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Understanding the gap between availability and utilization: A quantitative analysis of Cervical Cancer screening behavior in Kolkata's informal settlements

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Abstract
Despite the availability of free cervical cancer screening services in urban India, participation among marginalized women remains extremely low. This study examines the gap between the availability of preventive services and their actual community-level utilization in Kolkata's informal settlements, where dense medical infrastructure coexists with low participation in preventive health services. Using primary data from a cross-sectional house-to-house survey of 155 women aged 25-55, this study employs a Probit regression model to identify the socio-economic and institutional determinants of screening behavior. The findings reveal that the most significant barrier to screening is not a lack of awareness or clinical proximity, but the indirect economic cost of care-specifically, the loss of daily wages incurred due to time spent traveling to, waiting at, and undergoing screening at health facilities. Women who face this opportunity cost are significantly less likely to seek preventive care, even when services are geographically accessible and free of charge. In contrast, contact with frontline health workers and a woman's autonomy in making personal health decisions substantially increase the likelihood of screening uptake, while higher health literacy plays a supportive but insufficient role on its own. These results demonstrate that clinical proximity and awareness do not guarantee utilization in informal urban contexts, where immediate economic survival constrains preventive behavior. This study highlights the need for flexible, community-responsive screening models-such as mobile or after-hours services-that reduce income loss and better align public health delivery with the realities of women engaged in informal labor.

Keywords: Cervical cancer, awareness, screening, opportunity cost, agency, urban

Introduction

Cervical cancer represents a profound public health crisis in the developing world, acting as a "silent killer" that disproportionately claims the lives of women in their most productive years. India accounts for nearly one-third of global cervical cancer deaths, an incidence and death rate that underscores the significant challenges in the uptake of preventive screening services [1]. While medical advancements, such as Visual Inspection with Acetic Acid (VIA) and HPV testing, have rendered this malignancy largely preventable, the transition from clinical availability to community-level participation remains a hurdle. In the dense urban landscapes of India, particularly within marginalized settlements, the barrier to screening is rarely just a lack of hospitals. It is a complex intersection of economic survival, social agency, and systemic outreach. Despite the proliferation of free screening programs under the National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD), national data from the NFHS-5 reveal that screening prevalence in many regions remains alarmingly low, often staying below 2% [2].

In the specific context of West Bengal, the situation is particularly acute. Despite the presence of robust medical infrastructure in Kolkata, the utilization of screening services among the urban poor continues to be negligible. Existing research in Kolkata's urban indigent areas has documented a significant burden of cervical precancers and cancers, yet it simultaneously identifies a staggering lack of participation in routine screening [3]. More recent investigations in Kolkata highlight that even when women are aware of cancer risks, their health-seeking behavior is severely constrained by localized socio-economic factors. Specifically, lower educational attainment and poor socio-economic status are significantly associated with a failure to identify risk factors, resulting in many women remaining entirely unscreened-with a 0% lifetime screening rate-despite their proximity to major medical facilities [4]. Furthermore, research focusing on the urban areas of Kolkata suggests that health-seeking behavior is primarily reactive rather than preventive; due to the double burden of exhaustive paid labor and household chores, women in these clusters are constrained to prioritize immediate economic survival and family well-being over asymptomatic screenings [5].

This study addresses several critical voids in the existing literature, particularly the lack of data regarding the "hidden price" of healthcare in Kolkata's informal economy. While direct medical costs are often subsidized, the indirect economic burden of absenteeism-specifically the opportunity cost of lost daily earnings-remains a primary, yet unquantified, impediment for women residing in urban slums. For those reliant on daily wages, the time required for clinical visits represents a significant financial trade-off that is frequently overlooked in public health discourse. This study specifically addresses the paradox where high clinical density and proximity to major medical facilities do not equate to higher utilization in urban clusters. While the efficacy of the ASHA model is well-documented in rural West Bengal, its impact remains under-examined within the complex social structures of urban slums. Alongside this systemic factor, this study investigates the role of female agency and health literacy as measurable determinants of behavior. By evaluating whether the capacity for independent decision-making and a comprehensive knowledge of screening benefits serve as statistical predictors, the research provides a more precise

understanding of the internal barriers-particularly the gap where basic awareness exists but clinical uptake remains non-existent-that broader social narratives often fail to capture within Kolkata's urban landscape. Ultimately, by analyzing these multi-layered dimensions, this study seeks to explain the disconnect between the availability of preventive services and their actual community-level utilization.

Objective of the Study

With the above background, this study was undertaken with the following objectives:

1. To evaluate the gap between cervical cancer awareness and actual screening participation, thereby establishing the extent to which health literacy correlates with preventive medical action.
2. To identify the socio-economic determinants-specifically the role of opportunity costs and institutional outreach-that govern the utilization of free screening services within the surveyed population.

Data & Methodology

A community-based cross-sectional study was conducted among a total of 155 women, between the ages of 25 and 55, residing in the urban slums of Kalighat, Kolkata. Data collection was carried out through a house-to-house survey using a predesigned and pretested questionnaire, which was specifically structured to gather detailed information on health literacy regarding cervical cancer, the opportunity costs associated with seeking care (such as wage loss), and the actual utilization of preventive services. The questionnaire was administered in the regional language to ensure linguistic and cultural sensitivity. Ethical integrity was maintained by obtaining verbal informed consent from each respondent, with a guarantee of voluntary participation and data confidentiality. Furthermore, this study employed a reciprocal approach. The survey was integrated with cervical health advocacy; all respondents received informative materials on early detection, and a medical professional was present to offer direct clinical guidance and address health-related concerns regarding the screening process.

Table 1: Descriptive Statistics (Sample Size = 155)

Variables	Mean	SD	Min	Max
Screening Status	0.35	0.48	0	1
Control Variables				
Age	37.61	7.93	25	55
Knowledge Score	2.55	1.53	1	5
Wage Loss	0.61	0.49	0	1
Institutional Outreach	0.41	0.49	0	1
Agency	0.52	0.50	0	1

Source: Primary Data

To understand the barriers to cervical cancer screening and their socio-economic determinants, this study utilizes the dependent variable "screening status," which takes the value one if the respondent has undergone a screening and zero if they have never been screened. This binary approach provides a distinct framework to analyze the factors that either facilitate the uptake of preventive services or contribute to continued non-participation among those surveyed.

Table 2: Frequency Distribution of Screening Status

Screening Status	Frequency	Percentage (%)
Screened	55	35.48
Never Screened	100	64.52

Source: Primary Data

Several independent variables have been identified to capture the multidimensional factors influencing cervical cancer screening behavior. The variable "age" is the age of the respondent. The dummy variable "wage loss" takes the value one if the respondent incurs a loss of daily earnings to seek medical care and zero otherwise. The dummy variable "institutional outreach" takes the value one if the respondent has been visited by an ASHA or community health worker and zero if no such contact occurred. The dummy variable "agency" takes the value one if the respondent holds a primary decision-making role regarding her own health and zero otherwise.

The variable "knowledge score" serves as a composite index to quantify the level of awareness among respondents based on five specific indicators. Respondents were asked to: (1) identify at least two risk factors for cervical cancer; (2) recognize early warning signs or symptoms; (3) confirm whether cervical cancer is preventable; (4) identify a specific screening procedure, such as a Pap smear or VIA; and (5) locate a nearby health facility where screening services are provided. For each indicator, a correct response was assigned a value of one, while an incorrect or "do not know" response was assigned a value of zero. These points were aggregated to create a total score from 0 to 5, with higher scores representing greater awareness. This scale allows the model to measure how each additional piece of information increases a woman's likelihood of seeking screening.

Estimation Model & Results

Given the binary nature of the dependent variable, this study employs a Probit regression model. The model is based on an unobserved latent variable, Y_i^*, which represents the utility a respondent has toward seeking cervical cancer screening. The structured equation is expressed as:

$$Y_i^* = X_i\beta + \varepsilon_i,\ \varepsilon_i \sim N(0,1)$$

Here, X_i is a vector of independent variables, β is a vector of coefficients, and ε_i is the stochastic error term.

The observed variable, Y_i, is determined as:

$$Y_i = 1 \text{ if } Y_i^* \geq 0$$

This implies Y_i takes the value 1 if the respondent has undergone cervical cancer screening and 0 otherwise.
Therefore, the response probability can be derived as:

$$\text{Prob}(Y_i = 1 \mid X_i) = \Phi(\beta_0 + \beta_1 AGE_i + \beta_2 KSCORE_i + \beta_3 LOSS_i + \beta_4 OUTREACH_i + \beta_5 AGENCY_i)$$

Where,
AGE = age of the respondent
KSCORE = composite knowledge score
LOSS = loss of daily earnings to seek medical care
OUTREACH = contact with an ASHA or community health worker

AGENCY = primary role in personal health decision-making

Table 3: Estimation Results-Probit Model Analysis

Covariates	Coefficient	AME
Age	−0.0260	−0.0014
Knowledge Score	1.4848***	0.0779***
Wage Loss	−1.1091**	−0.0726**
Institutional Outreach	1.6069***	0.1073***
Agency	1.9349***	0.0999***
Pseudo Log-Likelihood	−14.3564	
Pseudo R^2	0.8576	
χ^2	36.99	

Source: Primary Data

(The dependent variable is Screening Status. AME denotes Average Marginal Effects. The sample size is 155. *** and ** indicate statistical significance at the one and five percent levels, respectively.)

This study finds that knowledge score has a positive and significant association with the likelihood of undergoing screening. In particular, a 10 percent increase in the knowledge score is likely to increase the likelihood of screening by 0.78 percentage points. Women who incur a loss of daily earnings to seek medical care have a lower likelihood of undergoing screening as compared to those who do not. In particular, women who incur a loss of daily earnings are 7.26 percentage points less likely to undergo screening as compared to those who do not. Women who have been visited by an ASHA or community health worker have a higher likelihood of undergoing screening as compared to those who have not been. In particular, women who have been visited by an ASHA or community health worker are 10.73 percentage points more likely to undergo screening as compared to those who have not been. Women who hold a primary decision-making role regarding their own health have a higher likelihood of undergoing screening as compared to those who do not. In particular, women who hold a primary decision-making role regarding their own health are 9.99 percentage points more likely to undergo screening as compared to those who do not.

Conclusion

This study indicates that in Kolkata's informal settlements, the provision of subsidized medical services is insufficient to ensure women actually use them, especially when their day-to-day socio-economic struggles are overlooked. The findings suggest that screening behavior is shaped by a complex interplay of financial, social, and cognitive factors. Specifically, the sacrifice of daily earnings serves as a primary obstacle that structural availability and the mere presence of medical facilities cannot mitigate. For many women in these clusters, the immediate necessity of economic survival often takes precedence over seeking preventive care for an asymptomatic condition, as the time spent at a clinic represents a direct threat to household financial stability.

However, the positive impact of institutional outreach and improved health literacy shows that active community engagement can effectively bridge this gap. The data indicate that interpersonal communication through frontline health workers is more effective than passive information dissemination in converting awareness into clinical action. Furthermore, the findings highlight that a woman's ability to make independent health decisions is as critical as the distance to the nearest clinic. This demonstrates that gender-based domestic roles and restricted mobility are significant internal barriers that persist even in a medically dense urban environment.

To conclude, the evidence suggests that public health policies must shift toward more flexible delivery models, such as evening clinics or mobile screening units, to better accommodate the schedules of the informal workforce. Strengthening the urban frontline health workforce and supporting female autonomy through targeted advocacy are essential steps to resolve the disconnect between service availability and actual utilization. By addressing these practical and social determinants of access, the healthcare system can better reach the most vulnerable women in Kolkata's urban landscape and move toward a more equitable preventive health framework.

References

1. Kulal S, H KJ, Anandakumar AS, H RR, G P. The Sociocultural Determinants of Cervical Cancer Outcomes in India: A Critical Review of Diagnostic Delays and Treatment Disparities. Cureus, 2025, 17(7).
2. Gopika MG, Prabhu PR, Thulaseedharan JV. Status of cancer screening in India: An alarm signal from the National Family Health Survey (NFHS-5). Journal of Family Medicine and Primary Care, 2022, 11(11).
3. Basu P, Sarkar S, Mukherjee S, Ghoshal M, Mittal S, Biswas S, *et al*. Women's perceptions and social barriers determine compliance to cervical screening: Results from a population based study in India. Cancer Detection and Prevention,2006:30:369-374.
4. Dutta S, Pattanayak S, Ahamed A, Basu M. Sociodemographic and behavioral risk factors for cervical cancer, its awareness and preventive practices among reproductive age group women in a slum area of Kolkata. IMC Journal of Medical Science, 2025, 19(1).
5. Roy S. Quality of Living, Health and Well-Being of Slum Dwelling Women Domestic Workers in Kolkata. Urban Health Risk and Resilience in Asian Cities, 2020, 271-292.