

Breast Cancer Screening in Women Aged 45-65 in Samarkand Region, Uzbekistan: A Cross-Sectional Analysis of Data from 2023

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DOI : <https://doi.org/10.61796/jmgcb.v1i12.1059>



Sections Info

Article history:

Submitted: Nov 06, 2024

Final Revised: Nov 16, 2024

Accepted: Nov 26, 2024

Published: Nov 26, 2024

Keywords:

Breast cancer

Screening

Early detection

Samarkand

Public health

ABSTRACT

Objective: Breast cancer is a leading cause of cancer-related mortality among women globally, and early detection through screening significantly reduces morbidity and mortality. This study evaluates the outcomes of breast cancer screening programs in the Samarkand region of Uzbekistan in 2023, focusing on participation rates, detection rates, and stage distribution across 17 districts and cities. **Methods:** Data were collected on women aged 45–65, including annual screening targets, the number of screenings performed, diagnosed cases, and cancer stage distribution (early stages 1–2 vs. late stages 3–4). Statistical analysis was conducted to determine completion and detection rates, as well as regional disparities in screening outcomes. **Results:** The screening program achieved promising outcomes in participation and early-stage cancer detection, with substantial variability among districts. A higher proportion of cases were detected at stages 1–2, indicating effective early diagnosis in some areas. However, significant regional disparities in screening completion and detection highlight inequitable access to services. **Novelty:** This study provides a comprehensive regional analysis of breast cancer screening outcomes in Uzbekistan, emphasizing the importance of addressing disparities to improve equitable access to early diagnosis and treatment. These findings underscore the need for targeted public health interventions to enhance program effectiveness and reduce the burden of late-stage breast cancer.

INTRODUCTION

Breast cancer is a significant public health challenge, particularly in low- and middle-income countries where screening programs are often underdeveloped or underutilized. Early detection through regular screening significantly increases the likelihood of successful treatment and improves survival rates. In Uzbekistan, breast cancer screening programs targeting women aged 45-65 have been gradually expanded. The Samarkand region, one of the country's major population centers, has been actively implementing these screening initiatives. This study aims to analyze the performance of these programs, focusing on the number of screenings conducted, the proportion of women diagnosed at early and late stages, and the overall effectiveness of the program.

RESEARCH METHOD

Data were collected from the breast cancer screening programs conducted in Samarkand region for women aged 45-65 in the year 2023. A total of 17 districts and cities were included in the analysis, and the following variables were recorded:

- Total number of women aged 45-65
- Annual screening targets
- Number of screenings performed

- Number of diagnosed breast cancer cases
- Distribution of cancer cases by stage (1-2 stage vs. 3-4 stage)

The data were analyzed to determine the completion rate of screening, the detection rate of breast cancer, and the proportion of cases detected at early (stages 1-2) vs. late (stages 3-4) stages. Statistical analysis was performed to identify trends and significant regional differences in screening outcomes.

RESULTS AND DISCUSSION

Screening Coverage and Completion Rates

The total target population for screening across the 17 districts and cities was 410,462 women aged 45-65. The annual plan set for the number of screenings was 82,090, with an actual number of 100,837 screenings conducted, resulting in an overall completion rate of 123%. However, there was significant variability in the completion rates across districts, with some districts surpassing their targets by a substantial margin, while others lagged behind.

For example:

- Samarkand City exceeded its target with 5126 screenings completed, representing 101.7% of the planned screenings.
- Nurabad District, on the other hand, had a much lower completion rate, achieving only 50% of its planned screenings (6139 out of 12,278).

	District/City Name	Total number of women aged 45-65	Annual Plan	Actual Completion	%	Total Number of Diagnosed Patients	Of which	1-2 stage (%)	3-4 stage (%)
1	Samarkand City	53,198	4,987	5,126	139	71%	4	29%	
2	Kattakurgan City	6,757	2,562	2,874	85	62.50%	3	37.50%	
3	Okdaryo District	25,843	3,571	3,972	54	80%	1	20%	
4	Bulungur District	47,733	3,901	4,337	75	71.13%	2	28.60%	
5	Jomboy District	12,798	4,073	4,751	75	71.13%	2	28.60%	
6	Ishtikhon District	21,280	5,545	5,962	64	66.60%	2	33.30%	

	District/City Name	Total number of women aged 45-65	Annual Plan	Actual Completion	%	Total Number of Diagnosed Patients	Of which	1-2 stage (%)	3-4 stage (%)
7	Kattakurgan District	23,273	5,861	6,241	5	3	60%	2	40%
8	Kushrobod District	6,822	3,114	3,502	6	4	66.60%	2	33.30%
9	Narpay District	20,426	5,273	5,813	5	3	60%	2	40%
10	Nurabad District	11,198	5,618	6,139	4	2	50%	2	50%
11	Pastdargom District	34,988	8,492	9,340	6	4	66.60%	2	33.30%
12	Pakhatachi District	38,145	4,021	4,628	9	6	66.60%	3	33.30%
13	Payarik District	24,330	6,601	7,136	3	3	100%	0	0%
14	Samarkand District	26,355	3,769	9,186	7	5	71.30%	2	28.60%
15	Taylok District	15,198	9,963	9,552	5	3	60%	2	40%
16	Urgut District	42,118	4,739	12,278	15	10	66.60%	5	33.30%
17	Region Total	410,462	82,090	100,837	11	75	65.20%	36	34.80%

Cancer Detection Rates

A total of 111 women were diagnosed with breast cancer across the region, out of which 75 cases (65.2%) were identified in the early stages (stages 1-2), and 36 cases (34.8%) were diagnosed at advanced stages (stages 3-4). This distribution varies across different districts:

- Okdaryo District reported the highest proportion of early-stage diagnoses, with 80% of cases detected at stages 1-2.
- In contrast, Nurabad District had a balanced distribution, with 50% of cases diagnosed at each stage (early vs. advanced).

Regional Variability in Cancer Stage Distribution

There were significant differences in the proportion of early vs. advanced-stage breast cancer cases across different districts. The districts with the highest proportions of early-stage breast cancer detection included:

- Payarik District, where 100% of the diagnosed cases were at stages 1-2.
- Okdaryo District, with 80% of cases detected early.

In districts like Samarkand City and Jomboy District, a significant proportion of cases were diagnosed at later stages, reflecting a greater need for improving early detection strategies.

Overall Performance and Challenges

While the overall screening rate was higher than the target, the wide variation in performance across districts suggests challenges in reaching all segments of the population. Factors contributing to these discrepancies may include:

- Differences in public awareness and education about the importance of screening.
- Variability in access to healthcare facilities and trained medical personnel.
- Socioeconomic factors influencing women's participation in screening programs.

Discussion

The results of this analysis suggest that while the Samarkand region has made significant progress in breast cancer screening, several challenges remain in ensuring that all women have access to early detection services. The overall high screening rate (123% of the target) indicates strong efforts in public health outreach. However, the uneven distribution of early vs. advanced-stage cancer diagnoses across districts highlights the need for targeted interventions.

The high proportion of early-stage cancer cases in districts like Okdaryo and Payarik may reflect more effective community engagement, better access to screening facilities, or more proactive healthcare providers. Conversely, districts with higher proportions of late-stage diagnoses, such as Samarkand City and Nurabad, may benefit from intensified awareness campaigns, mobile screening units, and improvements in healthcare infrastructure.

In particular, the large number of women diagnosed at later stages in some districts underscores the need for more widespread education about the importance of regular screenings, as well as increasing access to mammography and other diagnostic tools.

CONCLUSION

Fundamental Finding: The breast cancer screening program in the Samarkand region of Uzbekistan demonstrated promising participation and early detection rates, with a higher proportion of cases identified at early stages (1-2). However, significant disparities in screening completion and cancer detection were observed across districts, indicating inequitable access to screening services. **Implication:** These findings

underscore the need for targeted public health strategies to improve awareness, accessibility, and equity in screening programs. Addressing these disparities could enhance early detection, reduce the burden of late-stage breast cancer, and improve overall treatment outcomes for women in the region. **Limitation:** The study is limited by its reliance on program-reported data, which may not fully account for undiagnosed cases or variations in diagnostic accuracy between districts. Additionally, external factors influencing participation rates, such as socioeconomic and cultural barriers, were not extensively analyzed. **Further Research:** Future studies should investigate the underlying causes of regional disparities in screening outcomes and assess the impact of socioeconomic, cultural, and healthcare infrastructure factors. Longitudinal research evaluating the long-term effectiveness of the screening program on breast cancer morbidity and mortality rates is also recommended to guide policy and program development.

ACKNOWLEDGMENTS

The authors would like to acknowledge the healthcare workers, local authorities, and public health professionals who contributed to the successful implementation of the breast cancer screening program in Samarkand region

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