WASH Conditions and Public Health Status in Slums of Ahmedabad

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The structure of the presentation

Background
Literature review
Methodology adapted
WASH-related issues in Ahmedabad
Research findings of the study in the slums
Policy Implications and Research Agenda for the Future

Backgrounds

Basic WASH services

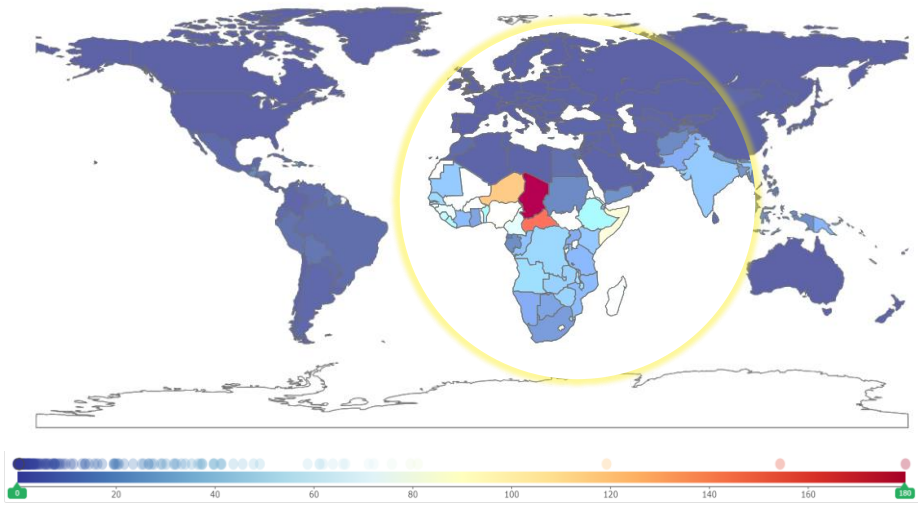
Safely Managed Water	Safe Sanitation	Safe Hygiene
• Availability • Quality • Quantity (including strategies to reduce water use) • Storage	• Inclusive toilet facilities • Quantity and Quality of toilet facilities; • Safe collection storage • Treatment of faecal waste.	• Availability of handwashing stations, soap and alcohol-based handwash • Hygiene related behavior change • Compliance and auditing

Public Health

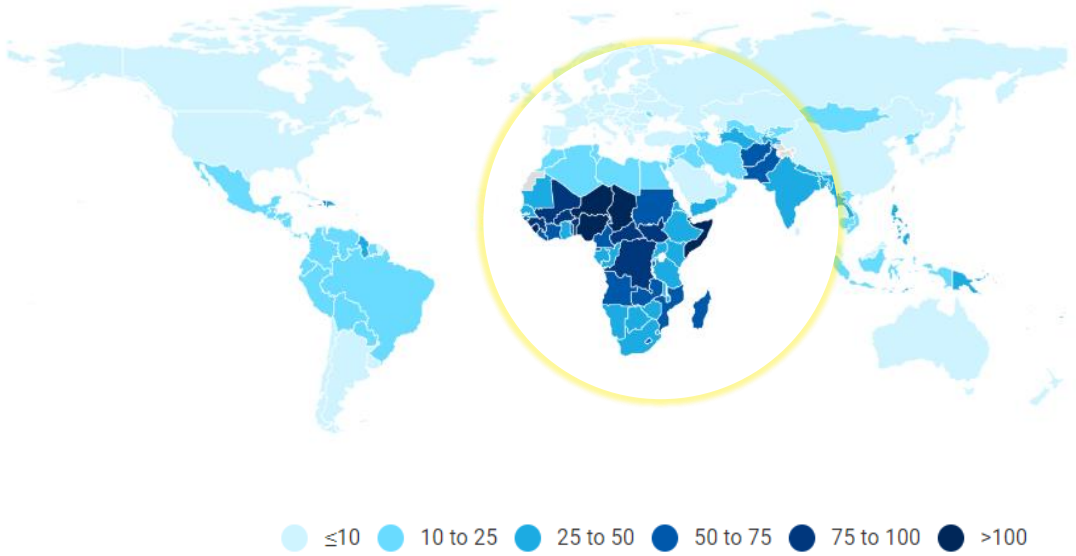
Source: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Wash and Public Health Linkages [Literature Review]

Deaths attributed to unsafe Water, Sanitation & Hygiene (deaths per 100,00)



Under-five mortality rate (deaths per 1,000 live births) by country, 2022



Least Developed Countries

Developing Countries

Developed Countries

Water
Sanitation
Hygiene

Deaths attributed due to diarrhea (per 100 000 population),2022

Mortality rate attributed to WASH (per 100 000 population),2022

Source: https://www.thelancet.com/lancet/visualisations/gbd-compare,2019, United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), 2024

Need for the Study- Real Concerns

Global Statistics

3.5 **billion** lack safely managed sanitation,

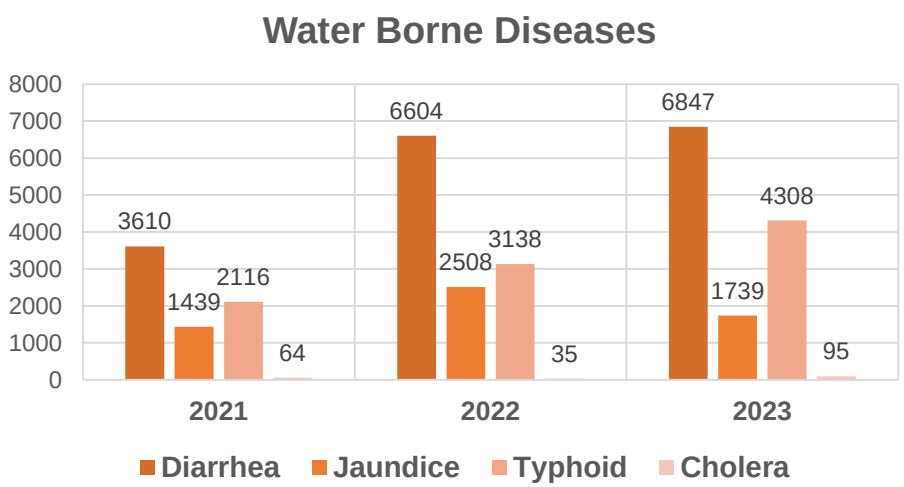
2.2 **billion** lack safely managed drinking water,

2.0 **billion** lack a basic handwashing facility,

1.4 **million deaths** annually could be averted

1.0 **million deaths due to** Diarrhoea

Ahmedabad Concerns



Indian Statistics

88% Indian have access to basic sanitation

67% grey water goes untreated to environment

12% still open defecate

Source: Integrated WW and septage management trainer module, NIUA.

37.7 million people being affected by waterborne diseases

117,000 under-5 children died due to diarrhoea alone

Source: UN SDG goals,2022

Source: Burden of disease attributable to unsafe drinking water, sanitation, and hygiene ,2023,https://www.ncbi.nlm.nih.gov/pmc/articles/

Ahmedabad- Site Selections and Sample

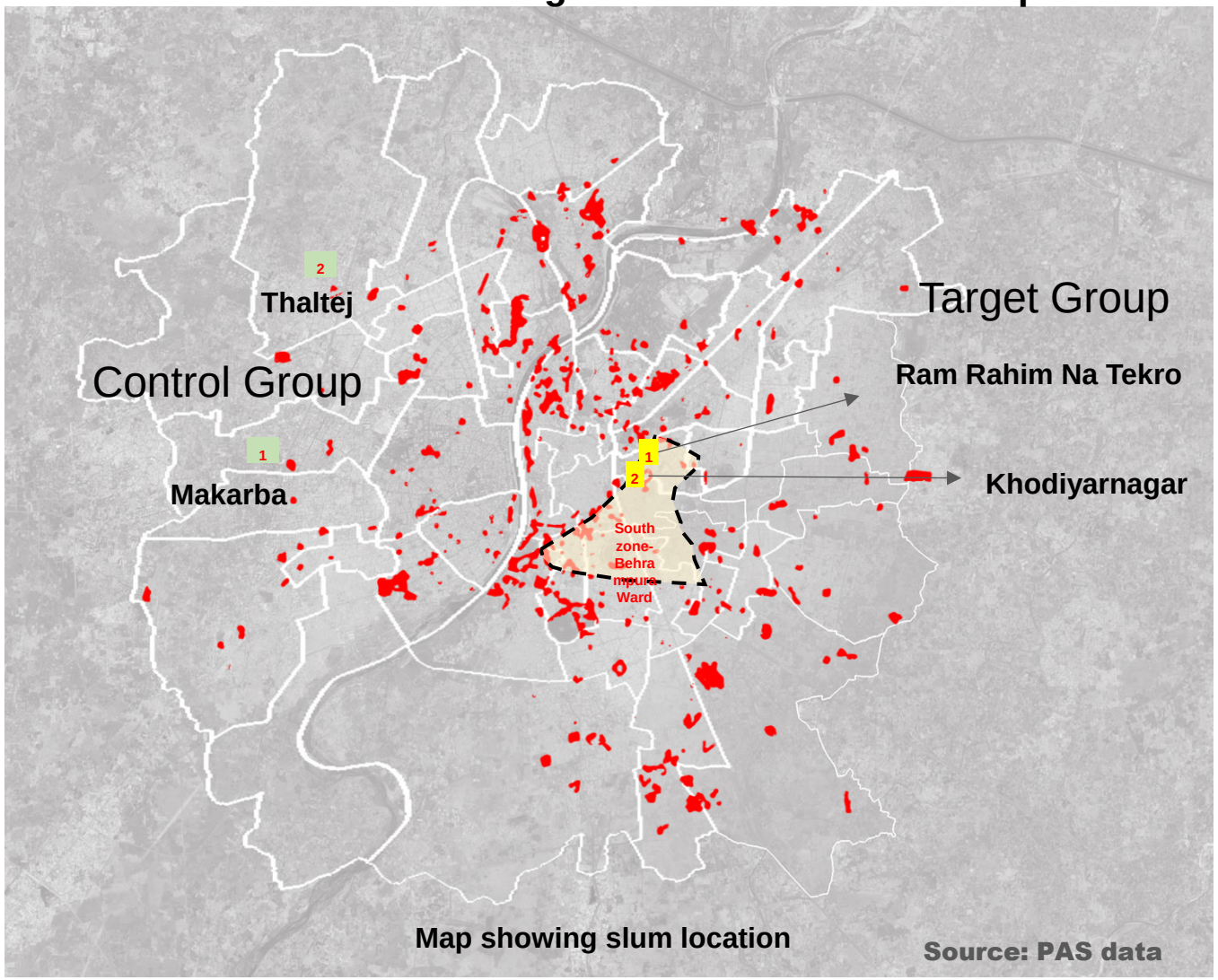
15th cleanest city

700 slums in the city

30% without basic facilities

97171 cases of water-borne diseases

Sites Selected-Target & Control Group



Map showing slum location

Source: PAS data

Population
7,692,000 (2023)

Area
488.1 Sq km

No. of Zones
7

No. of Wards
48

Water Supply
City-24hrs, vulnerable areas-2 hrs./day

Drainage Network
3470km
95% area covered in the city

Household Profiles of Surveyed Slums

Total surveys-61
Total subjects-284

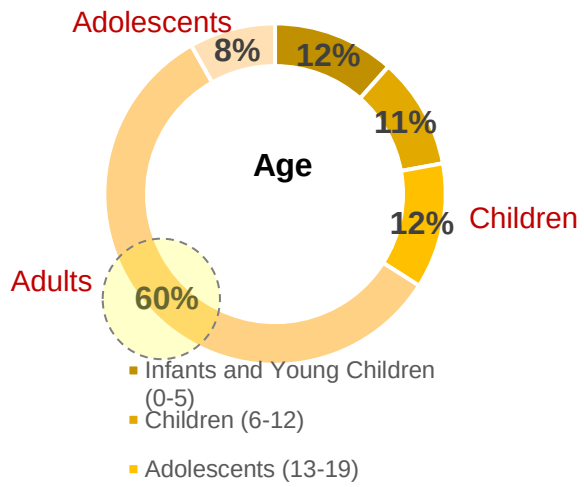
Gender

52% are **Male** | **48%** are **Female**

HH Ownership

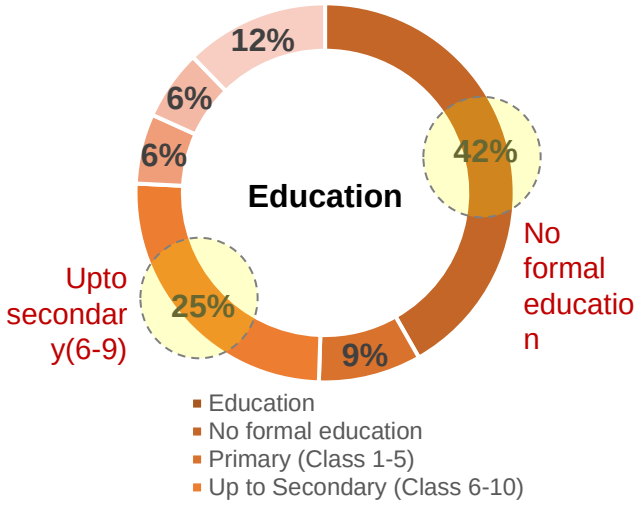
82% are **Owned** | **18%** are **Rented**

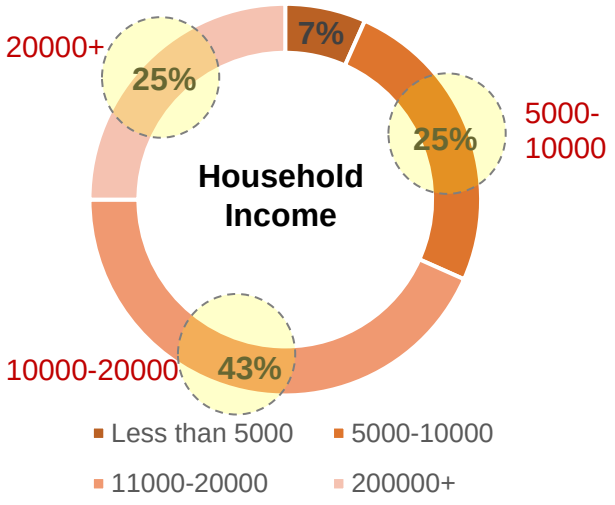
60% of individuals surveyed are aged between **20 to 59 years**



42% have **no formal education** while **25%** of respondents have completed **secondary education (Class 6-10)**

43% of surveyed households fall into the income bracket of **10000-20000**





Water and Sanitation- Status in Slums

Garbage on the streets is getting mixed with over flow of drain water

Table.3 : Household Income & Water

	Water					
Income Groups	Average water quality rating (Out of 5)	HH with water Contamination Concerns	No. of HH where drinking water is pre-treated	No. of HH where drinking water is treated	Location of tap	
					Inside	Outside
Less than 10000	4.0	68%	68%	11%	58%	42%
10000-20000	4.0	65%	65%	19%	68%	32%
More than 20000	4.2	55%	73%	27%	73%	27%
Total	4.1	62%	69%	19%	66%	34%

Table.4 : Household Income & Sanitation

	Sanitation					
Income Groups	Toilet Infrastructure rate (Out of 5)	IHHL (improved facility)	Unimproved	Water in Toilet facility		HH with drainage issues
				Stored	Tank	
Less than 10000	4.7	89%	11%	84%	16%	79%
10000-20000	4.4	94%	6%	90%	10%	58%
More than 20000	4.7	100%	0%	82%	18%	45%
Total	4.6	94%	6%	85%	15%	61%

Hygiene and Waste Management: Status in Slums

- **100%** **access to soap and water**
- With **increasing income** there is **slightly better hygiene practices** and **greater awareness**.

Open dumping of garbage

Houses around the dumping area smell of bad odour

Garbage on the streets is getting mixed with over flow of drain water

Defunct Hand Washing station at Ram Rahim na Tekro

- **61%** **of households disposed of waste in designated open plots**
- **29%** **have door-to-door collection service**
- **38%** **of households experience irregular waste collection,**

Prevalence of Diseases in Slums

Table.5 : Household Income & Disease Pattern

Income Groups	Disease pattern (last 6 months)									
	Waterborne Diseases				Vectorborne Diseases		Others	Total Disease Frequency	Gender	
	Diarrhea	Jaundice	Cholera	Typhoid	Dengue	Malaria			Male	Female
Less than 10000	7%	0%	0%	0%	0%	1%	1%	10%	29%	71%
10000-20000	5%	0%	0%	0%	0%	0%	3%	8%	36%	64%
More than 20000	2%	0%	0%	0%	2%	2%	2%	9%	25%	75%
Total	**5%**	**-**	**-**	**-**	**1%**	**1%**	**2%**	**9%**	**30%**	**70%**

- Highest incidences of diarrhea observed in households earning less than Rs. 10,000 (7%)
- **Higher occurrence of diseases among females** (70%) compared to males
- Households with lower incomes experienced frequent reoccurring symptoms like fever, nausea, and infections, occurring 6-7 times on average, with women and children being particularly vulnerable to diseases

Table.6 : Health Seeking Behavior

Income Groups	Health seeking behaviour					Health seeking behaviour	
	Primary care (Primary ailments)			Treatment (Inpatient)		Primary care (Primary ailments)	Treatment (Inpatient)
	UHWC	U-PHC	Private clininc	Govt	Private	None	None
Less than 10000	11%	21%	68%	42%	21%	100%	63%
11000-20000	10%	32%	58%	61%	6%	100%	68%
More than 20000	36%	27%	36%	64%	0	100%	64%
Total	**19%**	**27%**	**54%**	**56%**	**9%**	**100%**	**65%**

- Primary care is predominantly sought **from private clinics (54%)** across all income brackets
- **The treatment choices are largely preferred at government hospitals (56%)** and with increasing income the dependency on government hospitals has also increased.

Health Seeking Behaviors in Slums

Table.7 : Average expenditure and distance travelled for seeking healthcare

				Distance travelled		
Income Groups	Healthcare facility rating	Insurance or ABHA	% of health expenditure of monthly income (In Rs.)	Average distance traveled to seek primary care (In Km)	Average distance traveled to seek treatment (In Km)	Total average distance travelled
Less than 10000	3.9	11%	9%	0.2	2.3	1.3
11000-20000	3.9	19%	5%	0.3	1.8	1.1
More than 20000	4.4	36%	2%	0.3	1.2	0.7
Total	**4**	**-**	**5%**	**0.3**	**1.8**	**1.0**

- As the healthcare facility rating improves across income groups there is a noticeable decrease in the average monthly expenditure
- The **less than Rs. 10000 income range spend the 9% of their income** on heath expenditure
- The expenditure reduces with increasing health insurance benefit among the more than 20000 category (36%)
- Most expenses were on drugs followed by transport

Health Seeking Behavior

Key Challenges of Demand Side Actors

Household Profile
Larger household sizes within **smaller living spaces**
High population density and **limited access to basic amenities** increases health risks and strains already limited resources
Prevalence of male-led households across income groups suggests potential disparities in decision-making power
Lower levels of education or only a slight increase in education qualifications with rising income, there is no apparent correlation of awareness of hygiene behaviors with education.

Water, Sanitation & Hygiene
High concerns regarding **water quality issues** with signs such as unpleasant odors, visible dirt, or other indicators of impurity
Awareness on **benefit of consuming treated water** is low among lower-income households. Lack of education and awareness about water quality and treatment options
Outdoor taps may be more susceptible to contamination and less convenient to access
Practice of leaving water running for the first 20 minutes due to the smell suggests a potential wastage of water resources
The daily storage of water in drums within households, often without lids or proper storage practices, can serve as a breeding ground for the spread of infections and contaminants, posing significant health risks
Higher prevalence of sanitation issues, including **poor drainage, clogging, and the presence of pests**
Lack of **awareness and training of hygiene practices**
Irregular waste collection & disposal of waste in open plots
Unpleasant odors, breeding grounds and mixing of freshwater or used water with the waste disposed in open areas.

Key Challenges of Demand Side Actors

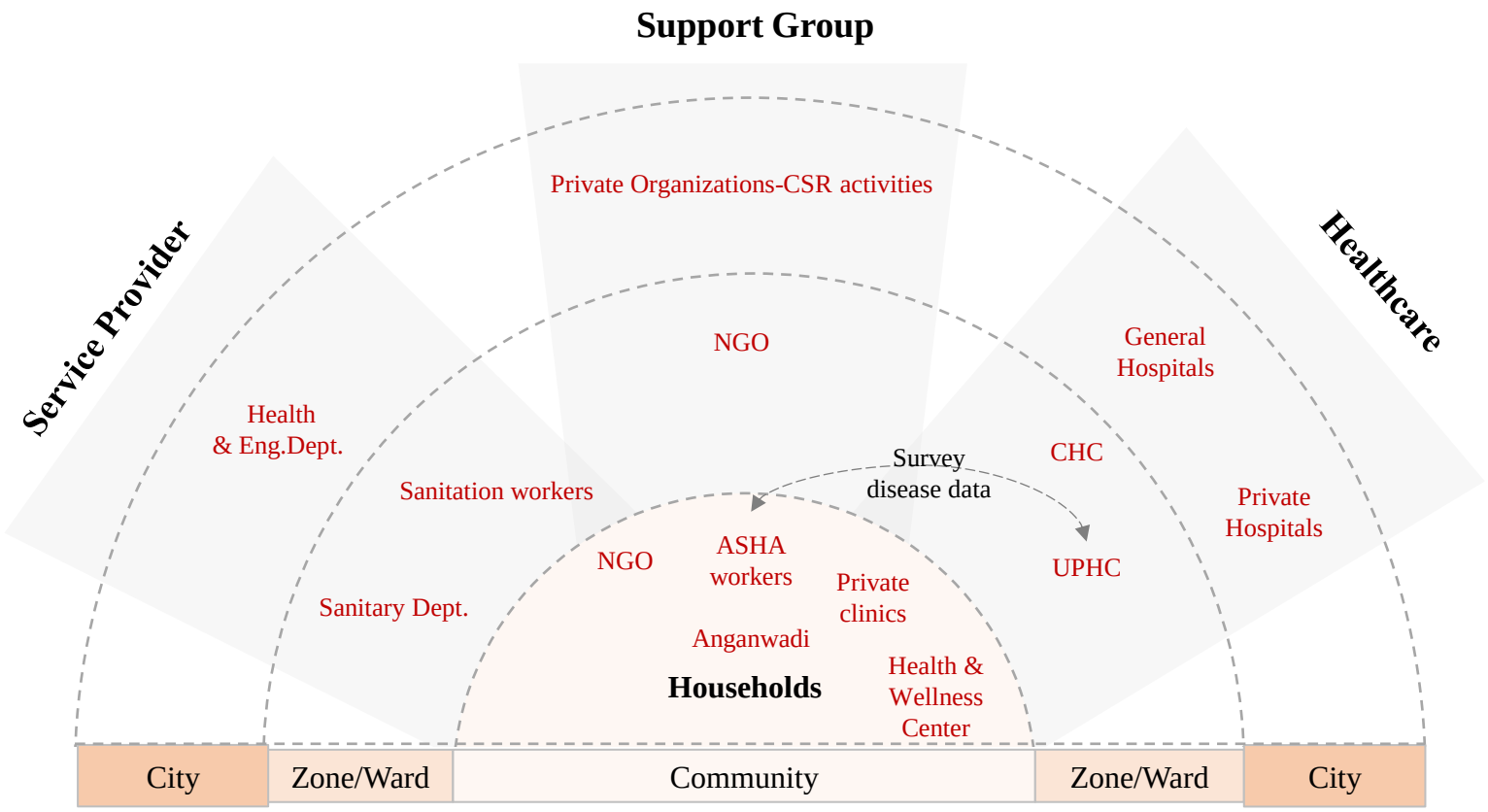
Prevalence of diseases
Number of **cases reported lower** than the actual on ground due to lack of awareness
Unawareness of disease identification by identifying prior indication of symptoms
Despite variations in income levels, waterborne diseases remain prevalent across all income brackets
Adults aged 20-59 and children are more vulnerable to disease recurrence due to poor WASH practices.
Infants and young children (0-5) and adult females are prone to symptoms very often

Access to Healthcare facilities
Relying on self treatment and lack of care-seeking behavior
Lack of financial funds ,lack of time/transport ,long waiting time at facilities
Hospitals to seek treatment very far, increasing transportation costs
Unavailability of doctors, staff & medicines in time of need
Limited operational hours at healthcare facilities
Private healthcare provision lacks regulation
Lack of **adequate Health Insurance**

Others
Unattended water taps that leak, used water overflow onto the road and combine with the neighboring drain line and cause weaker houses to collapse
NGO camps provide free medicines due to which the UHC refuses to give medicines during need of the hour
People are indifferent to any progress due to uncertainty about whom to approach for service repairs
Households resort to **makeshift solutions** for their WASH challenges rather than addressing them directly

Key Challenges-Demand Side

Stakeholders Mapping



Urban Health Center, Behrampura

NGO-Manav Gulzar

Image Source: Author

Supply-side observations

High Medium Low

Sector	Stakeholder	Responsibility	Roles			Influence	Engagement on ground	Challenges
			Planning/Decision Makers	Implementers	Support group/Partners			
Government	AMC-Health Department Chief Health Officer ,Deputy Health Officer	Overall supervision, monitoring & administration of Health of people & epidemic condition in all zones implementation of National health programme	✓	-	-	●●●	●○○	**Mobilizing community** engagement, **Resistance to Vaccinations** among population, delay in **seeking treatment**, **Awareness on diseases prevention**
	Urban Primary Health Center	Monitor waterborne & vector-borne illnesses, and any other health concerns within the locality. Identify any outbreaks and guide affected individuals to appropriate treatment facilities.	✓ -	✓	-	●●●	●●○	**Unsuitable timings** and **distance from urban poor areas** , **shortage of medicines**, drugs, equipment, **limited capacity** of health care professionals and demotivation
	Social Health Worker (ASHA worker)	Undertake D2D initiative to educate and bring women with children and pregnant mothers to get vaccinated. They educate on maintaining proper hygiene practices as part of their outreach efforts. Regular surveys are conducted within their locality to monitor and address any potential disease outbreaks promptly		✓	✓	●○○	●●●	**Limited progress despite efforts**, lack of awareness among women, minimal recognition of health importance **until illness strikes**, resource constraints.
	Anganwadi	Provide early childhood education, nutrition, and healthcare services to children under six and pregnant/lactating mothers and, contributing to their overall well-being and development. They serve as community hubs, offering support and resources for maternal and child health, nutrition, and community development initiatives.	-	✓	✓	●○○	●●●	**Hygiene concerns** due to inadequate cleanliness, **lack of water in washrooms**, unsanitary conditions forcing **open-area restroom use**, **risk of infection spread from admitting sick children**, and challenges in communicating concerns with indifferent families.

Stakeholder Consultations

High Medium Low

Sector	Stakeholder	Responsibility	Roles			Influence	Engagement on ground	Challenges
			Planning/Decision Makers	Implementers	Support group/Partners			
Healthcare Providers, Private Clinics	Government Hospitals (VS General Hospital or SVP Hospital etc.)	Hospitals are run by the government, ensuring that medical care is accessible to all, regardless of their financial status	-	✓	✓	●●○	●○○	**Poor availability of doctors and staff in facilities**
	Private Hospitals	-	-	✓	-	●○○	●○○	Limited **community linkages and outreach**
	Private Clinics	Medical service offering diagnostic, therapeutic, or preventive outpatient services along with providing medicines	-	✓	-	●○○	●○○	Unregistered practitioners, **Medicines given without diagnosis**
Private Organisations	CSR Activities Slum Development Activities	Education, skill development and poverty alleviation	✓	✓	✓	●●○	●●●	Lack of **Community participation & enthusiasm**, Potential gaps in knowledge
Non Governmental Organisation (NGO)	Manav Gulzar	A volunteer-driven organization that serves children and women through various community based projects in underprivileged. It offers free education to students in slum areas, from first to tenth grade, while also providing nutritional meals and access to clean drinking water.	-	✓	✓	●○○	●●●	**Lack of Community participation & enthusiasm**, Potential gaps in knowledge or resources within the community regarding health and hygiene, **Lack of coordination and integration among service providers**
	SAATH	Engages closely with disadvantaged populations, offering livelihood support, skill-building programs, and avenues for employment, as well as facilitating access to healthcare and educational resources	-	✓	✓	●○○	●●●	

Key Challenges of Supply Side Actors

Government

Mobilizing community engagement, Resistance to Vaccinations among population, delay in seeking treatment, Awareness on diseases prevention

Unsuitable timings and distance from urban poor areas , shortage of medicines, drugs, equipment, limited capacity of health care professionals and demotivation

Limited progress despite efforts, lack of awareness among women, minimal recognition of health importance until illness strikes, resource constraints.

Hygiene concerns due to inadequate cleanliness, lack of water in washrooms, unsanitary conditions forcing open-area restroom use, risk of infection spread from admitting sick children, and challenges in communicating concerns with indifferent families.

Healthcare Providers, Private Clinics

Poor availability of doctors and staff in facilities

Limited community linkages and outreach

Unregistered practitioners, Medicines given without diagnosis

Private Organisations

Lack of Community participation & enthusiasm, Potential gaps in knowledge

Non Governmental Organisation (NGO)

Lack of Community participation & enthusiasm, Potential gaps in knowledge or resources within the community regarding health and hygiene, Lack of coordination and integration among service providers

Convergence of public health schemes and programme

Convergence of Programs

Health Programs ⟷ **Convergence of Urban Programs** ⟷ **Urban policy Programs**

National Urban Health Mission(NUHM)

Effective participation of the community in planning and management of health care services , for strengthening the health service delivery component, community processes are devised with a multisectoral approach, mandating special attention for reaching out to urban poor and vulnerable sections

Ayushman Bharat

- **Health and Wellness Centres (HWCs)**

Centres are to deliver comprehensive primary health Care (CPHC) bringing healthcare closer to the homes of people. They cover both, maternal and child health services and non-communicable diseases, including free essential drugs and diagnostic services.

- **Pradhan Mantri Jan Arogya Yojana (PM-JAY)**

Provides a cover of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization across public and private empaneled hospitals in India

Better Fund utilization

Improved service delivery

Resource optimization

Coordination and collaboration

Strengthening governance mechanisms

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

Ensure a proper supply of water and a sewage connection in every household focusing largely on the poor and disadvantaged to improve the quality of life

Swachh Bharat mission (SBM)

National urban health mission can align with SBM to **encourage healthy hygiene practices**, **utilize SBM infrastructure**, and prevent waterborne diseases by **ensuring clean water and sanitation** in urban areas.

Pradhan Mantri Awas Yojana (PMAY-U)

Ensure better living conditions and access to basic healthcare services in new housing units.

DAY- NULM

Utilization of NULM **data sharing**, **infrastructure,** such as night shelters and city livelihood centers. **Mobilization for outreach programs, e.g. Urban Health & Nutrition day, immunization.**

Policy Implication: Bridging the gaps

WASH

- Concerns regarding water quality
- Prevalence of sanitation issues, including poor drainage, clogging, and the presence of pests
- Lack of awareness and training of hygiene practices
- Irregular waste collection & disposal

Health & Healthcare

- Challenge in disease detection and early prevention
- Perception/Desire to seek treatment-Health seeking behavior
- Health care reach
- High out of pocket expenses
- Healthcare utilization
- Poorly equipped health care services
- Limited Availability of Healthcare Providers
- Lack of awareness
- Limited Health Literacy
- Stigma and Misconceptions

Strategies

Improved WASH services

Awareness & Education

Early Detection and Screening

Healthcare-Availability and Accessibility

Providing financial assistance

- Bridging the gap between communities and government entities, advocating for policy changes, and ensuring that the voices of the people are heard
- Identify potential stakeholders who will facilitate easier engagement of programs, initiatives and services

Policy Implication: Bridging the gaps continues

Community

Mahila Arogya Samiti	Monitoring health
Self Help Groups	Awareness, providing information ,Develop skills, and achieve economic independence
Youth Advocacy Groups	Educational awareness, Voicing concerns & initiating discussions
NGO	Uplift the socio-economic status

- **Strengthening community services**
- **Improvement of living conditions**
- **Healthcare delivery, & support**
- **Community-based monitoring**
- **Awareness and behavioral change**

ASHA workers ⟷ **Anganwadi Representatives**

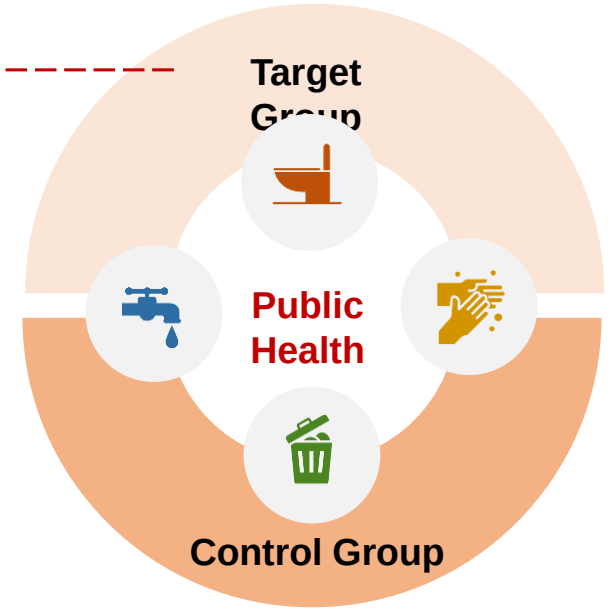
D2D regular surveys are conducted within their locality to monitor and address any potential disease outbreaks promptly

They serve as community hubs for early childhood education offering support and resources for maternal and child health, nutrition

Bridging the Gap

Establishing direct interaction channels, builds trust and rapport, making health awareness initiatives more effective

Conclusions and the way forward- future agenda for WASH



- Quality of life
- Income and employment distribution
- Education
- Healthcare-seeking behaviour
- Health inequities

Further Areas to Explore

- Extensive Research and Mapping of the Vulnerable Areas and Communities.
- Exploring avenues of sustainable financing models
- Health action plans can be implemented
- Improve healthcare infrastructure and service quality, and invest in robust data systems for evidence-based planning in vulnerable areas.

Thank You!

Global South Academic Conclave on WASH and Climate 2025

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