

## Preplanned Studies

## Cervical Cancer Screening Rates Among Chinese Women — China, 2023–2024

Mei Zhang<sup>1</sup>; Limin Wang<sup>2</sup>; Xiao Zhang<sup>1</sup>; Chun Li<sup>1</sup>; Zhenping Zhao<sup>1</sup>; Mengting Yu<sup>1</sup>;  
Maigeng Zhou<sup>2</sup>; Jing Wu<sup>2\*</sup>; Linhong Wang<sup>2</sup>

### Summary

#### What is already known about this topic?

The Chinese government has established targets for cervical cancer screening coverage among women of appropriate age: 50% by 2025 and 70% by 2030. Previous data from 2018–2019 indicated that 36.8% of women aged 35–64 years had been screened in China.

#### What is added by this report?

In 2023–2024, screening rates reached 51.5% among women aged 35–64 years, 57.9% among women aged 35–44 years, and 36.8% among women aged 20 years and above. Rural screening coverage (48.2%) approached but remained slightly below the 50% target. Several regions, particularly in the Eastern, Central, and Southern regions have achieved the 2025 target. Significant determinants of low cervical cancer screening coverage among Chinese women encompassed lower educational attainment, unemployment status, limited household income, lack of health insurance coverage, and absence of health check-ups.

#### What are the implications for public health practice?

Intensified implementation of the Action Plan to Accelerate Elimination of Cervical Cancer is needed, particularly in rural areas with suboptimal screening rates. Enhanced health education and service delivery should target women of lower socioeconomic status to facilitate their active participation in screening programs.

representative cross-sectional survey was conducted among adults from 31 provincial-level administrative divisions in China between August 2023 and May 2024. Following data cleaning, 96,819 female participants were included in the analysis. Cervical cancer ever-screening rates were calculated for the overall population and by subgroups. All results were weighted to provide more accurate population-level estimates.

**Results:** In 2023–2024, 51.5% of women aged 35–64 years had undergone cervical cancer screening at least once, with rates of 57.9% among women aged 35–44 years and 36.8% among women aged 20 years and above. Screening coverage in rural areas (48.2%) remained slightly below but approached the 50% target. Several regions (specifically, the Eastern, Central, and Southern regions) have achieved the 2025 target. Significant determinants of low cervical cancer screening coverage among Chinese women encompassed lower educational attainment, unemployment status, limited household income, lack of health insurance coverage, and absence of health check-ups ( $P < 0.05$  for all comparisons).

**Conclusions:** Intensified efforts are needed to implement the Action Plan to Accelerate Elimination of Cervical Cancer, particularly in rural areas. Additionally, enhanced health education and service provision should target women of lower socioeconomic status to promote their active participation in screening programs.

## ABSTRACT

**Introduction:** The Chinese government has established targets of 50% cervical cancer screening coverage by 2025 and 70% by 2030 for women of appropriate age. This study aimed to assess screening coverage across mainland China and analyze key sociodemographic and geographic determinants.

**Methods:** A nationally and provincially

Cervical cancer is the second most common cancer in women of reproductive age worldwide, particularly in developing countries (*1*). Globally, an estimated 662,044 cases (age-standardized incidence rate, ASIR: 14.12/100,000) and 348,709 deaths (age-standardized mortality rate, ASMR: 7.08/100,000) from cervical cancer occurred in 2022, representing the fourth

leading cause of cancer morbidity and mortality in women. Notably, China accounts for 23% of global cases and 16% of deaths (2). To address this significant global burden, the World Health Organization (WHO) launched the Global Initiative for Accelerated Elimination of Cervical Cancer in 2020, establishing national 90-70-90 targets for 2030, including screening 70% of women aged 35–45 years at least once in their lifetimes (3). In China, the National Public Health projects for cervical and breast cancer screening among women of eligible aged 35–64 years were initiated in 2009. Subsequently, in 2023, the Chinese central government released the Action Plan to Accelerate the Elimination of Cervical Cancer (2023–2030), setting screening coverage targets for women of appropriate age at 50% by 2025 and 70% by 2030 (4). However, our previous studies have indicated that cervical cancer screening rates in China remain suboptimal (5–6). The present study utilizes the latest nationally and provincially representative survey data to estimate screening coverage across Chinese mainland and analyze key sociodemographic and geographic determinants through logistic regression models based on complex sampling design. Our findings suggest that China as a whole have already achieved the 2025 target of screening 50% of women aged 35–64 years by 2024. Nevertheless, significant gaps remain in cervical cancer screening coverage to meet the 2030 target in rural areas and northeastern China. The study further demonstrates that women living in rural areas and those with low income, limited education, or unemployment are less likely to access cervical cancer screening services, thus requiring enhanced governmental attention and intervention.

This study utilized data from a national and provincial representative survey conducted in 2023–2024 to estimate current cervical cancer screening rates among adult women in China. Participants aged 18 years and above were selected from 298 districts/counties across all 31 provincial-level administrative divisions (PLADs) through a multi-stage and cluster randomized sampling method. The sampling methodology for survey districts/counties and participants has been described elsewhere (7–8). Trained local health staff conducted interviews using computer-assisted personal interviewing (CAPI). Female participants were asked about their history of cervical cancer screening, including the month and year of their most recent

screening, if applicable. Among 198,303 adults selected for interview, 188,388 completed the survey, yielding a 95.0% response rate. We excluded 82,130 male participants, 196 female participants younger than 20 years, and 9,243 female participants with missing sociodemographic data or unclear responses regarding cervical cancer screening history, resulting in a final analytical sample of 96,819 female participants. The ever-screening rate was defined as the percentage of individuals in the total population who had undergone at least one screening in their lifetime. We calculated the percentages of participants screened within various intervals: previous 1 year, previous 2 years, previous 3 years, previous 5 years, and ever in lifetime. Design-based multivariate logistic regression analysis was employed to identify predictors of ever-screening uptake among women aged 35–64 years. Standard errors (SE) were estimated using Taylor linearization with finite population correction. Statistical significance was determined using two-sided  $P < 0.05$ . All results were weighted using weights that incorporated multistage sampling weight, non-response weight, and post-stratification weight based on the seventh national census (2020) population to ensure representativeness at both national and provincial levels. All statistical analyses were performed using SAS (version 9.4, SAS Institute Inc., Cary, USA).

The final analysis encompassed 96,819 female participants aged 20 years and above. Among these participants, 48.2% resided in urban areas, 10.1% held college degrees, and 39.0% had undergone health examinations within the previous three years (Table 1).

In 2023–2024, 36.8% [95% confidence interval (CI): 35.5%, 38.1%] of Chinese adult women had undergone cervical cancer screening at least once in their lifetime. The ever-screening rates were 52.6% (95% CI: 50.8%, 54.4%) among women aged 30–49 years, 57.9% (95% CI: 55.9%, 60.0%) among women aged 35–44 years, and 51.5% (95% CI: 49.7%, 53.3%) among women aged 35–64 years (Table 2). The highest ever-screening rate was observed in the 35–44 age group, with rates declining to 4.7% among women aged 75 years and older. According to the data, 35.2%, 32.7%, and 24.2% of women had undergone cervical cancer screening at least once in the previous 5 years, the previous 3 years, and the previous year, respectively. Across all age groups and screening intervals, screening coverage was consistently higher among urban women compared to those living in rural areas (Table 2).

Lower cervical screening rates among women aged

TABLE 1. Sociodemographic characteristics of female participants aged 20 and above in the survey in China, 2023–2024.

Characteristics	No. of participants (N=96,819)	Proportion (%)
Age group (years)		
20–24	1,260	1.3
25–34	5,968	6.2
35–44	10,304	10.6
45–54	19,219	19.9
55–64	27,965	28.8
65–74	24,765	25.6
≥75	7,338	7.6
30–49	21,544	22.3
35–64	57,488	59.4
Residence		
Urban	46,634	48.2
Rural	50,185	51.8
Geographic region		
Northern	14,149	14.6
Northeastern	9,371	9.7
Eastern	24,626	25.4
Central	12,390	12.8
Southern	9,583	9.9
Southwestern	14,603	15.1
Northwestern	12,097	12.5
Education		
Primary or less	51,592	53.3
Secondary	24,615	25.4
High	10,835	11.2
College or above	9,777	10.1
Household income per capita (CNY)		
Q1 (<7,500)	16,649	17.2
Q2 (7,500–15,999)	18,616	19.2
Q3 (16,000–29,999)	15,630	16.2
Q4 (≥30,000)	19,300	19.9
Don't know/refused	26,624	27.5
Employment status		
Employed	57,249	59.1
Housework	24,932	25.8
Retired	4,414	4.6
Unemployed	10,224	10.5
With health insurance coverage		
No	2,310	2.4
Yes	94,509	97.6
Self-assessed health status		
Poor or fair	51,941	53.6
Good	44,878	46.4
Have health examination in the previous 3 years		
Yes	37,729	39.0
No	59,090	61.0

Abbreviation: CNY=Chinese Yuan.

TABLE 2. Cervical cancer screening coverages in women aged 20 years and above by age groups in China, 2023–2024.

Characteristics	Coverage (%) (95% CI)*			
	Screening ever in lifetime	Screening in the previous 5 years	Screening in the previous 3 years	Screening in the previous year
Total	36.8 (35.5, 38.1)	35.2 (34.0, 36.5)	32.7 (31.5, 33.9)	24.2 (23.2, 25.2)
Age group (years)				
20–24	7.5 (5.5, 9.4)	7.4 (5.4, 9.3)	7.0 (5.1, 8.9)	5.5 (3.6, 7.4)
25–34	32.7 (30.5, 34.9)	32.2 (30.0, 34.4)	30.4 (28.2, 32.6)	22.5 (20.5, 24.4)
35–44	57.9 (55.9, 60.0)	56.6 (54.6, 58.7)	53.3 (51.3, 55.3)	40.6 (38.6, 42.6)
45–54	56.2 (54.1, 58.4)	54.0 (51.8, 56.2)	50.0 (47.9, 52.2)	36.9 (35.0, 38.8)
55–64	38.0 (36.0, 40.0)	35.2 (33.3, 37.2)	31.9 (30.1, 33.8)	22.9 (21.4, 24.5)
65–74	12.6 (11.7, 13.5)	10.2 (9.3, 11.1)	8.7 (7.9, 9.5)	5.9 (5.3, 6.5)
≥75	4.7 (3.8, 5.6)	3.5 (2.7, 4.4)	3.2 (2.4, 4.0)	2.6 (1.9, 3.3)
30–49	52.6 (50.8, 54.4)	51.3 (49.5, 53.0)	48.2 (46.5, 49.9)	36.8 (35.3, 38.3)
35–64	51.5 (49.7, 53.3)	49.4 (47.7, 51.2)	45.9 (44.2, 47.5)	34.0 (32.6, 35.4)
Urban	38.8 (37.1, 40.4)	37.1 (35.5, 38.8)	34.5 (33.0, 36.1)	25.6 (24.3, 26.9)
30–49	53.8 (51.6, 56.1)	52.3 (50.1, 54.5)	49.4 (47.2, 51.5)	37.7 (35.8, 39.7)
35–44	59.0 (56.5, 61.5)	57.6 (55.0, 60.1)	54.3 (51.8, 56.8)	41.1 (38.6, 43.5)
35–64	53.3 (51.1, 55.4)	51.1 (48.9, 53.3)	47.4 (45.3, 49.5)	35.1 (33.3, 36.9)
Rural	33.1 (31.3, 34.9)	31.7 (29.9, 33.4)	29.3 (27.6, 30.9)	21.6 (20.1, 23.2)
30–49	49.8 (47.4, 52.2)	48.7 (46.4, 51.1)	45.5 (43.2, 47.8)	34.6 (32.3, 36.8)
35–44	55.2 (52.4, 58.0)	54.2 (51.5, 57.0)	50.9 (48.2, 53.7)	39.3 (36.5, 42.2)
35–64	48.2 (45.7, 50.7)	46.4 (43.9, 48.9)	43.1 (40.7, 45.4)	32.1 (29.9, 34.2)

Abbreviation: CI=confidence interval.

\* Screening rates are all weighted percentages.

35–64 years were observed in those living in western China, those with less education (40.2%; 95% CI: 38.0%, 42.3%), those in the lowest income bracket (44.6%; 95% CI: 42.1%, 47.1%), those without health insurance (24.3%; 95% CI: 20.4%, 28.3%), and those without health examinations during the past 3 years (38.8%; 95% CI: 36.9%, 40.8%). Regional data indicated that three regions (specifically, the Eastern, Central, and Southern regions) had achieved the 50% screening target, followed by the Southwestern region with a screening rate of 49.8%. In contrast, the Northeastern region exhibited substantially lower screening coverage, remaining below 40% (Table 3).

Multivariate logistic regression analysis revealed that, compared to women without health insurance, having health insurance was strongly associated with an increased likelihood of screening uptake [odds ratio (OR): 2.70; 95% CI: 2.15%, 3.40%]. Similarly, having undergone a health examination in the previous 3 years was also associated with a significantly higher likelihood of screening (OR: 2.17; 95% CI: 2.03%, 2.32%) (Table 3).

## DISCUSSION

Analysis of the current study demonstrates that in 2023–2024, 36.8% of women aged 20 years and above in China have undergone cervical cancer screening at least once in their lifetime. For women aged 30–49 years and 35–64 years, the 2025 target of 50% cervical cancer screening coverage has been surpassed. Nevertheless, screening uptake remains suboptimal, particularly in rural areas, certain PLADs, and among women of lower socioeconomic status.

Since the inception of China's first national free cervical cancer screening program for rural women aged 35–64 years in 2009, the country has achieved remarkable progress in improving screening rates through a comprehensive approach combining nationwide screening initiatives, public awareness campaigns, and technological advancements (4). This study demonstrates that these concerted efforts have yielded significant results. The screening coverage for women aged 35–64 years has increased substantially from approximately 36.8% in 2018 (5) to 51.5% in 2023–2024. More than half of women aged 30–49

TABLE 3. Multivariable logistic regression analysis of cervical cancer screening rates by sociodemographic factors among women aged 35–64 years in China, 2023–2024.

Characteristics	% (95% CI)	OR (95% CI)*	P
<b>Geographic region</b>			
Northern	43.4 (40.5, 46.3)	1.00(Ref)	0.002
Northeastern	33.8 (27.5, 40.2)	1.69(1.22, 2.36)	0.002
Eastern	58.8 (55.9, 61.6)	2.85 (2.05, 3.96)	<0.001
Central	58.1 (53.0, 63.1)	3.27 (2.26, 4.73)	<0.001
Southern	50.9 (44.1, 57.7)	2.36 (1.62, 3.44)	<0.001
Southwestern	49.8 (47.0, 52.6)	2.65 (1.90, 3.70)	<0.001
Northwestern	45.5 (40.5, 50.5)	1.87 (1.26, 2.77)	<0.001
<b>Education</b>			
Primary or less	40.2 (38.0, 42.3)	1.00(Ref)	
Middle	54.6 (52.4, 56.8)	1.87 (1.73, 2.01)	<0.0001
High	55.4 (52.6, 58.3)	1.87 (1.70, 2.07)	<0.0001
College or above	65.3 (61.8, 68.8)	2.46 (2.14, 2.84)	<0.0001
<b>Household income per capita (CNY)</b>			
Q1 (<7, 500)	44.6 (42.1, 47.1)	1.00(Ref)	
Q2 (7, 500–15, 999)	50.2 (47.9, 52.6)	1.22 (1.10, 1.35)	<0.0001
Q3 (16,000–29,999)	55.3 (52.6, 58.1)	1.37 (1.22, 1.53)	0.0009
Q4 (≥30,000)	58.8 (56.3, 61.2)	1.34 (1.20, 1.50)	<0.0001
Don't know or refused	46.3 (43.9, 48.6)	0.96 (0.86, 1.08)	0.496
<b>Employment status</b>			
Employed	53.8 (51.8, 55.8)	1.00 (Ref)	<0.0001
Housework	46.7 (44.3, 49.0)	1.57 (1.37, 1.78)	<0.0001
Retired	43.9 (39.3, 48.5)	1.47 (1.26, 1.72)	0.277
Unemployed	48.3 (44.3, 52.2)	1.12(0.91, 1.38)	
<b>With health insurance coverage</b>			
No	24.3 (20.4, 28.3)	1.00(Ref)	
Yes	52.1 (50.3, 53.8)	2.70 (2.15, 3.40)	<0.0001
<b>Self-assessed health status</b>			
Good	50.1 (48.1, 52.1)	1.00(Ref)	
Poor or fair	52.9 (51.1, 54.7)	1.21(1.11, 1.25)	<0.0001
<b>Have health examination in past 3 years</b>			
No	38.8 (36.9, 40.8)	1.00(Ref)	
Yes	61.8 (60.0, 63.6)	2.17 (2.03, 2.32)	<0.0001

Abbreviation: OR=odds ratio; CI=confidence interval.

\*OR, CI, and P were calculated using ever screened rates.

years have undergone at least one screening in their lifetime or within various screening intervals, exceeding the worldwide average screening rate reported in 2019 (9). However, a considerable disparity remains when compared to screening coverage in developed nations (e.g., 87% in the United States, 88% in Canada) (9–10). Although more than 57% of women aged 35–44 years have been screened at least once, this

coverage still falls substantially short of both the national and WHO 2030 targets.

A particularly encouraging finding from this study is that half of the regions in Chinese mainland have already surpassed the 2025 screening rate target ahead of schedule. Five years ago, only 3 PLADs had achieved the 50% target, and screening rates in 12 PLADs were below 40% (4). This marked



improvement underscores the effectiveness of implementing the free national screening program across diverse geographical regions.

This study was subject to at least two limitations. First, while the CAPI methodology reduced recall bias, it did not completely eliminate this potential source of error. Second, as this investigation was not specifically designed to assess cervical cancer screening, the questionnaire's limited scope precluded the inclusion of questions addressing practical barriers or individual reasons for non-participation in screening programs.

In summary, based on nationally and provincially representative survey data from 2023–2024, we present the most current estimates of cervical cancer screening rates across mainland China. Overall, 51.5%, 49.4%, 45.9%, and 34.0% of women aged 35–64 years have undergone screening at least once in their lifetime, and within the previous 5 years, 3 years, and 1 year, respectively. For the target population of women aged 35–64 years, the overall screening rate has reached the 2025 target, though this achievement is primarily driven by urban participation, with rural areas still showing a modest gap. To bridge the remaining disparities and meet both National and WHO targets for 2030, sustained policy and financial support for cervical cancer screening services is essential. Health education and outreach efforts should specifically target recommended age groups, while accessibility to health services requires strengthening in rural areas and northeastern regions.

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# Corresponding author: Jing Wu, [wujing@ncncd.chinacdc.cn](mailto:wujing@ncncd.chinacdc.cn).

<sup>1</sup> Division of NCD and Risk Factor Surveillance, National Center for Chronic and Noncommunicable Disease Control and Prevention,

Chinese Center for Disease Control and Prevention, Beijing, China; <sup>2</sup> National Center for Chronic and Noncommunicable Disease Control and Prevention, Chinese Center for Disease Control and Prevention, Beijing, China.

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