* The study included 10,674,184 cases of conventional cytology, 248,075 cases of liquid-based cytology, 530,755 cases of mammography, 18,846 cases of breast cancer, and 7,499 cases of cervical cancer. Significant decreases in incidence during the pandemic were observed for cervical cancer (p=0.009), breast cancer (p=0.002), cervical cytology (p=0.005), and mammography (p=0.007). Regional differences included decreases in cervical cancer rates in the Northwest and Southwest regions and decreases in breast cancer rates in most regions. Mammography rates were significantly reduced except in the east and southwest. *Conclusions:* The COVID-19 pandemic had a substantial impact on breast and cervical cancer screening and diagnosis rates in Mexico, with notable regional differences.

PALABRAS CLAVE

COVID-19, Tamizaje de Cáncer, Cáncer de Mama, Cáncer Cervicouterino

Resumen

Objetivo: evaluar cómo la pandemia de COVID-19 afectó la detección y diagnóstico de cáncer cervicouterino y de mama en México, con un enfoque en las disparidades regionales y métodos de tamizaje. *Métodos:* estudio retrospectivo basado en datos del Centro Nacional de Equidad de Género y Salud Reproductiva (CNEGSR) y Sistema de Información sobre Cáncer en la Mujer (SICAM) de entre 2013-2023 de mujeres de 25 a 69 años. Se analizaron tasas de detección y diagnóstico de ambos tipos de cáncer por región, utilizando la prueba de T de Student y correlación de Pearson. *Resultados:* el estudio incluyó 10,674,184 casos de citología convencional, 248,075 de citología en base líquida, 530,755 de mastografía, 18,846 diagnósticos de cáncer de mama y 7,499 de cáncer cervicouterino. Se observaron disminuciones significativas en la incidencia de durante la pandemia para el cáncer cervicouterino (p=0.009), cáncer de mama (p=0.002), citología convencional (p=0.005) y mastografía (p=0.007). Las diferencias regionales incluyeron disminuciones en las tasas de cáncer cervicouterino en las regiones del noroeste y suroeste, y disminuciones en las tasas de cáncer de mama en la mayoría de las regiones. Las tasas de mastografía se redujeron significativamente, excepto en las regiones este y suroeste. *Conclusión:* la pandemia impactó significativamente las tasas de detección y diagnóstico del cáncer cervicouterino y de mama, destacando disparidades regionales importantes.

KEY WORDS

COVID-19 Pandemic, Cancer Screening, Breast Cancer, Cervical Cancer

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Introduction

Breast cancer (BC) and cervical cancer (CC) are the leading and secondary causes of cancer death among women in Mexico[1–3] Early detection remains the cornerstone for reducing mortality from these diseases. Screening for CC with conventional cytology (CS) and liquid-based cytology (LBC), combined with mammography (MG) for BC, is essential to detect early-stage disease or precancerous changes.[4,5] Early diagnosis leads to more effective and less invasive treatments, improving survival rates, especially in rural or resource-poor communities.[6]

Inadequate and ineffective screening programs in Mexico were further challenged by the emergence of the COVID-19 pandemic in the early 2020's.[2,7] This global health crisis required rapidly restructuring health systems and reallocating resources to cope with the pandemic. Significant challenges included delays in diagnosis due to prolonged disruptions, increased perioperative risks, and higher mortality rates in patients with concurrent COVID-19.[8–10] In addition, the depletion of critical healthcare resources, including operating rooms and intensive care unit (ICU) beds, severely impacted the delivery of non- COVID medical care, highlighting the vulnerability of healthcare preparedness.[11,12]

Previous studies have highlighted the negative impact of the COVID-19 pandemic on gynecologic cancer screening, with diagnostic testing volumes in several countries failing to return to pre-pandemic levels.[13,14] In Mexico, short-term effects have been documented, showing changes in cancer screening services. However, long-term effects, including a comparison of screening volumes and outcomes before and during all years of the pandemic, have not been analyzed, leaving a significant gap in understanding the lasting effects of the pandemic. The main objective of the present work is to analyze the impact of the COVID-19 pandemic on the detection and diagnosis rates of CC and BC in Mexico.

Methods

Study Design, Data Source, and Participants

This study used data from publicly available sources provided by the Mexican National Center for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM), following the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).[15] The database collects de-identified national data on breast and cervical cancer screening and diagnosis from health institutions under the Ministry of Health (SSA) that serve more than 24 million people without social security[16]. The data are publicly available at: https://datos.gob.mx/busca/organization/cnegsr.

Cervical cancer screening included both conventional cytology and liquid-based cytology, which were analyzed separately. The dataset covers the period from 2013 to 2023, focusing on women aged 25 to 64 years, and includes Mexican state-specific details and cytology results during this period. Mammography was the screening modality for breast cancer among women aged 25 to 69 years from 2013 to 2023, with a data gap in 2019 due to unavailability. These datasets provided state-level information along with screening results. Histopathologic confirmation was used to diagnose both breast and cervical cancer among individuals aged 25 to 69 years from 2017 to 2023. The datasets included details on Mexican status, histopathologic results, and aspects of treatment management. Table 1 provides a summary of the methodology, time frame, age range of women, and data available from each dataset.

Table 1
Summary of cervical and breast cancer screening and diagnosis datasets Time period, age range of women, and information available

Variables	Methodology	Timeframe	Women's Age Range	Available Information[b]	Number of Results
Cervical cancer screening	Conventional (CS) and liquid-base cytology (CBL)	2013-2023	25 to 64	Mexican state Cytological outcomes	CS: 10 674 184 CBL: 248 075
Breast cancer screening	Mammography (MG)	2014-2023[a]	25 to 69	Mexican state Mammography results	530 755
Cervical (CC) and breast cancer (BC) diagnosis	Histopathology	2017-2023	25 to 69	Mexican state Histopathological results	BC: 18 846 CC: 7 499

[a]Information for 2019 was not available. [b]Available information remained constant across annual datasets. **Source of Information:** Own development. Data were obtained from the Mexican National Centre for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM), both available at: https://datos.gob.mx/busca/organization/cnegsr.

Main Outcome Measures

The annual incidence per 100,000 women was determined from the population size obtained from the National Institute of Statistics and Geography (INEGI) based on the 2020 census.[17] Incidence was calculated for both cervical and breast cancer screening and diagnosis. The Mexican states were divided into eight regions based on their health infrastructure: Northwest (Baja California, Baja California Sur, Chihuahua, Durango, Sinaloa and Sonora), Northeast (Coahuila, Nuevo Leon and Tamaulipas), West (Jalisco, Michoacan, Colima, and Nayarit), East (Hidalgo, Puebla, Tlaxcala, and Veracruz), Central South (Mexico City, State of Mexico and Morelos), Central North (Aguascalientes, Guanajuato, Querétaro, San Luis Potosí and Zacatecas), Southeast (Campeche, Quintana Roo, Tabasco and Yucatán) and Southwest (Chiapas, Guerrero, and Oaxaca).[18] The COVID-19 pandemic period was defined as March 23, 2020, to May 9, 2023.[19] Since only annual information is available, the data from 2020 to 2023 were conceptualized as the pandemic period, while the period before 2020 was considered pre-pandemic.

Statistical Analysis

The Kolmogorov-Smirnov test was used to assess normal distribution. Since the incidence data showed a normal distribution, t-tests were performed to examine the annual incidence of breast cancer screening and diagnosis differences between the study periods in all regions. In addition, a Pearson correlation test was performed to assess the relationship between the incidence of diagnosis and screening and the relationship between CBL and CS. Stacked area plots were generated to represent the distribution of the incidences studied over time visually. Statistical significance was set at $p < 0.05$, with 95 % confidence intervals (CI). Means ± standard deviations (SD) were used to represent quantitative variables, while qualitative variables were summarized as frequencies and percentages. All analyses were performed using the Statistical Package for the Social Sciences (SPSS, version 25, IBM).

Ethical Considerations

The research used de-identified data from open-access datasets published by the Mexican National Center for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM), following Mexican standard NOM-012- SSA3-201214. As a retrospective observational study, it was considered minimal risk according to the Mexican General Law on Health Research. The Ethics Committee of the Women's Hospital of Sinaloa, Secretariat of Health (No. 202411-64) granted ethical approval for this study.

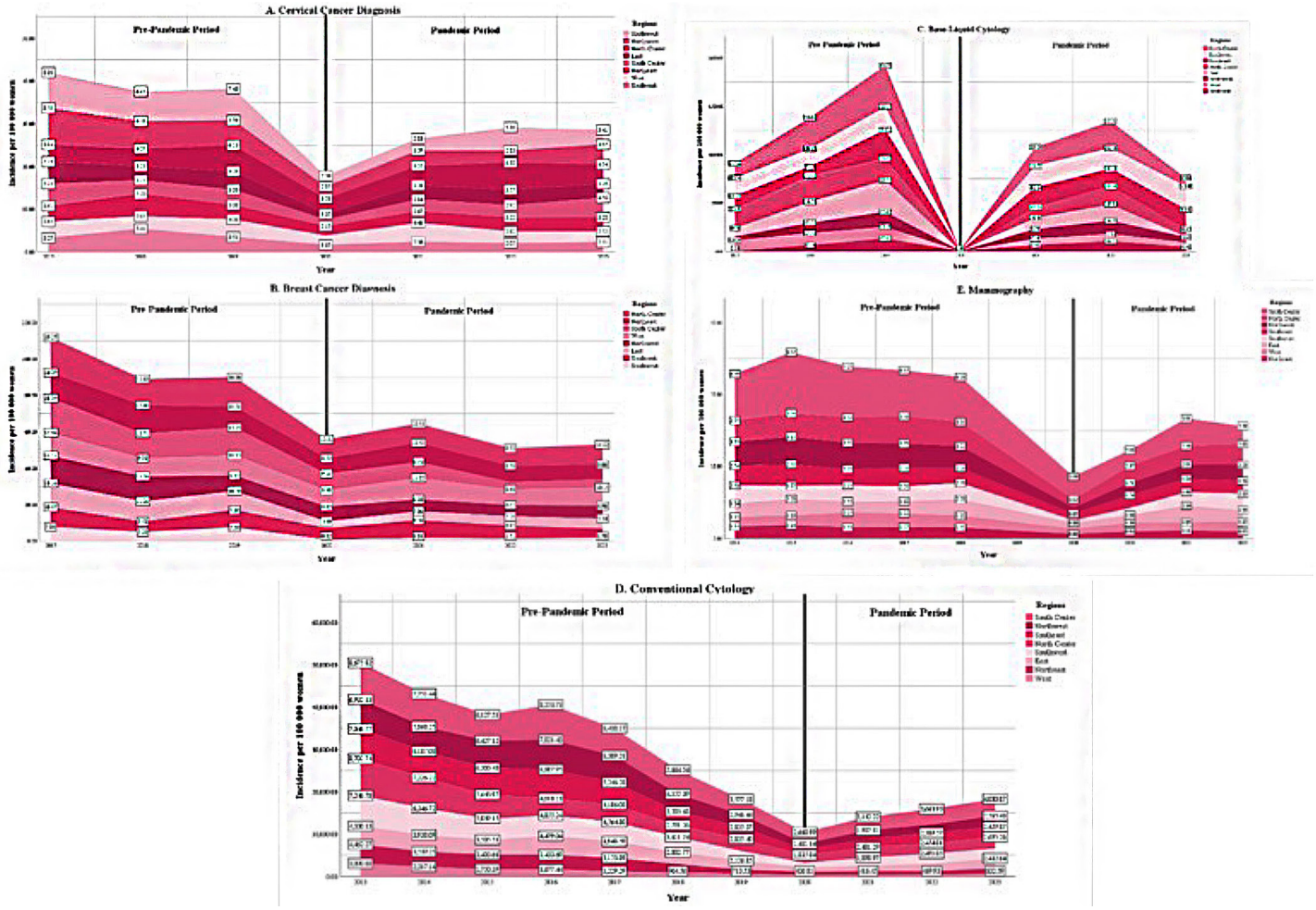
Results

General Characteristics

The study included 10,674,184 cases of CS, 248,075 cases of CBL, 530,755 cases of MG, 18,846 cases of CB, and 7,499 cases of CC. The most common histopathologic finding in BC was invasive ductal carcinoma, found in 62.8 % of cases, while in CC, carcinoma in situ or cervical intraepithelial neoplasia grade III was found in 73.6 % of cases. In BC screening, approximately 77.4 % of MG cases were classified as benign. In CC screening, 27.1% of CS cases and 63.0 % of CBL cases were negative for intraepithelial lesions or malignancy.

Figure 1

Stacked area plots of annual incidence per 100,000 women in all regions of Mexico comparing pre-pandemic (pre-2020) and pandemic (2020-2023) periods for: (A) cervical cancer diagnoses, (B) breast cancer diagnoses, (C) liquid-based cytology, (D) conventional cytology, and (E) mammography.



Each graph shows changes in incidence rates over time, highlighting regional trends and changes between the pre-pandemic and pandemic periods. A black vertical line marks the year 2020, separating the pre-pandemic period from the COVID-19 pandemic era. Stacks are arranged in descending order of annual incidence, with the highest incidence appearing at the top of each graph. **Source of Information:** Own development. Data from 2013 to 2023, sourced from the publicly accessible databases of the Mexican National Center for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM), available at: https://datos.gob.mx/busca/organization/cnegsr.

Annual Incidence of Breast and Cervical Cancer Diagnoses, Screening, and Impact of the COVID-19 Pandemic

An overall decrease in incidence rates was observed for all variables during the first year of the pandemic. For CC, CCB, and CM, rates stabilized in the years following the decline in 2020 (Figure 1-A, C, E). In contrast, CS showed a negative trend from 2013 onwards, with a notable increase during the pandemic, although still at lower levels than in previous years (Figure 1-D). Meanwhile, BC rates have remained relatively unchanged, maintaining levels comparable to those observed since the pandemic's beginning and persisting until the end of 2023 (Figure 1-B).

Significant reductions in annual COVID-19 incidence rates during the pandemic were observed at the national level for CC ($p = 0.009$), BC ($p = 0.002$), CS ($p = 0.005$), and MG ($p = 0.007$). At the regional level, reduced rates for CC were observed only in the Northwest ($p = 0.011$) and Southwest ($p = 0.005$) regions. In contrast, variations were observed for BC in almost all regions except the Southeast ($p = 0.392$) and West ($p = 0.267$). In addition, the variable CBL showed reduced incidence rates exclusively in the north-central ($p = 0.038$)

and western (p = 0.014) regions. On the other hand, CS rates were systematically lower during pandemic periods. The MG rate decreased in almost all regions except the East (p = 0.217) and Southwest (p = 0.164). The annual incidence rates for each variable in the different regions are shown in Table 2.

Table 2

Annual incidence per 100,000 women of cervical cancer (CC), breast cancer (BC), liquid-based cytology (LBC), conventional cytology (CC), and mammography (MG) in different regions of Mexico, classified according to the pre-pandemic (P-PDM) and pandemic (PDM) periods of COVID-19

ID	Era	Year	Region								
			East	North Center	Northeast	Northwest	South Center	Southeast	Southwest	West	Total
CC	P-PDM	2017	5.18	3.94	3.61	8.59	5.23	3.29	8.36	3.83	5.25
		2018	3.23	4.09	5.20	6.46	3.23	5.41	6.95	2.97	4.69
		2019	4.29	6.13	3.38	5.79	3.60	3.51	7.43	4.08	4.77
		2020	1.35	3.53	2.15	2.85	1.55	1.65	2.50	2.21	2.23
		2021	3.26	4.55	2.67	3.59	2.84	2.36	2.83	4.46	3.32
	PDM	2022	3.57	6.38	3.22	2.83	2.90	2.05	5.36	2.80	3.64
		2023	3.26	4.54	3.28	4.67	4.56	2.31	3.41	2.52	3.57
	p-value		0.133	0.974	0.084	**0.011***	0.291	0.092	**0.005***	0.379	**0.009***
BC	P-PDM	2017	13.16	19.17	14.09	15.11	18.99	10.67	7.84	12.68	13.96
		2018	11.26	14.43	15.46	13.59	13.71	5.58	5.00	9.98	11.13
		2019	10.59	16.06	11.51	8.42	15.25	9.36	7.58	11.15	11.24
		2020	3.80	10.31	8.55	8.02	9.11	6.23	0.82	8.98	6.98
		2021	5.06	10.53	10.59	6.33	8.73	9.58	1.81	11.88	8.06
	PDM	2022	5.29	9.72	8.78	6.00	4.09	6.90	1.51	8.68	6.37
		2023	5.54	11.02	8.06	6.96	4.46	5.03	1.78	10.15	6.62
	p-value		**0.0001***	**0.004***	**0.010***	**0.026***	**0.006***	0.392	**0.022***	0.267	**0.002***
CBL	P-PDM	2017	89.78	200.50	0.00	34.55	152.84	131.77	183.54	116.34	113.67
		2018	220.79	272.72	62.44	103.31	320.04	87.23	189.10	127.76	172.92
		2019	328.54	226.38	132.61	153.65	426.70	294.31	238.27	121.49	240.24
		2020	0.03	0.00	1.09	0.00	20.75	0.00	0.00	2.36	3.03
		2021	118.68	109.81	65.02	96.59	189.21	202.34	226.77	67.49	134.49
	PDM	2022	169.96	189.41	104.02	134.79	275.77	180.11	213.91	77.12	168.14
		2023	2.75	80.12	45.40	54.48	82.06	203.62	240.90	47.61	94.62
	p-value		0.128	**0.038***	0.796	0.591	0.156	0.767	0.651	**0.014***	0.207
CS	P-PDM	2013	4330.13	8702.74	4462.27	6932.33	8675.82	7046.77	7246.78	3090.68	6310.94
		2014	3938.09	7226.22	3539.25	5868.25	7751.44	6187.00	6346.72	2317.14	5396.76
		2015	3505.51	5643.97	3403.66	6427.12	6127.51	6303.40	5039.15	1750.39	4775.09
		2016	4479.04	4010.13	3433.69	7021.43	8253.73	6807.95	4855.24	1677.44	5067.33
		2017	3948.59	4106.08	3123.89	6309.21	6438.17	5246.28	4564.80	1229.29	4370.79
		2018	2802.77	2791.26	1942.71	4155.39	5664.54	3203.68	3611.74	964.56	3142.08
		2019	2126.85	2835.49	887.38	2946.44	3577.18	2835.37	2308.62	713.53	2278.86
		2020	1050.65	1835.04	644.17	1481.14	2660.99	1187.78	1150.68	426.81	1304.66
		2021	1292.94	2481.29	846.17	1987.81	3142.22	1992.70	1898.97	416.45	1757.32
	PDM	2022	1729.38	2454.01	770.22	1972.20	3663.93	2389.57	2491.05	469.93	1992.54
		2023	2432.64	2695.26	1238.99	2565.43	4000.07	2429.87	2318.55	632.59	2289.17
	p-value		**0.003***	**0.019***	**0.008***	**0.001***	**0.006***	**0.005***	**0.009***	**0.020***	**0.005***
MG	P-PDM	2014	1.84	2.95	1.64	3.33	6.49	2.74	2.53	1.35	2.86
		2015	2.28	3.26	1.84	3.80	8.47	2.98	1.87	1.33	3.23
		2016	1.54	3.52	1.53	3.66	7.05	2.25	2.25	2.07	2.98
		2017	1.68	3.78	1.57	3.38	6.37	2.56	2.09	1.90	2.92
		2018	2.28	3.36	1.50	3.02	6.26	2.08	2.28	1.66	2.80
		2019	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]
		2020	0.80	1.12	0.60	0.87	3.19	0.89	0.37	0.75	1.07
		2021	1.10	2.37	0.94	1.71	2.18	1.74	1.01	1.20	1.53
	PDM	2022	2.34	2.56	1.11	2.01	3.81	1.84	1.90	1.09	2.08
		2023	1.59	2.88	0.95	2.23	2.49	1.76	2.33	1.35	1.95
	p-value		0.217	**0.018***	**0.001***	**0.001***	**0.0001***	**0.009***	0.164	0.027	0.007*

The table shows annual incidence rates per 100,000 women for key health indicators in different regions of Mexico, including cervical cancer (CC), breast cancer (BC), liquid cytology (lc), conventional cytology (CC), and mammography (MG). The data are divided into the pre-pandemic period (P-PDM) before 2020 and the pandemic period (PDM) of COVID-19, from 2020 to 2023. Comparisons before and during the pandemic were made using t-tests. Statistical significance was set at p < 0.05, indicated by an asterisk and highlighted in black. aNA: not available. Source of Information: Own development. Data provided by the Mexican National Centre for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Women's Cancer Information System (SICAM), publicly available at: https://datos.gob.mx/busca/organization/cnegsr.

Correlation Between Breast and Cervical Cancer Diagnosis and Screening

The annual incidence rates of MG showed a positive correlation with CC in all regions; however, statistical significance was observed only in the northeast region (r = 0.855, p = 0.030). When examining cervical cancer screening, both CBL and CS showed po-

sitive associations (including both significant and non-significant correlations) with CC in all regions except the Northwest and North Central regions. Statistically significant associations were observed only in the Northwest (r = 0.961, p = 0.0001), the Southwest (r = 0.828, p = 0.021), and nationally (r = 0.861, p = 0.013) for the CS-CC relationship. Finally, the relationship between conventional and newer cervical cancer screening methods (CS vs. CBL) incidence rates showed nonsignificant positive correlations except in the Northeast and Northwest regions (Table 3).

Table 3

Correlation analysis between breast cancer (BC), cervical cancer (CC), conventional cytology (CS), liquid-based cytology (CBL) and mammography (MG): CS-CBL, CBL-CC, CS-CC, and MG-BC.

Regions	Correlation							
	CS-CBL		CBL-CC		CS-CC		MG-BC	
	r	p-value	r	p-value	r	p-value	r	p-value
East	0.116	0.805	0.548	0.302	0.766	0.045*	0.472	0.344
North Center	0.563	0.188	0.406	0.366	-0.068	0.884	0.756	0.082
Northeast	-0.467	0.291	0.191	0.681	0.552	0.198	0.855	**0.030***
Northwest	-0.124	0.791	-0.047	0.921	0.965	0.0001*	0.782	0.066
South Center	0.173	0.710	0.097	0.837	0.722	0.067	0.804	0.054
Southeast	0.145	0.756	0.032	0.945	0.516	0.236	0.479	0.337
Southwest	0.360	0.428	0.353	0.437	0.828	0.021*	0.528	0.282
West	0.714	0.071	0.566	0.185	0.218	0.638	0.673	0.143
Total	0.243	0.600	0.687	0.088	0.861	0.013*	0.782	0.066

This table presents Pearson's correlation analysis between diagnostic methods and cancer diagnoses. The correlations are analyzed as follows: between conventional cytology and liquid-based cytology (CS-CBL), between liquid-based cytology and cervical cancer diagnosis (CBL-CC), between conventional cytology and cervical cancer diagnosis (CS-CC), and between mammography and breast cancer diagnosis (MG-BC). These comparisons highlight the diagnostic consistency and potential predictive relationships between the different cervical and breast cancer screening methods. Analyses were performed using only annually available data. Therefore, all correlations were based on information from 2017 to 2023, except for MG-BC, as 2019 MG data were unavailable, and thus, 2019 data were omitted from the MG-BC analysis. Statistical significance was set at $p < 0.05$, defined with an asterisk, and highlighted in black. **Source of Information:** Own development. Data were provided by the Mexican National Centre for Gender Equity and Reproductive Health (CNEGSR) and the Mexican Information System on Cancer in Women (SICAM), available at: https://datos.gob.mx/busca/organization/cnegsr.

Discussion

Key Findings

The study analyzed cases of confirmed BC and CC diagnoses and their screening methods, showing an overall decrease in diagnosis and screening rates during the first year of the COVID-19 pandemic. Statistical differences in the reduction of annual COVID-19 incidence rates during the pandemic were observed at the national level for the variables CC (p = 0.009), BC (p = 0.002), CS (p = 0.005), and MG (p = 0.007), and different behaviors depending on the individual health division region. Regarding correlation, significant associations were observed only in the Northeast region between MG and BC and at the Northwest, Southwest, and national levels for the CS-CC relationship.

Implications for Clinical Practice and Directions for Future Research

The observed decline in diagnosis and detection rates during the pandemic in Mexico raises concerns about delayed diagnosis, which may result in more advanced disease at the time of detection and worse clinical outcomes for patients. This finding underscores the critical need to strengthen public health initiatives to ensure that cancer screening remains timely and accessible, even during global health crises. Future research could examine the long-term consequences of these delays on patient survival and cancer staging. In addition, future studies could focus on strategies to improve screening coverage, especially in underserved areas that showed the most significant declines and explore the feasibility of alternative screening approaches such as home testing and telemedicine consultations. In addition, research on regional disparities in cancer screening and diagnosis could inform targeted interventions to improve outcomes in specific communities.

A meta-analysis evaluating the impact of the COVID-19 pandemic on CC in six countries (USA, Italy, Canada, Scotland, Belgium, and Slovenia) reported that the participation rate of women in screening programs almost halved between 2019 and 2020.[14] In Latin America, Vazquez Rosas et al.[20] studied the impact of the pandemic on cancer control in several countries, analyzing data from 2019 to 2020. Their study considered government interventions, cancer care costs, and regional disparities and reported a significant decrease in participation rates. In Mexico, Cruz-Valdez et al.[21] conducted a retrospective analysis using administrative records from the Ministry of Health. They found a 67.8 % (90 % CI: -72.3 %, -61.7 %) decrease in positive Pap smear results between April and December 2020. Similarly, Doubova et al.[22] examined data from the Mexican Institute of Social Security (IMSS), comparing January 2019 to December 2020, and found a more than two-thirds decrease in BC (79 %) and CC (68 %) detection. Our findings are consistent with these previous studies, highlighting a widespread decline in cancer screening and diagnosis pro-

grams during the COVID-19 pandemic. In particular, our observations are consistent with those of Sasidharanpillai et al.[14] who reported a significant decline in CC screening rates. However, we observed a slight recovery in cytology rates during the pandemic. Similarly, our results support the findings of Cruz-Valdez et al.[21] and Doubova et al.,[22] who documented significant declines in positive diagnoses and MG and cytology yields. However, our study extends these analyses by examining regional disparities and thus identifies significant differences in the impact of the pandemic in different parts of Mexico.

Strengths

A notable strength of the study is its emphasis on regional data analysis, which allows us to capture local variations in access to and impact of screening programs. This approach provides a more detailed understanding of disparities in cancer control across Mexico, which has not been adequately addressed in other studies reviewed. The study also covers a more extended period, through 2023, providing a more complete perspective on recovery in the years following the pandemic. In addition, by including traditional and newer screening methods (CS and CBL), the study provides a more complete picture of the current diagnostic tools.

Limitations

One of the study's main limitations is its reliance on administrative records, which may underestimate the true incidence of cancer, particularly in areas with limited access to health services. In addition, although regional data are included in the analysis, the lack of detailed sociodemographic information may limit the ability to interpret the observed differences between regions fully. In addition, the study is limited to data from the public health system, excluding private health facilities, which reduces the generalizability of the results to the entire Mexican population. Finally, the lack of data from MG in 2019 may also affect applicability.

Conclusion

The present work highlights a significant decrease in cancer diagnosis and detection rates during the first year of the COVID-19 pandemic in Mexico, with regional variations in impact observed. The findings underscore the need to strengthen public health initiatives to ensure timely detection and address regional disparities.

Conflict of Interest

The authors declare no conflicts of interest.

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