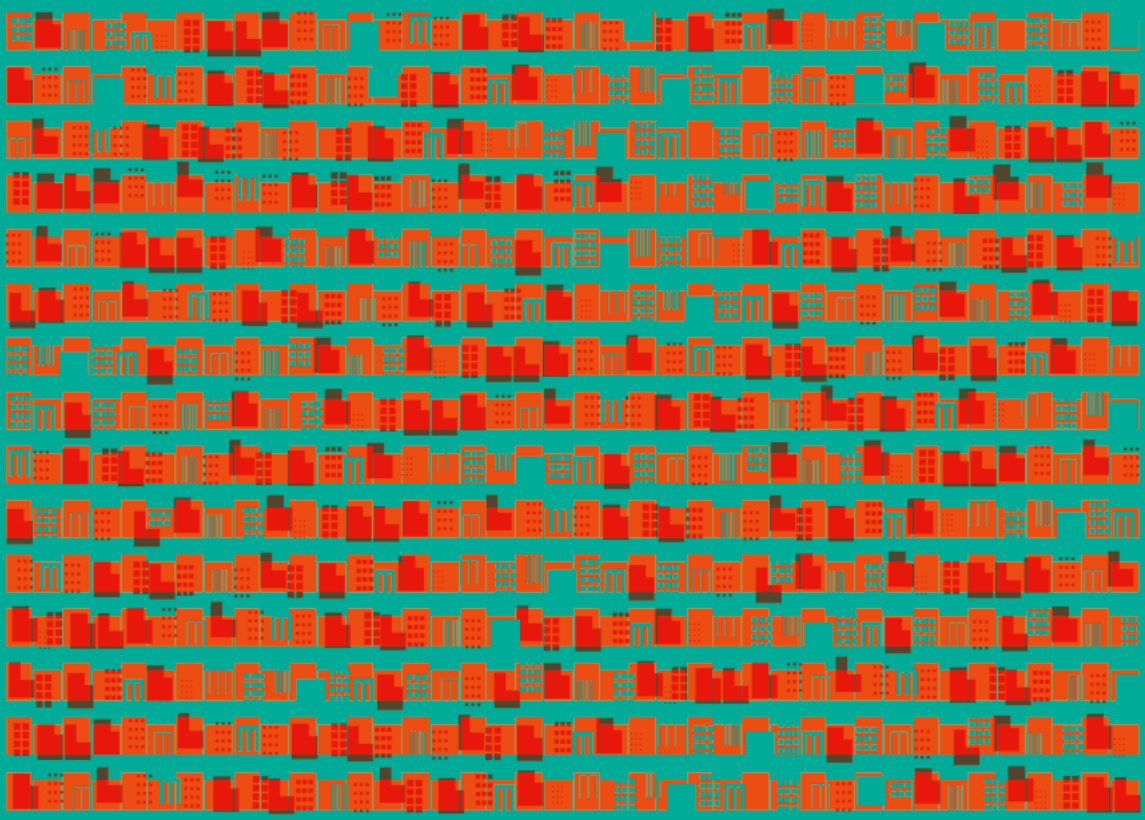
COMPREHENSIVE ASSESSMENT OF INFORMAL SETTLEMENTS IN BAGMATI CORRIDOR OF KATHMANDU VALLEY

JUNE 2024



Scientific report

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Acknowledgement

We, at Médecins du Monde (MdM) France Nepal, are proud to have the *Comprehensive Assessment of Informal Settlement in Bagmati Corridor of Kathmandu Valley* project in Kathmandu, Nepal. We extend our heartfelt gratitude to our HQ team, Clemence Arceluz, Hugo Alvarez, Julie Grammont, Pauline Bignon, Juan Diego Poveda and Aurore Camier for their valuable feedback and guidance. It was possible due to the constant effort of Nepal mission team members, Ms. Sandhya Subedi, Mr. Arun Kanta Paudel, and Mrs. Shreelata Rana. Their dedication and expertise were key to achieving our objectives.

We would also like to acknowledge the exceptional efforts of Anweshan team led by Mr. Manish Gautam and Ms. Sanju Maharjan whose leadership and specialized knowledge were vital in steering the project forward.

We also thank Action Against Hunger (ACF) for their logistical support during data collection. Finally, we express our sincerest thanks to every individual and organization that played a role in facilitating this research. We sincerely acknowledge the contribution of the researchers, data collectors, community leaders, FCHVs, healthcare providers, CBOs, and all participants for their cooperation and contributions. Your contributions, support, willingness to participate has been essential in enriching our study and advancing our understanding.

Médecins du Monde (MdM) France, Nepal mission

February 2025

Graphic design: Christophe Le Drean

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BMI	Body Mass Index
CAPI	Computer Assisted Personal Interviewing
CBO	Community Based Organizations
CDs	Communicable Diseases
CGI	Corrugated Galvanized Iron
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
DDT	Dichlorodiphenyltrichloroethane
FAO	Food and Agriculture Organization
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
FP	Family Planning
HDD	Household Dietary Diversity
HIV	Human Immunodeficiency Virus
IDI	In-depth Interview
IUD	Intrauterine Device
IWW	Informal Waste Worker
KII	Key Informant Interview
LAM	Lactational Amenorrhea Method
LPG	Liquefied Petroleum Gas
MdM	Médecins du Monde
MPI	Multidimensional Poverty Index
MUAC	Mid-upper Arm Circumference
NHI	National Health Insurance
NHIP	National Health Insurance Program
OOP	Out-Of-Pocket cost
ORS	Oral Rehydration Solution
PCA	Principal Component Analysis
PPE	Personal Protective Equipment
PPS	Probability Proportional to Size
QDA	Qualitative Data Analysis
SDG	Sustainable Development Goal
SPSS	Statistical Package for the Social Sciences
TV	Television
UHC	Urban Health Center
UHPC	Urban Health Promotion Center
UNICEF	United Nations for Children's Fund
VBD	Vector Borne Disease
WHO	World Health Organization

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INTRODUCTION

Informal settlements are becoming a primary housing option for a significant and expanding portion of the urban population in developing cities worldwide[1]. Rapid urbanization and migration from rural areas to cities are key factors driving the increasing occurrence of informal settlements[2]. In the informal settlements a small group of individuals organize together to claim open land, resisting eviction attempts by landowners or government authorities[3]. Thus, informal settlements, are locations where individuals reside on land for which they lack legal ownership[4].

Informal settlements typically exhibit inadequate infrastructure due to their lack of legal recognition. Residents of these settlements are primarily from lower-income groups, often engaged in wage labor or informal work sectors. Moreover, informal settlements lack formal land ownership for the houses constructed within them[5]. On the other hand, people in the informal settlements often experience lack education, skills, empowerment and good health as they are excluded from the economic, social and political sphere of life[6]. As a result, informal settlements emerge as one of the most vulnerable groups in society, facing heightened risks of poverty, discrimination, and limited access to essential services including health and opportunities for advancement. People in informal settlements live in extremely harsh conditions[7]. The vulnerability of these informal settlers will continue to rise[8]. Recognizing the seriousness of the issue, the Sustainable Development Goals (SDGs) have included addressing informal settlements as part of Goal 11[9].

In Nepal, informal settlements in Kathmandu are on the rise due to the increasing trend of rural-to-urban migration driven by the search for improved educational and employment opportunities. These settlements are located along the five rivers of the Kathmandu valley- Bagmati, Bishnumati, Hanumanthe, Tukucha and Dhobikhola[10]. These settlements often lack basic amenities such as electricity, clean water, and sanitation facilities. Housing conditions are typically poor, with residents often constructing makeshift shelters from whatever materials they can find. Due to limited space, it's common for multiple families to reside in cramped quarters[11].

The study shows that children living in informal settlements in cities have worse nutrition than both urban and rural children[12]. Those living in informal settlements are highly susceptible to preventable diseases, both communicable and non-communicable, and face high mortality rates[13]. Their poor social and economic conditions, coupled with inadequate sanitation and lack of access to safe water, likely contribute to these confronts[14].

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1. RATIONALE OF THE STUDY

Residents living in informal settlements encounter various threats to their well-being[15]. The informal settlements found in the Kathmandu valley are marked by overcrowding, substandard housing conditions, insufficient sanitation facilities, limited availability of clean water, and inadequate sewage and drainage infrastructure, all of which increase their susceptibility to health issues and malnutrition[16]. A study conducted in 2013 revealed that, the majority of the population of informal settlements relied in daily wages for their income, the per capita income in the studied communities was Rs. 100 per day[17]. The residents experience financial constraints that directly affect their dietary and living standards. They consume less nutritious and unsanitary food, rely on polluted groundwater from nearby rivers for drinking, and reside in substandard physical environments[18]. Therefore, the primary health issues in these settlements were respiratory disease, gastrointestinal disorders, and burn injuries15. Research conducted in six urban informal settlements within the Kathmandu valley revealed elevated rates of stunting (38%), wasting (9%), and underweight (30%) among preschool-aged children, as well as a considerable incidence of chronic energy deficiency (9%) among their mothers[19].

The hidden cities: unmasking and overcoming health inequities in urban settings report states worldwide, approximately 828 million individuals reside in slum environments, constituting roughly one-third of the global urban populace. This number is expected to increase in South Asia, where urban populations are forecasted to surge from 45% to 62% by the year 2050[20]. Given the increased susceptibility of residents in informal settlements to health issues, it is necessary to evaluate their health and well-being alongside the determinants that influence their positive health outcomes. Acknowledging the interconnected nature of socio-economic factors, health status, and nutrition, interventions can be developed to tackle the health challenges faced by residents which will ultimately improve the overall health and quality of life of individuals living in informal settlements.

2. OBJECTIVES

The objective of the study on informal settlements of Kathmandu valley is to assess the health and wellbeing of marginalized people living in the four informal settlements areas of Bagmati river corridors located in three wards of Kathmandu district including informal waste workers so as to identify their accessibility to quality health services and health seeking behavior.

The specific objectives of this study are as follows:

- To assess the health, nutrition and socio-economic conditions of people residing in informal settlements including informal waste workers.
- To assess the major health issues or problems, health seeking behaviors, health care accessibility and utilization among the informal settlements.
- To identify the barriers and facilitators to accessing the health care services.
- To assess the physical environment, living conditions, infrastructure and sanitation facilities in informal settlements
- To assess the knowledge, attitudes and practices related to the National Health Insurance (NHI) scheme among the informal settlements, identifying the barriers to enrollment and utilization.

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RESEARCH METHODOLOGY

1. STUDY DESIGN

Explanatory sequential mixed method study was conducted where the qualitative data was collected based on the preliminary analysis of the quantitative data collected. The quantitative part involved literature review, collection of data on demographics, health status, health care utilization and socio-economic indicators and observation. The qualitative part involved the conduction of Key Informant Interview (KII), In-depth Interview (IDI) and Focus Group Discussion (FGDs) with relevant stakeholders, informal waste workers and the community members respectively.

2. STUDY SITE AND JUSTIFICATION

Initially, four informal settlements—Shantinagar, Dirghayu Tole, Chadani Tole, and Balkhu Basti—were purposively selected based on recommendations from MdM France. This selection was aligned with the project's long-term objectives and focused on the health vulnerabilities of populations living in informal settlements along the Bagmati River corridor. Residents in these settlements face significant exposure to pollution, primarily due to solid waste dumping and the encroachment of public toilets into the river, which increases their susceptibility to infections and diseases. These four informal settlements are located in three different wards (31, 9, and 14) of Kathmandu district.

However, the study could not include the participants from all four proposed study sites, but instead includes the findings from the representative samples selected from Shantinagar and Balkhu Basti only in this report. The details of Chandani tole have also not been included in this study. Being abided by the ethical standards and research protocol, it was necessary to exclude one of the proposed sites due to not receiving approval for applicability of information gathered from those location.

Figure 1: Study sites

From the preliminary analysis, it was found that the people of the Chandani Tole belonged to a higher socio-economic status which was beyond the characteristics of the informal settlements which could have skewed the whole data. From the suggestions of MdM team, the collected data from Chandani Tole were excluded from analysis.

3. SAMPLE SIZE

Sample size was calculated by using the formula for finite population, given that N = 627 (10)

$$\text{samplesize} = \frac{n}{1 + n/N}$$

Where, N= total finite population

$$n = \frac{z^2 pq}{d^2}$$

z= Z-score corresponding to the desired confidence interval (1.96 for a 95% confidence interval)

p = prevalence rate (assuming 50%)

d = margin of error (considered as 5%)

Therefore,

$$\text{samplesize} = \frac{n}{1 + \frac{n}{N}} = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{z^2 pq}{N}} = \frac{\frac{1.96^2 x 0.5 x (1-0.5)}{0.05^2}}{1 + \frac{\frac{0.5^2 x 0.5 x (1-0.5)}{0.05^2}}{627}} = 239$$

including 20% non-response rate, the ultimate sample size was 286.8~286

Since, Dirghayu tole was excluded from the sample as the stakeholders from the settlement did not provide approval for data collection, the sample size was adjusted during the implementation phase. To maintain the planned sample size, the number of participants originally allocated to Dirghayu Tole was proportionately redistributed among the other three settlements. For this redistribution, the PPS was applied to the number of households identified in the real field.

During data collection, instances of non-response were encountered as some participants were not present at the time of the visits. To address this, each household was revisited twice. Despite these efforts, some participants remained unavailable and were thus classified as non-respondents.

4. STUDY POPULATION

The study population for this study consists of all eligible men, women (household head) aged 18 years & above of the selected households of the informal settlements; informal waste workers residing the selected settlements; community leaders; health care providers; female community health volunteers and representative from community organizations.

Criteria for the selection of the study population:

- All the informal waste workers, either male or female, 18 years and above, residing within the selected informal settlements were compulsorily selected.

Table 1: Sample size distribution

SN	Name of the settlements	Estimated Household size	Actual Household size	Proposed Sample size	Additional sample size using PPS	Actual Sample size	Sample covered	Participation rate (%)
1	Shantinagar	150	295	68	10	78	71	91.02
2	Dirghayu Tole	60	—	27	—	—	—	—
3	Chandani Tole	56	55	26	2	28*	27	96.43
4	Balkhu Basti	361	400	165	15	180	180	100
	Total			**286**	**27**	**286**	**278**	

*Data from Chandani tole was collected but it has been excluded

— Either male or female household head, 18 years and above were recruited from each of the selected households.

5. SAMPLING TECHNIQUE

First, all the informal waste workers residing in each of the selected settlements were mandatorily included in the study. Then, to cover the remaining sample, systematic random sampling was applied to select the households to reach the predetermined sample size.

To accurately identify and include informal waste workers in the study, community leaders were initially engaged to assist in locating the residences of these workers within each selected settlement. Upon locating them, we inquired whether they received a wage or salary from any municipal or private company. Those who did not receive any money through wages or formal employment, but depended solely on selling collected waste, were included in the study, while those who received wages or salaries were excluded.

In response to non-responses of the households from the initial list, a relist was created. This relist included additional households selected through the same systematic random sampling method to compensate for the non-responding households.

6. DATA COLLECTION METHOD AND TECHNIQUES

6.1. Quantitative

Face to face interview

Face to face interview was conducted with the study participants including informal waste worker (IWW) using the structured questionnaire for the household survey.

Anthropometric measurement

Anthropometric measurement included measuring the height and weight of participants and children aged 6 to 59 months. Mid Upper Arm Circumference (MUAC) of children between the ages of 6 to 59 months was also taken. UNICEF/ WHO recommended Seca Digital Weight Machine and Height/Length Equipment was used to measure the height and weight of the children and MUAC tape was used to measure the MUAC.

Observation

An observational assessment was performed for the living conditions-physical environment, infrastructure and sanitation facilities. The observation checklist was developed for this purpose. For the observation, permission from households' head was sought following the consent procedures.

6.2. Qualitative approach

Key informant interview (KII), in-depth interview (IDI) and focus group discussions (FGD) were adopted for qualitative data collection for in-depth understanding of the health and well-being of the people in informal settlements.

Key informant interviews (KII)

The interviews were conducted with community leaders, Female Community Health Volunteer (FCHV), health care providers and representatives from community-based organizations (CBOs).

In-depth interview (IDI)

The IDI was conducted with informal waste workers to understand perceptions and perceived links between living conditions and health from an individual experience point of view.

Focus Group Discussion (FGDs)

The FGDs were conducted with the heterogenous group community members including both male and female inhabitant in same group. However, few sections of the qualitative guideline was administered among the female participants separately at the end of group discussion.These discussions provided insights into the lived experience of the people residing in the informal settlements.

7. SAMPLE CHART

The sample distribution across the settlements for the studies is as follows:

Table 2: Sample chart

SN	Participants	Sample size	Data collection method	Criteria	Ward
Quantitative					
1	Study participants	265	Face to face interview	Living in the settlement for more than six months	9, 14, 31
	Adults	278	Anthropometric measurement	Household head/ member aged above 18 years available during the time of data collection	
	Children 6 to 59 months	50	Anthropometric measurement MUAC	Children within the selected households	
	Informal waste workers	13	Face to face interview with informal waste workers Anthropometric	Living in the settlement for more than six months	14
2	Observations	278 households	Direct field observations		9, 14, 31
Qualitative					
3	Community leaders	1*2 settlements = 2	KII	the people who were actively engaged in the welfare of the people of the informal settlements and were residing within the selected informal settlements	14, 31
4	Health care providers	1*2 settlements = 2	KII	the health care providers from Urban Health Promotion Centres or the community health post located nearby to the settlements, one each.	14, 31
5	Representative from CBOs	1*1organizations= 1	KII	CBO working for the welfare of the people living in the settlement	14
6	FCHVs	1*3 settlements = 3	KII	The FCHVs either residing in the settlement or engaged in the outreach and prevention work with the people of informal settlements.	9, 14, 31
7	Informal waste workers	1*1 settlements = 1	IDI	Living in the settlement for more than six months	14
8	Community members	1*3 settlements = 4	FGD	community members who were not selected in the quantitative study	9, 14, 31
	The FGD with community member was conducted in such a way that after finishing the discussions initially with both the groups, female participants were retained for subsequent discussions.				
	Total		**8 KII+1 IDI+3 FGD**		

8. STUDY TOOLS AND INSTRUMENTS

The structured interview questionnaire and observation checklists were developed for quantitative data collection while semi-structured interview guidelines, IDI guidelines and FGD guidelines were developed for qualitative data collection. The questionnaire and guidelines were developed based on different available literatures. The final questionnaire and guidelines were shared with Médecins du Monde (MdM) France Nepal team. The final version of the questionnaire was reviewed collaboratively by members from both the MdM and Anweshan teams. Details on tools used is provided in Annex Table 1.

9. PRE-SURVEY VISIT

The core research team from Anweshan conducted a pre-survey visit on 8th, 9th and 26th April and 3rd, 7th and 9th May 2024 for the necessary preparation for data collection. The coordination was done was done with the 9, 14 and 31 ward offices of Kathmandu district with the letters requesting for approval of data collection. The community leaders from each settlement were approached requesting support for data collection. The social mapping of each settlement was made with the help of community leaders for better understanding of the settlements and planning for data collection.

10. PRETESTING

A pretesting was conducted in Jagritinagar, the informal settlement of ward no. 31, Kathmandu district on May 17, 2024. The primary objective was to evaluate the methodology, use of anthropometric equipment, data collection tools and time associated with the survey in the real field settings. The approval from the respective ward office was taken. The community leaders were contacted in advance. All six field researchers carried out the data collection. Members of the Anweshan team supervised the field researchers for clarity and support. After pretesting, a brief feedback session was conducted. Feedback from the field researchers and participants was gathered and the tools were refined making the necessary adjustments. The tools were made ready for the actual survey.

11. RESEARCH TEAM

A team of six members of field researchers underwent three days training in Anweshan training hall for data collection focused on quantitative data collection. The researchers were trained on the study objective, purpose, methodology and expected outcome. The training was also focused on practical skills necessary for anthropometric measurements with height board, weighing machine and mid-upper arm circumference (MUAC) tape. Field researchers were selected based on public health background with prior work experience in health-related research. The qualitative data collection was accomplished by Anweshan team.

12. FIELD IMPLEMENTATION

Data collection was conducted from 18th May 2024 to 25th May 2024 for the period of eight days. Face to face interviews were conducted with the participants regarding the demographic information, socio-economic status, living standards and health and nutrition status and national health insurance. Moreover, the trained enumerators conducted anthropometric and MUAC measurements. The qualitative data collection started from 20th May 2024, after preliminary analysis of collected data.

The field team reported daily to the field supervisor, who oversaw their work, addressed any challenges or issues that arose and provided support when needed. The survey manager verified the data accuracy. The z-scores were calculated for the reported anthropometric data on each day. For any discrepancies observed, the field researchers were contacted personally. The participants were also followed up for verification of the information gathered. Spot check and monitoring activities were carried out by Anweshan team daily during the period of data collection.

13. DATA MANAGEMENT AND ANALYSIS

The computer assisted data collection and CAPI techniques were used for fieldwork. The data was collected using password protected KOBO collect. The collected data was kept in password protected laptops and desktops. The identifiers were omitted to maintain confidentiality and anonymity of the data. Data cleaning and validation procedures were then conducted to rectify errors or inconsist-

encies. The data were transferred to SPSS for analysis, with syntax built for the survey dataset. SPSS V.23 was utilized for analysis of cleaned data. The quantitative data were analysed using descriptive statistics. The Multidimensional poverty index (MPI) and Principal Component Analysis (PCA) were computed to determine the socio-economic conditions of the participants. The chi-square tests were applied for comparing categorical data.

For qualitative data, all recorded IDI, KII and FGDs were transcribed and translated in English. The thematic analysis following hybrid coding process was done using QDA Miner Lite V3.0.5 software. The findings of the qualitative study were triangulated with the quantitative study.

14. ETHICAL CONSIDERATION

Ethical approval was obtained from the Ethical Review Board, Nepal Health Research Council with registration number 198/2024 on 30 April 2024. Written informed consent was obtained from each participant before data collection. The participants were informed of their right to withdraw from the study at any time without consequences. Confidentiality and anonymity of the participants were maintained throughout the study. Identifiers like name and location were removed before sharing the transcripts. Moreover, the parental consent was obtained for the participants under 5 years of age for their anthropometric assessments.

15. LIMITATION OF THE STUDY

— After conducting a preliminary analysis, it became clear that the study participants from Chandani Tole (27 individuals) exhibited less homogeneity in their characteristics in terms of socio-economic status in comparison to other study sites. This lack of consistency could potentially undermine the generalizability of the results. Consequently, at the request of MdM, these participants were excluded from the final analysis. As a result, the total number of participants was 251. Similarly, the qualitative data collected from Chandani Tole was also excluded from the analysis.

— As analysis was conducted from the data collected from only two settlements, the findings cannot be generalized to all informal settlements.

— Another limitation of the study is the low number of informal waste workers among the participants. This limited representation of a specific subgroup within the informal settlements could affect the comprehensiveness of the study's findings. As informal waste workers may face unique challenges and conditions, their underrepresentation may result in an incomplete understanding of the broader issues affecting informal settlement residents.

FINDINGS

1. SOCIO-ECONOMIC AND HEALTH CONDITIONS

Socio-economic status significantly influences health, education, and overall quality of life. In informal settlement areas, comprehending the socio-economic conditions is vital for creating effective interventions. The socio-economic conditions of the residents of informal settlements are generally poor due to the lack of essential social amenities, such as quality education, vocational training, reliable income sources, and adequate hygiene and health resources [21] .

The residents of informal settlements with low incomes directly affect their food and living conditions. They often consume less nutritious and unhygienic food, drink contaminated water, and live in substandard housing with poor ventilation, limited space, leaky roofs, and damp floors[22]. These lower socio-economic conditions can result in deteriorating health and overall well-being[23]. In a survey conducted by Lumanti, it was revealed that about 40 per cent of residents used firewood for cooking, 20 per cent used kerosene, and the remainder used gas (LPG) stoves[24]. Another survey in Kathmandu among informal settlements revealed that, 7 per cent of household members encountered a major health issue in the year preceding the survey, with gastrointestinal diseases, respiratory illnesses, accidents, and injuries being the main causes[25]. (5)

Informal settlements are characterized by poverty, illiteracy, and poor health conditions. Social factors are as crucial as physical factors in determining residents' health status and the appropriate interventions. Public policy aimed at continuously improving social determinants of health, such as income, education, housing, food security, and neighborhood conditions, can have positive and lasting impacts on people's health[26 27].

1.1. Overview of informal settlement residency

When overviewing the residency in the two settlements, it was found that people have lived in Shantinagar for for up to 65 years, with an average residency of 19.4 years, while in Balkhu Basti for upto 45 years, with average of 16 years Except for two participants, all were Nepali, coming from different provinces. Half (50.2%) were originally from different districts of Bagmati Province, followed by 28.1 per cent from Koshi Province, and only 0.8 per cent from Sudurpaschim Province. Majority of the people in the Shantinagar were living in the settlement due to unaffordable rent (54.9%) followed by obtaining free/cheaper land for living (49.3%), not having ancestral land (19.7%) and other reasons Meanwhile, the reasons for living in the Balkhu Basti included lack of money to buy land (74.4%), easy access to employment (71.1%), unaffordable rent elsewhere (53.3%), obtaining free/cheaper land (36.7.2%), lack of ancestral property (43.9.1%), and other reasons. Some participants mentioned their work in collecting recyclables and waste, which made it difficult to find rental housing elsewhere, and the need to return home late at night as reasons for living in the informal settlement.

The qualitative data revealed similar findings on the duration of residency in the informal settlement ranging from 9 months to 28 years to even up to 45 years. The people living in Balkhu Basti

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Table 3: Overview of informal settlement residency

Characteristics	Shantinagar (%)	Balkhu Basti (%)	Total
Duration of residency			
Average duration of staying	19.4 years	16 years	
Range	2-65 years	0-45 years	
Place of origin			
Nepal	100	98.9	249
India	—	1.1	2
If Nepal, province wise place of origin			
Bagmati Province	47.9	51.1	125
Koshi Province	35.2	25.3	70
Madhesh Province	8.5	9.6	23
Gandaki Province	4.2	6.2	14
Lumbini Province	1.4	6.2	12
Karnali Province	2.8	0.6	3
Sudurpaschhim Province	—	1.1	2
Reason for living in settlement*			
Lack of money to buy land	39.4	74.4	162
Easy access to job/employment	31.0	71.1	150
Unaffordable rent	54.9	53.3	135
For obtaining free/cheaper land for living	49.3	36.7	101
Not having ancestral land/property	19.7	43.9	93
Living in slums since generation	7.0	3.3	11
Eviction from the origin	1.4	5.0	10
Easy access to education	2.8	0.6	3
Others	2.8	1.1	4

*Multiple response

Table 4: Distribution of participants according to informal settlement and type of participants

Type of participants	Shantinagar	Balkhu Basti	Total
Household Head	71.8%	77.8%	191
Family member aged above 18	28.2%	15.0%	47
Informal waste workers	—	7.2%	13
Total	**71 (28.3%)**	**180 (71.7%)**	**251**

reported staying in the settlement for 20-21 years while the people in Shantinagar stated different duration of residency i.e., some said 28 years while some reported living in the settlement for 45 years. The Balkhu settlement was established since 2003 AD while Shantinagar was established since 1997 AD in the government owned land. The people living in the settlement were mainly from Nepal. The participants in the qualitative interview said that poverty, expensive rent outside the settlement and in search of job opportunities were some of the main reasons of their internal migration from their place of origin towards the informal settlement. This finding supports the quantitative data.

> *"The reason for living in this settlement is due to poverty and unemployment. If we rented a place outside this settlement, we wouldn't be able to afford it". - [Community member, FGD, Shantinagar]*

Moreover, community leader from Balkhu talked about having some facilities like school and religious places within their settlement.

> *"We have a school named Jagaran Primary School which is registered within the education ministry. We have 3 temple: the main being Pathibhara temple, a Shiva temple and a temple in the far end of the community. There are 4 churches as well." [Community leader, KII, Balkhu]*

1.2. Socio-demographic information

Out of a total of 251 participants, 71.7 per cent were from Balkhu Basti while 28.3 per cent were from Shantinagar. The majority of the participants were household heads in both Balkhu Basti (77.8%) and Shantinagar (71.8%), while only 7.2 per cent were informal waste workers. All the informal waste workers were from Balkhu Basti.

Females constituted 52.6 per cent of the participants. Regarding nationality, 99.2 per cent were Nepali, with only two Indians. Most participants were from the Janajati ethnic group (61.8%), followed by Dalit (16.5%), Brahmin/Chhetri (14.5%), and others. Nearly half (49%) were Hindu, followed by Christian (29.7%), Buddhist (15.7%), Muslim (4%), and Kirat (1.2%). The primary language spoken was Nepali (83.3%), and 76.9 per cent of the participants were married.

Table 5: Demographic characteristics of participants

Characteristics	Frequency	Percentage
Gender of household head		
Male	119	47.4
Female	132	52.6
Nationality		
Nepali	249	99.2
Indian	2	0.8
Ethnicity (n=249)		
Brahmin/Chhetri	36	14.5
Janajati	154	61.8
Dalit	41	16.5
Madhesi	6	2.4
Muslim	10	4.0
Thakuri	2	0.8
Religion (n=249)		
Hindu	122	49.0
Buddhist	39	15.7
Muslim	10	4.0
Christian	74	29.7
Kirat	4	1.6
Language		
Nepali	209	83.3
Maithili	13	5.2
Tamang	15	6.0
Others (Hindi, Awadhi, sherpa...)	14	5.6
Marital status		
Single	25	10.0
Married	193	76.9
Separated	4	1.6
Widowed	29	11.6

1.3. Disability related information

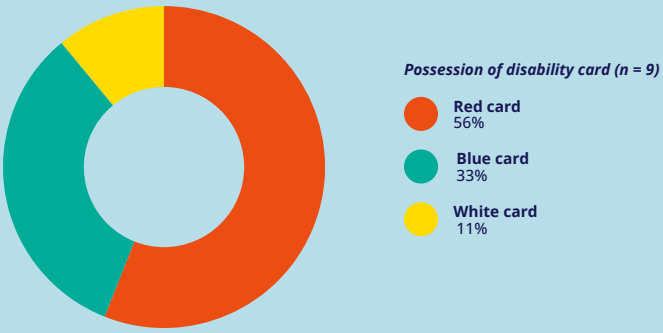
Out of 251 households, 18 households had members with disabilities. In Shantinagar, 11.3 per cent of households had members with disability, while in Balkhu Basti, it was 5.6 per cent. One household had two members with disability, making a total of19 members with disability in the selected households.

Of the 19 members with disability, 57.9 per cent were males and 42.1 per cent were females. The mean age of the people with disability was 46.32 years with minimum age 12 years and maximum age 72 years.

Table 6: Types of disability among members of households

Types of disability	Male (%)	Female (%)	Total
Physical disability	63.6	75.0	13
Visual impairment: blind and low vision	27.3	12.5	4
Hearing impairment: deaf and hard of hearing	—	12.5	1
Speech impairment	9.1	—	1
Mental disability: intellectual disability, mental illness and autism	9.1	—	1
N	**11**	**8**	**19**

Figure 2: Possession of disability card among household members



Among the types of disability, 13 members had physical disabilities with 63.6 per cent being male and 75.0 per cent females. Four members had visual impairments, comprising 27.3 per cent males and 12.5 per cent females. There was only one female member with a hearing impairment and one male member with a speech impairment. Additionally, mental disability was present in one male member.

Among the members with disability, nearly half (47.4%) had a disability card. Out of them, five had a red card, three had a blue card and one had a white card[28].

28 **Red Card** - Profound disability: A person who is in such a condition that he or she has difficulty with performing his or her day-to-day activities even with continuous support of others. **Blue Card** - Severe disability: A person who is in such a condition that he or she needs support of others continuously to perform personal activities and involve in social activities. **Yellow Card** - Moderate (mid-level) disability: A person who is in such a condition that he or she can regularly participate in his or her daily activities and in social activities if physical facility is available, environmental barrier is ended or education or training provided.**White Card** - Mild disability: A person who is in such a condition that he or she can regularly participate in his or her daily activities and social activities if there exists no physical and environmental barrier.

1.4. Socioeconomic status

Wage employment was the main source of income for 43 per cent of the participants' families, while 5.6 per cent relied on informal waste work. Monthly incomes ranged from NPR 1,000 to NPR 150,000 with a median amount of NPR 20,000. Regarding accommodation, almost one fifth (19.1%) of the participants lived in rented places, paying rent to house-owners. Rent ranged from NPR 1,000 to NPR 13,000, with amedian amount of NPR4,000. More than half (53.8%) of the participants had loans, with the majority (72.6%) borrowing from friends or relatives, followed by neighbors (23.7%), savings and credit groups (21.5%), cooperatives (16.3%), and banks/financial institutions (8.1%). Loan amounts ranged from NPR12,000 to NPR 1,500,000, with a median loan amount of NPR 200,000.

Similarly, participants in the qualitative approach mentioned that occupation of male living in the settlement were mostly daily wage work and labor and females mostly worked in other people's house for washing utensils and housekeeping job.

"Most men work as daily laborers and women work as house helps, which have helped in the financial aspect of the people here." - [Community leader, KII, Shantinagar]

"Most are involved in daily labour. We have a fruit market that provides to the entire Kathmandu in the north of this basti. We have a food grocery market in the west that serves the entire city as well. People work in the loading and unloading section in these markets. There are vegetable markets in Balkhu which lies in the south, where people work as porter as well." - [Community leader, KII, Balkhu Basti]

As most of them worked as wage workers and laborers, their daily earning would be mostly NPR 500-700 which indicates their monthly income within the range of NPR 20,000. This qualitative finding supports the quantitative finding regarding income of the participants.

"Most of our brothers and sisters do laborious work earning up to 200-500 rupees per day. The highest pay that some of our brothers earn is 1000-1500 rupees per day by working more than 12 hours. Most of the people earn 500-700 rupees per day, working from early morning till late at night. There are only few people earning 1000 or above." - [Community member, FGD, Balkhu Basti]

The participants from qualitative study mentioned about taking loans from relatives and Sahu (boss/employer). Interestingly, the purpose of taking loan as revealed by the qualitative participants were mainly for building houses and health check-up/operation cost/for treatment of diseases.

"Due to insufficient living space, we added an extra floor to our house. We took a loan from Sahu for the construction. We have no idea how we'll be able to repay the loan by working as laborers. With limited job opportunities, it's difficult to earn money. All of us have constructed our house by borrowing money from others." - [Community member, FGD, Shantinagar]

As depicted in the table below on the type of accommodation, the majority (80.9%) had their own home in the settlement. The qualitative findings revealed similar information.

"Many people claim to own their houses, while others have bought theirs from previous owners. Renters seem to be fewer in number." - [FCHV, KII, Balkhu Basti]

Table 7: Socioeconomic status

Characteristics	Frequency	Percentage
Main source of income		
Wage employment	108	43.0
Self-employment/ business	50	19.9
Salaried worker	48	19.1
Migrant labor	19	7.6
Informal waste work (waste picking/ management)	14	5.6
No income recently	10	4.0
Retired/pension	2	0.8
Monthly income (in NPR)		
1-10000	54	22.4
10001-20000	91	37.8
20001-30000	57	23.7
30001-40000	22	9.1
40001-50000	12	5.0
Above 50000	5	2.1
Family loan		
Yes	135	53.8
No	116	46.2
Source of loan* (n=135)		
Friends/Relatives	98	72.6
Neighbors	32	23.7
Saving and credit group	29	21.5
Co-operatives	22	16.3
Bank or Finances	11	8.1
Type of accommodation		
Own home	203	80.9
Rented place	48	19.1

*Multiple response

Wealth quintile

The Principal Component Analysis (PCA) was performed to identify the wealth quintile of the surveyed household. The wealth quintile was categorized into five categories: lowest, second, middle, fourth and the highest. Interestingly, all the categories of wealth quintile had almost equal distribution of the households.

Multidimensional Poverty Index

The analysis of the Multidimensional Poverty Index (MPI) for the surveyed population reveals significant insights into the extent and nature of poverty within the settlements. The MPI is a comprehensive

Table 8: Wealth quintile

Wealth quintile	Frequency	Percentage
Lowest	50	19.9
Second	50	19.9
Middle	51	20.3
Fourth	50	19.9
Highest	50	19.9

Table 9: MPI Indicators

Dimension	Indicator	Household is deprived if...	Weight
Health	Nutrition	Any child for whom there is nutritional information is undernourished in terms of weight for age (underweight) or height-for-age (stunting). (a)	1/6
	Child Mortality	A child under 18 has died in the household in the five-year preceding the survey. (b)	1/6
Education	Years of Schooling	No household member aged 11 years or older has completed 6 years of schooling.	1/6
	School Attendance	Any school-aged child is not attending school up to the age at which he / she would complete class 8.	1/6
Living Standard	Cooking Fuel	The household cooks with dung, wood, or charcoal	1/18
	Improved Sanitation	The household's sanitation facility is not improved, or it is improved but shared with other households. (c)	1/18
	Improved drinking water	The household does not have access to improved drinking water or safe drinking water is at least a 30-minute walk from home, roundtrip. (d)	1/18
	Electricity	The household has no electricity	1/18
	Housing	The household has inadequate housing materials in any of the three components: floor, roof, or walls.	1/18
	Assets ownership	The household does not own more than one of these assets: radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator, and does not own a car or truck.	1/18

Source: Nepal's multidimensional poverty index 2021

Table 10: Incidence (H), Intensity (A) and Multidimensional Poverty Index (MPI)

Poverty Cut-off (k)	Index	Value	95% CI (Lower, Upper)	Poor household	Total Household
k value =33.33%	MPI	0.032	(0.017, 0.049)	20	251
	Headcount ratio (H, %)	7.8	(4.6%, 11.2%)		
	Intensity (A, %)	40.9	(37.9%, (43.9%)		

Figure 3: Intensity gradient among the poor

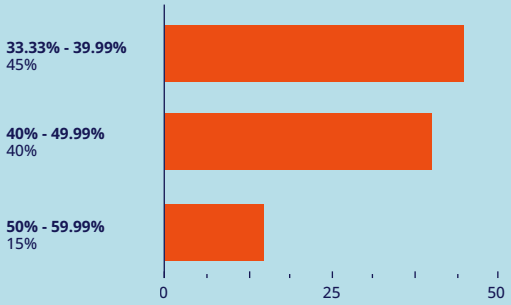
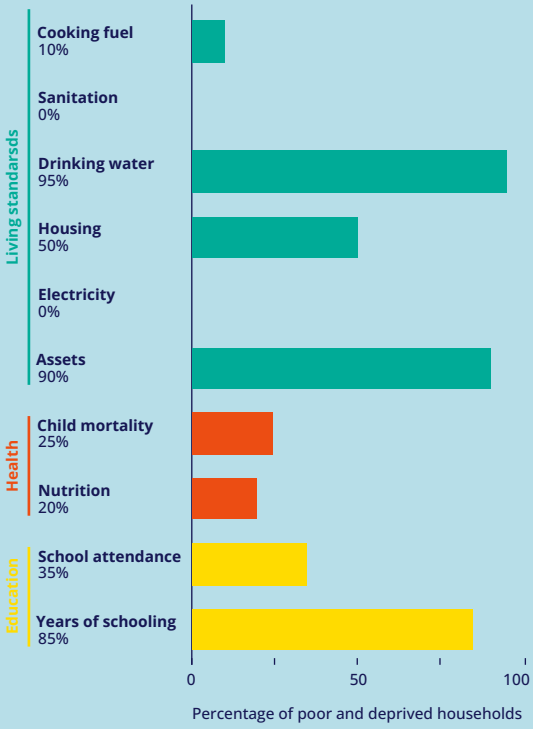


Figure 4: Censored headcount ratios



measure that captures the multiple deprivations that people in poverty experience across various dimensions. It showed the composition of poverty according to each of the 10 included indicators. This study adopted the revised National MPI structure for the calculation of multidimensional poverty.

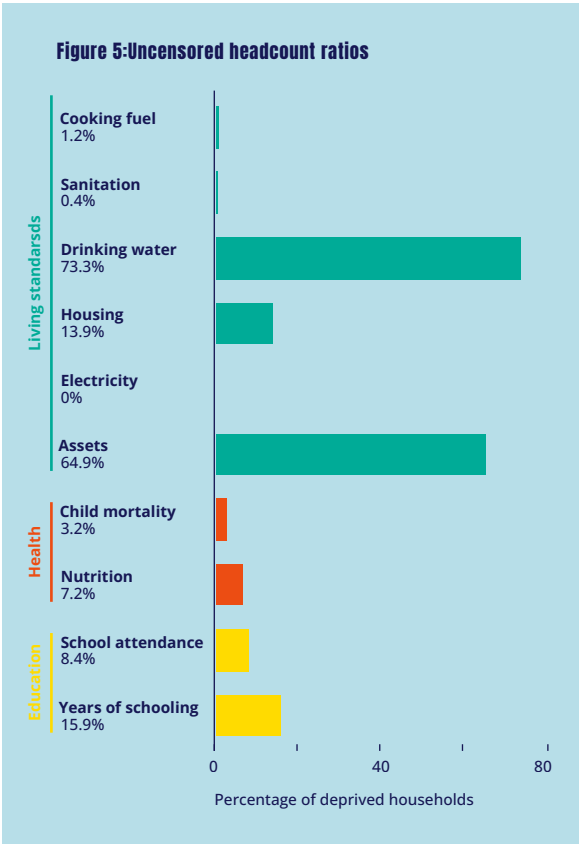
The threshold for considering a household as multidimensionally poor was set at 33.33 per cent. This means that households experiencing deprivation in at least one-third of the weighted indicators were classified as multidimensionally poor. The MPI for the surveyed population was 0.032. This index value represents the proportion of people who are multidimensionally poor, adjusted by the intensity of the deprivations they experience. The low MPI value indicates that multidimensional poverty affects a small portion of the population. The headcount ratio (H) was 7.79 per cent which means 7.79 per cent of households in settlements were multidimensionally poor. The intensity of poverty (A), which measures the average proportion of deprivations experienced by poor households, is 40.9 per cent.

Most (45%) of the multidimensionally poor households in the settlement experience deprivation in the lowest intensity band, with deprivation scores between 33.3 per cent and 39.9 per cent of all weighted indicators. Only 15 per cent of households face an intensity between 50 per cent and 59.9 per cent of the weighted indicators. No households experience deprivation beyond 60 per cent of the weighted indicators which means there were no households with extreme multidimensional poverty.

Composition of MPI by indicators

The censored headcount ratio of an indicator represents the proportion of households that are multidimensionally poor and deprived in that specific indicator. The highest censored headcount ratios were found in the indicator of drinking water, with 95 per cent of multidimensionally poor households lacking access to drinking water. Additionally, 85 per cent of poor households had no members who completed six years of schooling. An important indicator of child mortality revealed that 25 per cent of poor households had at least one member under the age of 18 who died in five years preceding the survey. The reported causes of these deaths included conditions such as Chronic Obstructive Pulmonary Disease (COPD), jaundice, and malnutrition.

The uncensored headcount ratio of each indicator refers to the proportion of households deprived in that indicator across the total number of households surveyed (251), including both poor and non-poor households. The highest level of deprivation was found in access to drinking water, with 73.3 per cent of



households having poor access. This was followed by deprivation in assets, affecting 64.9 per cent of households. Additionally, 8.4 per cent of households had school-aged children who could complete class eight but were not attending school.

1.5. Living standards

Regarding physical facilities, we assessed various aspects such as electricity, type of cookstove used, flooring materials, roofing materials, wall materials, the room used for sleeping, and ownership of farmland. All the surveyed households had access to electricity. The major source of cooking fuel was LPG, used by 98.8 per cent of families, with only three households using wood as cooking fuel. Cement was the most commonly used flooring material (85.3%), followed by earth/sand (10.8%). Corrugated Galvanized Iron (CGI) sheet was the roofing material for 92.4 per cent of households, and it was also used as wall material by 37.1 per cent of households, followed by cement (26.7%) and blocks (15.1%). Most households (44.6%) had only one room for sleeping, and very few (4%) had more than three rooms for sleeping. Nearly one-third of the households (31.5%) were overcrowded[29] as there were more than three individuals who had to share/sleep in single room. Less than one-third (27.5%) of households possessed their own agricultural land.

The qualitative approach gave a deeper insight about the facilities. Interestingly, participants of focus group discussion revealed that they did not have access to electricity and had to use traditional lamps when they first shifted to the settlement.

"We did not have supply of electricity in our area, we only used traditional lamp. We used it for very long time, after many requests we took electricity from the neighboring area, for which we paid 25 rupees per unit. But now after many requests for many years, government has supplied electricity to us and it costs 9 rupees per unit." - [Community member, FGD, Balkhu Basti]

In addition, they lived in houses made of plastics/tarpoline, tin, bamboo and rags; tent or huts during their initial days of migration to informal settlement.

"It has only been three to four years since we built proper houses, before that we were living inside a plastic hut. After many struggles, earning money from various works and saving money from what we earn we were able to build somehow proper houses for living safe during any kinds of weather." - [Community member, FGD, Balkhu Basti]

Building materials

Building structures, including kitchen walls, doors, windows, and toilet materials, were observed. It was found that 28.7 per cent of households had no separate kitchen, while CGI sheet (29.1%) and cement (26.7%) were the major materials used for kitchen walls. Regarding doors, 39.8 per cent of households had improved doors, followed by CGI sheet doors (37.1%). Proper windows were present in 45.8 per cent of households, but 33.9 per cent of households had no windows. For toilet walls, the major materials used were CGI sheet (37.1%), cement (30.3%), and bricks (17.9%).

29 WHO Housing and Health Guidelines. Geneva: World Health Organization; 2018. Table 3.1, Measures of crowding. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535289/table/ch3.tab2/

Table 11: Percentage of Households by Type of Physical Facilities

Household characteristics	Frequency	Percentage
Type of cookstove		
Liquefied petroleum gas (LPG)/ cooking gas stove	248	98.8
Traditional solid fuel stove	3	1.2
Flooring Materials		
Cement	214	85.3
Earth/sand	27	10.8
Wood planks/plywood	3	1.2
Carpet	3	1.2
Ceramic tiles	2	0.8
Parquet or polished wood	1	0.4
Palm/bamboo	1	0.4
Roofing Materials		
Metal/tin	232	92.4
Cement	19	7.6
Wall Materials		
CGI sheet	93	37.1
Cement	67	26.7
Bricks	44	17.5
Cement blocks	38	15.1
Plywood	3	1.2
Refused wood	2	0.8
Stone with mud	1	0.4
Uncovered adobe	1	0.4
Wood planks/shingles	1	0.4
Plastics/Tripaal	1	0.4
Rooms Used for Sleeping		
One	112	44.6
Two	92	36.7
Three	36	14.3
More than three	10	4.0
Overcrowding		
Yes	79	31.5
No	172	68.5
Own Farmland		
Yes	69	27.5
No	182	72.5

Table 12: Building structures

Building structure	Frequency	Percentage
Kitchen wall		
CGI sheet	73	29.1
Separate kitchen not available	72	28.7
Cement	67	26.7
Bricks	20	8.0
Sand Crete blocks	11	4.4
Used woods	8	3.2
Door		
New improved door	100	39.8
CGI sheet	93	37.1
Plywood	29	11.6
Used woods	27	10.8
Others	2	0.8
Window		
Proper window present	115	45.8
Windows not available	85	33.9
CGI sheet	38	15.1
Plywood	10	4.0
Used clothes	3	1.2
Toilet wall		
CGI sheet	93	37.1
Cement	76	30.3
Bricks	45	17.9
Sand Crete blocks	33	13.1
Others	4	1.6

Table 13: Waste disposal mechanism

Type of waste	Frequency	Percentage
Solid waste disposal*		
Approved waste collection points	250	99.6
Others	3	1.2
Liquid waste disposal		
Drainage	128	51.0
Toilet	106	42.2
Rivers	9	3.6
Thrown haphazardly at roadside	7	2.8
Septic Tank	1	0.4

*Multiple response

Table 14: Accessibility to roads

Types of roads access to houses	Shantinagar (%)	Balkhu Basti (%)	Total
Graveled road and motorable	71.8	82.2	199
Footpaths	7.0	17.8	37
Pitched road and motorable	21.1	—	15
Streetlight			
Yes	25.4	85.6	172
No	74.6	14.4	79
Total	71	180	251

Waste disposal mechanism

Solid waste was disposed of at approved waste collection points by almost all households (99.6%), and later it was collected by the municipal office. Liquid waste disposal varied, with 51 per cent of households using drainage systems, 42.2 per cent disposing of it in toilets, and a very few (3.6%) directly disposing of it into rivers.

Furthermore, it was highlighted in the qualitative interviews about waste was collected through assigned waste collecting vehicles in their area.

> *"Waste is collected twice every week. We pay Rs. 200 monthly to the collection companies that collect wastes and take it to the dumping sites. The waste management situation has improved a lot. Waste used to be thrown in the river or just anywhere, but it has now improved." - [Community leader, KII, Balkhu Basti]*

The in-depth interview with informal waste worker at Balkhu Basti revealed that they separate plastics and cardboards that they could sell and earn certain amount, before dumping solid waste collected from the household.

> *"We cannot sell most materials, but we separate plastics and cardboards that can be sold. I sell plastics and cardboards, and in addition, I also sell bottles." - [Informal waste worker, IDI, Balkhu Basti]*

Accessibility of road

Road accessibility varied across the settlements. In Balkhu Basti, 82.2 per cent of households had access to a graveled and motorable road, while 17.8 per cent had access to footpaths. In Shantinagar, 71.8 per cent of households had access to a graveled and motorable road, and 21.1 per cent had access to a paved and motorable road. Regarding the availability of streetlights, only 25.4 per cent of households in Shantinagar had access to streetlights, compared to 85.6 per cent in Balkhu.

One of the community leaders said that the condition of road has always been the same-dusty, dirty and muddy road in their settlement.

> *"This has become the most astonishing aspect. You have seen the condition of the road in the middle of the city, this has been the situation ever since we have been here. the dirt and dust throughout and muddy in the rainy season. This must be the only road that has never been completed within Kathmandu in my opinion." - [Community leader, KII, Balkhu Basti]*

FCHV from Balkhu also said that the roads are dusty and they avoid eating lunch in the area during vaccination campaigns.

> *"The roads are cleaner than before but are still not paved. During our vitamin distribution campaigns in Baisakh, it's difficult to stay there due to the dust, and we avoid eating lunch there. During the rainy season, water would collect in the tires, increasing the risk of dengue." – [FCHV, KII, Balkhu Basti]*

Environmental sanitation

The surroundings of the surveyed households were observed to assess environmental sanitation. It was found that more than half (52.6%) of the households had bad smells and odors in their surroundings. Water pooling was observed around 23.5 per cent of the households, hazardous waste was present in six per cent, and animal dung was also found in the surroundings of six per cent of the households.

Table 15: Environmental sanitation

Characteristics	Frequency	Percentage
Presence of bad smelling and odor	132	52.6
Presence of water pooling	59	23.5
Presence of hazardous wastes	15	6.0
Presence of animal dung	15	6.0

The qualitative interview with FCHVs support the above quantitative findings. FCHVs revealed that water gets collected in the area increasing the risk of infection from dengue. Additionally, the environment in informal settlement used to be dirty but after awareness raising programs, people have started maintaining the cleanliness.

"During the rainy season, water would collect in the tires, increasing the risk of dengue. We spent a lot of time counselling them not to use tires in roofs, and now the surroundings are cleaner too." – [FCHV, KII, Balkhu Basti]

"The environment here used to be dirty but now it is clean, everyone understood to keep their environment clean. Children used to practice open defecation, people were into live-stock (duck, chicken, pig) farming, now it is not allowed. It's cleaner than before." – [FCHV, KII, Shantinagar]

1.6. Drinking water

Jar water was the main source of drinking water for 72.1 per cent of families, followed by tanker water for 23.9 per cent. Only two families used standpipes, tubewells, or protected wells each. Distance was not an issue, as 98.8 per cent could fetch water within 30 minutes. Although jar water was the primary drinking source, tanker water (72.1%) was the main source for bathing and washing, followed by tubewell (25.5%). Regarding wastewater from bathing and washing, 43.8 per cent disposed of it in the toilet, 43.8 per cent in drainage, 7.2 per cent on the road, 3.6 per cent in the river, and 1.6 per cent haphazardly.

The findings from quantitative and qualitative part were similar. The qualitative participants mentioned that the main source of drinking water used by the people living in the settlement is jar water for which they had to pay a certain amount. Only those who can afford to pay for jar water would buy them while others used tank water for drinking too. For washing and bathing purposes, they used the water stored in the water tank inside their settlement.

"Talking about drinking water, some use jar water costing 15 rupees per jar, some use tubewell water, some use the water that is stored in different tanks (1,2,3) in the settlement by an organization, I don't know if they still fill the tanks with the water that comes in the tanker. I think the tanks water costs 10 rupees per jar." - [FCHV, KII, Shantinagar]

"Most families buy jar water, while tank water is used for washing clothes and bathing." - [FCHV, KII, Balkhu Basti]

Many participants pinpointed that there's no provision of drinking water and the water quality test has never been conducted in their area. There were also concerns about not receiving Melamchi water in their area when Melamchi water is available in neighbouring areas. This concern was frequently raised during interviews and discussion as buying water for drinking and washing/bathing purposes was found to be linked with financial burden.

"The signboard states that the water is filtered, but we haven't inspected the tank ourselves by going inside it, so we don't know for sure. I drink the water based on trust." – [Community member, FGD, Shantinagar]

"There haven't been any improvements in drinking water. We have been consuming water from the tanker in the past and still do the same. Most people also but water jars. We had made several pleas to provide us water from Melamchi, but there haven't been any improvements." – [Community leader, KII, Shantinagar]

1.7. Sanitation

The most common sanitation facility for households was flush to piped sewer system (98%) while only 1.2 per cent use flush to septic tank toilet. In informal settlements, a significant 93.2 per cent reported using toilets for bathing purposes, with 4.4 per cent of families resorting to bathing in open spaces.

Table 16: Percentage of household by water facilities

Characteristics	Frequency	Percentage
Source of drinking water		
Jar water	181	72.1
Tanker-truck	60	23.9
Bottled water	4	1.6
Public tap / standpipe	2	0.8
Tubewell/borehole	2	0.8
Protected well	2	0.8
Distance to source of drinking water		
Within 30 minutes	248	98.8
More than 30 minutes	3	1.2
Source of water for bathing/washing		
Tanker-truck	181	72.1
Tubewell/borehole	64	25.5
Piped into yard / plot	3	1.2
Piped to neighbor	3	1.2
Disposal of wastewater from bathing and washing*		
Toilet	110	43.8
Drainage	110	43.8
Thrown in the road	18	7.2
Thrown in the river	9	3.6
Thrown indiscriminately/ Stored for kitchen garden	4	1.6

*Multiple response

Table 17: Percentage of Households by Type of Sanitation Facilities

Characteristics	Frequency	Percentage
Type of toilet		
Flush to piped sewer system	246	98.0
Flush to septic tank	3	1.2
Flush to open drain	1	0.4
Pit latrine with slab	1	0.4
Bathing station		
Toilet and bathroom same	234	93.2
Open space	11	4.4
Separate bathroom	4	1.6
Neighbors bathroom	2	0.8

Similarly, participants from qualitative study mentioned about the availability of toilet facility which is now connected to the drainage system.

"Many years back, there were only four toilets in this community, everyone here used to share that toilet. But now after the drainage system was installed in this community, every single house has its own toilet." - [Community member, FGD, Balkhu Basti]

1.8. Health and Nutrition

Health status

Regarding the burden of diseases, it was found that 56.2 per cent of families had a member with a chronic disease. Among these, hypertension was the most prevalent, affecting 70.2 per cent of families. This was followed by diabetes (43.3%), musculoskeletal disorders (32.6%), chronic respiratory diseases including asthma and bronchitis (19.1%), heart disease (14.2%), and mental disorders (3.5%) etc. Regarding injuries and accidents, 10.4 per cent of participants reported experiencing them by family members within the past year.

When participants were asked about acute diseases experienced in the last six months, 78.1 per cent of families reported having suffered from acute illnesses. Fever was the most common acute disease, affecting 85.7 per cent of these families. Other prevalent acute diseases included the flu (74.5%), cough (30.6%), diarrhea (28.1%), skin and subcutaneous diseases (7.1%), respiratory infections and tuberculosis (4.6%), eye infections (3.6%), and dengue (3.1%). This data indicates that people living in informal settlements are at risk for various diseases, including waterborne, vector-borne, and diseases caused by environmental exposure, such as respiratory, skin, and eye infections. This suggests that environmental exposure and the living conditions in these settlements are major contributing factors to the increased risk of diseases.

Moreover, it was mentioned quite often during the qualitative approach that people residing in the settlement suffered from cold/cough, diarrhea and jaundice. There were also reported cases of dengue, cancer, tuberculosis, asthma and heart diseases.

"There are respiratory problems, skin related, eye problems as they are directly connected to the river and environmental pollution. The summer

Table 18: Disease burden

Chronic diseases (n=141)	Acute diseases (n=196)	Injury/Accident
Hypertension (70.2%)	Fever (85.7%)	Yes (10.4%)
Diabetes (43.3%)	Flu/difficulty breathing (74.5%)	No (89.6%)
Musculo skeletal disorders (32.6%)	Cough (30.6%)	
Chronic respiratory disease (Asthma, Bronchitis) (19.1%)	Diarrhea (28.1%)	
Heart disease (14.2%)	Skin and subcutaneous diseases (7.1%)	
Mental disorders (anxiety, depression, psychosis, etc.) (3.5%)	Respiratory infection and Tuberculosis (4.6%)	
Gastrointestinal diseases (2.8%)	Eye infection (3.6%)	
Stroke (2.1%)	Dengue (3.1%)	
Liver cirrhosis (1.4%)	Jaundice (3.1%)	
Cancer (1.4%)	Dysentery (1.5%)	
Others (3.5%)	Typhoid (1.5%)	
	Others (2.6%)	

season is here, most of the CDs among the squatter settlements are water borne diseases." – [Healthcare provider UHPC, KII, Balkhu Basti]

"There are water and vector borne diseases. Informa settlement people usually come for seasonal diseases like common cold, skin diseases are also seen often, stomachache, diarrhea etc." - [Healthcare provider UHPC, KII, Shantinagar]

Mostly, the qualitative participants mentioned about the seasonal disease outbreak particularly dengue and diarrhea. They revealed that it was quite a problem during the rainy season. Additionally, they highlighted the cause for dengue outbreak in their settlement was mainly because they live beside the Bagmati river corridor and the discontinuation of spraying DDT by the concerned government authority. They also raised concerns about the spread of waterborne diseases as they consume jar water and water supplied to them in the settlement via water tank which is said to be purified.

"The highest risk is from the mosquitoes. DDT used to be provided before, so we were able to control the mosquitoes before but not anymore. The other is because of water, people are likely to have diarrhoea and fever." – [Community leader, KII, Shantinagar]

"The water is said to be purified but that's the case. and most people consume the water without any treatment and we have seen several frequent cases of diarrhoea and dysentery." – [Community leader, KII, Balkhu Basti]

The qualitative approach highlighted the health initiatives taken by various stakeholders. This includes health camps conducted by organizations, spraying Dichloro Diphenyl Trichloroethane (DDT) for dengue prevention, vaccination and awareness campaigns conducted by the ward level and facilitated by the FCHVs in the informal settlement.

"They (Ek Ek Paila) conducted health camps in the community like dental checkups, eye test, and gynae related." – [Community member, FGD, Balkhu Basti]

"We and the ward collaboratively sprayed DDT powder to prevent dengue; we also supported materials such as mosquito nets, etc." – [CBO Representative, KII, Balkhu Basti]

Reproductive health

When married participants were asked about family planning-related questions, it was found that 33.7 per cent of them were currently using family planning methods, with 76.9 per cent of them utilizing temporary methods. Among those using temporary family planning methods, the majority (42%) used Depo, followed by pills (24%) and condoms (20%). Two participants or their spouses were using Intra Uterine Devices (IUDs).

Furthermore, parents with children below one year of age were asked where they delivered their baby. It was found that out of 18 participants, 16 (88.9%) had institutional delivery, while two babies were delivered at home.

Nutrition Status

Household dietary diversity (HDD)

To calculate the dietary diversity among the households' members, the survey used 12 food categories as mentioned in Food and Agriculture Organization (FAO) guidelines[30]. The participants were then asked about the consumption of each of these food groups by the members of the households in the last 24 hours proceeding the survey based on their recall.

The figure below depicts that almost all households (99.2%) consumed spices, condiments and beverages in the last 24 hours. Cereals were the most consumed food, with 96.0 per cent of members having eaten cereals within this timeframe. Oil and fats were consumed by 85.3 per cent of household members, and legumes, nuts and seeds were also commonly included in the diet by 79.7 per cent of participants. Vegetables[31] were part of the diet in 78.9 per cent of households, while 76.5 per cent consumed white tuber roots. Sweets were included in the diet by 71.3 percent of households. Nearly half of the households (51.0%) included meat[32], and 50.2 per cent included milk in their diets. Fruits[33] and eggs were consumed by smaller percentages of households, at 39.0 per cent and 33.5 per cent respectively. Fish and other seafood were eaten by a smaller percentage of households, at 4.8 per cent.

Based on the above data the HDD, a composite index of the above food groups, was calculated. HDD was measured by assessing the variety of 12 aggregated food groups consumed within a 24-hour period, derived from 16 original food groups in the questionnaire. Each food group consumed was scored as 1, while non-consumption was scored as 0, and the scores were summed up. Households consuming six or more food groups were categorized as having high dietary diversity, those consuming four to five food groups as medium dietary diversity, and those consuming three or fewer food groups as having the lowest dietary diversity.

The table below shows that 86.1 per cent of the households have high dietary diversity. The households with medium dietary diversity were 13.5 per cent. Meanwhile only one household had the lowest dietary diversity.

In the qualitative interview and discussion, participants said that they do not have time and money for having nutritional food as most of them worked as laborers.

> *"There is no time to eat, we are laborers. I go to work at 6 am in the morning, sometimes it is already 2 pm while having lunch." - [Community member, FGD, Balkhu Basti]*

> *"In such a case where their parents earn through wage employment we doubt if the children are getting enough nutritious food according to their age." – [Healthcare provider UHPC, KII, Balkhu Basti]*

The nutritional status of the participants was assessed by calculating their body mass index (BMI), the ratio of weight relative to height (kg/m2), according to WHO standards. Based on these measurements, the participant was categorized into one of the following groups: underweight, normal weight, overweight, or obese.

Weight and height were collected for all the participants. Overall, six per cent of the participants were underweight, while more than one-third of the participants (38.6 %) were overweight and 18.3 per cent were obese.

The nutritional status of children of 6-59 months age, from the selected households, was calculated based on weight-for-age (underweight), height-for-age (stunting) and weight-for-height (wasting) with the use of WHO child growth standards. There was a total of 50 children of age groups 6-59 months age in the selected 251 households.

Among the 50 children who participated, 24 per cent were underweight, while 28 per cent were stunted and 12 per cent were wasted.

This was quite contradictory with the perception of people living in informal settlements. Most of them said that there aren't malnourished children

30 Kennedy G, Ballard T, Dop MC. Guidelines for measuring household and individual dietary diversity 2011. European Union and FAO. 2011

31 The vegetable food group is a combination of Vitamin A rich vegetables and tubers, dark green leafy vegetables and other vegetables.

32 The meat group is a combination of organ meat and flesh meat.

33 The fruit group is s combination of Vitamin A rich fruits and other fruits.

Table 19: Findings related to family planning and institutional delivery

Reproductive health related characteristics	Frequency	Percentage
Current use of FP method (n=193)		
Yes	65	33.7
No	128	66.3
Types of FP method used (n=65)		
Temporary	50	76.9
Permanent	15	23.1
Types of temporary FP method* (n=50)		
Depo	21	42.0
Pills	12	24.0
Condom	10	20.0
IUD	2	4.0
Calander method	2	4.0
Lactational Amnorrhoea Method (LAM)	2	4.0
Implant	1	2.0
Withdrawal	1	2.0
Place of delivery (n=18)		
Health facility	16	88.9
Home	2	11.1

*Multiple response

Figure 6: Consumption of each food group in the last 24 hours by household members based on recall

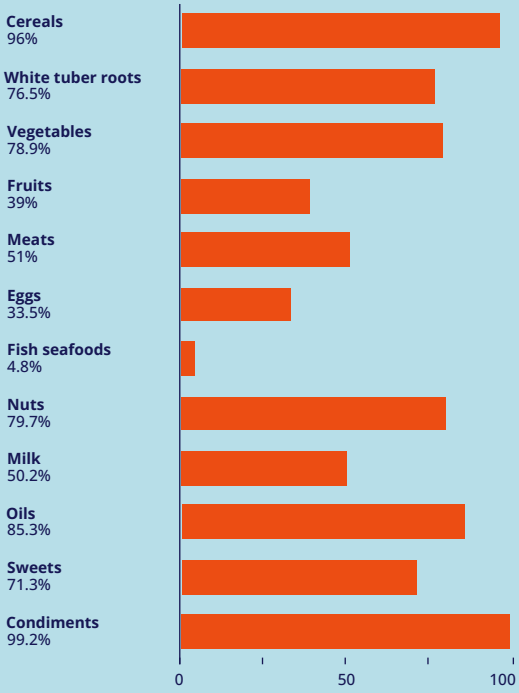


Table 20: Household dietary diversity

Household dietary diversity	Frequency	Percentage
High dietary diversity (≥6 food groups)	216	86.1
Medium dietary diversity (4 and 5 food groups)	34	13.5
Lowest dietary diversity (≤ 3 food groups)	1	0.4
Total	**251**	**100.0**

Table 21: Adults' nutritional status

Body Mass Index	Frequency	Percentage
Underweight	15	6
Normal	93	37.1
Overweight	97	38.6
Obese	46	18.3
Total	**251**	**100**

Table 22: Settlement-wise nutritional status of children

Settlement-wise nutritional status of children	Shantinagar (%)	Balkhu Basti (%)	Total
Underweight	11.1 %	26.8 %	12
Stunting	—	34.1 %	14
Wasting	11.1 %	12.2 %	6
Total of children	9	41	50

in their settlement during the qualitative interviews.

"There aren't children that are malnourished, but children do get sick every now and then. People are aware about the importance of nutrition, but their financial situation becomes a barrier." – [Community leader, KII, Shantinagar]

"One child had severe malnutrition. Now, the nutritional status of that child has also improved. The mother brings the child in the vitamin campaign. There are no cases of malnutrition in the present." – [FCHV, KII, Balkhu Basti]

On this matter, participants from qualitative part highlighted the need to distribute Micronutrient powder and train and educate the mothers/caregivers on nutritional diet so that there are no malnutrition cases.

"There should be distribution of Lito to the children of the settlement. The mothers can also be given training to prepare cereals at home. The pregnant and lactating mothers should also be given knowledge about the daily dietary intake." - [FCHV, KII, Balkhu Basti]

The table below highlights the settlement-wise nutritional status of children. Among the nine children in Shantinagar, 11.1 per cent were underweight and wasted. Among the 41 children in Balkhu Basti 26.8 per cent were underweight, 34.1 per cent were stunted while 12.2 per cent were wasted.

1.9. Occupational safety of informal waste workers

During observations, it was noted that all 13 informal waste worker households lacked posters, flyers, or other informational resources in their surroundings. Regarding Personal Protective Equipment (PPE), more than one-third of the informal waste workers households (69.2%) had masks, but other PPE items such as gloves, gowns, caps, and boots were not available. Although there were masks, none of the informal waste workers were observed using PPE.

From the qualitative findings, one of the reasons for not wearing masks was the experience of suffocation.

"Because it's difficult to breathe while wearing the mask. Previously, I used to collect waste nearby, but now I have to go all the way to Narayanthan to collect it."- [Informal waste worker, IDI, Balkhu Basti]

In the qualitative findings, the informal waste worker was found saying that he did not wear boots and jackets as there is no money to buy them.

"No, I don't wear boots and jackets. I don't have money to buy them."- [Informal waste worker, IDI, Balkhu Basti]

2. ACCESS TO HEALTH CARE SERVICES AND ITS BARRIERS

The constitution of Nepal and Public Health Service Act of 2075 explicitly ensures that every individual has the right to access quality health care services in an easy and convenient manner.[34] However, the inhabitants of the informal settlements, residing at the margins of society are often

34 Nepal Law Commission. The Public Health Service Act, 2075 (2018) [Internet]. 2018 Sep. Available from: https://www.lawcommission.gov.np/en/wp-content/uploads/2019/07/The-Public-Health-Service-Act-2075-2018.pdf

Table 23: First place of receiving treatment for disease or injuries

Health problem	Chronic disease		Acute disease		Injury/accident	
First place to receive treatment	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Health care facilities	138	97.9	194	99.0	26	100
Traditional healers	3	2.1	2	1.0	—	—
Total	**141**	**100.0**	**196**	**100.0**	**26**	**100**

deprived of basic access to education, health care and a decent standard of living.[35] Since, health is considered as a cornerstone of the social welfare system, and individuals in good health are regarded as vital for sustainable development, it's imperative that people not only adopt healthy lifestyles but also utilize healthcare services to either maintain or recover their health in times of illness.[36] Therefore, one of the main responsibilities of any country is to provide, to maintain, and to promote equitable and affordable health services. Access to health services is one of the key issues contributing to the development of any society including informal settlements which, in turn, influence health services utilization.[37]

Urban challenges are prevalent among slum, and informal settlement dwellers who lack access to the majority of social services found in cities, including healthcare.[38] There is significant gap in the availability, accessibility, and affordability of health services between the wealthy and impoverished residents of urban settlements in developing nations. This imbalance is widely recognized and results from a complex interplay of economic, social, and political factors.[39] Evidence suggest that health care accessibility in informal settlements is influenced by multiple factors, including economic constraints, geographic barriers, social determinants, and systemic issues within the health care system.

One crucial step in developing interventions aimed at ensuring equitable access to health services is assessing the current state of health services utilization. Unfortunately, this aspect has often been overlooked, particularly for urban impoverished area such as informal settlement in developing countries including Nepal. Determinants of poor access and utilization are likely to differ across various local contexts, both within and among countries. Identifying the specific barriers to healthcare access for a given population is vital to ensuring the rights of humans and ultimately universal health coverage.[40] The utilization of health care services among residents of informal settlements is influenced by several factors, including health literacy, cultural beliefs, and the availability of alternative medicine. Recognizing obstacles to healthcare access in informal settlements is crucial for refining policy frameworks and initiatives aimed at delivering culturally sensitive, patient centered care to the squatter and informal settlement.[41] This comprehensive study aimed to uncover the status and barriers, gathering valuable insights regarding health care accessibility and utilization.

2.1. Accessibility to health care services

Pattern of health seeking behavior

The table below depicts that almost all the participants and their families residing in Shantinagar and Balkhu Basti visit health care facilities for check-up when they suffer from chronic or acute diseases and injuries/accidents. It was found that

35 https://uasjournal.fi/kansainvalisyys/quality-of-life-in-a-kathmandu-slum/#1458134585005-b3f22396-5506
36 Abdollah K, J Amir J, Saeid A. Estimating out of pocket payments [oop] for medical cares in Qazvin province in 2009.
37 Gharibi F, Heidari A, Zarei M. Percentage of out-of-pocket payment for health services by people of Kurdistan in 2010.
38 Amiresmaili M, Yazdi-Feyzabadi V, Heidarijamebozorgi M. Health services utilization among slum dwellers: An experience from Iran. Journal of Education and Health Promotion. 2019 Jan 1;8(1):210.
39 Devasenapathy N, Ghosh Jerath S, Allen E, Sharma S, Shankar AH, Zodpey S. Reproductive healthcare utilization in urban poor settlements of Delhi: Baseline survey of ANCHUL (Ante natal and child health care in urban slums) project BMC Pregnancy Childbirth. 2015;15:212
40 Devasenapathy N, Ghosh Jerath S, Allen E, Sharma S, Shankar AH, Zodpey S. Reproductive healthcare utilization in urban poor settlements of Delhi: Baseline survey of ANCHUL (Ante natal and child health care in urban slums) project BMC Pregnancy Childbirth. 2015;15:212
41 Coumans JVF, Wark S. A scoping review on the barriers to and facilitators of health services utilisation related to refugee settlement in regional or rural areas of the host country. BMC Public Health. 2024 Jan 17;24(1):199.

Table 24: Settlement-wise percentage of participants and their families receiving health services

Health problem	Chronic disease			Acute disease in last six months			Injury/accident in last year*		
Received the health service	S** (%)	BB*** (%)	Total	S** (%)	BB*** (%)	Total	S** (%)	BB*** (%)	Total
Health post/ urban health clinic	—	2.0	2	—	4.7	7	—	—	
Government hospital	41.0	59.6	75	27.3	20.3	42	33.3	50.0	11
Private hospital	38.5	8.1	23	36.4	-	16	50.0	27.8	8
Clinic	7.7	13.1	16	13.6	18.9	34	_	11.1	2
Pharmacies	12.8	17.2	22	22.7	56.1	93	33.3	27.8	7
Semi-government hospital	—	—	—	—	—	—	16.7	—	1
Total	**100.0**	**100.0**	**138**	**44**	**148**	**192**	**6**	**18**	**24**

* Multiple response. ** Shantinagar. *** Balkhu Basti.

Table 25: Means of transportation used for reaching the health facility (multiple choice)

Health problem	Chronic disease		Acute disease		Injury/accident	
Means of transportation	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Motorbike	8	5.8	12	6.3	3	12.5
Taxi	44	30.4	22	11.5	11	45.8
Public vehicles	55	39.9	41	21.4	2	8.3
Ambulance	2	1.4	—	—	6	25.0
On foot/ someone carried them to hospital	73	52.9	160	83.3	8	33.3
Total	**138**	**100.0**	**192**	**100.0**	**26**	**100**

Table 26: Preferred place for health check-up and time taken to reach the nearest health facility

	Shantinagar (%)	Balkhu Basti (%)	Total
Place where you usually go when you are sick or need advice about health			
Pharmacies	43.7	59.4	138
Government hospital	8.5	31.7	63
Private hospital	29.6	2.8	26
Clinic	16.9	4.4	20
Health post/ urban health clinic	1.4	1.1	3
Traditional healers	—	0.6	1
Total	**71**	**180**	**251**
Time taken to reach the nearest health facility			
Less than 30 minutes	95.8	96.7	242
1 hour	4.2	3.3	9
Total	**71**	**180**	**251**

Table 27: Reasons for being unable to seek health care due to unaffordability in past 12 months

Any time during the past 12 months when you family members need service but did not afford it *	Frequency	Percentage
To see a regular doctor or general health provider	58	23.1
Prescription medicines	74	29.5
To see a specialist	84	33.5
Follow-up care and medicine refill	71	28.3
Emergency care	15	6.0
Dental care (including check-ups)	4	1.6
Eyeglasses/eyeservice	10	4.0
Mental health care or counselling	3	1.2
There was no such condition	140	55.8
Total	**251**	**100**

* Multiple response.

only three and two people living in informal settlement visited traditional healers for receiving treatment for chronic disease and acute disease respectively.

This quantitative finding is similar to the qualitative finding. Most of them said that they visited health facilities for treatment than going to traditional healers.

> *"We do not go to traditional healers; instead, we go to the hospital. The decision depends on the nature of the disease. If it can be treated at a clinic, we go there; otherwise, we go to the hospital. Civil hospital is located nearby." – [Community member, FGD, Shantinagar]*

Some people also mentioned about visiting private health facilities if they had money so that they could get suggestion from doctor and treatment within shorter period because the large patient queue and reports in government hospitals require a lot of time.

> *"We used to prefer government hospitals like Bir Hospital or Patan Hospital. However, now, if I have money and can receive faster treatment at a private hospital, I opt for that. In emergencies, we prefer private hospitals because of their quicker service compared to government hospitals." - [Informal waste worker, IDI, Balkhu Basti]*

Utilization of healthcare services

The majority of the participants (41% in Shantinagar and 59.6% in Balkhu Basti) reported receiving health services from government hospitals for chronic disease. When asked if the participants and their family members received health service, 192 responded receiving health services for acute diseases and 24 responded receiving health services for injuries/accidents. It was found that more than half of the participants (56.1%) residing in Balkhu Basti would go to pharmacies for any acute disease. Around 36 per cent of the participants received health services from private hospitals for the past six months regarding acute diseases in Shantinagar while the participants from Balkhu Basti did not visit private hospitals in the last six months when they had acute diseases. For getting health services in case of injuries or accidents, hospitals (government or private) were mostly visited by the participants or their families in both the settlements.

Interestingly, majority of the participants revealed that they either went to the health facility on foot or someone carried them to the health facility for getting health service in case of chronic disease (52.9%) and acute disease (83.3%). About 45.8 per cent of the participants reported using taxi to get the health service during injuries and accidents.

When asked about the place they usually visit when they are sick or need some advice about health, participants from both the settlements responded going to pharmacies the most. Moreover, 31.7 per cent of the participants from Balkhu Basti also preferred going to government hospitals while that for participants in Shantinagar was only 8.5 per cent. In addition, participants from Shantinagar and Balkhu Basti visiting private hospital for check-up or advice was 29.6 per cent and 2.8 per cent respectively. The percentage of participants in both the settlements visiting health post or urban health clinic was comparatively low.

In terms of the type of participants for the study who were informal waste workers, household heads for respondents other than informal waste workers and any member of household above 18 years, in the absence of household head were selected. And it was found that informal waste workers usually went to government hospital (46.2%) and household heads (53.9%) and household members above 18 years (68.1%) went to pharmacies.

Almost all the participants reported it took them less than 30 minutes to reach the nearest health facility in Shantinagar as well as in Balkhu Basti.

2.2. Barriers to health care services

In the past 12 months, 33.5 per cent of the participants residing in informal settlement could not go see a specialist doctor when they needed to because they could not afford it. Similarly, 29.5 per cent of them could not afford to buy the medicines prescribed to them during check-up.

Additionally, various barriers to health care services were revealed during the qualitative approach. Many qualitative participants highlighted the financial constraint being the most dominant barrier. Below are some of the sub themes generated from the analysis of qualitative interviews and discussions.

Affordability constraints

The financial constraints led the people living in informal settlement to either not seek health care services or delay in the process of seeking healthcare. The major barrier to access healthcare service for people of informal settlement is the lack of financial capacity as reported by almost all the participants in qualitative approach. As reported, the cost for healthcare services is quite high for them especially when they are struggling to survive with their waged income. They mentioned that they cannot afford to get health service for emergency cases and also getting checked in private hospitals. They shared this vulnerable situation very often when talking about seeking health services when they are sick.

> *"We cannot afford to go for emergency checkup and get admitted in a private hospital when we are sick. We go to government hospitals, stand in queue and wait for our turn. Sometimes it takes days to get the reports, there are cases people dying without being able to complete the checkup." – [Community member, FGD, Balkhu Basti]*

> *"We suffer from all kinds of diseases. But we survive it all by only taking one paracetamol or two medicines when we are sick because we cannot afford to get admitted at the hospital for treatment. We self-cure ourselves. If one gets admitted, we have to collect donations, even one rupee, 2 rupee we collect from the people in the community to treat the admitted person." – [Community member, FGD, Balkhu Basti]*

Delay in seeking health care

The participants during the focus group discussion highlighted the delay in seeking the health care of people towards their health as one of the barriers to health care services. They would not go for seeking health care when they are feeling unwell but rather wait until their health gets worse. This might be due to their negligence as well as financial constraints as reported by the community members.

> *"It is also due to lack of awareness; if people sought medical attention as soon as symptoms appear, it would cost them significantly less than waiting until the symptoms worsen. Even when I get sick, I do not seek medical care right after its occurrence, I feel it is also my lack of awareness. We tend to regret later for not checking it on time after the condition has worsened. We neglect even though we know." – [Community member, FGD, Balkhu Basti]*

Participants of qualitative study particularly FCHVs and Healthcare providers raised concerns and challenges in providing counselling services and sharing information about the ongoing national programs like Vitamin A and vaccination campaign, for the participation of people living in informal settlement. They poured their feelings about how difficult it is to convince people to participate in vaccination campaigns and free health camps as most people living in the settlement tend to seek health services quite late.

Residents of the settlement are generally unreceptive and hesitant towards government programs. FCHVs and healthcare providers report that the community members were barely interested to participate in national initiatives (for instance: child immunization programs) and awareness generating programs, which is quite concerning. Healthcare providers struggle to organize health programs, often needing to first persuade community leaders to engage the people.

> *"There is challenge in counselling the informal settlement people, there is lack of awareness in them although we bring programs like health checkups that benefit them, people are difficult to convince. There is difficulty in gathering people to take part in any programs. When we health workers or any other organization go directly to organize programs then it gets very difficult. We must take programs through FCHVs and key persons of that area." – [Healthcare provider UHPC, KII, Shantinagar]*

Inappropriate location of Urban Health Promotion Center (UHPC)

The quantitative data shows that most of the participants preferred visiting pharmacies, clinics and private hospitals over government institutions like UHPC. One of the reasons observed and highlighted during the qualitative part by community members was the location of UHPC with respect to the settlement. The current location of UHPC and its catchment area made the people of the settlement in the study sites to seek an alternative option for health care rather than visiting UHPC. This was also affirmed by the representatives from the provider's side. The health care provider also highlighted the reduction in patient flow after the change in location of UHPC which seems to be

quite concerning. It was also shared during the interview that the people residing in the settlement were unaware about the shift of location of UHPC.

> *"People here are unaware, there are people who know about it but do not visit UHC for health facilities. It is quite far from this community, that as well might be the reason. It used to be nearby, they could easily have access but now it is far away." – [FCHV, KII, Shantinagar]*

> *"The shift of location has impacted the patient flow. When we were at Shantinagar many people used to come for health services as it was near and at the center to the informal settlement area. After the shift of UHPC in Bhimsengola, it has become far and new to them. People come in this building for official work more than for checkups. From the past one-year people from the informal settlement have stopped coming. During the vaccine and other national health programs they come no matter what but for other problems it has become way too far. It is the main reason for the decrease in the patient flow." – [Healthcare provider UHPC, KII, Shantinagar]*

Unavailability of services at UHPC

One limitation of UHPC is the inconsistent availability of services and supplies. Often, when people visit for health services, they don't receive what they need, leading to disappointment and reluctance to return. Residents of the informal settlement report not getting prescribed medicines at UHPC most of the time, often only receiving paracetamol, and sometimes not even that due to shortages.

> *"Sometimes when we visit for checkups, at the end they have said sorry due to unavailability of the medicine and advise us to come back later to get it or visit another drug store." – [Community member, FGD, Balkhu Basti]*

> *"They come with various health problems and without money. We provide services free of cost but we do not have all the services, we do not have every kind of medicine and not enough. Sometimes they must buy it at other shops. We face such kind of situations. There is still a gap in providing all kinds of services to the people. Majorly we face lack of medicines and lab is not yet operational." – [Healthcare provider UHPC, KII, Balkhu Basti]*

3. NATIONAL HEALTH INSURANCE

The government has committed to guarantee universal access to basic health services free of cost through establishment of basic health service facilities in every ward of the 753 local government[42] [43]. Thus, the National Health Insurance Program (NHIP), a social health protection initiative by the Government of Nepal, is designed to provide quality healthcare to citizens without causing financial hardship[44]. The NHIP is additionally directed by the government's dedication to attaining universal health coverage, in alignment with SDGs target 3.8[45]. The NHIP aims to prevent individuals from falling into poverty due to healthcare costs arising from accidents or illness[46].

The national health insurance system in Nepal draws financial support from two primary channels: government funding and contributions from its enrolled members in the form of premiums, which require annual renewal. The yearly premium stands at NPR 3,500 ($26.40) per family, with an extra charge of NPR 700 ($5.30) for each additional insured member beyond five family members. Under the NHIP scheme, members are entitled to receive cost-free medical care at accredited healthcare facilities, capped at a maximum of NPR 100,000 ($754) per family annually. Moreover, families comprising more than five members receive supplementary benefits, with an additional NPR 20,000 ($150.80) allocated for each extra member, not surpassing an overall benefit ceiling of NPR 200,000 ($1,508.30) per family. The government extends subsidies on premiums to specific targeted demographics: ultra-poor individuals, senior citizens, severely disabled persons, leprosy patients, multidrug-resistant tuberculosis patients, and households affected by HIV/AIDS receive complete premium subsidies. Additionally, the Government of Nepal

42 MoLJPA. Constitution of Nepal 2015. Kathmandu, Nepal: Ministry of Law, Justice & Parliamenatry Affairs; 2015.
43 MoHP. National Health Policy 2076. Kathmandu, Nepal: Ministry of Health and Population; 2019.
44 Khanal GN, Bharadwaj B, Upadhyay N, Bhattarai T, Dahal M, Khatri RB. Evaluation of the National Health Insurance Program of Nepal: are political promises translated into actions? Health Res Policy Syst. 2023;21(1):7.
45 NHRC. Towards Universal Health Coverage:: Addressing Financial Hardship and Improving Access to Healthcare in Nepal (Policy brief). Kathmandu: Nepal Health Research Council; 2022.
46 Gurung GB, Panza A. Implementation bottlenecks of the National Health Insurance program in Nepal: Paving the path towards Universal Health Coverage: A qualitative study. Int J Health Plann Manage. 2022;37(1):171–88.

offers a 50% subsidy on premiums for female community health volunteers[47] [48].

Despite the implementation of the NHIP, challenges remain. Population coverage under the NHIP is low, and there are issues with renewal among those who are covered. By the end of 2022, only 22.5% of the national population was covered. Of the total population covered 57% renewed their membership6.

In Nepal, the urban population has grown to 66.17%[49], with 40% residing in slums[50]. These informal settlements face numerous health problems[51], yet there are significant challenges in implementing health programmes in informal settlements[52]. Thus, the national health insurance in the setting of the informal settlements provides an opportunity to address the health care requirements of marginalized urban population.

3.1. Knowledge on National health insurance

Slightly more than half (50.6%) of participants living in informal settlements had heard about the national health insurance program. Regarding the source of information, the majority (87.4%) reported receiving information from friends, neighbors, and relatives, followed by other mediums such as radio, TV, and newspapers (20.5%).

In one of the FGD conducted with community members in Shantinagar, among the 12 qualitative participants, only four had heard about the NHI. One participant mentioned that s/he became aware of insurance through health care providers while another qualitative participant mentioned that she heard about NHI from the news. There were varied sources of information on NHI as reported by the participants of qualitative approach; wards, news, FCHVs and neighbors.

> *"I've heard about NHI. When my son-in-law was diagnosed with cancer and underwent surgery at the Teaching Hospital, the total cost was around NPR 15,00,000. The insurance covered one lakh."- [Community member, FGD, Shantinagar]*

> *"I heard about the NHI from the news four months back."- [Community member, FGD, Balkhu Basti]*

Participants who had heard about health insurance were asked further to assess their knowledge on the subject. None of the participants correctly answered the question when asked regarding the type of health facility providing services under the health insurance scheme. Only 15 per cent correctly responded to the question about the types of services covered by the scheme. Almost one-third (20.9%) knew that the premium amount for a family of up to five members was NPR. 3500, while very few (6.3%) knew that each additional member must pay NPR 700 to be included in the scheme if the family size exceeds five members.

The ceiling amount of benefits covered by health insurance was correctly responded by 22 per cent of participants, who knew it was one lakh per family. More than three-fifths (60.6%) of participants knew that enrollees must pay a certain amount to receive healthcare services. It is positive that 67.7 per cent knew that enrollees must visit health institutions where the health insurance scheme is implemented to utilize the benefits. However, only 28.3% of participants knew that the insurance lasts for only one year and must be renewed annually.

There were eight questions related to knowledge on NHI and a score of one was allocated to each question that was answered correctly. A score of 0-3 was scored as "poor knowledge", a score of 4-6 was scored as "moderate knowledge" and a score of 7-8 was scored as "exceptional knowledge"[53]. More than one third of the participants (71.7%) had poor knowledge of NHI. A quarter of the participants (26.0%) had moderate knowledge on NHI while only 2.4 per cent of the participants had exceptional knowledge on NHI.

47 Ayer R, Tiwari S, Jnawali SP, Dael RV. A Study on Nepal's National Health Insurance Program. Asian Development Bank; 2024 May.
48 Sharma P, Yadav DK, Shrestha N, Ghimire P. Dropout analysis of a national social health insurance program at Pokhara metropolitan city, Kaski, Nepal. Int J Health Policy Manag. 2022;11(11):2476.
49 Central Bureau of Statistics (CBS) [Nepal]. 2021. Population Census 2021., Kathmandu, Nepal: Central Bureau of Statistics.
50 The World Bank. Population living in slums (% of urban population).
51 Poortaheri N, Alimohammadzadeh K, Hosseini SM, Maher A, Bahadori M. Health needs assessment of the residents of the informal settlements in South-eastern Iran: A case study of Bam city. J Educ Health Promot. 2021;10(1).
52 van de Vijver S, Oti S, Oduor C, Ezeh A, Lange J, Agyemang C, et al. Challenges of health programmes in slums. The Lancet. 2015;386(10008):2114–6.
53 Govender N, Mahomed O. Knowledge, Attitude and Perception of the National Health Insurance Amongst Health Workers in Ugu District, Kwa-Zulu Natal, South Africa in 2017. The Open Public Health Journal. 2020 Dec 31;13(1).

Figure 7: Percentage of participants who had heard about NHI

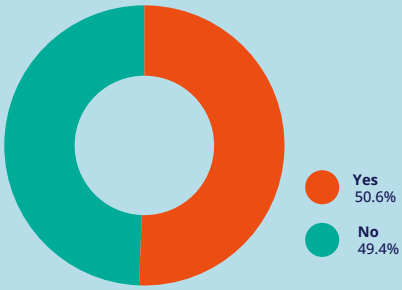


Figure 8: Source of information on NHI (n = 127)

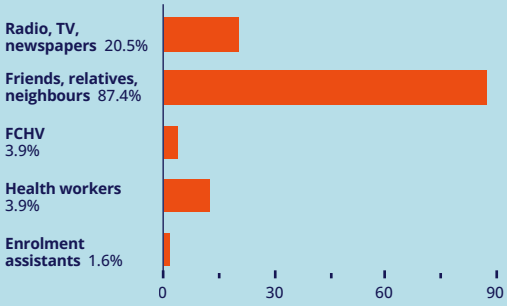


Table 28: Knowledge on National Health Insurance

Questions	Frequency	Percentage
Types of health institution where national health insurance scheme provided		
Governmental institution	44	34.6
Private institution	3	2.4
Both of above Ω	0	0.0
Don't know	80	63.0
Types of services covered by national health insurance		
Emergency services	6	4.7
Inpatient services	3	2.4
Outpatient services	3	2.4
Drugs	11	8.7
All of the above Ω	19	15.0
Don't know	85	66.9
Premium amount for families of 5 member		
NPR 3500 Ω	38	29.9
Don't know	89	70.1
Additional premium amount per members beyond 5		
NPR 700 Ω	8	6.3
Don't know	119	93.7
Benefit ceiling amount for families of 5 member		
NPR 1,00,000 Ω	28	22.0
Don't know	99	78.0
Know that enrollees have to pay certain amount for health checkup		
Yes Ω	77	60.6
No	50	39.4
Enrollees can visit any hospital for health checkup		
Yes	41	32.3
No Ω	86	67.7
Know that insurance last for one year		
Yes Ω	36	28.3
Don't know	91	71.7
Total	**127**	**100**
Overall knowledge level		
Poor knowledge	91	71.7
Moderate knowledge	33	26.0
Exceptional knowledge	3	2.4

Ω signifies the correct response

Table 29: Frequency table of attitude towards NHI

Statements (n=127)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Health insurance is important and necessary.	1 (0.8%)	7 (5.5%)	5 (3.9%)	83 (65.4%)	31 (24.4%)
Health insurance is difficult to obtain.	1 (0.8%)	11 (8.7%)	27 (21.3%)	76 (59.8%)	12 (9.4%)
Health insurance helps for early treatment.	2 (1.6%)	16 (12.6%)	46 (36.2%)	61 (48.0%)	2 (1.6%)
Health insurance helps during emergency.	2 (1.6%)	8 (6.3%)	53 (41.7%)	57 (44.9%)	7 (5.5%)
Health insurance provides financial security/ decreases Out of Pocket expenditure.	1 (0.8%)	6 (4.7%)	65 (51.2%)	45 (35.4%)	10 (7.9%)
Health insurance helped people to access good health care services.	1 (0.8%)	5 (3.9%)	79 (62.2%)	38 (29.9%)	4 (3.1%)
The insured client and non-insured client are equally treated while seeking health care services.	1 (0.8%)	15 (11.8%)	87 (68.5%)	23 (18.1%)	1 (0.8%)
There is friendly environment of health care providers	0	12 (9.4%)	91 (71.7%)	22 (17.3)	2 (1.6)
The quality of health care services is satisfactory.	1 (0.8%)	7 (5.5%)	92 (72.4%)	23 (18.1%)	4 (3.1%)
People in your community are willing to have health insurance.	0	11 (8.7%)	64 (50.4)	39 (30.7)	13 (10.2%)

Table 30: National Health Insurance related practice

Characteristics	Frequency	Percentage
Current enrollment status (n=127)		
Enrolled	12	9.4
Not enrolled	115	90.6
Reasons for enrollment* (n=12)		
Financial protection	9	75
Better than OOP	3	25
Relatives advised to do so	9	75
Getting subsidy	5	41.7
Ever utilized health insurance scheme		
Yes	6	50
No	6	50
Purpose of using health insurance scheme* (n=6)		
Emergency care services	4	66.7
Outpatient services	6	100
Inpatient services	4	66.7
Availability of services		
Yes, all the services were available	1	16.7
Yes, but inadequate	4	66.7
Don't know	1	16.7
Satisfaction with services		
Satisfied	5	83.3
Not satisfied	1	16.7

* Multiple response.

Among the qualitative participants, understanding of NHI varied. One participant said accurate information, possibly because some residents of the informal settlement were enrolled in NHI and shared information among themselves. However, some participants were unaware of the drug scheme under NHI, likely because it was only recently implemented in Kathmandu, leading to limited awareness and knowledge.

> *"From my understanding what I heard is that, once you pay NPR 3500 rupees a family of 5 members will get health insurance. It must be renewed every year, and it will cover the amount of 1 lakh rupees"- [Community member, FGD, Balkhu Basti]*

> *"When purchasing medication, we receive discounts. For example, if the total cost is NPR. 1000, after the discount, we only need to pay NPR. 300."- [Community member, FGD, Shantinagar]*

FCHV from Shantinagar shared that the people in the settlements had varied levels of awareness regarding the NHI. They even highlighted that they have been somehow involved in sharing information on NHI within the settlements.

> *"Ward has informed about the enrollment that if we pay NPR 3500, 5 members in the family get the service. Some are aware, some are unaware and do not understand. I have informed everyone about it, if they want to get enrolled then they can." – [FCHV, KII, Shantinagar]*

3.2. National health insurance related attitude

The attitude towards national health insurance was assessed using 10 statements among those participants who had heard about the national health insurance. The responses were evaluated by the five-point Likert rating scale ranging from strongly disagree (score 1) to strongly agree (score 5). A mean score of all the studied attitude statements was then calculated from individual scores.

A quarter of the participants (24.4%) strongly agreed that health insurance is important and necessary. However, only 9.5 per cent of the participants agreed that health insurance is easy to obtain. Almost half of the participants (49.6%) agreed that health insurance helps for early treatment. Half of the participants (50.4%) agreed that health insurance helps during emergencies. While 50 per cent of the participants neither agreed nor disagreed on health insurance providing financial security/decreases out of pocket expenditures. Moreover, almost one-third of the participants are neutral on health insurance helped people to access good health care services (62.2%) and the insured client and non-insured client are equally treated while seeking health care services. Less than one-fifth of the participants (18.9%) believed that there would be a friendly environment of health care providers. Only 21.2 per cent of the participants agreed that the quality of health services is satisfactory. 40.9 per cent of the participants agreed that the people in their community are willing to have health insurance.

Overall, the attitude of the people living in the settlement was mixed in terms of enrollment in NHI. Some participants in the qualitative study showed a positive attitude towards enrollment in NHI. The FCHV also mentioned the availability of representatives of NHI in the ward office and how they have been sharing about NHI with the settlement longing for a positive attitude towards enrolling in NHI scheme.

> *"Yes, I would be interested to get enrolled in national health insurance scheme but before that I need to have full knowledge on what health insurance actually is." – [Informal waste worker, IDI, Balkhu Basti]*

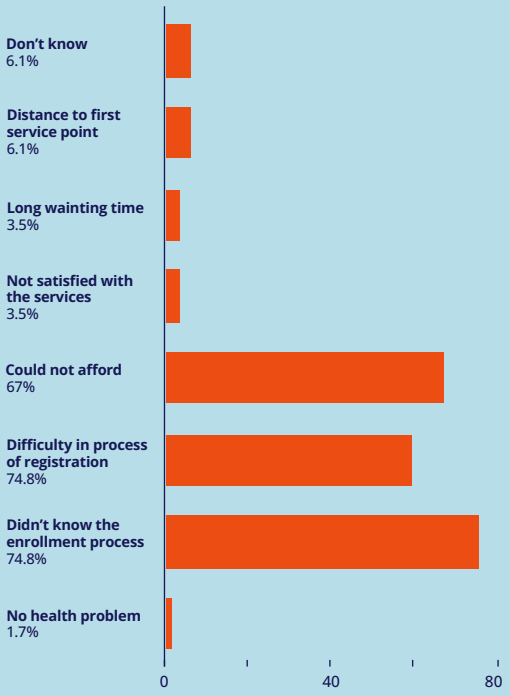
Moreover, the people of the informal settlements also shared their interest in getting enrolled in national health insurance scheme if they were provided with some financial support. As people were aware of the benefits of the NHI, they showed positive attitude on getting enrolled under NHI scheme.

> *"If we suffer from chronic diseases, enrolling in the insurance scheme is beneficial. Typically, people with financial means enroll in the scheme. Even those without sufficient funds can benefit if they enroll and bring recommendation letters from their village; they can then access services here as well." – [Community member, FGD, Shantinagar]*

However, other exhibited a more critical stance towards NHI. The negative attitude was also found among the qualitative participant. This may be attributed by their past experiences related to utilization of health insurance scheme.

> *"Even with insurance, they only provide cheap medications for free and tell us to buy expensive ones elsewhere. That's why I don't think insurance*

Figure 9: Reasons for not enrollment



is necessary. When my son-in-law needed surgery, I searched for the needed medicine at clinics around Teaching Hospital and Gangalal Hospital but couldn't find it. Despite having insurance, they only gave us cheap medicines, and we had to look for urgent medications outside the hospital."- [Community member, FGD, Shantinagar]

3.3. National health insurance related practice

Participants who had heard about health insurance were asked practice-related questions. It was found that 9.4 per cent of the 127 participants reported being enrolled in health insurance, among whom only six had utilized the services. Two-thirds of those who used the services felt that the services were available but inadequate for their needs. When asked about the reasons for enrollment, 75 per cent of participants from the enrolled households said they got enrolled because their relatives advised them to do so and for financial protection. Other reasons included receiving subsidies (41.7%) and the perception that it was better than out-of-pocket expenditure (25%).

The qualitative findings also showed that the majority of the participants had not been enrolled in NHI. This may be because of less awareness on NHI and those who were aware and willing had financial constraints as stated by the health care providers.

"Only few of the people in informal settlements have taken NHI."- [FCHV, KII, Shantinagar]

"The majority of people in Balkhu Basti have not enrolled in health insurance"- [CBO representative, KII, Balkhu Basti]

3.4. Barriers to enrollment

Participants who were not enrolled in health insurance were asked about their reasons for not enrolling. The majority (74.8%) did not know about the enrollment process, 67 per cent reported financial constraints, stating they could not afford the premium, and 59.1 per cent reported difficulties in the registration process.

Qualitative findings also support the above findings. People living in the settlement expressed concerns about the registration process, stating that the documentation process is not supportive of their enrollment. This is evident from the following statement:

"To get enrolled in insurance, we have to return to our original place to obtain a recommendation letter (Sifaris). This process takes more than 4-5 days, requiring us to stay in a hotel. Most of us are laborers and cannot afford to take 4-5 days off work for this." [Community member, FGD, Shantinagar]

The other reason for non-enrollment as per the qualitative findings was financial constraints. Many of the qualitative participants expressed concerns regarding the payment of premiums. They were struggling to fulfill hand to mouth and it was almost impossible for them to pay the premiums.

"I have not been enrolled in the national health insurance because of financial reasons. The income I earn is insufficient to feed my family of five which creates a challenge. Additionally, we have to pay rent, so we have to pay for food

instead of insurance."- [Informal Waste Worker, IDI, Balkhu Basti]

4. CHALLENGES IN INFORMAL SETTLEMENTS

4.1. Sense of safety and security

Regarding the sense of safety living in informal settlements, nearly half of the participants (48.2%) reported feeling unsafe living in these areas. Among those participants, the majority (83.5%) felt unsafe due to proneness to natural hazards like flood and storm. The risk of eviction was reported by 75.2 per cent of the participants. Almost half of the participants felt unsafe due to theft (52.1%) and alcoholism (49.6%), while 41.1 per cent felt unsafe due to drug abuse. Meanwhile regarding the sense of safety at home almost all the participants (99.6%) felt safe, the one who did not feel safe was due to alcoholism.

The qualitative study reveals mixed perceptions regarding the safety and security in settlements. While some community members consider the environment safe, others shared experiences related to alcoholism, violence, and crime.

"We feel safe in the settlement. There are no fights, and everyone gets along well, so it's nice." [Community member, FGD, Shantinagar]

"Conflicts are rare in the settlement, although occasional disputes do occur. Overall, it is a safe place." [Informal Waste Worker, IDI, Balkhu Basti]

Table 31: Reasons for not feeling safe staying in informal settlements

Reasons for not feeling safe staying in informal settlements* (n=121)	Frequency	Percentage
Alcoholism	60	49.6
Drug abuse	51	42.1
Violence in the neighbourhood	37	30.6
Prone to natural hazards	101	83.5
Diseases outbreak (waterborne diseases, VBD)	40	33.1
Eviction	91	75.2
Fear of theft	63	52.1

* Multiple response.

The cases of violence and crime contributes to the unsafe environment in the settlements as per FCHVs and representative from CBOs. Women reported feeling unsafe including at their home due to violence related to alcoholism.

"There are also cases of violence and crime prevalent." [CBO representative, KII, Balkhu Basti]

My husband becomes violent towards me when he drinks alcohol. He also pulls my hair. However, when he is sober, he behaves very nicely, he is like God when he is sober. [Community member, FGD, Shantinagar]

The majority of participants from FGDs and KIIs cited the risk of floods across the settlements as primary reason for not feeling safe in the settlements. Some of them also shared having taken initiative like building embankments, however the recurring floods puts them at risk every year as these settlements are built at the riverside of Bagmati.

"Our biggest natural threat is flooding, especially in the rainy season. Flooding still happens despite the gaping wall having been built." [Community leader, KII, Shantinagar]

Eviction from settlements

Almost all KIIs and FGDs participants expressed their fear of getting evicted from the settlements. The respondents expressed dissatisfaction with the actions taken by government bodies so far. They even felt like they have been politicized for their votes and their situation is not understood by the government as they demand suitable replacement options.

"We are afraid of eviction. Even when the government vehicles are seen, eviction comes to mind." - [Community member, FGD, Balkhu Basti]

"In every 5 years, the candidates lure us to drop vote for them with many fake promises. The same government put pressure to evict us from this place. It is very much unacceptable, we are also human being, they need to know us and understand us." - [Community member, FGD, Balkhu Basti]

"We aren't secure at all. Government officials are not listening to any of our pleas or issues. So, we are at risk and are struggling. People are

Table 32: Alcohol use among participants and family members

Characteristics	Total	Percentage
Ever used alcohol (n=251)		
Yes	103	41.1
No	148	58.9
Alcohol use within 30 days (n=103)		
Yes	49	47.6
No	54	52.4
Ever used alcohol among family members (n=251)		
Yes	98	39.0
No	153	61.0
Alcohol use among family members within 30 days (n=98)		
Yes	76	77.6
No	22	22.4

Table 33: Tobacco consumption among the participants

Characteristics	Shantinagar	Balkhu Basti	Total
Tobacco smoking (n=251)			
Yes	23.9%	42.2%	93
No	76.1%	57.8%	158
Current tobacco smoking (n=93)			
Yes	11.8%	42.1%	34
No	88.2%	57.9%	59

Table 34: Exposure to secondhand smoking within the past 30 days

Variables	Frequency	Percentage
Exposure to secondhand smoking in home		
Yes	119	52.6
No	132	47.4
Exposure to secondhand smoking in the community		
Yes	214	85.3
No	37	14.7

constantly at risk of being removed from here." - [Community leader, KII, Shantinagar]

Health outcome associated with fear of eviction

Many participants reported experiencing psychosocial stress and trauma due to the fear of eviction. As government bodies attempt to clear spaces occupied by informal settlements, residents faced constant uncertainty regarding their future. During KII and FGDs with community leaders, they affirmed that the demolition of these settlements has significantly impacted the mental health of the inhabitants. This ongoing threat has created a pervasive sense of insecurity and anxiety among the residents, further exacerbating their stress and mental health issues.

"We have a lot of problems, and it's hard to sleep at night thinking about them (loan, eviction)."- [Community member, FGD, Shantinagar]

"I have heart disease, so I take medication for it. When there was construction happening at my house and I heard the news about possible eviction, I almost passed out from worrying too much". [Community member, FGD, Balkhu Basti]

"There are threats mostly from the government at the moment. Just recently, one of our friends passed away from a heart attack when the dozer was demolishing. It was in the news as well." - [Community leader, KII, Balkhu Basti]

4.2. Alcoholism and Smoking

Alcohol use

The table below depicts the prevalence of alcohol use among participants. The percentage of participants who ever used alcohol was 41.1, and among participants of Balkhu Basti, it was 42.2 per cent. Meanwhile, among those who used alcohol, recent use within the last 30 days was reported by 47.8 per cent of the participants.

The table below shows the prevalence of alcohol use among the family members of the participants. More than one third of the participants (39%) reported that their family members consumed alcohol at some point. Among these family members, 77.6 per cent were reported to have consumed alcohol within the last 30 days.

Qualitative findings also indicate that alcohol consumption is common among residents of the settlement. Many of these individuals work as laborers and use alcohol as a coping mechanism.

"People tend to fight when they drink. They may have a fight one day, but the next day, when they are sober, they become friends again."- [Community member, FGD, Shantinagar]

Tobacco consumption

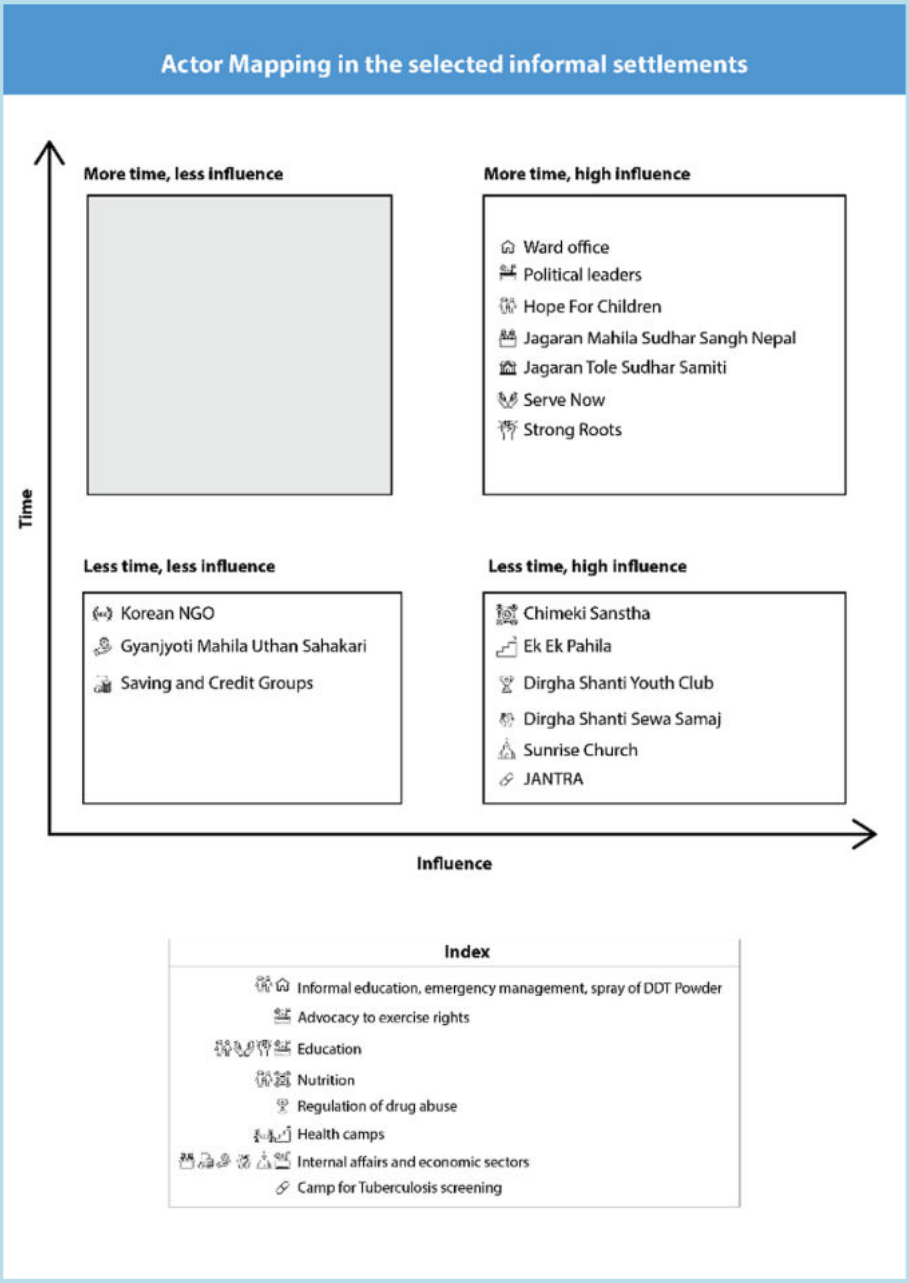
More than one third of the participants (37.1%) were reported smoking tobacco at some point. Nearly half of the participants (42.2%) from Balkhu Basti reported smoking tobacco at some point. Among those who reported tobacco smoking, 11.8 per cent in Shantinagar and 42.1 per cent in Balkhu Basti were currently smoking tobacco. This indicates a significantly higher prevalence of tobacco smoking among participants in Balkhu Basti compared to Shantinagar.

Regarding the current smokeless tobacco products use among the participants who had smoked tobacco product at some point, nearly two-third of the participants (61.3%) reported using smokeless tobacco products like chewing tobacco, betel, quid and snuff by nose or mouth. The smokeless tobacco consumption was higher in Shantinagar (82.4%) when compared to Balkhu Basti (56.6%).

Exposure to secondhand smoking

The table below depicts the exposure of participants to secondhand smoking. More than half of the participants (52.6%) reported that they were exposed to secondhand smoking at their homes. Meanwhile, the percentage of participants exposed to secondhand smoking in the community was 85.3.

Figure 10: Actor mapping



5. ACTOR MAPPING

The actor mapping conducted in the selected informal settlements provides a clear visual representation of various stakeholders categorized by their influence and the time they invest in the community. This analysis will delve into each quadrant of the mapping, interpreting the roles and impacts of the actors involved.

In the informal settlements, actors such as the Ward Office, Political Leaders, Hope for Children, Jagaran Mahila Sudhar Sangh Nepal, Jagaran Tole Sudhar Samiti, Serve Now, and Strong Roots are highly influential and invest significant time. These actors are integral to the community's development, focusing on multiple sectors. For instance, the ward office and political leaders play crucial roles in local governance and community management, advocating for rights and responding to emergencies, including disease outbreaks by distributing DDT powder to prevent dengue. Hope for Children work in the health sector, conducting awareness sessions and providing nutritional counseling to children and pregnant and postpartum mothers. Jagaran Mahila Sudhar Sangh Nepal focuses on the financial empowerment of people living in informal settlements. Organizations like Serve Now and Strong Roots, along with Hope for Children in Balkhu Basti, work to improve the education of children living in these settlements.

Actors with less time but high influence include Chimeki Sanstha, Ek Ek Pahila, Dirgha Shanti Youth Club, Dirgha Shanti Sewa Samaj, Sunrise Church, and JANTRA. These actors, despite their limited time, have substantial influence. Chimeki Sanstha, Ek Ek Pahila, and JANTRA participate in advocacy to improve the nutritional and health status of people living in settlements, along with conducting health camps and screening camps for tuberculosis. Local groups like Dirgha Shanti Youth youth club and Dirgha Sewa Samaj work for youth wellbeing, particularly regulating drug abuse within settlements and managing community internal affairs and economic sectors.

Actors with limited time and influence include the Korean NGO, Gyanyjyoti Mahila Uthan Sahakari, and Saving and Credit Groups. These actors play roles in educational initiatives, financial support, and credit services respectively.

CONCLUSION

This study on informal settlements offers valuable insights into residents' living conditions, socio-economic status, health-related issues, and aspects of the National Health Insurance. Surveyed populations in settlements came from all parts of the country. Common reasons for staying included a lack of money to buy land, easy access to employment, and unaffordable rent. The research highlights significant disparities in socio-economic and health conditions among residents. Wage employment is the primary source of income, with 37.8 per cent of households earning between 10,001 and 20,000 monthly. However, 7.79 per cent of households are identified as multidimensionally poor, while one-fifth belong to the lowest quintile.

Key issues identified include inadequate access to drinking water as jar water being the major source for drinking water for 72.1 per cent of households and a notable proportion of the population lacks essential services and infrastructure, leading to poor living standards and health outcomes. Environmental sanitation is also a concern, highlighted by the presence of bad-smelling and water pooling in the surroundings.

Health and nutrition statuses are also concerning, with undernutrition being prevalent issues. A substantial 56.2 per cent of families reported chronic disease conditions, and 78.1 per cent experienced acute health problems within six months, including occupational diseases like eye infections, musculoskeletal disorders, and skin infections. Despite a high dietary diversity noted in 86.1 per cent of households, there were cases of malnourished children aged 6-59 months, with 24 per cent underweight, 28 per cent stunted, and 12 per cent wasted. These findings underscore the urgent need for timely and appropriate interventions. Regarding the use of family planning methods, one-third of married respondents reported using family planning, with temporary methods being the most common. Depo-Provera, pills, and condoms were frequently used as temporary methods. There were instances of home deliveries, with 2 out of 18 children below one year of age being born at home.

Almost all the participants and their families residing in Shantinagar and Balkhu Basti visit health facilities for check-up when they suffer from chronic or acute diseases and injuries/accidents. The majority of the participants (41% in Shantinagar and 59.6% in Balkhu Basti) reported receiving health services from government hospitals for chronic disease. When asked about the place they usually visit when they are sick or need some advice about health, participants from both the settlements responded, going to pharmacies the most. The percentage of participants in both the settlements visiting health post or urban health clinic was comparatively low. In terms of the type of participants, the informal waste workers usually went to government hospitals (46.2%) and household heads (53.9%) or members above 18 years (68.1%) went to pharmacies. In the past 12 months, 33.5 per cent of the participants residing in informal settlement could not go see a specialist doctor when they needed to because they could not afford it.

Additionally, various barriers to health care services were revealed during the qualitative approach. Many qualitative participants highlighted the financial constraint being the most dominant barrier along with negligence related to health risk, inappropriate location of UHPC and unavailability of services at UHPC. The financial constraints led the people living in informal settlement to either not seek health care services or delay in the process of seeking healthcare. The participants during the focus group discussion highlighted the delay in health seeking behavior of people towards their health as one of the barriers to health care services. Participants of qualitative study particularly FCHVs and Healthcare providers raised concerns and challenges in providing counselling services and sharing information about the ongoing national programs like

Vitamin A and vaccination campaign, for the participation of people living in informal settlement. The quantitative data shows that most of the participants preferred visiting pharmacies, clinics and private hospitals over government institutions like UHPC. Often, when people visit for health services, they don't receive what they need, leading to disappointment and reluctance to return which is one of the limitations of UHPC.

Just over half of the participants (50.6%) were aware of the national health insurance. The primary sources of information were friends, neighbors, and relatives. Information from FCHVs and enrollment assistants was less commonly heard. This could be due to the recent implementation of insurance in Kathmandu.

Although participants had heard about the NHI, the majority of them (71.7%) had poor knowledge on insurance. Only a small percentage (2.4%) demonstrated exceptional knowledge. Qualitative findings indicated diverse understandings of NHI among participants, reported by FCHVs as well. Some participants even provided accurate information about NHI.

The majority of the participants had a positive attitude towards NHI. Around forty per cent of the participants believed that people in the community are willing to have NHI. However, one of the qualitative participants shows a negative attitude as attributed by his past experiences related to NHI scheme utilization.

Few of the participants had enrolled in NHI although the majority of the participants were willing to get enrolled. The main reasons for enrollment were their ignorance related to NHI enrollment process, financial constraints and difficulty in registration process.

Regarding the sense of safety living in informal settlements, nearly half of the participants (48.2%) reported feeling unsafe living in these areas. Among those participants, the majority (83.5%) felt unsafe due to proneness to natural hazards like flood and storm. The majority of participants from FGDs and KIIs cited the risk of floods across the settlements as primary reason for not feeling safe in the settlements. The risk of eviction was reported by 75.2 per cent of the participants. Almost all KIIs and FGDs participants expressed their fear of getting evicted from the settlements. Many participants reported experiencing psychosocial stress and trauma due to the fear of eviction. As government bodies attempt to clear spaces occupied by informal settlements, residents faced constant uncertainty regarding their future. Meanwhile regarding the sense of safety at home almost all the participants (99.6%) felt safe, the one who did not feel safe was due to alcoholism.

The percentage of participants who ever used alcohol was 41.1, and among participants of Balkhu Basti, it was 42.2 per cent. Meanwhile, among those who used alcohol, recent use within the last 30 days was reported by 47.8 per cent of the participants. More than one third of the participants (37.1%) were reported smoking tobacco at some point. Among those who reported tobacco smoking, 11.8 per cent in Shantinagar and 42.1 per cent in Balkhu Basti were currently smoking tobacco. The smokeless tobacco consumption was higher in Shantinagar (82.4%) when compared to Balkhu Basti (56.6%). More than half of the participants (52.6%) reported that they were exposed to secondhand smoking at their homes. Meanwhile, the percentage of participants exposed to secondhand smoking in the community was 85.3.

In the informal settlements, actors such as the Ward Office, Political Leaders, Hope for Children, Jagaran Mahila Sudhar Sangh Nepal, Jagaran Tole Sudhar Samiti, Serve Now, and Strong Roots are highly influential and invest significant time. Actors with less time but high influence include Chimeki Sanstha, Ek Ek Pahila, Dirgha Shanti Youth Club, Dirgha Shanti Sewa Samaj, Sunrise Church, and JANTRA. Actors with limited time and influence include the Korean NGO, Gyanyjyoti Mahila Uthan Sahakari, and Saving and Credit Groups. These actors play roles in educational initiatives, financial support, and credit services respectively.

RECOMMENDATIONS

FOR GOVERNMENT

Informal settlement

The majority of the people left their hometown and were living in the informal settlement mainly for employment opportunities available in Kathmandu.

Recommendation: *The concerned government authorities could identify and map the stakeholders working in/for informal settlement based on their sector of work. The government could initiate to list the organization at ward level and coordinate with them to plan for livelihood and vocational based training targeting people living in informal settlement without duplication of resources.*

Government authorities could create job opportunities in their respective region of origin and support financially to the people in need to start a small business of their own.

Water

The major source of drinking was found to be jar water in informal settlements. People spend money to buy jar water which is beyond their affordability, and they kept referring to Melamchi water being available in the nearby formal settlements.

Recommendation: *Thus, the government could take necessary actions for the provision of water supply in the informal settlements.*

It was reported that there were no source of water inside the informal settlement so people bought tanker water for basic usage. Those who could not afford to buy jar water would consume the tanker water without any treatment which led to water borne diseases.

Recommendation: *It would be appreciated by the people living in informal settlements if the government could act on testing the water quality and provide feasible water treatment options.*

Road conditions

Most of the houses in the informal settlement had accessibility to dusty graveled roads. As reported under disease burden, people suffering from air borne diseases are also higher.

Recommendation: *It is an appeal to prioritize improving the road conditions within the settlement area. Collaborating with other organizations working in/for informal settlements and any corporates and private organizations would save the resources to better improve the available road linkages.*

Place of delivery

Few women in the settlement are still giving birth at home.

Recommendation: *It is a strong urge to the government to raise awareness on importance of institutional delivery, particularly among residents of informal settlements.*

Health service centers and UHPC

The people of the settlements had affordability constraints to seek health care services. The available government health facilities such as UHPC that provides free basic health services, were located in inappropriate locations for the people living in informal settlements.

Recommendation: *It is recommended that the government should conduct a thorough assessment of potential alternative locations that are more centrally located within the settlement's catchment area.*

It is recommended that the government should maintain a record system to track the health status and treatment specific data of the patients from informal settlements.

Enrollment in National Health Insurance

Only half of the people in the informal settlements are aware of the NHI and among those who had heard, the majority of them had poor knowledge.

Recommendation: *It is a plea to the government to spread awareness among residents of informal settlements about the National Health Insurance program through targeted community outreach, and collaboration with local leaders. Mobilization of FCHVs could be one of the approaches.*

The majority of the residents of the informal settlements did not enroll in the NHI as they could not afford the yearly premium amount.

Recommendation: *It is a request to the government to include the people of the informal settlements in the subsidy group who are under the poverty line.*

Sense of safety and security

Nearly half of the participants reported feeling unsafe living in the settlement.

Recommendation: *It is an appeal to the government to prioritize improving safety and security measures in the settlement. This could be done through an increased police patrolling, establishment of at least one police booth per settlement, better street lighting and investing in social programs aimed at crime prevention and fostering a sense of community safety.*

FOR DEVELOPMENT PARTNERS

Socio-economic conditions

The majority of the people of the informal settlements were waged workers who earned their living on a daily basis.

Recommendation: *Provide training related to income generating skills such as sewing, knitting, handicrafts and so on to uplift the socio-economic conditions of the people of the settlements in close collaboration with government bodies.*

Education

More than eight per cent of households had school-aged children who could complete class eight but were not attending school.

Recommendation: Identify and address the barriers preventing school-aged children from attending classes despite their capability to complete class eight. This may include targeted outreach, financial support mechanisms like scholarships, and community-based initiatives to ensure these children have access to and engage in education opportunities.

Drinking water

Most of the people in the settlements are deprived of access to drinking water.

Recommendation: *Provide reliable access to safe drinking water for residents of the settlements which may include infrastructure development, along with initiatives for water quality testing and treatment to ensure public health and well-being.*

Environmental sanitation

Presence of hazardous waste.

Recommendation: *Raise awareness regarding the harmful effects of hazardous waste along with proper waste management practices. Conduct regular clean-*

up campaigns with the involvement of community members.

Bathing station

Some people reported that they bath in open space

Recommendation: *Prioritize the establishment of proper bathing stations equipped with adequate privacy measures and water facilities, within the settlement to ensure people in the settlement can maintain their personal hygiene in a dignified manner.*

Malnutrition

There was a high prevalence of underweight, stunting and wasting in children aged 6-59 months of the households in the informal settlements.

Recommendation: *Implement comprehensive nutrition programs and regular growth monitoring targeting the children living in informal settlements actively involving thenearby health facilities. In addition, raise awareness on importance of balanced diets in children, access to healthcare services and encourage treatment of undernourished children according to government protocol.*

PPE related issue

Informal waste workers not wearing the PPE during their work

Recommendation: *Development partners can work in collaboration to ensure the regular supply of PPE to informal waste workers and educate them on its importance for their safety, fostering awareness and compliance.*

Enrollment on NHI

The majority of the residents of the informal settlements did not enroll in the NHI as they could not afford the yearly premium amount.

Recommendation: *Prioritize reducing financial barriers to NHI enrollment in informal settlements through subsidized premium with the collaboration with local authorities and targeted awareness campaigns for effective implementation.*

Alcoholism

Alcohol consumption was high among the people living in the informal settlements

Recommendation: *Establish counseling services, raise awareness about the health and social consequences of excessive alcohol consumption. Collaborate these activities with local health authorities, FCHVs and community leaders.*

FOR COMMUNITY

Safe drinking water

The people living in the settlement reported using the water from tank without any treatment/purification.

Recommendation: *Implement water purification methods such as boiling, using water filters, SODIS or adding chlorine tablets to ensure safe drinking water. Community stakeholders should educate people on the importance of use of treated/purified water along with the consequences of using water without treatment.*

Environmental cleanliness

There were sanitation related issues in the settlement such as water pooling and presence of hazardous waste.

Recommendation: *The people living in the community should initiate regular cleanliness campaigns in order to mitigate water pooling and promote proper hazardous waste management. This may include promoting hygiene education and advocating for proper waste disposal practices among residents to maintain a cleaner and safer environment.*

Issue related to diseases/illnesses

It was found that many people living in the settlement were suffering from either chronic or acute diseases.

Recommendation: *Encourage physical activity within the community level. Prioritize proactive healthcare by participating in free medical check-ups, screening camps, and adhering to treatment plans for chronic or acute diseases.*

Nutritional deficiency

There was a high prevalence of underweight, stunting and wasting in children aged 6-59 months of the households in the informal settlements.

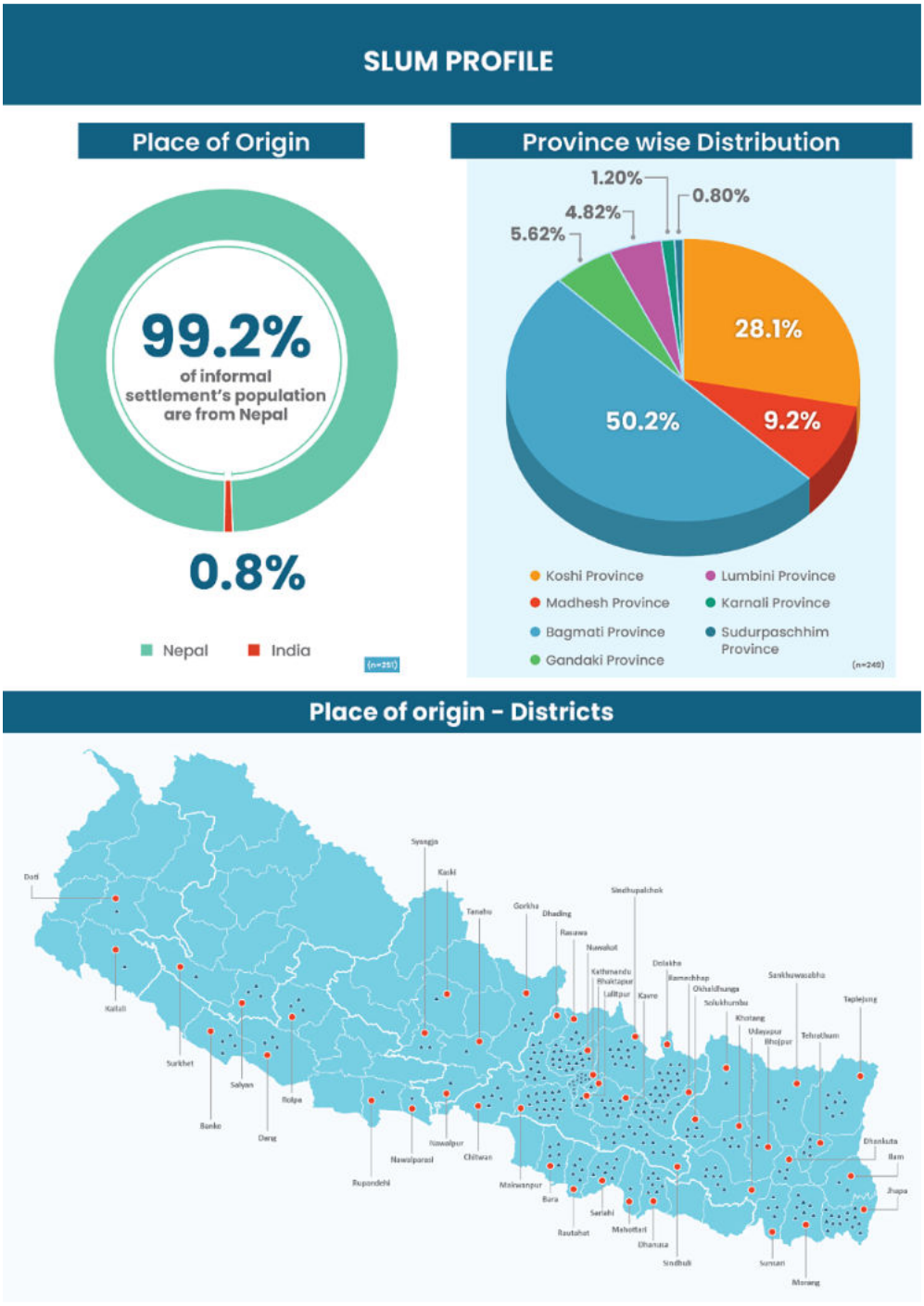
Recommendation: *Encourage breastfeeding practices and regular growth monitoring sessions. Compliance with national nutrition program i.e., receiving multi nutrient powder. Compliance with the treatment of undernourished children.*

Issue related to violence due to alcoholism at home

Women reported feeling unsafe including at their home due to violence related to alcoholism.

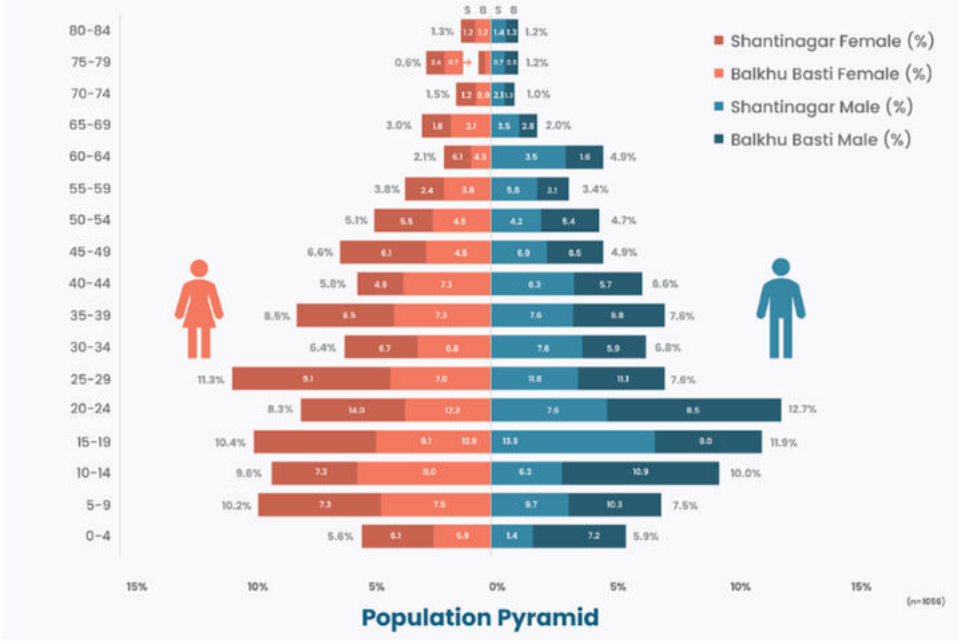
Recommendation: *Report about violence to the concerned authority or reachout via helplines when they need support.*

SLUM PROFILE



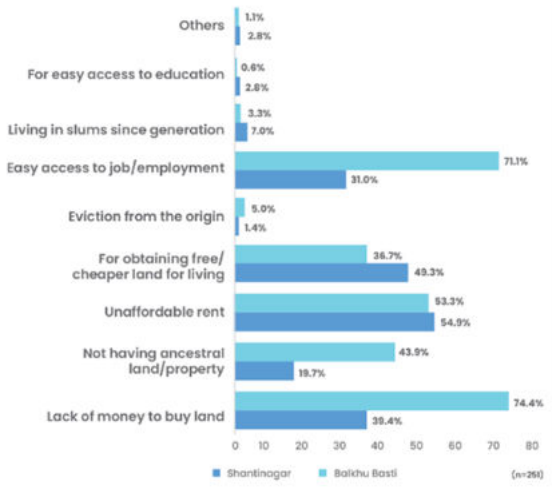
SLUM PROFILE

Demographics



Population Pyramid

The reason for staying in informal settlements



Education Status

Education Level	Shantinagar	Balkhu Basti	Total
No formal schooling	25.7%	25.7%	271
Grade 1-5	23.0%	28.9%	288
Grade 6-10	32.8%	30.3%	327
Grade 11-12	16.2%	10.7%	129
Bachelor and above	2.4%	4.5%%	41
Total	**296**	**760**	**1056**

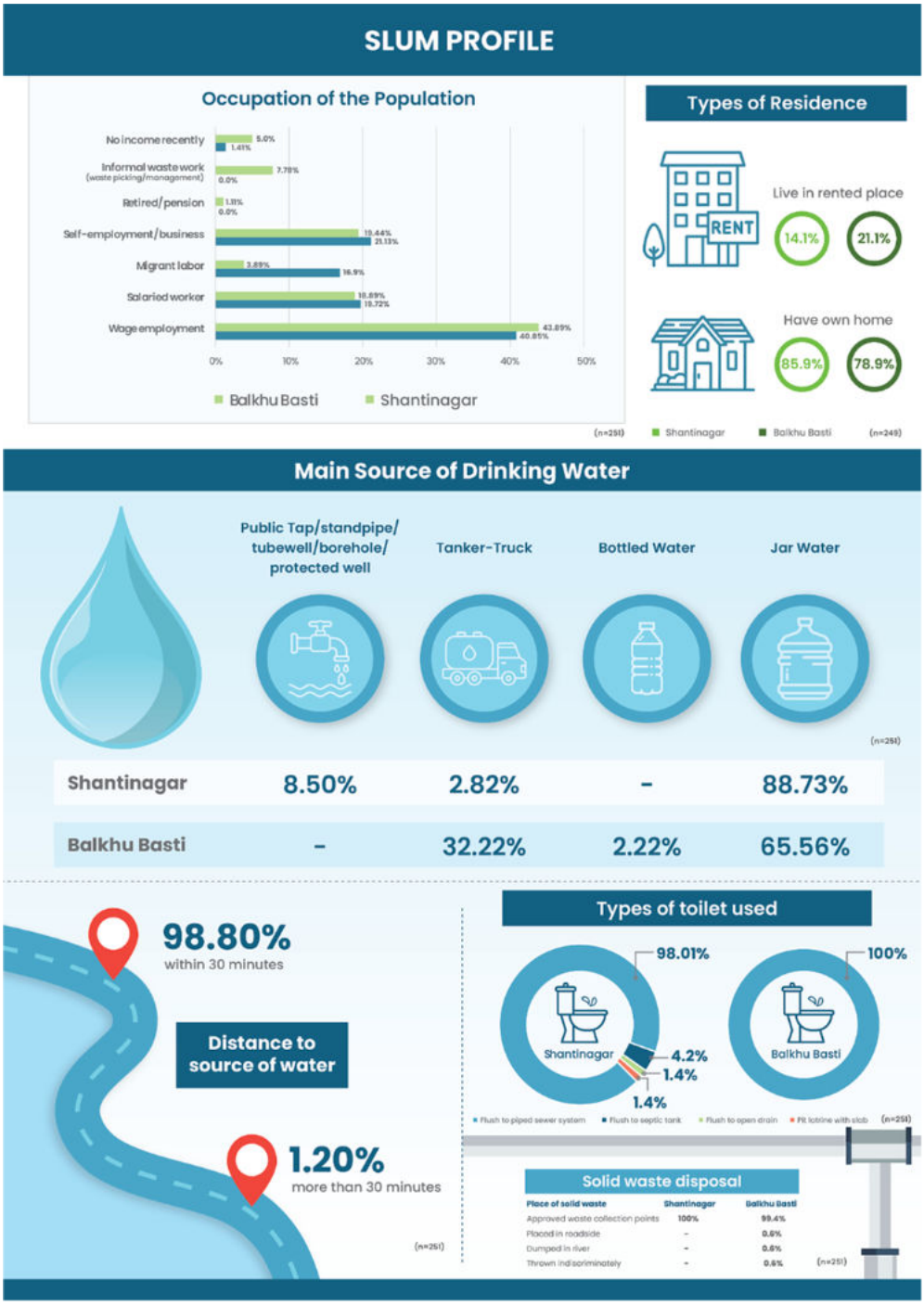
(n=1056)

Poverty Index

20 out of 251
household (7.8%) are multidimensionally poor

Drinking water deprivation
Overall 73.3%
100% in Balkhu Basti, 5.5% in Shantinagar

School attendance deprivation
Overall 8.4%
8.3% in Balkhu Basti, 8.5% in Shantinagar

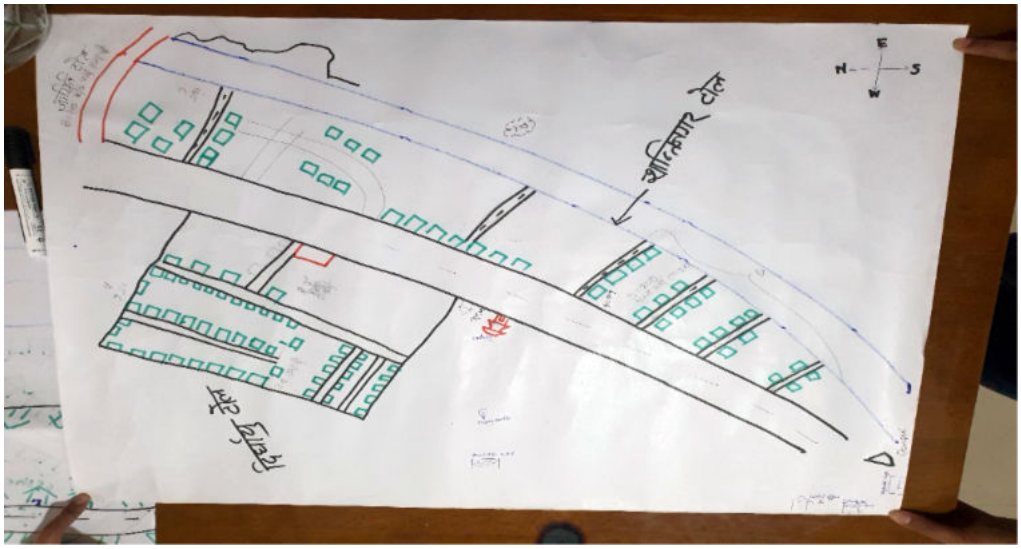

SLUM PROFILE
Occupation of the Population
No income recently
5.0%
1.41%
Informal waste work
(waste picking/management)
7.78%
0.0%
Retired/pension
1.11%
0.0%
Self-employment/business
10.44%
21.13%
Migrant labor
3.89%
16.9%
Salaried worker
10.89%
19.72%
Wage employment
43.89%
40.85%
0%
10%
20%
30%
40%
50%
Balkhu Basti
Shantinagar
(n=251)
Types of Residence
RENT
Live in rented place
14.1%
21.1%
Have own home
85.9%
78.9%
Shantinagar
Balkhu Basti
(n=249)
Main Source of Drinking Water
Public Tap/standpipe/ tubewell/borehole/ protected well
Tanker-Truck
Bottled Water
Jar Water
(n=251)
Shantinagar 8.50% 2.82% - 88.73%
Balkhu Basti - 32.22% 2.22% 65.56%
98.80%
within 30 minutes
Distance to source of water
1.20%
more than 30 minutes
(n=251)
Types of toilet used
98.01%
Shantinagar
4.2%
1.4%
1.4%
100%
Balkhu Basti
Flush to piped sewer system
Flush to septic tank
Flush to open drain
Pit latrine with slab
(n=251)
Solid waste disposal
Place of solid waste
Shantinagar
Balkhu Basti
Approved waste collection points 100% 99.4%
Placed in roadside - 0.6%
Dumped in river - 0.6%
Thrown indiscriminately - 0.6%
(n=251)

ANNEXURE

SOCIAL MAPPING

Figure 1: Balkhu Basti

Figure 2: Shantinagar



RESEARCH TOOLS FOR DATA COLLECTION

SN	Tools	Tool type
1	Tool 1.1	Structured questionnaire for the survey including anthropometric recording sheets and KAP on NHI
2	Tool 2.1	KII Guidelines for community leaders
3	Tool 2.2	KII Guidelines for health care providers
4	Tool 2.3	KII Guidelines for FCHVs
5	Tool 2.4	KII Guidelines for representative from CBOs
6	Tool 2.5	IDI with Informal Waste Workers
7	Tool 3.1	FGD guidelines for community members
8	Tool 4.1	Observation checklist

Operational Definition	
Demographic information	The study of a population based on characteristics like age, race, genders, socioeconomic status, etc.
Slum profile	The profile of the people living in the informal settlements that includes age, gender, educational status.
Informal waste worker	Worker who makes a living by using items that other people have thrown away as trash while working in harmful and terrible environments. Those who do not receive daily wage or salary from any organization.
Place of origin	where something came from or was raised in its early years.
Ancestral land	lands occupied by an indigenous group or people.
Eviction	The legal method through which a landlord may remove someone from their rented property.
Main sources of income	That source of income, or collection of sources, that provides the greatest amount of a person's overall income.
Aquaculture	Breeding, cultivation, and harvesting fish, and aquatic plants is known as Aquaculture.
Wage employment	The employer pays the employee a wage or compensation in exchange for his labor.
Family's monthly income	The total amount of money in average received during one particular month.
Type of household residence	This may refer to residences of all kinds, including rented house, own home or shared accommodation.
Home owned	A person who owns the home they live.
Rented place	A monthly charge that a renter pays the owner for the use of their space.
Paraffin	A flammable material that is mostly used for coating and sealing, candles, rubber compounding, pharmaceuticals, and cosmetics. It is particularly obtained from distillates of wood, coal, petroleum, or shale oil.
National health insurance	National health insurance is an initiative run by the government that protects people against the high costs of medical care.

Operational Definition	
Diabetes	A chronic condition caused on by inadequate production of insulin by the pancreas or inefficient insulin use by the body
Hypertension	A medical condition when blood vessel pressure (140/90 mmHg or more) is too high.
Heart diseases	A particular kind of illness that impacts the heart or blood vessels.
Chronic respiratory disease	The diseases which affect the lungs, airways and other structures.
Musculo skeletal disorders	Injuries or conditions affecting the muscles, nerves, tendons, joints, cartilage, and spinal discs are known to as musculoskeletal disorders (MSD).
Mental disorder	A clinically significant disruption in an individual's behavior, emotion regulation, or thinking processes is suggestive of a mental disorder.
Cancer	A term for conditions where abnormal cells grows abnormally and have the potential to spread into adjacent tissues.
Chronic Kidney Disease	The presence of a kidney problem or, regardless of the aetiology, an estimated glomerular filtration rate (eGFR) of less than 60 ml/min/1.73 mt2 that lasts for three months or more.
HIVs/STIs	The virus called HIV (human immunodeficiency virus) targets the immune system of the body.
Stroke	A stroke is a potentially fatal disorder that results from insufficient blood flow to a portion of the brain.
Liver cirrhosis	The illness known as cirrhosis causes the liver to become permanently damaged and scarred.
Alzheimer's disease and other dementias	A decrease in cognitive abilities, such as memory loss, thinking, and the capacity to do basic tasks, to the point where it seriously impacts a person's day-to-day activities.
Health worker	One who provides sick and injured people appropriate services and care
No. of bedrooms	1 (if bedroom and kitchen is in the same room)
FCHV	Female community health volunteer
Health facilities	The place where provide health care.
Calendar method	The calendar or regularity approach uses numerical calculations derived from previous menstrual cycles.
LAM	A means of temporarily preventing pregnancy through breastfeeding

CONSENT FORMS

For quantitative study participants

General Introduction

Hello! My name is ..... Currently, I am working as a researcher at Anveshan Pvt. Ltd., based in Lalitpur, and I am involved in a comprehensive study conducted by Médecins du Monde (MdM). We are conducting a detailed study of informal settlements in various locations along the Bagmati River within the Kathmandu Valley. As part of this study, we invite you to participate.

Purpose of the Study

The primary purpose of this study is to evaluate the health, nutrition, and socio-economic conditions of people residing in informal settlements along the Bagmati River in the Kathmandu Valley. It aims to identify the social upliftment of marginalized people living in four informal settlements along the Bagmati River, assess the healthcare-seeking behaviors of waste management workers, and evaluate their access to quality health services. Additionally, the study seeks to explore knowledge, attitudes, and practices related to national health policies and identify barriers to the implementation of the National Health Insurance (NHI) scheme in these settlements.

What Will Happen in This Study?

We will conduct interviews to collect data on the health, nutrition, and socio-economic conditions of residents in the selected settlements. Measurements of your height, weight, and, if applicable, your child's height, weight, and MUAC will be taken. We will also observe your household. The interviews will be conducted in person and will take approximately 30 to 45 minutes. You are free to skip any questions or withdraw from the study at any point if you feel uncomfortable. However, your responses are valuable for this research. The information you provide will be used solely for research purposes, and no personal details will be disclosed to anyone. All information and contact details will be kept strictly confidential.

Are There Any Risks to You?

There are no risks associated with your participation in this study. You will only be asked questions about general information.

What Are the Potential Benefits to You?

If you agree to participate in this study, your height and weight, as well as your child's height, weight, and MUAC (for children only), will be measured. There are no direct benefits, but the information gathered will help identify health conditions and future needs, contributing to the development and implementation of effective health solutions.

Can You Decline or Withdraw from the Study?

Your participation in this study is entirely voluntary, and you can refuse or withdraw at any point.

Confidentiality

The confidentiality of the data collected from you will be ensured. The information will only be used for the purposes of this study. No personal information will be used during data analysis, storage, or publication.

Voluntary Participation

If you do not wish to participate in this study, you are not obliged to do so. The decision is entirely up to you, and we will respect your choice. If you prefer not to answer certain questions, you may choose to stop the interview at any time. You may also withdraw from the study whenever you wish. However, we hope that you will answer all the questions, as this will help identify and address the needs of your community and benefit the entire country. No direct payments or reimbursements are included in this study.

Use of Data

The information you provide will be recorded and used solely for writing reports and publishing research papers.

Contact Details for Study Team and ERB

This study is being conducted by Médecins du Monde (MdM) and has been approved by the Nepal Health Research Council. If you have any questions about the study, you may contact the Anveshan Pvt. Ltd. office in Lalitpur at 01-5526674.

Principal Investigator: Ms. Sandhya Subedi
For information regarding ethical approval, you can contact the Nepal Health Research Council, Government of Nepal, Ramshah Path, Kathmandu,

Nepal, Telephone: +977-1-4254220, Email: nhrc@nhrc.gov.np.

Do You Have Any Questions About This Study?

If you have any questions regarding your role in this research or study, please feel free to contact the main office of Anveshan Pvt. Ltd. at 01-5526674 or call our Co-Investigator, the Managing Director of Anveshan, at +977-9801030033.

Are You Willing to Participate in This Study?

— Yes

— No

I declare that I have read the information mentioned above and voluntarily agree to be a part of this study.

Serial No.
Name of Participant
Phone Number
Signature/Thumbprint
Guardian's Signature/Thumbprint
Date of Interview

For KII and IDI participants

General Introduction

Hello! My name is ..... I am currently working as a researcher at Anveshan Pvt. Ltd., located in Lalitpur, and I am here as part of a comprehensive study conducted by Médecins du Monde (MdM). We are conducting an extensive study of informal settlements in various areas within the Kathmandu Valley. In this context, we invite you to participate in this study.

Objective of the Study

The primary objective of this study is to evaluate the health, nutrition, and socio-economic status of people living in informal settlements within the Kathmandu Valley. Specifically, it aims to assess the social upliftment of marginalized individuals living in four informal settlements along the Bagmati River. Additionally, it seeks to identify access to quality healthcare services and health-seeking behaviors among waste management workers. The study will also examine knowledge, attitudes, and practices related to national health and identify barriers to implementing the National Health Insurance (NHI) scheme within these informal settlements.

What Will Happen During the Study?

We will conduct interviews with selected individuals to study the health, nutrition, and socio-economic conditions of people living in the selected settlements. Each interview will be conducted in person and will take approximately 30 to 45 minutes. You have the freedom to refrain from answering any questions or to withdraw from the study at any time if you feel uncomfortable. However, your responses are considered valuable for the study. All answers provided will be used solely for research purposes and will not be disclosed to anyone. Your information and contact details will be kept confidential and handled with the utmost privacy.

What Are the Risks of Participating in This Study?

There are no risks to you from participating in this study. You will only be asked to answer general questions about your experiences and observations.

Potential Benefits of Participating in the Study

If you agree to participate in this study, your responses will be recorded. There are no direct benefits to you; however, the collected information will help identify health conditions and requirements, contributing to addressing health-related challenges and promoting development in the future.

Can You Choose to Participate or Decline?

Participation in this study is entirely voluntary, and you can decide to participate or decline at any point during the study.

Confidentiality: The data collected from you will be kept confidential. The information will be used exclusively for study purposes. No personal identifiers will be included in data analysis, storage, or publication.

Voluntary Participation: If you choose not to participate in the study, that is entirely your decision, and we respect it. You may also stop the interview at any time or withdraw from the study whenever you wish. However, we hope that you will respond to all the questions, as this will help

provide services and benefits to your community and the country as a whole. No direct payment or compensation is included in this study.

Use of Data: The information you provide will be recorded. Additionally, the data will be used solely for analysis and research publications.

Study Team and ERB Contact Information

This study is being conducted by Médecins du Monde (MdM). The study has received approval from the Nepal Health Research Council. If you have any questions about this study, do not hesitate to contact the office of Anveshan Pvt. Ltd. at 01-5526674 in Lalitpur.

Principal Investigator: Sandhya Subedi For inquiries about ethical approval of the study, you may contact the Nepal Health Research Council, Ramshah Path, Kathmandu, Nepal. Telephone: +977-1-4254220, Email: nhrc@nhrc.gov.np.

If you have any questions about this study: If you have any questions about your role in the research or study, feel free to contact the main office of Anveshan Pvt. Ltd. at 01–5526674 or call our co-investigator and Managing Director of Anveshan at +977–9801030033.

Would You Like to Participate in the Study Now?

— Yes

— No

By reading the details mentioned in this form, I voluntarily agree to participate in this study.

S. No.
Participant's Name
Phone Number
Signature/Thumbprint
Interview Date

For FGD Participants

General Introduction

Hello! My name is ..... I am currently working as a researcher at Anveshan Pvt. Ltd., located in Lalitpur, and I am here as part of a comprehensive study conducted by Médecins du Monde (MdM). We are conducting an extensive study of informal settlements in the Bagmati River vicinity in the Kathmandu Valley. In this context, we invite you to participate in this discussion.

Objective of the Study

The primary objective of this study is to evaluate the health, nutrition, and socio-economic status of people living in informal settlements in the Bagmati River vicinity. Specifically, it aims to assess the social upliftment of marginalized individuals living in four informal settlements and identify access to quality healthcare services and health-seeking behaviors among waste management workers. The study will also examine knowledge, attitudes, and practices related to national health and identify barriers to implementing the National Health Insurance (NHI) scheme within these settlements.

What Will Happen During the Study?

We will conduct group discussions and interviews to study the health, nutrition, and socio-economic conditions of people living in selected settlements. Discussions will last approximately 45 minutes to 1 hour. You have the freedom to refrain from answering any questions or to withdraw from the study at any time if you feel uncomfortable. However, your responses are considered valuable for the study. All answers provided will be used solely for research purposes and will not be disclosed to anyone. Your information and contact details will be kept confidential and handled with the utmost privacy.

What Are the Risks of Participating in This Study?

There are no risks to you from participating in this study. You will only discuss general observations and information based on your daily life experiences.

Potential Benefits of Participating in the Study

If you agree to participate in this discussion, your responses will be recorded. There are no direct benefits to you; however, the collected information will help identify health conditions and requirements, contributing to addressing health-related challenges and promoting development in the future.

Can You Choose to Participate or Decline?

Participation in this study is entirely voluntary, and you can decide to participate or decline at any point during the study.

The rest of the section mirrors the same details as the general study participation guidelines above.

Would You Like to Participate in the Discussion Now?

— Yes

— No

By reading the details mentioned in this form, I voluntarily agree to participate in this study.

S. No.
Participant's Name
Phone Number
Signature/Thumbprint
Discussion Date

Government of Nepal

Nepal Health Research Council (NHRC)

Estd. 1991

Ref. No.: 1895

Total budget of research	**NRs 11,12,259.00**
Ethical review processing fee	**NRs 33,367.77**

Investigator Responsibilities

- If you do not start the project within 3 months of this letter, please contact the Ethical Review M & E Section at NHRC
- Any amendments shall be approved from the ERB before implementing them
- Submit progress report every 6 months
- Submit final report after completion of protocol procedures at the study site
- Comply with all relevant international and NHRC guidelines
- Abide by the principles of Good Clinical Practice and ethical conduct of the research

If you have any questions, please contact the Ethical Review M & E Section at NHRC.

Thanking you,

Dr. Pramod Joshi
Member Secretary

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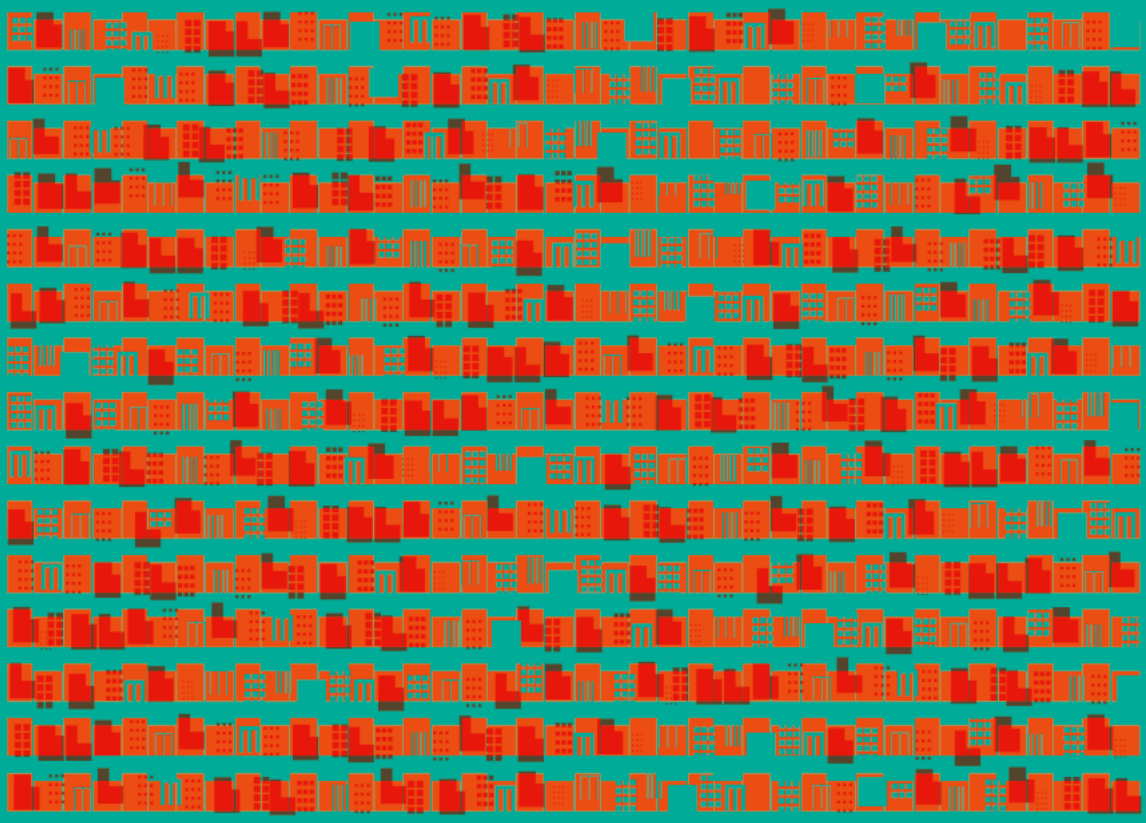
Website: http://www.nhrc.gov.np, E-mail: nhrc@nhrc.gov.np



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FEBRUARY 2025