National Centre for Good Governance

An autonomous & apex-level institution of Government of India

Primary Healthcare Delivery, Accessibility and Utilization in North -west, New Delhi

GARIMA
Email - 23ma0001@iitism.ac.in)
Indian Institute of Technology (ISM) Dhanbad

Certificate by the Guide

This is to certify that the research paper titled **"PRIMARY HEALTHCARE DELIVERY, ACCESSIBILITY AND UTILISATION IN NORTH-WEST, NEW DELHI"** is a record of the research work carried out by Garima, Intern at National Centre for Good Governance (NCGG), Batch 3 under my guidance and supervision in partial fulfilment of the requirements for the certificate of internship.

Signature
Prof. Ashvini Kumar Singh
Department of Social Work
Faculty of Social Sciences
Jamia Millia Islamia
(A Central University)
Jamia Nagar New Delhi

Date: 01/07/2024

ABBREVIATIONS

ASHA	Accredited Social Health Activist
CGHS	Central Government Health Scheme
GoNCT-D	Government of National Capital Territory of Delhi
JJ Colonies	Jhuggi Jhoparis
MCDs	Municipal Corporation of Delhi
MMUs	Mobile Medical Units
MoHFW	Ministry of Health & Family Welfare
mPHCs	Mobile Primary Healthcare Centre
MVs	Mobile Vans
NCT	National Capital Territory
NUHM	National Urban Health Mission
PHCs	Primary Health Centers
PWD	Public Works Department
UHC	Universal Health Coverage
UPHCs	Urban Primary Health centers

Contents

ABSTRACT

The present study investigates the availability and accessibility of the various healthcare services provided at Mohalla clinics. Thirty people of different age groups were selected from two different Mohalla Clinics – Jahangir Puri and Azadpur (Fruit Mandi) in north-west Delhi.

The researcher interviewed each participant one by one to obtain their perspectives on functioning of the Mohalla clinics and how successful do they cater to the healthcare needs. The results showed that most of the participants had a positive perception and preferred Mohalla Clinics over other healthcare services. Most patients expressed satisfaction with the doctor, location, infrastructure, and overall services. A collaboration between health NGOs and Mohalla Clinics will facilitate the organization of public health camps and educational activities. It is suggested that Mohalla Clinics, with their facilities and advantageous locations, should set higher goals and address the deficiency of preventive public health as well as basic healthcare. Mohalla Clinics have the potential to transform from sub-centres focusing mostly on curative services to neighbourhood-specific wellness centres catering to the various health requirements of distinct neighbourhoods.

INTRODUCTION

Brief History of Health and Location

Health and location were found to be related in the distant past. Hippocrates, the father of medicine, initiated the recognition and study of this relationship. He writes in his treatise "Airs, Waters, and Places" that people who reside in rough, high-elevation country that is distinguished by water and significant seasonal differences in climate will have large bodies, exhibit bravery and hardiness, and possess a certain amount of wildness in their personalities. However, he pointed out that people who live in low, humid areas with warm water and cold winds will be neither huge nor less, and courage and roughness are not inherent characteristics of their nature. As a result, he concluded that residing in lowlands close to waterways increased the risk of contracting malaria. Furthermore, Hippocrates wrote on subjects including the many features of towns and how they affect people's public health (Geraghty, E).

Another more instance dates back about fifteen hundred years, to the Persian surgeon and master planner Al-Razi who identified the best site for a hospital to be developed in Baghdad. Al-Razi arranged meat in a number of wooden containers in Baghdad City to determine his placements. To determine where the last piece went bad, he examined the parts. Following that, he decided to build the hospital there since it was the healthiest and cleanest location possible—free of smoke and pollutants—and could house patients in need of clean, fresh air (Geraghty, E).

However, the first spatial map of health that showed how the epidemic was spreading plague sickness was developed in Bari, Italy, in 1694 (Koch and Tom and Geraghty) .One of the most dreadful illnesses of all is the plague. Nothing was known about the origins or the propagation of the plague at that time. Three spatial choices helped to control the pandemic. Philip Arrieta, the royal auditor, created a health map that served as the basis for these choices. To keep the active sickness

under control, there was first a coastline patrol. Second, tents were used to shelter groups of soldiers to guard the quarantine, and a wall separated the disease's active and healthy zones. Third, the entire province was protected by a general cordon.
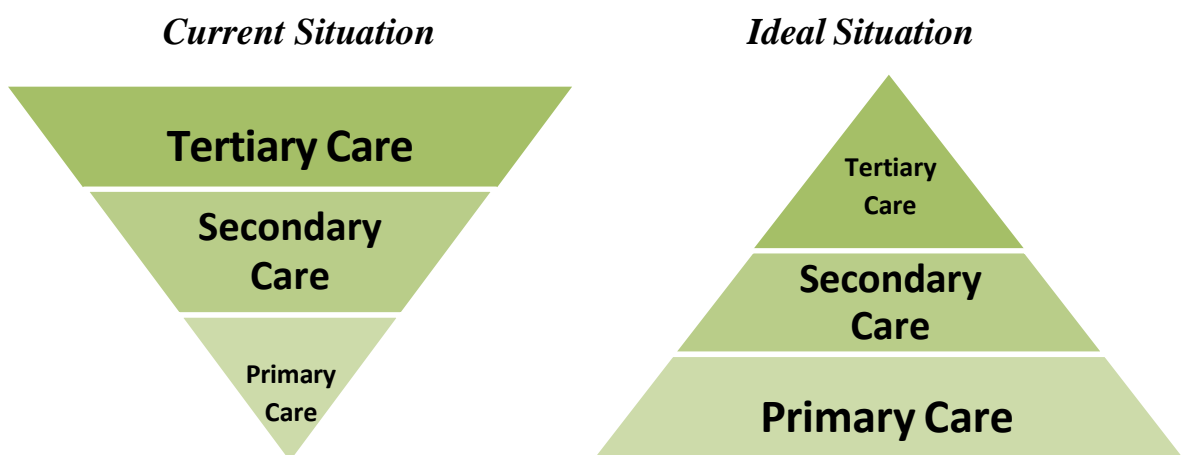
When the cholera pandemic hit London, England, in 1854, GIS in the field of health began to take shape. Infact, 500 individuals were killed by this virus every week. Dr. Snow, the pioneer of modern epidemiology, was the hero of this issue. In order to combat this pandemic, Dr. Snow used a different strategy. He created spatial mapswith a variety of disease-related elements depicted, such as the sites of outbreaks, roadways, property borders, and water lines. When he added these elements to the map, there were cholera cases close to waterways and that a significant portion of deaths (seen by the map's black colour) occurred in close proximity to the water.

Digital maps replaced paper maps once computer systems developed, especially between 1960 and 1990, when the most popular GIS systems, such as Esri software, were created and released (GisGeography). In the 1960s, computer systems were used in the geographical sciences, whereas in the 1970s, GIS was used in scientific domains, according to Clarke et al. (Clarke,K.;McLaerty, S.L.; Tempalski, B). This made the process of creating maps easier and allowed urban and health planning maps to overlap, making it easier to choose acceptable places and sites for expansion based on a variety of factors. Additionally, it was made easier to manage spatial (geographic) databases.

Accessibility to Healthcare

"Access to healthcare is not just a privilege, but a fundamental human right that ensures thewell-being of every individual in our society. We must strive to create a system where no one is left behind, irrespective of their socio-economic status." - Dr. A.P.J. Abdul Kalam

As one of the 17 global goals set forward by the UN, the third Sustainable Development Goal (SDG) aims to guarantee healthy lifestyles and enhance wellbeing for all people, regardless of age. (Department of Economic and Social Affairs, United Nations, 2015). According to the World Health Organization (WHO), accessibility in healthcare is defined as "the ease with which clients can reach health facilities and health services in terms of location, time, and cost." This definition underscores the importance of considering multiple factors that influence individuals' ability to access healthcare services, beyond just geographic proximity. It highlights the need to address barriers related to affordability, transportation, cultural preferences, and other socio-economic factors that may hinder access to care.

Current Situation

Tertiary Care

Secondary Care

Primary Care

Ideal Situation

Tertiary Care

Secondary Care

Primary Care

One way to organize the three facets of healthcare is as a pyramid: primary, secondary, and tertiary healthcare. A well-developed primary healthcare sector that flows upward to more specialist treatment should ideally be included in the pyramid (Institute for Work & Health, 2016).

One of the main goals when public health services are offered is attaining social and spatial equity or justice. Resources for healthcare must be allocated in a way that balances the needs of the general public. However, access to health care is not universal, just like it is with many other services provided as a public good. Any public facility's placement in a given region is fundamentally a choice about how to share a certain kind of public service among various populations. To equitably distribute services across the various demographic groups is the aim of this type of decision-making. An essential component of this decision making process is the concept of accessibility. There are two main geographic thought processes that can be distinguished regarding the accessibility of medical services: (i) potential accessibility, or the availability of a service and a way to access it; and (ii) consumption, or actual accessibility

The five characteristics of accessibility, as proposed by Lesvesque (et al.), are:

(1) Adaptability;

(2) Suitability;

(3) Availability and adaptation;

(4) Reasonability; and

(5) Applicability.

Accessibility is composed of three main parts. These four questions—who, what, where, and how—can be used to describe these three main parts.

The three main components of the welfare approach are who gets what, where, and how (Amer, 2007:17).
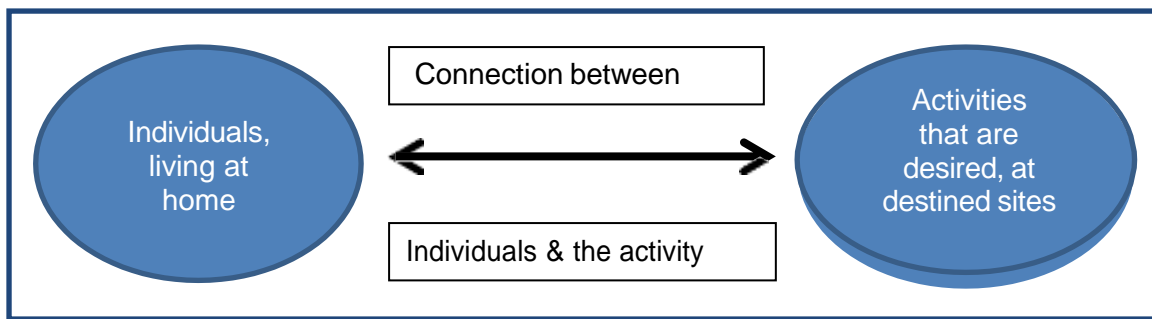
Figure 1: Accessibility primary components (Halden,2005:2)

All definitions of accessibility, according to Halden et al. (2005:3), make reference to these issues, so:

- The "Who" and "Where" is being considered that is to say accessibility is a quality of individuals/ locations.
- The "what" refers to the possibilities that are being realized, such as the use of land, supply points of activities, or resources (people) which enable individuals or locations to meet their desired needs.
- And the ―how‖ the elements which divide individuals and locations from the points of supply. These elements may include duration, cost, distance, information, and other elements that operate as access barriers or deterrents (Halden ,2005:2).

Therefore, the term "accessibility" refers to the:

"When considering people, accessibility is about "the ease with which any individual or group of people can reach an opportunity or defined set of opportunities"; this is often referred to as origin accessibility. When considering service providers, accessibility is "the ease with which a given destination can be reached from an origin or set of origins" (David Simmonds Consultancy, 1998); this is usually referred to as destination accessibility, catchment accessibility or facility accessibility." Halden et al. (2005:3)

The definition above highlights two primary points of view: the individual's (-origin) and the service provider's (-destination) (Halden et al., 2005:3).

Primary Healthcare Provision in New Delhi

The National Capital Territory Government of Delhi, through the Department of Health and Family Welfare, is dedicated to offering its inhabitants preventative, promotional, and curative healthcare services. In 2015, Delhi reorganized its healthcare system in the following ways:

(a) Aam Aadmi Mohalla Clinics, also known as Mohalla Clinics
(b)Polyclinics,/multi-specialty clinics
(c) Hospitals with many specialties (formerly known as secondary level hospitals)
(d) Hospitals with super specializations (formerly known as tertiary level hospitals)
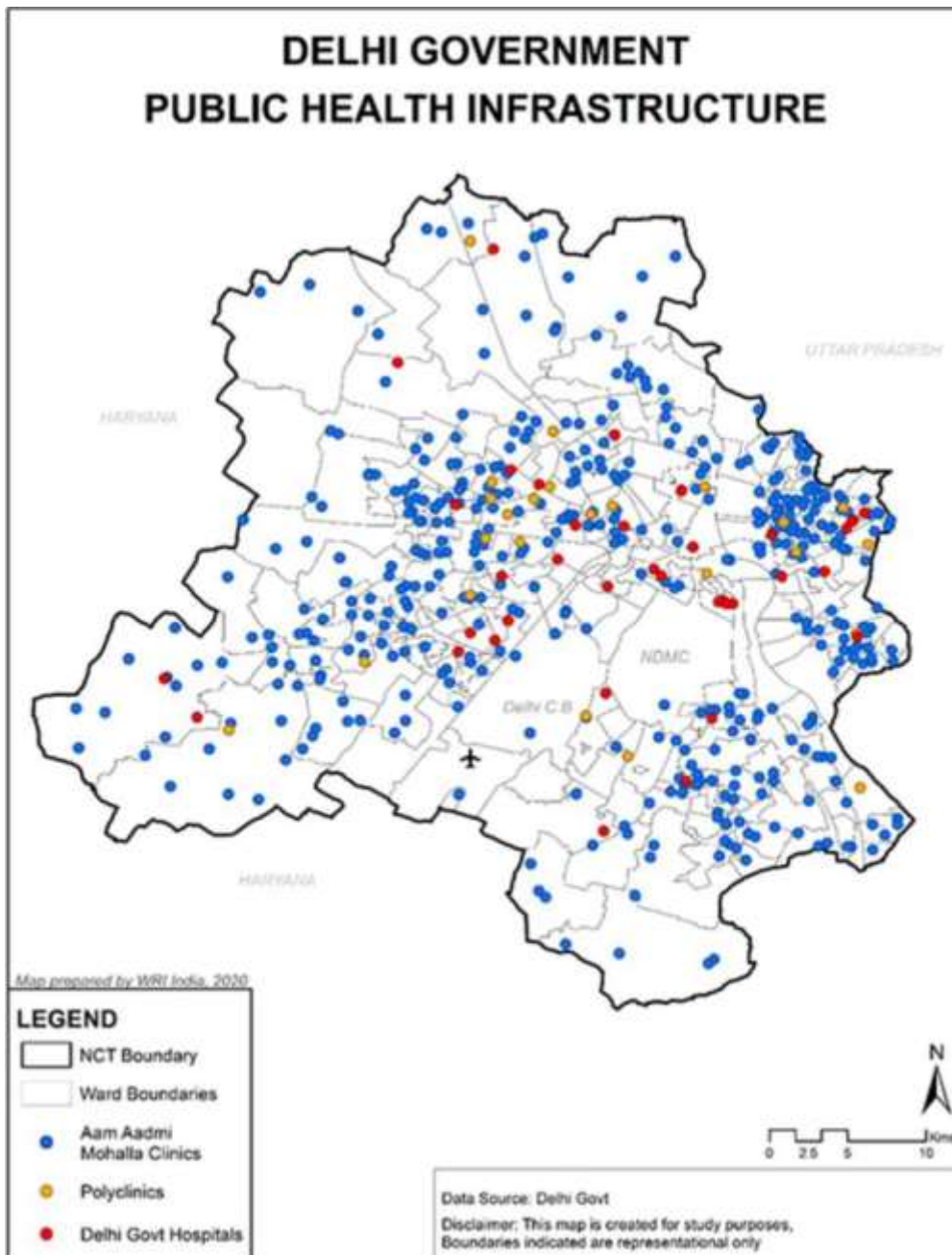
Figure 2: Public health infrastructure in Delhi (W.R.I. India, 2020)

The government of the National Capital Territory (NCT) of Delhi provides medical services to its citizens, as of March 31, 2023, through 38 Multispecialty and Super Specialty Hospitals, 174 Allopathic Dispensaries, 60 Seed Primary Urban Health Centers, 521 Aam Aadmi Mohalla Clinics, 30 Polyclinics, 55 Ayurvedic Dispensaries, 25 Unani Dispensaries, 117 Homeopathic Dispensaries, and 46 School Health Clinics. Below is a hypothetical hierarchy model of the healthcare delivery services now offered in Delhi:
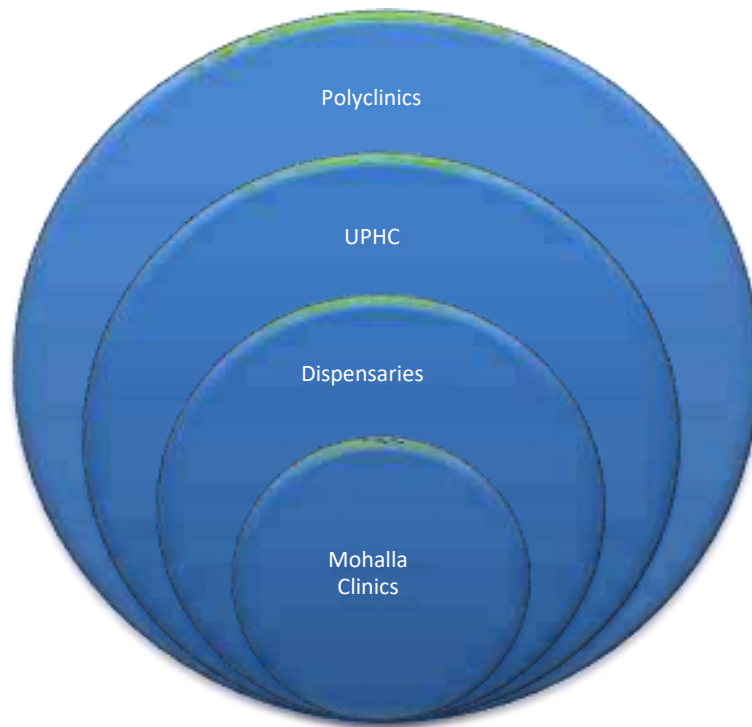
Figure 3: Hierarchy model of existing healthcare delivery services in Delhi

Mohalla Clinics: An Overview

Mohalla clinics, often referred to as community clinics, are a component of Delhi's PHCs andare intended to look like the state's mobile health clinics. Prior to the creation of mohalla clinics, dispensaries were used to meet the healthcare requirements of Delhi inhabitants, particularly those from the weaker socioeconomic groups. However when mohalla clinics were established, the selection of primary health Delhi's centers have grown. The primary goal of mohalla clinic establishment was to guarantee that residents of Delhi will have access to all medical services particularly the underprivileged group that does not have access to high-quality medical care. Offering medical care to those who live nearby by means of a walking distance is another goal in the design of mohalla clinics.

The Mohalla program began in a community clinic situated in a Delhi slum neighborhood. The growing use of mobile medical units (MMUs) and vans (MVs) led to its development. Last but not least, it was reinforced by the highest level of government's resolve to fulfill its obligations and improve healthcare systems rather than offering band-aid solutions like Mobile Vans (MVs) and Medical Units (MMUs).

Mobile Medical Units (MMUs) and Vans (MVs) had an impact on Mohalla Clinics. A number of Indian governments and municipal corporations, including Maharashtra and Gujarat, have expressed interest in opening comparable clinics in one form or another in their respective states. These MMUs are not exclusive to India; in addition to South Africa, Greece, Zambia, and Saudi Arabia.

Patients in underprivileged areas receive medical supplies, physicians, and other staff members via a fleet of modified or converted tempo vans and other vehicle types. The Delhi administration decided to swiftly extend the state's MMU network by adding a few additional MMUs to it. States and the union Ministry of Health & Family Welfare (MoHFW) typically fund these MMUs and the locations in which they would provide services, such as impoverished neighborhoods, illegal colonies, and immigrant communities' enclaves. There was a great need for these van-based clinics' services and a great response from the communities they served. Health systems have a number of advantages, including in terms of affordability, responsiveness, equity, quality, and accessibility which is further explained as follows:

a. Accessibility: make high-quality healthcare more accessible to everyone.

b. Equality: give attention to underprivileged and marginalized groups in society who have challenges in accessing healthcare.

c. Ensuring that services are provided in compliance with established protocols and live up to people's expectations.

d. Comprehensive assurance of vital health services: this refers to providing coverage for a wider range of illnesses and ailments than just a limited set of services.

e. Financial protection: lowers all costs for the public and lowers the cost of health care, preventing people from going bankrupt as a result of using these services. No cash up front for medical treatments, either direct or indirect.

f. Community participation: encouraging the essential sense of ownership by actively involving the community in the selection and identification of clinic locations.

REVIEW OF LITERATURE

Studies on dimensions of service accessibility have become increasingly prevalent and include, among others, Green et al. (2009), Tanser et al. (2006), Higgs (2004), Lou & Wang (2006), Morojele et al. (2003), Lovett et al. (2002), and Khan (1992). The majority of these research have shown how helpful GIS's tools are for calculating service accessibility by location. According to McLafferty (2003:28), these studies have also investigated the use of GIS tools for the analysis of both geographical and systematic disparities in service access along social and economic lines. Numerous health outcomes are impacted by physical access to healthcare; however, in many underdeveloped nations, where traditional geographic methods are frequently inappropriate, it is difficult to properly estimate physical access (Tanser et al., 2006:691). The allocation of flows from demand origins to one or more supply centers, along with the estimation of flows attracted by each supply center, have been accomplished by using GIS and related network analysis tools in order to address the aforementioned shortcomings (Morojele et al., 2003:6). Allocating a facility does not ensure that its services will be utilized, but this kind of analysis is not container based.

Prior research on the subject of spatial factors has looked at three main categories of factors and their effects on accessibility overall:

(a) the health delivery system's spatial configuration and features, including a wide range of quality measures related to specific services;

(b) the transportation system's role in getting people to these locations, including the relative importance of private and public transportation in various socio-cultural contexts; and

(c) the characteristics of the people using health services or, more commonly, the characteristics of the communities in which they live based on pertinent census data (Higgs, 2004:122).

In the Otago region of New Zealand, Bagheri et al. (2005:1) employed network analysis to determine the optimal path based on the shortest time between residential areas and primary healthcare institutions. The mean centre of population distribution within each meshblock polygon was employed as the meshblocks' geometric centroids rather than a simple geometric one. According to the study, in order to enhance the methodology, non-spatial factors like deprivation indices, ethnicity, education, gender, age, income, housing, and modes of transportation should be taken into account. Then, when assessing primary healthcare accessibility, spatial and non-spatial factors should be combined into a single frame.

In order to measure the accessibility of general practitioner surgeries in East Anglia to public and private transportation, Lovett et al. (2002:97) combined information from patient registers with details of road network characteristics, bus routes, and community transport services in a GIS. Although it was advised that the practical challenges of combining these data sources and approaches should not be overlooked, the research was able to demonstrate the potential use of patient registrations and GIS in measuring accessibility. Table 1 offers an overview of more pertinent research

Table 1: Examples of previous studies using GIS to measure accessibility

Authors	Area	Health issue	Methodology	Findings
Samuel & Adagbasa (2014)	Ibadan	Health resources	Composed index of critical accessibility (CICA)	Significant proportion of the population still finds it difficult to access basic health services as and When needed.
Al-Taiar et al. (2010)	Yemen	Vaccination	Measured distances in a straight line and when driving.	All three metrics demonstrated a substantial correlation with distances and childhood vaccinations after taking socioeconomic status into account.
Nteta et al. (2010)	Gauteng Province's Tshwane Region	Primary Medical Care	Self-reported survey instruments	Most Participants can access the facilities efficiently put to use.
Tanser et al. (2006)	KwaZulu Natal's Hlabisa health subdistrict	Primary Medical care	GIS Cost analysis	Lengthening the distance Travelled.
Lin et al. (2005)	Michigan	Pain Control	Measured separation between the patient and the zip codes.	Comparable disparities observed between Potential and revealed Facilities in both urban and rural settings.

Lou & Wang (2003)	Chicago	Primary care	Gravity based and Two-step floating catchment area	Two-step floating catchment area is a more straightforward and comprehensible method for better identifying locations where there is a scarcity of health professionals.
Parker & Campbell (1998)	Scotland	Emergency, accident and general practitioner	Measured separation between patient and Zip codes of the facility.	General Practioner services: Most patients select medical offices close to their home address, many opt to receive care from location Close to their homes.
Mthembu (1997)	KwaZulu-Natal's Manguzi Health Ward	Medical facilities	Scheduled interviews	Mobile medical facilities and the accessibility of traditional healers was found to be much higher than that of residential clinics and hospitals.

Rationale of the Study

The Mohalla Clinics in Delhi, established to provide accessible primary healthcare services, are an important reference point for assessing the efficacy and accessibility of urban healthcare. Prior studies have often overlooked certain factors that are crucial to comprehending Mohalla clinic accessibility, such as the locations of the clinics, the operational hours, and the range of services they offer. Furthermore, there is a lack of information regarding inhabitants' opinions, their degree of satisfaction, and the general effect these clinics have on their health and wellbeing. Notably, prior research has not sufficiently examined how these clinics compare to other healthcare providers in the area or how they serve vulnerable populations, such as elderly and low-income families. This study attempts to fill in these gaps by offering a thorough grasp of the roles that Mohalla clinics perform in providing people of Delhi basic healthcare. Policymakers and healthcare providers will benefit from the findings, which indicate areas of strength and opportunity for improvement to guarantee more efficient and fair healthcare services.

Research Question

What factors are connected with residents' access to, and utilization of, healthcare?

Objectives of the Study

- To explore the availability and accessibility of the various healthcare services provided at Mohalla clinics and

- To know about the perceptions of the people about the functioning of Mohalla clinics and how successful do they cater to the healthcare needs of thepeople residing in Delhi.

METHODOLOGY

Design

This study uses a descriptive research design to investigate the factors influencing residents' availability, accessibility, and range of services provided at Delhi's Mohalla Clinics. A descriptive research design is preferred for its capacity to enable a thorough study of the current state of healthcare services. The descriptive design makes it easier to comprehend how these clinics operate inside Delhi's urban healthcare system by methodically gathering and evaluating data on a range of clinic operations and user experiences. This approach is reasonable since it offers a strong basis for assessing the clinics' influence and driving future policy decisions to improve healthcare service in the region.

Universe

The Universe of this study is Delhi, the capital city of India, which is renowned for its varied population and unique healthcare needs. Delhi was selected as the study site because of its diverse population, which comprises people of many ages, socioeconomic backgrounds, and health conditions. This diversity offers a thorough understanding of the ways in which various population segments access and use primary healthcare services.

The study, which focuses on two Mohalla clinics, investigates how these establishments serve as an essential part of Delhi's primary healthcare system with the goal of reducing the load on tertiary care institutions and enhancing community health outcomes overall. The purpose of this study is to add to the growing body of knowledge on urban primary healthcare delivery in developing nations by offering insightful analysis of the advantages and disadvantages of the Mohalla clinic model.

Azadpur (the Fruit Mandi) —North Delhi's Azadpur is well-known for Azadpur Mandi, one of Asia's biggest wholesale fruit and vegetable marketplaces. The population is heterogeneous, with a notable share of migrant labourers who migrate from states such as Bihar, Uttar Pradesh, and West Bengal in pursuit of job prospects. These labourers usually reside in nearby slum areas, characterized by overcrowded and substandard living conditions.

In *Jahangirpuri,* there are concerns like overpopulation and intermittent sanitary issues. Although primary healthcare services are now more widely available, mohalla clinics in the region continue to face difficulties. These include sporadic staffing and medical supply shortages that result in lengthy wait times and inadequate healthcare coverage, especially in areas with higher population densities.

Participants

The participants were of different age groups residing near the Azadpur and Jahangir Puri Mohalla Clinics in the northwest district of Delhi. The study used convenient sampling to select 30 participants at each mohalla clinic, where the responses were collected only from 25-27 due to data saturation. Furthermore, the doctor, nurse, pharmacist were also contacted to become a part of the study. The informed consent was taken from the participants and the stakeholders. The convenient sampling method allows for the inclusion of participants who are readily available and willing to share their experiences, ensuring a varied sample that encompasses different demographics, including age, gender, socioeconomic status, and health conditions.

Instruments

The researcher conducted semi-structured interviews with the participants, which were 15– 20 minutes long. There were pre-determined questions based on the previous literature, including open-ended exploratory questions that were asked during the interview. These questions were constructed to gain an understanding of participants perception about the clinic's benefits and drawbacks, their willingness to help improve its operations, their thoughts on community involvement in health services, their willingness to pay for primary healthcare, the distance they had to travel to access clinic services, the cost of their travel, the travel time and the waiting period in the clinic. These were some of the themes that were explored in interviews. Further, follow-up questions were asked to bring out the positive or negative experiences of the participants with the Mohalla Clinics.
In addition, doctors of the Mohalla Clinics were interviewed. However, when the author approached the auxiliary nurse, midwife, and pharmacist in one of the clinics for an interview, they declined to talk and instead sent to the doctor.

Data Collection

The data was collected through face-to-face interviews with each participant in the mohalla clinics. Through passive observation, participants were selected, and their readiness to respond to certain questions was requested. Before starting the interview, the researcher informed the participants about maintaining the anonymity and confidentiality of the information shared. It was also made sure that the interviewer let the participants know that the information gathered will be published online for everyone to access and utilize. The concerns of the participants were also addressed with reassurance by the researcher. The first question regarding the services rendered, staff information, and facilities available (from physicians and nurses) was asked after the participants had confirmed their informed verbal agreement. The next question is to describe an average day at the PHC, including every activity that is done. Regarding the patients, it was asked that they explain their typical visitation schedule to the Mohalla Clinic. The next crucial inquiry is: What aspects of this PHC's (mohalla clinics) overall system do you like, and what about it do you dislike? Finally, the participants are invited to recommend ways to improve the current state of affairs (if any). Author self-observation is also indicated in terms of the overall cleanliness and hygiene of the place.
Interviews with doctors and staff took place within the Mohalla Clinic, while it was conducted outside the Mohalla Clinic with the patients after they had consulted the doctor. The doctors and nurses participated in the interview in English (and occasionally in Hindi), whereas the patients completed it in Hindi. The records of the responses were made in English. The researcher recorded and transcribed each interview, separately.

Data Analysis

Starting with the creation and organization of data files, the researcher followed the procedures for data analysis given by Creswell (2014). The researcher categorized and transcribed each of the recorded interviews separately in order to do this. As a result, the interviews with the participants were categorized according to time. Subsequently, the researcher analysed the transcribed interviews and underlined the responses provided by the people interviewed. This made the overall message and contemplative tone easier to understand. After carefully analysing each participant's response, a number of themes were generated in the third phase of defining and categorizing the data into meaningful codes. The "what" and "how" that the participants encountered were further described using quotes and narratives, emphasizing the textual and structural description of the conditions that was being studied. This was achieved through the use of participant quotes and narratives, which conveyed both positive and negative viewpoints regarding the Mohalla Clinics' in comparison to the healthcare institutions they were utilizing

For this study, secondary data was also analyzed from the MPD 2021, the Census of 2011, government reports like the National Health Policy 2017 and the guidelines of the National Urban Health Mission, various cabinet notes about Mohalla Clinics, and a plethora of other pertinent data (published or unpublished) from GoNCT-D (such as the list of Mohalla Clinics that are operational, the list of Mohalla Clinics that are rented, and a list of sites that have been turned over to the Public Works Department (PWD)).

RESULTS

This section discusses the study's findings relating to each of the research objectives. These objectives are:

1. Evaluation of the availability and accessibility of the various healthcare services provided at Mohalla clinics.

2. Functioning of the Mohalla clinics and how successful do they cater to the healthcare needs of the people residing in Delhi slums.

3. Proposing measures to improve efficiency and sustainability of Mohalla Clinics.

Mohalla Clinic's effectiveness in providing primary urban health services

Based on the surveys and interviews that were done in the research locations, this section evaluates Mohalla Clinics' performance as a health service provider. People who lived 500 meters away from a clinic but chose not to use it gave a variety of explanations. Those who qualified for these services included those who didn't need to visit a doctor for primary healthcare; needing healthcare of secondary level and above; having an alternative such as Central Government Health Scheme (CGHS) dispensaries available to them; being able to afford private healthcare; finding that a particular medical test is unavailable; finding that the opening hours of Mohalla Clinics do not suit them, or simply being unaware of the Mohalla Clinics.

However, for the residents who do use the clinics, there are a number of significant advantages that are covered below.

Accessibility

First of all, the public can access them. About 51% of consumers reside 500 meters or less from a clinic, with an average distance travelled of 1.3 km. The typical travel takes 18 minutes, and there is very little money involved. This demonstrates how some of the gaps in the existing healthcare system's accessibility are addressed by Mohalla Clinics.

In the case of Azadpur Mohalla Clinic, users came from Azadpur, Adarsh Nagar which was around 1.5 km to the clinic, Morji Wala Bagh Village around 2.2 km and Jahangir Puri which was 1.8 km from the mohalla clinic. And for Jahangir Puri Mohalla Clinic, the users came from neighbourhoods other than Jahangir Puri such as GTB Nagar, Shalimar Bagh and Adarsh Nagar which was around 5.2 km, 2.5 km and 3.1 km from the Mohalla Clinic respectively.

Figure 4: Localities from which users come to Mohalla Clinics
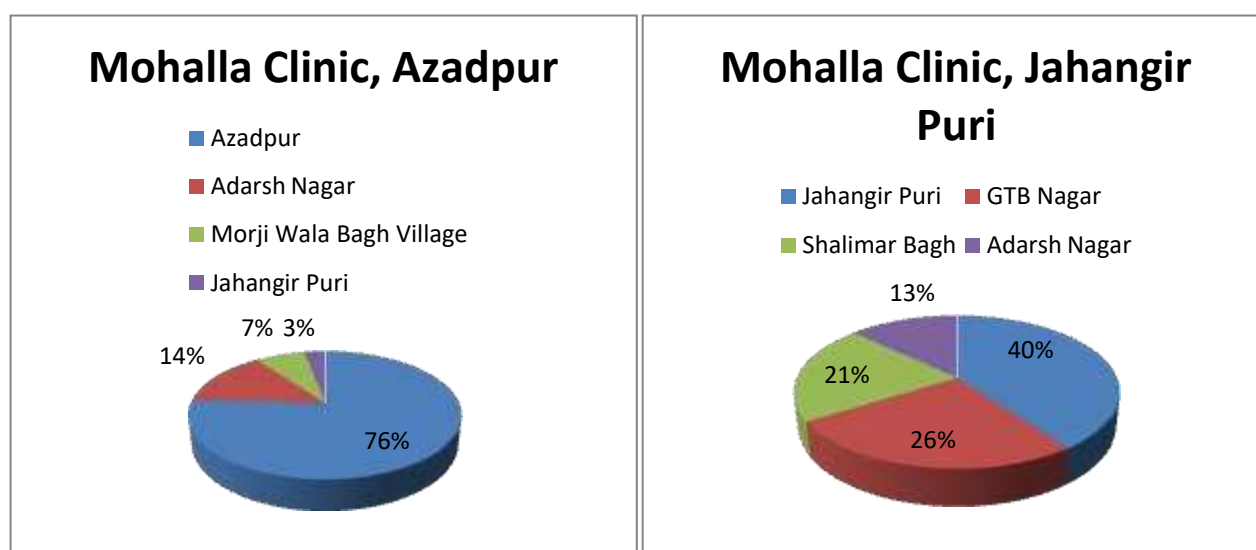
Prior to the Mohalla Clinics, these patients either self-diagnosed and self-medicated or used alternate government or private healthcare facilities. (Table 2).

Table 2: *Healthcare facilities used before opening of Mohalla Clinics(* Source: Primary survey)

Mohalla Clinic Location		Monthly HH Income (INR)	Government Facility						Private			% Self diagnosing/ medicating
			% Users	Distance Travelled (km)	Travel Time (hours)	Travel Cost (INR)	Waiting Time (hours)	Total Time (hours)	% Users	HH Expenditure on Health (INR)	HH Expense % of HH Income	
Jahangir Puri	Max	15,000	73%	7.8	1:00	40	5:00	6:00	14%	2090	14%	13%
	Avg	8,900		2.0	0:20	24	2:30	2:50		1220	14%	
	Min	5,000		0.5	0:05	10	0:10	0:15		350	7%	
Azadpur Mandi	Max	12,000	37%	10	0:30	150	1:30	2:00	47%	1070	9%	20%
	Avg	9,400		5.1	0:16	62	1:10	1:26		278	3%	
	Min	5,000		3.0	0:08	10	1:00	1:08		70	1%	

Reduced cost

The Mohalla Clinics' health services are provided without cost. Free diagnostic tests, medications, and consultations are provided. 34% of respondents who had previously utilized private healthcare save almost 11% of their monthly average salary, or INR 1,250. The 10% of respondents who had previously used self-medication are now more likely to seek appropriate medical attention at the Mohalla Clinics thanks to these lower expenses. However, there's also the opportunity cost of missing employment because of the hours of operation. Only18% of respondents stated they had not missed work because of their attendance at the clinic, compared to 57% who claimed they had. The remaining 25% did not work. A few responders voiced their displeasure with the clinics' administration, operating hours, the way the diagnostic centre was run, and the amount of time and attention the doctors gave each patient. Thus, we may conclude that although Mohalla Clinics are making a positive impact on people's lives, community involvement will enhance the clinics' overall performance.

However, there was disagreement among the respondents when asked about community involvement at Mohalla Clinics. Certain individuals believed that the community ought to determine the hours of operation and supervise the management of diagnostic sample collection in the clinics; in other words, they want community involvement in certain activities and implementation issues at their Mohalla Clinic. Others believed that the monitoring and assessment of clinic services ought to involve the community. On the other side, other respondents believed that things were best left to experts (i.e., doctors) because the community lacked the capacity for them.

Health needs are diverse

Due to their employment and surroundings, residents and workers close to Azadpur Fruit Mandi deal with a number of real health problems. The high frequency of injuries and fractures is one major cause for concern. There is an increased risk of accidents due to the busy activity at the fruit market, which includes heavy lifting, operating machines, and traversing crowded locations. Injuries of various kinds are frequently caused by slips, falls, and being struck by moving items. Further exacerbating these concerns is the absence of appropriate safety gear. Additional common causes of respiratory issues include dust, pollution, and possible chemical residues from pesticides on fruits and vegetables. Eye infections and skin irritations are frequent among those who handle produce without adequate hygiene practices.

Residents of Jahangir Puri face significant health challenges due to high pollution levels and severe congestion. There is a shortage of clean drinking water and adequate sanitary facilities. Overcrowded living conditions exacerbate these problems by worsening indoor air quality and spreading infectious diseases. Additionally, residents suffer from injuries and musculoskeletal problems due to hazardous living conditions. Limited access to healthcare, economic constraints and poor health literacy further hinder their ability to manage health issues.

Mohalla Clinics: the insiders' view

PATIENTS' RESPONSES

Most patients expressed satisfaction with the doctor, location, infrastructure, and overall services. Nevertheless, the responders also offered suggestions for enhancing Mohalla Clinics, which comprised: - enhancing openness by providing patients with information about their health and available treatments; expanding clinic spaces and building barriers to ensure the safety of women and children; enhanced accessibility to medications; and shorter turnaround time for test report generation, which now takes three to four days

DOCTORS' RESPONSES

Doctors were interviewed to understand their concerns and recommendations regarding the clinic, and what incentivized them to take up the job. Overall, the findings showed that the doctors felt that their patients were satisfied and that they were happy with the medicines stock. The doctors transmit patient data over the loud system using electronic tablets. Nevertheless, the following were their primary worries and suggestions: - the project's sustainability, considering its reliance on political agendas; the Clinics' location, which should ideally be in the innermost reaches of the JJ Colonies; public health and preventive healthcare awareness programs; technology use training and backup systems for data recording and systematic checks; and improved infrastructure in terms of expanded spaces, continuous power and water supply, and availability of ambulances for emergencies.

Mohalla Clinics: the outsiders' view

Access to primary healthcare services has improved for the urban poor. A large number of Mohalla Clinics have been established in the most innermost circles of Jhuggi Jhopries, expanding the reach of public clinics in those locations. Waiting time has decreased significantly, which is an opportunity cost, particularly for those who work a daily job. The typical wait time at Azadpur and Jahangir Puri has dropped from several hours to about 15 to 20 minutes. For those in poverty, the cost of healthcare services has decreased. Mohalla Clinics offer substantial reductions in opportunity and travel costs in addition to free diagnostic testing and medications. Public dispensaries also offer free treatments, but the overwhelming number of patients and the unpredictability of medication availability are significant barriers. The quality of private health treatments is frequently questioned in addition to their price.

Analyzing Mohalla clinics using a universal healthcare system

- Increasing Population Coverage
1. Less time spent traveling and waiting due to greater geographic accessibility (opportunity cost).
2. Convenient office hours motivate individuals to arrive early sick stages to get medical attention.
3. Improved access for underprivileged and inaccessible groups, such as immigrant bastis, resettlement colonies, and Jhuggi Jhopari (J.J.) clusters.
4. Adequate technology to satisfy regional medical needs, such as electronic data maintenance for patient health records and token vending machines for patient queuing (equity).

↯ Increasing availability of quality health services
1. Offering healthcare services in a quality-assured package from qualified experts.
2. Provide consumers the choice of providers, with the opportunity to weed out unfit experts.
3. Include marginalized people in the mainstream healthcare system; this may alter how they seek medical attention.
4. Attending to people's non-medical requirements (reaction): the offering of drinking water and token vending demonstrates the careful design thought given to the machine and patient waiting area.

↯ Protection and effectiveness of finances

1. Lower healthcare costs by guaranteeing free prescription drugs and diagnostic testing: Approximately 70% of the public's healthcare budget is spent on prescription drugs and testing.
2. Making services affordable for the underprivileged: accessibility lowers waiting times and transportation expenses (the potential cost of missing employment).
3. Reasonably priced interventions: the cost of the services would be affordable. through creating a strong referral network that allows for the community to handle 80–90% of health issues. It might lessen the strain on more prestigious medical institutions.

The following section discusses recommendations to improve the efficiency and sustainability of Mohalla Clinics.

POLICY RECOMMENDATIONS

Measures to increase Mohalla Clinics' sustainability and efficiency

In light of the aforementioned observations and conclusions, the author consequently recommend the following actions to boost Mohalla Clinics' effectiveness and ensure the program's long-term viability.

1. During their surveys and interviews, respondents expressed a preference for Mohalla Clinics over clinics managed by other organizations, such as MCDs, and many of them had ceased using MCD dispensaries' services. As a result, author advise that MCD's health-related duties be transferred to GoNCT-D, a higher level of government with greater funding and resources available for health-related initiatives.

2. The community should be involved in the monitoring and assessment of the services. In addition to being less expensive than CCTV cameras or other IT-based surveillance, it would foster a sense of community ownership and accountability for the Mohalla Clinic. The clinic's operating hours, which may vary depending on the neighborhood, should be determined with input from the community.

3. As the primary landowner and land-regulating body in Delhi, the three MCDs can be included in the decentralized site selection process. This could expedite the site selection process and guarantee that the Mohalla Clinics are located in the best possible locations.

## *Mohalla Clinics to Mohalla Health Centres*

Public health and primary healthcare are closely related, so a comprehensive strategy must be implemented at the local level. It is suggested that Mohalla Clinics, with their facilities and advantageous locations, should set higher goals and address the deficiency of preventive public health as well as basic healthcare. Mohalla Clinics have the potential to transform from sub-centers focusing mostly on curative services to neighborhood-specific wellness centers catering to the various health requirements of distinct neighborhoods.

This approach expands on the current curative, primary healthcare-focused architecture of the program by incorporating preventative public health, a neighborhood-specific component. It makes several recommendations that might be combined or utilized in concert to offer the extra, neighborhood-specific preventative public health component.

A **wellness centre** must be able to assess the current state of health and public health issues in the neighbourhood as well as be able to track and react to any changes in these issues as they arise in order to effectively address the health needs of the community.

Therefore, a **Monitor + Response** based model is required to ensure that the various health demands of neighborhoods are met through a feedback loop that actively incorporates modifications as needed.

Existing Curative Primary Healthcare

1 • Doctor

2 • Nurse

3 • Lab Technician

4 • Pharmacist
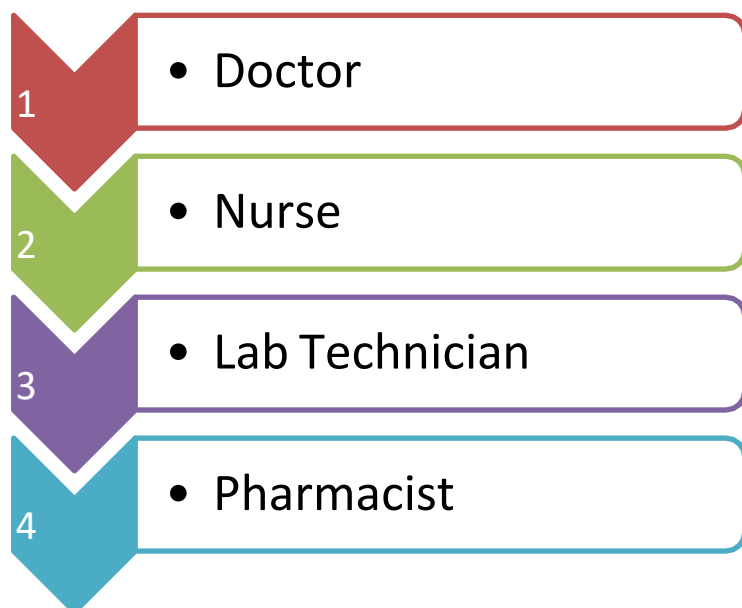
Proposed Preventive Public Health
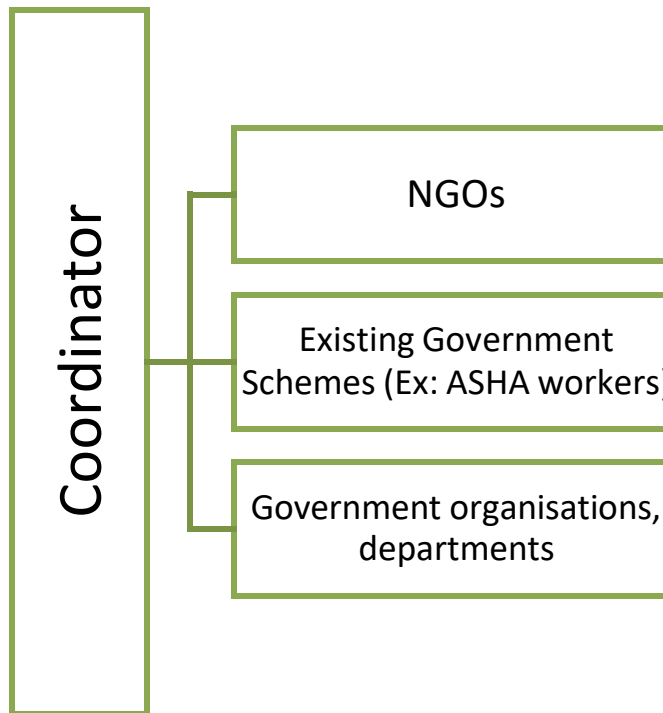
To incorporate the parallel aspect of preventive public health in Mohalla Clinics, a Coordinator (person or organization) can be employed. The Coordinator will be in responsible of delivering preventative public health to the neighborhood, in the same way that the core team of medical professionals offers curative primary healthcare.

The Coordinator should ideally be a public health specialist employed on a contract basis (much like private physicians) to oversee and analyze data (with the aid of technology) and create reports on a regular basis for every Mohalla.

As the name implies, the Coordinator's primary duty is to make sure that various organizations that provide preventive public health work effectively together. The Coordinator bears the additional duty of proactively seeking feedback from multiple sources to ensure that public health services cater to the specific needs of the neighborhood and adapt accordingly as health needs evolve.

The Coordinator could collaborate with the following public health organizations: NGOs, government departments and organizations, and practices in currently running government programs (like ASHA workers, etc.).

These organizations could support public health initiatives that aim to prevent diseases, like:

o Immunizations and vaccinations

o Cleanliness and hygienic living circumstances

o Knowledge of Nutrition

o Safe Water to Drink

o Fumigation

o Pest control

o Additional health – related environmental issues

The Primary Health Centre (PHC) is one of the current polyclinics that the National Urban Health Mission (NUHM, 2013) outlines as a place where non-governmental organizations can integrate in preventative and promotional capacities. With the addition of Mohalla Clinics a tier below even PHCs, this connection between NGOs and PHCs be further decentralized.

A collaboration between health NGOs and Mohalla Clinics will facilitate the organization of public health camps and educational activities. Certain facets of preventive public health could be difficult for private entities like NGOs to deliver. Therefore, it might be necessary for government agencies and departments to carry out these responsibilities, like installing sewage systems, conducting fumigation and others.

ASHA can be integrated with Mohalla Clinics. They can spread awareness about health and its social determinants in a way that empowers the community to put emphasis on the planning, utilisation and accountability of healthcare policies.

LIMITATIONS

The limitations of the study stem from the sample size, which were 25–27 individuals in both the locality. Understanding the limits posed by such small sample size, the study or research is limited in its ability to generalize about any problem, issue, or matter. The interview flow may have been affected, and unanticipated data loss may have resulted from the author's attempt to record every response in its original state during the session. Because of the constant traffic and long line-ups that form early in the morning to see the Mohalla Clinic open at its appointed time, the research setting—the Mohalla Clinics—is not conducive to conducting research.

CONCLUSION

With the Mohalla Clinics initiative, which offers essential healthcare services to outlying populations, the study looks into Delhi's healthcare system. The case study outlines the advantages and disadvantages of the Mohalla Clinic system's failure to achieve the noble objective of universal health coverage (UHC).

If we carefully examine the operationalization of Mohalla Clinics as a whole, there are a number of benefits that have previously been mentioned, including the ability to collaborate with dispensaries, UPHC, and polyclinics specifically for urban India. The primary health care sector should implement the following suggestions in order to get Universal Health Coverage (UHC).

(a.) Draft an operating plan and road map that takes into account all relevant administrative, financial, and technological factors. The government might think about releasing this information to the general public together with quantifiable timelines and indications.

(b.) Create systems for performance monitoring and assessment; use real-time analysis of the data these facilities provide.

(c.) Refrain from duplication, even if it makes political sense: use the existing dispensaries as polyclinics or Mohalla Clinics. Following an analysis of their operations, these dispensaries ought to be given a suitable place in Delhi's system of providing healthcare services. Mohalla Clinics focus on clinical services; in contrast, additional public health services are offered by other National Urban Health Mission (NUHM) institutions, such as Urban Primary Health Centres (UPHC).

(d.) Ensure financial sustainability and political buy-in by interacting with important stakeholders, including political parties, local authorities, council members, and other stakeholders. Create a

consensus, or at least make an effort to.

Healthcare on Wheels - Delivering healthcare to disadvantaged communities' doorsteps

The goal of universal health coverage, or UHC, is to provide everyone with access to inexpensive healthcare. The concepts of UHC are still not fully implemented in rural India, and aside from dispensaries, polyclinics, UPHCs, and mohalla clinics, the author discovered a gap. In India, access to primary healthcare is restricted to urban areas. Due to a number of obstacles, including limited resources and bad road connectivity, the isolated population is still underserved. Therefore, the concept of creating the Primary Health Centre (mPHC), a foldable system with movable infrastructure, will serve as the missing component needed to achieve Universal Health Coverage (Figure 8).

Figure 5: An illustration of the proposed mobile primary health centre (mPHC) as the missing component needed for implementing universal health coverage (UHC)
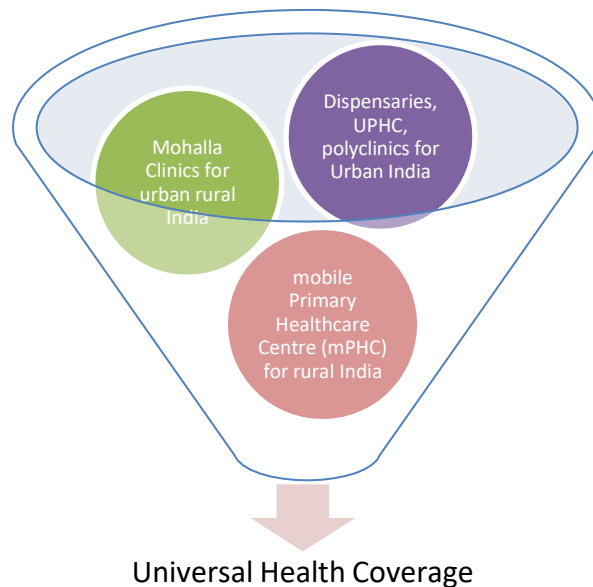
These findings came from an analysis and review of the advantages and disadvantages of Mohalla Clinics, along with a suggestion for further actions to further India's goal of universal health coverage (UHC). It is anticipated that the results will open doors for the creation and application of these facilities in settings with limited resources.

ACKNOWLEDGEMENTS

DECLARATIONS

Consent to participate: The author has taken verbal consent from all the participants.

Competing interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

Al-Taiar, A., Clark, A., Longenecker, J. C., & Whitty, C. J. M. (2010). "Physical accessibility and utilization of health services in Yemen." International Journal of Health Geographics, 9, 38

Amer, S. 2007. Towards Spatial Justice in Urban Health Services Planning - A SpatialAnalytic GIS-Based Approach Using Dar es Salaam, Tanzania as a Case Study, The Netherlands: International Institute for Geo-Information Science and Earth.

Bagheri, N., Benwell, G. L., & Holt, A. (2005). "Measuring spatial accessibility to primary health care in rural areas: Improving the effectiveness of the two-step floating catchment area method." Applied GIS, 1(2), 1-14.

Clarke,K.;McLaerty, S.L.; Tempalski, B. On epidemiology and geographic information systems: A review and discussion of future directions. Emerg. Infect. Dis.1996, 2, 85–92

Geraghty, E. Why Health is so Spatial. Available online https://www.youtube.com/watch?v=3p7OFICg9Ak (accessed on 30 January 2020).

GisGeography. The Remarkable History of GIS. Available online: https://gisgeography.com/history-of-gis/ (accessed on 3 February 2020).

Green, C., Jones, S., & Hawley, H. (2009). "Measuring access to health care services using GIS: A case study." Health Services Research, 44(2), 850-871.

Halden, D., Jones, P. and Wixey, S. 2005. Measuring Accessbility as Experienced by Different Socially Disadvantaged Groups, Working Paper 3, University of Westminster: Transport Studies Group.

Higgs, G. (2004). "A literature review of the use of GIS-based measures of access to health care services." Health Services Research, 39(1), 927-950.

Khan, A. A. (1992). "An integrated approach to measuring potential spatial access to health care services." Socio-Economic Planning Sciences, 26(4), 275-287.

Koch, T. Mapping the Miasma: Air, Health, and Place in Early Medical Mapping. Cartogr. Perspect. 2005, 4–27, 4–27.

Levesque, JF., Harris, M.F. & Russell, G. Patient-centred access to health care:conceptualising access at the interface of health systems and populations. Int J Equity Health 12, 18 (2013).

Lin, G., Allan, D. E., & Penning, M. J. (2005). "Examining distance effects on hospitalizations using GIS: A study of three health regions in British Columbia, Canada." Environment and Planning A, 37(11), 2097-2115.

Lou, W., & Wang, F. (2003). "Spatial accessibility of health services in Southwestern Ontario." International Journal of Health Geographics, 5(1), 30.

Lou, W., & Wang, F. (2006). "Spatial accessibility of health services in Southwestern Ontario." International Journal of Health Geographics, 5(1), 30.

Lovett, A., Haynes, R., Sunnenberg, G., & Gale, S. (2002). "Accessibility of primary health care services in East Anglia." Social Science & Medicine, 55(1), 45-54.

Lovett, A., Haynes, R., Sunnenberg, G., & Gale, S. (2002). "Accessibility of primary health care services in East Anglia: Incorporating patient and practice data into GIS analysis." Social Science & Medicine, 55(1), 97-111.

McLafferty, S. (2003). "GIS and health care." Annual Review of Public Health, 24(1),25-42.

Morojele, N., Nkosi, S., Kekwaletswe, C., & Moshia, K. M. (2003). "Using GIS to improve service delivery in South African townships." International Journal of Health Geographics, 2(6), 1-10.

Mthembu, T. (1997). "Accessibility of Healthcare Facilities in Manguzi Health Ward, KwaZulu-Natal." Health Bulletin, 55(2), 123-132.

Nteta, T. P., Mokgatle-Nthabu, M., & Oguntibeju, O. O. (2010). "Utilization ofPrimary Health Care Services in the Tshwane Region of Gauteng Province, South Africa." PLoS ONE, 5(11), e13909.

Parker, M., & Campbell, J. (1998). "Measuring access to primary medical care: Some examples from Scotland." Health & Place, 4(1), 1-9.

Patel, Sejal & Pant, Priyankita. (2020). Decentralisation and urban primary health services: a case study of Delhi's Mohalla Clinics. Commonwealth Journal of Local Governance. 23. 10.5130/cjlg.vi23.6987.

Samuel, F. O., & Adagbasa, E. (2014). "A Composed Index of Critical Accessibility (CICA) for Health Resources in Ibadan." Journal of Health and Place, 26, 78-85.

Tanser, F., Gijsbertsen, B., & Herbst, K. (2006). "Modelling and understanding primary health care accessibility and utilization in rural South Africa: An exploration using a geographical information system." Social Science & Medicine, 63(3), 691- 705.

Tanser, F., Gijsbertsen, B., & Herbst, K. (2006). "Modelling and understanding primary health care accessibility and utilization in rural South Africa: An exploration using a geographical information system." Social Science & Medicine, 63(3), 691- 705

APPENDIX A: Interview Questions

(I). Type of services provided at Mohalla clinic

- Diagnosis of illness
- First aid
- Immunization services
- ANC and PNC checkup
- Treatment of illness

(II). Utilization pattern of services at Mohalla clinics amongst slum residents of Delhi

- Was the disease diagnosed at Mohalla clinic
- Doctor at Mohalla clinic guide you about your illness
- Any difficulties faced while availing treatment at Mohalla clinic
- Any other institute(other than Mohalla clinic) where you are seeking treatment
- Prefer lab facilities at Mohalla clinic over private lab facilities
- Prefer Mohalla clinic for emergency health problems
- Motivating factor to seek healthcare at Mohalla clinic
- Proximity from the residence
- Referred by a friend/relative
- Positive experience from the past
- Free treatment services
- Advertisement/hoardings/ pamphlets

(III). Cost of availing treatment by slum residents of Delhi

- Consultation fee for seeking treatment for chronic disease (Rs/month)
  50-200
  201-350
  350-500
  501-650
  651-800

- Investigation cost for seeking treatment for chronic disease (Rs/month)
  50-150
  151-250
  251-350
  351-450
  451-600
  >600

- Medicinal cost for seeking treatment for chronic disease (Rs/month)
  50-250

251-500
501-750
751-1000
>1000

- Transportation cost for seeking treatment for chronic disease (Rs/month)

10-50

51-90

91-130

>130

(IV). Perception of slum residents regarding Mohalla clinic

- Positive aspects of mohalla clinic compared to other healthcare facilities.
  Free treatment
  Proximity from the residence
  Waiting time is less
  Doctor is sincere and has a positive attitude

- Suggestions to improve services provided by mohalla clinic
  Infrastructure to be improved
  Waiting time should be reduced
  Staff behavior should be modified
  Doctor should be more regular and guide properly
  Public convenience should be available
  First aid facilities should be available
  Medicine supply should be prompt
  Investigations should be done properly and on time delivery of reports
  Timings should be increased up to 4pm.

Turnitin Originality Report

Processed on: 01-Jul-2024 14:30 IST

ID: 2411138639

Word Count: 8521

Submitted: 1

REPORT* By Garima Garima ***

Similarity Index	Similarity by Source
14%	Internet Sources: 14% Publications: 6% Student Papers: 2%

3% match ()

Sejal Patel, Priyankita Pant. "Decentralisation and urban primary health services: a case study of Delhi's Mohalla Clinics", 'University of Technology, Sydney (UTS)', 2020

3% match ()

Md Haseen Akhtar, Janakarajan Ramkumar. "Making primary healthcare delivery robust for low resource settings: Learning from Mohalla Clinics", Discover Social Science and Health

3% match ()

Mokgalaka, Hunadi. "GIS-based analysis of spatial accessibility : an approach to determine public primary healthcare demand in metropolitan areas", School of Architecture, Planning and Geomatics, 2015

2% match (Internet from 22-Dec-2017)

http://ccs.in/sites/all/books/com_books/dch-2016.pdf

1% match (Internet from 21-Feb-2024)

https://ijip.in/wp-content/uploads/2024/02/18.01.104.20241201.pdf

1% match (Internet from 18-Apr-2024)

http://ncgg.org.in/sites/default/files/lectures-document/NCGG_Internship_Compendium_2023_Batch_1.pdf

1% match (Internet from 12-Apr-2024)

https://delhiplanning.delhi.gov.in/sites/default/files/Planning/important-news/economic_survey_of_delhi_2023-24_english.pdf

1% match (Internet from 20-Dec-2022)

https://www.researchgate.net/publication/361642836_Inventory_management_strategies_and_healthcare_delivery_in_hospitals_in_the_Mashonaland_region_of_Zimbabw

< 1% match (Internet from 09-Oct-2020)

https://open.uct.ac.za/bitstream/handle/11427/13758/thesis_ebe_2015_mokgalaka_hm.pdf?sequence=

< 1% match (Internet from 13-Jun-2020)

https://www.mdpi.com/2220-9964/9/6/352/html

< 1% match (Internet from 14-Jul-2020)

https://hpp.tbzmed.ac.ir/FullHtml/HPP_19422_20170529003731

< 1% match (student papers from 25-Feb-2013)

Submitted to University of Leicester on 2013-02-25

< 1% match (student papers from 25-Apr-2024)

Submitted to Indian Institute of Management on 2024-04-25

< 1% match (Internet from 05-May-2015)

http://www.gsdi.org/gsdiconf/gsdi14/papers/160.pdf

< 1% match (Internet from 06-Dec-2019)

http://www.planningafrica.org.za/images/banners/History-Documents/01.%20SAPI%202014%20Conference%20Proceedings.pdf

Primary Healthcare Delivery, Accessibility and Utilization in North -west, New Delhi GARIMA INDIAN INSTITUTE OF TECHNOLOGY (ISM) DHANBAD 1

Contents

ABSTRACT The present study
investigates the availability and accessibility of the various healthcare services provided at Mohalla clinics.
Thirty people of different age groups were selected from two different Mohalla Clinics - Jahangir Puri and
Azadpur (Fruit Mandi) in north-west Delhi. The researcher interviewed each participant one by one to obtain
t heir perspectives on functioning of the Mohalla clinics and how successful do they cater to the healthcare
needs. The results showed that most of the participants had a positive perception and preferred Mohalla Clinics
over other healthcare services. Most patients expressed satisfaction with the doctor, location, infrastructure, and
overall services. A collaboration between health NGOs and Mohalla Clinics will facilitate the organization of
public health camps and educational activities. It is suggested that Mohalla Clinics, with their facilities and
advantageous locations, should set higher goals and address the deficiency of preventive public health as well
as basic healthcare. Mohalla Clinics have the potential to transform from sub-centres focusing mostly on
curative services to neighbourhood-specific wellness centres catering to the various health requirements of
distinct neighbourhoods. INTRODUCTION Brief History of Health and Location Health and location were found
to be related in the distant past. Hippocrates, the father of medicine, initiated the recognition and study of this
relationship. He writes in his treatise "Airs, Waters, and Places" that people who reside in rough, high-elevation
country that is distinguished by water and significant seasonal differences in climate will have large bodies,
exhibit bravery and hardiness, and possess a certain amount of wildness in their personalities. However, he
pointed out that people who live in low, humid areas with warm water and cold winds will be neither huge nor
less, and courage and roughness are not inherent characteristics of their nature. As a result, he concluded that
residing in lowlands close to waterways increased the risk of contracting malaria. Furthermore, Hippocrates
wrote on subjects including the many features of towns and how they affect people's public health (Geraghty, E).
Another more instance dates back about fifteen hundred years, to the Persian surgeon and master planner Al-
Razi who identified t he best site for a hospital to be developed in Baghdad. Al-Razi arranged meat in a number
of wooden containers in Baghdad City to determine his placements. To determine where the last piece went
bad, he examined the parts. Following that, he decided to build the hospital there since it was the healthiest and
cleanest location possible–free of smoke and pollutants–and could house patients in need of clean, fresh air
(Geraghty, E). However, the first spatial map of health that showed how the epidemic was spreading plague
sickness was developed in Bari, Italy, in 1694 (Koch and Tom and Geraghty) One of the most dreadful illnesses
of all is the plague. Nothing was known about the origins or the propagation of the plague at that time. Three
spatial choices helped to control the pandemic. Philip Arrieta, the royal auditor, created a health map that served
as the basis for these choices. To keep the active sickness under control, there was first a coastline patrol.
Second, tents were used to shelter groups of soldiers to guard the quarantine, and a wall separated the
disease's active and healthy zones. Third, the entire province was protected by a general cordon. When the
cholera pandemic hit London, England, in 1854, GIS in the field of health began to take 3 shape. Infact, 500
individuals were killed by this virus every week. Dr. Snow, the pioneer of modern epidemiology, was the hero of
this issue. In order to combat this pandemic, Dr. Snow used a different strategy. He created spatial maps with a
variety of disease-related elements depicted, such as the sites of outbreaks, roadways, property borders, and
water lines. When he added these elements t o the map, there were cholera cases close to waterways and that
a significant portion of deaths (seen by the map's black colour) occurred in close proximity to the water. Digital
maps replaced paper maps once computer systems developed, especially between 1960 and 1990, when the
most popular GIS systems, such as Esri software, were created and released (GisGeography). In the 1960s,
computer systems were used in the geographical sciences, whereas in the 1970s, GIS was used in scientific
domains, according to Clarke et al. (Clarke,K.;McLaerty, S.L.; Tempalski, B). This made the process of creating
maps easier and allowed urban and health planning maps to overlap, making it easier to choose acceptable
places and sites for expansion based on a variety of factors. Additionally, it was made easier to manage spatial
(geographic) databases. Accessibility to Healthcare "Access to healthcare is not just a privilege, but a
fundamental human right that ensures thewell- being of every individual in our society. We must strive to create
a system where no one is left behind, irrespective of their socio-economic status." Dr. A.P.J. Abdul Kalam As
one of the 17 global goals set forward by the UN, the third Sustainable Development Goal (SDG) aims to
guarantee healthy lifestyles and enhance wellbeing for all people, regardless of age. (Department of Economic
and Social Affairs, United Nations, 2015). According to the World Health Organization (WHO), accessibility in
healthcare is defined as "the ease with which clients can reach health facilities and health services in terms of
location, time, and cost." This definition underscores the importance of considering multiple factors that
influence individuals' ability to access healthcare services, beyond just geographic proximity. It highlights the
need to address barriers related to affordability, transportation, cultural preferences, and other socio-economic
factors that may hinder access to care. One way to organize the three facets of healthcare is as a pyramid:
primary, secondary, and tertiary healthcare. A well-developed primary healthcare sector that flows upward to
more specialist treatment should ideally be included in the pyramid (Institute for Work & Health, 2016). Tertiary
Care Tertiary Secondary Care Care Secondary Care Primary Care Primary Care Current Situation Ideal
Situation One of the main goals when public health services are offered is attaining social and spatial equity or
justice. Resources for healthcare must be allocated in a way that balances the needs of the general public.
However, access to health care is not universal, just like it is with many other services provided as a public
good. Any public facility's placement in a given region is fundamentally a choice about how to share a certain