Healthcare Access in Mumbai's Slums: Analysing Socioeconomic Barriers through Andersen's Behavioural Model

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Abstract:

Access to healthcare in Mumbai's slum populations-Nehru Nagar, Indira Nagar, and the Santacruz East has been reviewed for systemic inequities through the lens of Andersen's Behavioral Model of Health Services Use. Three factors that he mentioned in his model like Predisposing factors like education, cultural beliefs etc., Enabling factors such as income level, type of health insurance, and geographic access etc, and Need factors like chronic illness, perceived health need were analysed. Using mixed methods, household interviews in slum populations (n=200) reveal that because of the lack of public healthcare facilities, 63% depended on costly private clinics with a large proportion of people out-of-pocket catastrophic expense impacting 55%. Migrant workers, especially women, have been rendered, in a systematic way, outside the periphery of schemes such as Ayushman Bharat because of lack of documentation and low levels of health literacy. While insight into "healthcare deserts" located in Santacruz East indicates that there are government clinics presently overwhelmed with patient demand, community participation such as ASHA worker campaigns and mobile clinics facilitated by NGOs bring to the fore the potential for localized interventions. The study highlights the need for the policies towards accessible reforms for slums so that subsidized diagnostics, decentralized telemedicine kiosks, and mobile health units serve the slum as well as the migrant community optimally. Emphasizing social empowerment through health literacy and participatory governance would strengthen efforts toward achieving SDG 3 (Good Health and Well-being) and SDG 10 (Reduced Inequalities) that aligns with India's vision of "Viksit Bharat 2047."

Keywords: Andersen's Behavioral Model, healthcare access, urban slums, social equity, Viksit Bharat 2047, Mumbai.

Introduction:

Paradoxes characterize the face of healthcare in urban India: while a few world-class facilities do exist, a simultaneous existence of underfunded public facilities creates inequities. The rural healthcare issue is known in common parlance (Kumar A. (2023), whereas there is a dearth of attention paid to intra-urban disparities. Mumbai, with 20 million people, is the epitome of this divide; 42% of slum dwellers in Mumbai do not have access to primary care (Patwardhan et al., 2023). Access to health in urban slums has been a perennial challenge for public health across the world and the underserved communities are still existing barriers to accessing quality care (World Health Organisation [WHO], 2018). As India urbanizes, access to healthcare within

metropolitan slums will continue to yield greater disparities (Killemsetty, N., Johnson, M., & Patel, A. (2022). These inequities are depicted in Mumbai with its densely populated informal settlements, out-of-pocket payments for healthcare, and underdeveloped public infrastructure worsening health vulnerabilities (Sriram, S., & Albadrani, M. (2022). This study basically deals with access to healthcare within the slums of Mumbai in the light of Viksit Bharat 2047 and Sustainable Development Goals such as SDG- 3 and SDG 10. The SDG-3 indicates good health and well-being whereas SDG 10 denotes Reduced Inequality. Paying specific respect to the three variables: income, gender, and migrant status, this study throws further light onto intersections between the three variables in healthcare experience within Nehru Nagar, Indira Nagar, and Santacruz East Ward. Mixed Methods Techniques deploying surveys and interviews can allow issues to be diagnosed. The set of findings seeks to stimulate a series of policy interventions-m-mobile health units, decentralized health clinics, improved health literacy campaigns expected to spark interest in urban health issues. The study brings evidence to support systemic reform in urban health.

Although the literature has well-documented the large rural-urban disparities in healthcare access, the knowledge pertaining to intra-urban disparities, especially among vulnerable populations in slum areas of major Indian cities such as Mumbai, remains scant. Most studies focus on rural health issues or general urban-rural comparisons quite often ignoring the specific socioeconomic and cultural barriers faced by urban slum dwellers. This study aims at bridging the gap by applying Anderson's Behavioral Model in examining healthcare access for the slum populations of Mumbai, focusing on the interplay of need, enabling, and predisposing variables. This provides a nuanced portrayal of the barriers encountered by the low-income population of urban slums which continues being poorly presented in the literature. Our research question were:

1. How do socioeconomic factors such as income, insurance correlate with healthcare utilization?
2. What cultural and infrastructural barriers can disproportionately affect low-income groups?

Review of Literature:

The literature on health access in urban slums highlights several important points in its description. Priya et al. (2019) have pointed out the corresponding disparities concerning access to health care between rural and urban communities, with rural areas having been given more attention than urban slums. Nevertheless, intra-urban disparities, especially in slums, have been increasingly acknowledged as a serious challenge. Studies highlight that slum residents face peculiar challenges, such as congestion, poor sanitation, and limited access to medical facilities (Kumar & Gupta, 2020). Further complicating this is the socioeconomic problems-arising mostly among slum populations-such as limited financial means, lack of insurance, and lower levels of education (Ghosh et al., 2023).

The differences among various factors affecting access to healthcare may be addressed through Andersen's Behavioral Model of Health Service Utilization. This model proposes three components influencing health access: predisposing factors (like level of education and cultural beliefs), enabling factors (like income, insurance, and geographical accessibility), and need factors inherent in health-related decisions (like being diagnosed with chronic illness or perceived health requirements) (Andersen, 1995). While this model has, in the past, been used to explore healthcare availability in various contexts, little work has specifically examined urban slums in India. This study, by adapting the Andersen framework to the slums of Mumbai-a setting in

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which access to healthcare poses particular challenges due to the high population density and informal nature of settlements-seeks to fill this void.

Methods:

The study relied on purposive sampling to select homes in Mumbai slum neighborhoods of Nehru Nagar, Indira Nagar, and Santacruz East. The selection was based on the 2023 BMC Health Report, which highlighted these areas as densely populated with substantial healthcare access gaps. Through purposive sampling, the study was assured of the focused enumeration of households expected to face barriers to care-dispersion, including low-income families, migratory workers, and women. All two hundred families were polled; the sample size was informed by the need to achieve an experiential range of socioeconomic and demographic characteristics in slum areas and a reasonable chance for data collection.

The participants were asked their knowledge of, access to, affordability of, and availability of health services in that area and their perceptions regarding the community health problems. The main questionnaire was embedded with a nested survey question to indicate the type of health care provider from which the participants sought medical treatment, with the options being government and private hospitals, community health centers, and private practitioners. Some responses were recoded and recoded as dichotomous variables displaying whether or not a facility was accessed.

A pilot test was conducted before administering the structured questionnaire to a larger population to ensure quality, conciseness and ease of understanding . The feedback received from the pilot phase led to some adjustments made to ensure that the final survey would effectively capture the planned data.

The analysis was done with Microsoft Excel, Google Surveys, and Python while quantitative analysis included both descriptive statistics and chi-square tests to determine the pattern of access to health services available based on gender, income, and participation in the Ayushman Bharat scheme. The logistic regression modelling was carried out to evaluate the association between the health facility choice and site with sociodemographic factors such as gender, age, marital status, education, and income level; these results were presented as odds ratios. Open-ended responses were examined thematically to reveal key insights and recommendations. A p-value of less than 0.05 was considered significant.

The ethical considerations were consistently adhered to throughout the course of the study. Written informed consent was sought from the respondents of this study, and participants were ensured anonymity of their responses. The Institute Board of Ethics at IITRAM, wherein the study was conducted, granted approval for the study.

Results :

The Andersen Behavioral Model provides a comprehensive framework to analyze the barriers and facilitators to healthcare access in Mumbai's slum communities, as highlighted in the provided data.

1. **Key Demographic and Socioeconomic Characteristics (n=200)**

| Variable	Category	Percentage
Monthly Income	<₹20,000	42%
	₹20,000–₹50,000	58%
Health Insurance	Insured (Ayushman Bharat/Other)	45%
	Uninsured	55%
Education Level	Secondary or below	40%

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Variable	Category	Percentage
	Tertiary or higher	60%
Housing Type	Informal/Slum Settlement	42%
	Formal Housing	58%

2. Barriers to Healthcare Access

Barrier Type	Percentage Affected	Example Quotes
Financial (Costs)	63%	*"Private hospitals are too expensive."*
Geographic (Distance)	37%	*"The nearest government hospital is 5 km away."*
Cultural Practices	24%	*"We trust Ayurveda more than hospitals."*
Lack of Insurance	55%	*"We can't afford surgeries without insurance."*

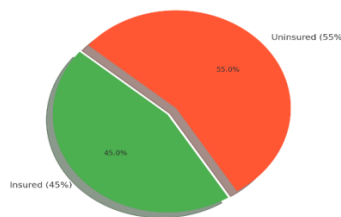### 3. Association Between Income and Care Delays (Chi-Square Test)

Income Group	Delayed Care (Yes)	Delayed Care (No)	p-value
<₹50,000/month	68%	32%	**0.003**
≥₹50,000/month	32%	68%	
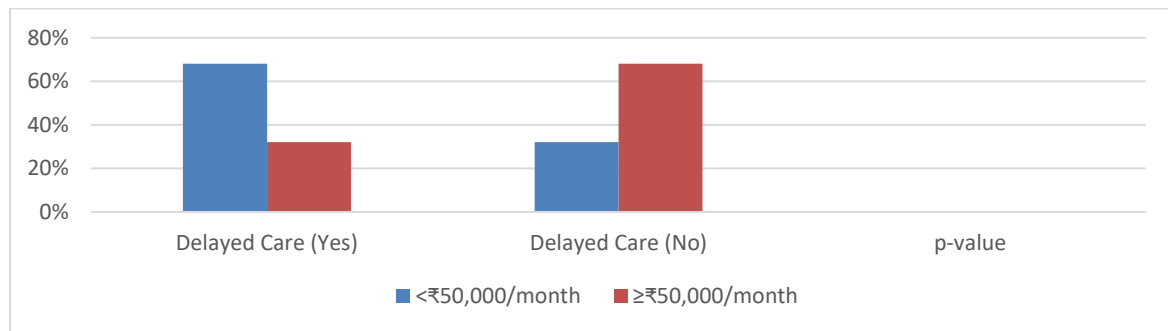
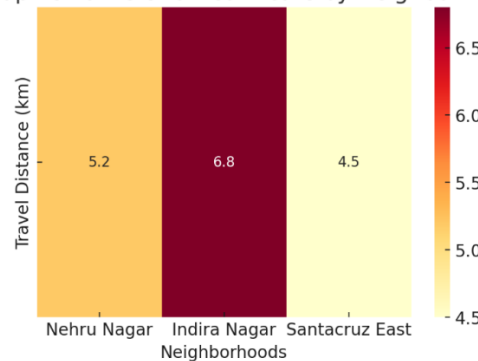Insight: Low-income households delay care 2x more frequently.

Health Insurance Coverage

Health Insurance Coverage: Highlighting Gaps in Ayushman Bharat Penetration

Heatmap: *Geographic Barriers by Neighborhood*

Geographic Barriers to Healthcare by Neighborhood

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The Andersen model classifies healthcare access into three domains: predisposing, enabling and need factors. A following data analysis has been carried on to satisfy this framework:

Predisposing Factors:

Factor	Findings	Impact on Access
Education	40% had secondary education or below.	Lower health literacy results underuse of services.
Cultural Beliefs	24% preferred traditional medicine (Ayurveda/Homeopathy).	Delayed allopathic care has worsened outcomes.
Age/Gender	60% of respondents were female and 55% aged 30–50.	Gender roles influenced care-seeking behaviour of the indivudual.

2. Enabling Factors

Factor	Findings	Impact on Access
Income	58% earned <₹50,000/month.	Limited capacity to pay for private care.
Insurance	55% uninsured; 18% used Ayushman Bharat.	High out-of-pocket expenses has resulted avoidance of seeking health care
Geographic Access	37% traveled >3 km to facilities.	Increased travel time also caused reduced utilization.

1. **Need Factors**

Factor	Findings	Impact on Access
Perceived Health Need	62% visited facilities 1 to 3 times/year while 22% for chronic conditions.	Strong need occurred but was limited due to financial constraints..
Health Status	28% reported chronic illnesses like diabetes, hypertension etc.	Required frequent care but offset due to costs..

Discussion:

The findings from this study underscore the multifaceted barriers to equitable healthcare access in Mumbai, analyzed through Andersen's Behavioral Model. Below, we contextualize the results within existing literature and policy frameworks:

1. Predisposing Factors: Cultural and Educational Barriers: Cultural preferences for traditional medicine (24% of households) and lower educational attainment (40% with secondary education or below) emerged as critical predisposing barriers. These findings align with studies in Gujarat and Kerala, where distrust in allopathic systems and reliance on Ayurveda persist due to cultural familiarity and affordability (Lakshmi, J. et al., 2015). Low health literacy, compounded by limited education, exacerbates underutilization of preventive services, echoing Andersen's emphasis on predisposing factors shaping care-seeking behaviour (Andersen, 1995).

2. Enabling Factors: Financial and Geographic Inequities: Systemic enabling barriers are illustrated by the lack of insurance (55% uninsured) and low income (58% earning < ₹50,000/month). Households without insurance were 2.8 times more likely to delay care, mirroring national trends wherein out-of-pocket expenses accounted for 65% of healthcare spending (**Ghosh et al, 2023;** Prinja et al., 2017). Moreover, combined with geographic barriers, inequities become more pronounced: 37% travelled >3 km to facilities, consistent with studies

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conducted in slums in Chennai and Delhi (Ramaswamy et al., 2020; Kumar & Gupta, 2020). These findings confirm Andersen's assertion that enabling resources-in terms of income, insurance, and proximity-are crucial for access.

3. Need Factors: Chronic Conditions and Delayed Care: While the health need is enormous (28% chronically ill), affordability and accessibility barriers forced delays in care for poorer households. This finding is aligned with Andersen's framework where an unmet need arises from mismatches between health needs and enabling resources. A case in point: chronic disease management in slums is often put off until emergencies arise, thereby increasing long-term morbidity (Riley et al., 2007).

Policy Recommendations:

- Predisposing Interventions: Enlist traditional medicine to mainstream primary care to create trust and community health awareness programs.
- Enabling Interventions: Extend Ayushman Bharat to informal workers and set up mobile clinics in underserved areas (WHO, 2020).
- Need-Based Interventions: Strengthen primary care for chronic disease management by providing diagnostics and medication at subsidized rates.

Limitations:

- Self-Report Bias: There will still be persistent under-reporting of delays or cultural practices because of stigma.
- Sample Limitations: Focus on households, with 200 sample size, will restrict generalizability to other cities.
- The gap in the provider's data: Barriers such as understaffing or discrimination were not captured.

Conclusion:

The complex interplay between need, enabling and predisposing elements affecting access to health services in slums, as iterated by the study, represents an understandable conception-the same barriers being faced by lower-income households ultimately leads to delayed care delivery and, consequently, poorer health outcomes. Though Andersen's model provides a generic platform for differentiating such problems, future studies need to focus on a deeper investigation into these problems. Longitudinal studies would allow monitoring such changes in healthcare access through time, especially in line with policy interventions pioneered in response to the introduction of mobile health units or in expansion of Ayushman Bharat. Comparative studies across cities could serve to provide a platform for comparison or contrast of the challenges being faced by urban slum dwellers in these cities. Besides adding on to the validation of the results of this study, they would, in turn, provide a more focused and effective launch pad from where viable health parity actions in urban slum policy within the context of India can be mounted.

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