

## Research Article

# Factors affecting Nepalese rural dwellers' choice of first-contact health facility: a cross-sectional survey

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### Background

Despite significant progress in Nepal's health indicators over the past three decades, regional disparities in public health centre (PHC) provision and accessibility remain severe. It has been reported that rural dwellers prefer and place more trust in outreach centres (ORCs) run by the Dhulikhel Hospital. However, the reasons behind this remain unclear. We aimed to examine the determinants of Nepalese rural dwellers' choice of first-contact health facility.

### Methods

This was a cross-sectional survey among 1,098 adult rural dwellers in Nepal. The study sample was first divided into PHC and ORC groups, and intergroup differences were tested using Pearson chi-square test and independent sample t-test. Then, binary logistic regression was performed to analyse first-contact health facility decision-making.

### Results

Sex, education level, importance of health care satisfaction, importance of free health care, diagnosis of hypertension, diagnosis of diabetes, insurance coverage, savings, community-level cooperation, and distance to the health facility were significant factors affecting the choice of the first-contact health facility. Most significantly, people who were unconcerned about receiving free health care were 19.417 times more likely to use ORCs. Additionally, it was observed that rural dwellers perceived ORCs as providing higher quality health care.

### Conclusions

The government must promote cooperation between PHCs and ORCs, as it is essential to understand consumer demand, supply-side issues, and institutional aspects of health care in rural areas to achieve universal access to health care.

Over the past three decades, Nepal has achieved impressive improvements in health indicators. This has been driven by the health care policies established since the signing of the Alma Ata Declaration in 1978, which emphasized the importance of primary health care.<sup>1</sup> The established goals have been achieved based on the primary health care master plan, which aimed to strengthen public health centre (PHC) infrastructure and leverage local community networks. However, despite the progress made in the national primary health care system, regional disparities in the provision and accessibility of health facilities are becoming increasingly severe.<sup>2</sup> In Nepal, which has 8 of the world's 10 highest peaks, towns and villages are predominantly lo-

cated in hills and mountains, which limits access to infrastructure. Consequently, rural dwellers, who account for 49.7% of the total population, have poor access to health care.<sup>3</sup> Economic, geographical, cultural problems, and insufficient health care capacity are the main factors impeding their access to health care services.<sup>4</sup>

The Ministry of Health and Population (MoHP) is making efforts to enhance the accessibility of health care across the country based on a range of health care policies. It launched the National Social Health Insurance (NSHI) program in 2016 and has gradually expanded it across the country with the goal of reaching Universal Health Coverage (UHC).<sup>5</sup> Consequently, health insurance coverage in-

creased nationwide from 9% in 2016 to 38% in 2019. The program is ongoing and aims to reach 90% coverage by 2030.<sup>6</sup> Active research is constantly underway in this context to accumulate evidence regarding ways to promote and reinforce the NSHI program.

The MoHP is also endeavouring to build partnerships between public and private health care providers. As of May 2021, Nepal had a total of 5,553 PHCs, consisting of 5,425 PHCs, 105 secondary PHCs, and 23 tertiary referral hospitals.<sup>7</sup> PHCs located in Nepal's rural areas are in a deteriorated state and provide low-quality health care due to a lack of personnel, equipment, and community-level infectious disease prevention and health promotion programs. Accessibility to PHCs is also limited by the transportation challenges posed by the complex geographical terrain.<sup>8</sup> To address these local public health problems, a variety of private health facilities are being operated in rural areas with insufficient health care facilities. The outreach centres (ORCs) run by Dhulikhel Hospital are exemplary examples. Since 1996, Dhulikhel Hospital's ORCs have been built in areas with poor health care services (as of 2021, there are 18 ORCs in different rural parts of Nepal); they operate on a 24/7 basis with the mission of providing high-quality holistic health care services. Due to their capacity to carry out public health programs for local communities beyond the reach of PHCs, ORCs have gained a foothold as important health facilities in rural areas of Nepal. Hence, it is reported that rural mountain dwellers place more trust in private health facilities, including ORCs, and prefer them over PHCs. Given the continuously emerging issues relating to the functions, roles, and systems of public and private health facilities, the MoHP has promoted partnerships between public and private health facilities. These partnerships are based on the assumption that they will fulfil their respective roles and functions using their own human resources. However, it is expected that it will take 10 years to address the current problems.<sup>9</sup>

This study aims to examine the determinants of Nepal's rural dwellers' choice of first-contact health facilities. Thus, three research objectives were set: (1) examining the factors that lead residents to visit public and private health facilities (PHC and ORC, respectively); (2) examining the determinants of decision-making for visiting PHC or ORC; and (3) preparing reference data for establishing and implementing Nepal's health care system policies based on these factors.

## METHODS

### STUDY DESIGN

This cross-sectional study aimed to examine the determinants of Nepal's rural dwellers' choice of first-contact health facility.

### STUDY SAMPLE

One city from each of four selected districts was used as a representative sample of Nepalese rural communities. The selected districts/cities were Sindhupalchowk district/

Manekharka area, Tanahun district/Puttar area, Kavre district/Salambu area, and Sindhupalchowk district/Hindi area. The survey respondents were adults ( $\geq 18$  years) residing in these areas (supplementary Figure 1).

### SAMPLE SIZE AND DATA COLLECTION

The sample size of the questionnaire survey was calculated using a formula proposed by Naing et al.<sup>10</sup> based on a 95% CI, prevalence (p) of 0.6, significance level of 5%, and sampling error precision of 10%. The calculated sample size, considering a 10% dropout rate, was 1,128; the number of respondents was set at 1,169. Stratified random sampling was adopted to select survey respondents. We used the list of households and chose randomized selection for data collection.

To minimize non-sampling errors, the survey was conducted by enumerators who were trained in advance and visited each household to conduct one-on-one interviews from July 16 to September 15, 2022.

### SURVEY TOOL

The questionnaire was developed to examine rural dwellers' access to health facilities by modifying USAID's Demographic and Health Survey and UNICEF's Multiple Indicator Cluster Survey to suit the local situation. The content validity of the questionnaire was assessed by a joint collaborative team from Yonsei University in South Korea and the schools of the Dhulikhel Hospital and Gandaki Medical College in Nepal. Thus, the validity and reliability of the questionnaire developed were tested in a preliminary survey, and the final version of the questionnaire was then translated into Nepali.

### VARIABLES

The type of first-contact health facility visited by rural mountain dwellers when using health care services was set as the dependent variable, and the answers to the question "Where do you usually go to seek health care as a first-contact point?" were codified as 1 and 2 for PHC and ORC, respectively.

The independent variable categories comprised individual variables, physical accessibility to health facility, economic accessibility to health care, and distance to health facility. The individual variables included sex, education level, age, number of family members, diagnosis of hypertension, and diagnosis of diabetes. Facility type enquired about the most important aspects of health care for respondents, namely "importance of health care satisfaction" and "importance of free health care". Economic capacity variables included monthly income, insurance coverage, and savings. Distance to a health facility was a measure of how far respondents had to travel to visit their nearest health facility.

## DATA ANALYSIS

To examine the determinants of Nepalese rural dwellers' choice of first-contact health facility, the study sample was first divided into PHC and ORC groups, and intergroup differences were tested. For analysis, the Pearson chi-square test and independent sample t-test were performed. Second, binary logistic regression was performed to analyse the determinants of decision-making relating to the first-contact health facility. The Hosmer-Lemeshow goodness-of-fit test was performed to determine the fit of the binary logistic regression analysis equation for the dependent binary variable, and the explanatory power of each variable was approximated with Cox and Snell's  $R^2$ . The analyses were performed using SPSS Statistics 26.0.

## ETHICAL CONSIDERATIONS

Institutional ethical approval was obtained from the Nepal Health Research Council (NHRC; NHRC approval number: 225/2021P). Permission to conduct the baseline survey was obtained from the respective wards of the following four rural municipalities: Ghiring-1, Paanchpokhari-4, Bhotekoshi-4, and Chauri Deurali-3. Informed written consent was obtained from each participant prior to the interviews. The purposes of the study were made clear to the participants, and their confidentiality and privacy were ensured throughout the study. It was ensured throughout the interview that participation was voluntary.

## RESULTS

## CHARACTERISTICS OF THE STUDY SAMPLE

The data collected from 1,098 residents living in the rural areas in Nepal were analysed. Among the respondents, men slightly outnumbered women (50.9% vs. 49.1%). The regional distribution of the respondents was well balanced, with 25.7% from Manekkharka, 25.2% from Hindi, 24.9% from Salambu, and 24.2% from Puttar. Only 6.8% of the respondents had health insurance coverage, and respondents diagnosed with hypertension and diabetes accounted for 25.5% and 8.1% of the sample, respectively.

More respondents visited ORCs (52.2%) than PHCs (health centres/health posts; 47.8%). The mean values of age, distance to a health facility, and monthly income of the respondents were 46.6 years, 15.5 miles, and 22,499 NPR (approx. 185.96 USD), respectively ([Table 1](#)).

## DIFFERENCES IN VARIABLES ACCORDING TO THE CHOICE OF FIRST-CONTACT HEALTH FACILITY

The Pearson chi-square test and independent sample t-test were performed to analyse differences in factors according to the choice of first-contact health facility among Nepalese rural dwellers. This analysis identified sex, education level, importance of health care satisfaction, importance of free health care, diagnosis of hypertension, diagnosis of diabetes, insurance coverage, savings, community-level cooperation, and distance to a health facility

**Table 1. Characteristics of the study sample (n=1,098)**

Variables	n	%
Sex		
Male	539	49.1%
Female	559	50.9%
Residential area		
Puttar	266	24.2%
Salambu	273	24.9%
Manekkharka	282	25.7%
Hindi	277	25.2%
Insurance coverage		
Yes	75	6.8%
No	1023	93.2%
Diagnosis of hypertension		
Yes	280	25.5%
No	818	74.5%
Diagnosis of diabetes		
Yes	89	8.1%
No	1009	91.9%
First-contact health facility		
PHC (public health centre/ health post)	525	47.8%
ORCs (outreach centres)	573	52.2%
Age (M±SD)	46.6 ± 16.8	
Distance to health facility (min) (M±SD)	15.5 ± 23.0	
Monthly income (NRs) (M±SD)	22499.0 ± 28150.2	

as significant factors affecting the choice of first-contact health facility ([Table 2](#)).

## ANALYSIS OF THE FACTORS AFFECTING THE CHOICE OF FIRST-CONTACT HEALTH FACILITY

A binary logistic regression was performed to analyse the determinants of decision between PHCs and ORCs as first-contact health facilities among Nepalese rural dwellers. The Hosmer-Lemeshow test, which was performed to determine the model fit of the binary logistic regression, confirmed the goodness-of-fit of the regression model with a test statistic ( $\chi^2$ ) of 7.05 ( $P=0.531$ ). A univariate analysis was also performed to identify the factors affecting decision-making related to PHCs and ORCs.

A univariate analysis of factors affecting the choice of first-contact health facility revealed the following variables as significant factors: sex (cOR=1.40,  $P=0.005$ ), importance of health care satisfaction (cOR=0.31,  $P<0.001$ ), importance of free health care (cOR=10.82,  $P<0.001$ ), diagnosis of hypertension (cOR=2.15,  $P<0.001$ ), diagnosis of diabetes (cOR=2.84,  $P<0.001$ ), insurance coverage (cOR=1.68,  $P=0.036$ ), savings (cOR=1.56,  $P<0.001$ ), community-level cooperation (cOR=3.35,  $P<0.001$ ), and distance to health facility (cOR=1.01,  $P<0.001$ ).

**Table 2. Differences between the PHC and ORC groups by variable**

Variables		PHC (n=525)		ORC (n=573)		t/ $\chi^2$	P-value
		n	%	n	%		
Sex	Male	281	53.5%	258	45.0%	7.91	0.005**
	Female	244	46.5%	315	55.0%		
Education level	Illiterate	239	45.5%	247	43.1%	16.16	0.003**
	Preschool	121	23.0%	91	15.9%		
	Lower secondary	94	17.9%	139	24.3%		
	Secondary	48	9.1%	73	12.7%		
	Higher Secondary	23	4.4%	23	4.0%		
Health care satisfaction	Important	397	75.6%	521	90.9%	46.82	<0.001***
	Not important	128	24.4%	52	9.1%		
Free health care	Important	351	66.9%	90	15.7%	298.27	<0.001***
	Not important	174	33.1%	483	84.3%		
Diagnosis of hypertension	Yes	95	18.1%	182	32.3%	29.04	<0.001***
	No	430	81.9%	338	74.5%		
Diagnosis of diabetes	Yes	23	4.4%	66	11.5%	18.73	<0.001***
	No	502	95.6%	507	88.5%		
Insurance coverage	Yes	27	5.1%	48	8.4%	4.50	0.034*
	No	498	94.9%	525	91.6%		
Savings	Yes	223	42.5%	307	53.6%	13.52	<0.001***
	No	302	57.5%	266	46.4%		
Community-level cooperation	Yes	304	57.9%	471	82.2%	77.87	<0.000***
	No	221	42.1%	102	17.8%		
Distance to health facility (min) (M±SD)		27.7±22.4		33.5±23.1		-4.18	<0.001**
Monthly income (NRs) (M±SD)		23,978.7±28,110.5		21,143.3±28142.8		1.66	0.095
Number of family members (M±SD)		4.53±2.23		4.68±2.30		-1.13	0.258

By analysing the factors affecting the choice of first-contact health facility with the same formula used for multivariate analysis, it was found that the respondents who considered health care satisfaction important were 4.8 times more likely to use ORCs compared to those who considered it unimportant (aOR=0.20,  $P<0.001$ ). Those who did not consider it important to receive free health care were 19.41 times more likely to use ORCs (aOR=19.41,  $P=0.001$ ). Additionally, patients with hypertension and diabetes were 1.87 (aOR=1.87,  $P=0.001$ ) and 1.37 (aOR=1.37,  $P=0.001$ ) times more likely to use ORCs, respectively. Additionally, the likelihood to choose ORCs was 4.31 times higher (aOR=4.31,  $P<0.001$ ) among those who had insurance coverage and 2.24 times higher (aOR=2.24,  $P<0.001$ ) among those who advocated community-level cooperation ([Table 3](#)).

## DISCUSSION

This study aimed to examine the determinants of Nepalese rural dwellers' choice of first-contact health facility. Thus, the questionnaire respondents were divided into those who

preferred PHCs and those who preferred ORCs as first-contact health facilities.

To test the study sample's representativeness of the target population, the participants' general characteristics were compared to those of other studies. First, the proportion of insured respondents was 6.8%, which is considerably lower than the national insurance coverage rate of 38.0%.<sup>6</sup> This disparity can be attributed to the NSHI program launched by the MoHP in 2016, which was implemented with the goal of achieving universal health coverage. Thus, the national health insurance coverage rate increased from 9% in 2016 to 38% in 2019. However, the four survey areas in this study had not yet been exposed to the NSHI program as they are remote areas in Nepal. Among the study sample, the prevalence of hypertension was 25.5%, which is slightly higher than the national level (24.5%); we confirmed this to be within the range of the confidence level.<sup>11</sup> Furthermore, the prevalence of diabetes was 8.1%, that is, 1% lower than the national level (9.1%), which was also confirmed to be within the range of the confidence level.<sup>12</sup>

**Table 3. Binary logistic regression: Determinants of first-contact health care facility decision**

Variables	Univariate				Multiple		
	cOR	95% CI	p-value		aOR	95% CI	p-value
Sex							
Male	1				1		
Female	1.40	[1.10–1.78]	0.005*		1.21	[0.88–1.67]	0.230
Education level							
Illiterate	1				1		
Preschool	0.72	[0.52–1.00]	0.055		0.82	[0.53–1.28]	0.390
Lower secondary	1.43	[1.04–1.96]	0.026*		1.35	[0.88–2.07]	0.166
Secondary	1.47	[0.98–2.20]	0.062		1.86	[1.09–3.19]	0.022
Higher secondary	0.96	[0.52–1.77]	0.915		0.63	[0.28–1.41]	0.268
Health care satisfaction							
Important	1				1		
Not important	0.31	[0.21–0.43]	<0.001***		0.20	[0.135–0.321]	<0.001
Free health care							
Important	1				1		
Not important	10.82	[8.10–14.45]	<0.001***		19.41	[13.39–28.14]	<0.001
Diagnosis of hypertension							
No	1				1		
Yes	2.15	[1.62–2.86]	<0.001***		1.87	[1.27–2.75]	0.001**
Diagnosis of diabetes							
No	1				1		
Yes	2.84	[1.74–4.64]	<0.001***		1.37	[0.73–2.56]	0.001**
Insurance coverage							
No	1				1		
Yes	1.68	[1.03–2.74]	0.036*		4.31	[2.17–8.56]	<0.001
Savings							
No	1				1		
Yes	1.56	[1.23–1.98]	<0.001***		1.18	[0.82–1.69]	0.361
Community-level cooperation							
No	1				1		
Yes	3.35	[2.54–4.42]	<0.001***		2.24	[1.49–3.38]	<.001***
Distance to facility (M±SD)	1.01	[1.006–1.01]	<0.001***		1.03	[1.02–1.04]	<.001***
Monthly income (M±SD)	1.00	[1.00–1.00]	0.092		1.00	[1.00–1.00]	0.092
Cox Snell							0.383
Negelkerke R2							0.512

Binary logistic regression analysis, which was performed to examine the determinants of first-contact health facilities used by rural dwellers in Nepal, identified sex, importance of health care satisfaction, importance of free health care, diagnosis of hypertension, diagnosis of diabetes, insurance coverage, community-level cooperation, and distance to a health facility as significant factors. Private ORCs were found to be used more frequently by respondents who did not attach much importance to health care costs and those who considered health care satisfaction important. The primary health care approach focuses more on promot-

ing healthy communities than on curing diseases, one of the ideals espoused in the Alma Ata Declaration, which can result in lower therapeutic effects.<sup>13–16</sup> In particular, PHCs provide maternal and neonatal health care personnel and services, while their services for chronic diseases and injuries are relatively less developed.<sup>17</sup> Hence, residents who attach importance to health care satisfaction choose privately operated ORCs as first-contact health facilities. Previous studies have pointed out that Nepalese rural residents perceive the health care provided by PHCs as being unsafe, lacking respect for patients, and having low continuity

of use, resulting in low sociocultural accessibility.<sup>18-20</sup> In contrast, ORCs are perceived to provide high-quality health care services and are usually staffed by two or three physicians/health paramedics trained at the Kathmandu University School of Medicine at Dhulikhel Hospital (Kathmandu, Nepal). Additionally, ORCs are equipped with medical devices, such as X-ray machines and blood pressure monitors, as well as operation rooms; therefore, they are preferred by rural dwellers.

The analyses of this study showed that rural dwellers in Nepal prefer to visit the ORCs as first-contact health facilities when diagnosed with hypertension or diabetes. Nepal's PHCs often lack the medical systems required for noncommunicable disease management, especially essential medicines and medical devices for treating hypertension, diabetes, and cardiovascular diseases.<sup>21-23</sup> Due to these problems, residents with chronic diseases tend to prefer ORCs over PHCs. To address the current problems of PHCs, the MoHP is conducting a range of programs jointly with international organizations, focusing on ensuring accessibility to health care, providing high-quality health care services, reforming the health care system, and adopting a multisectoral approach with the goal of strengthening primary PHC capacity by 2030.<sup>9</sup> Despite these efforts, rural dwellers still prefer ORCs to PHCs when they require high-quality services. However, they often do not receive high-quality health care services due to various problems, including the burden of medical bills and transportation challenges. In fact, as demonstrated by the results of this study, respondents who were insured were 4.319 times more likely to visit ORCs than those who were not. The Nepalese government has been implementing the NSHI plan since 2016, working toward the target of UHC and 90% national insurance coverage by 2030. To reach the goal of UHC, it is essential for the NSHI to gain a good understanding of consumer demand, supply-side issues, and institutional aspects. However, there is still a lack of documentation on the NSHI program in Nepal.<sup>24</sup> In this regard, the results of this study can serve as a reference for attempts to explain the positive effects of the NSHI program.

Nepal has been implementing a plan to build various cooperative networks to strengthen regional health governance as one of its health sector strategies. One key agenda of this strategy involves strengthening the health care system through partnerships between public and private health facilities. Nepal's rural dwellers have geographical disadvantages in terms of accessibility, and their income levels are lower than those of urban residents, drastically reducing their spatial and economic accessibility to health facilities. As mentioned above, there are usually two types of health facilities in remote mountain villages: PHCs and ORCs. In view of this, cooperation between PHCs and ORCs is essential, as emphasized in the national health sector strategic plan. In particular, there is a need to clearly distinguish the functions and roles of PHCs and ORCs to preclude confusion when local community residents access health care services. It is also necessary to set up a system to rapidly deliver high-quality health care. PHCs are operated by a team of two health care professionals trained un-

der the umbrella of the MoHP, one administrative member, and female community health volunteers (FCHVs). FCHVs, in particular, provide a variety of services, including health education (such as maternal and neonatal health care programs), community communication, and counselling.<sup>25,26</sup> To differentiate PHCs from ORCs, it is necessary to leverage FCHVs by organizing an FCHV team for each local community and entrusting it with community health promotion education and counselling tasks. In this regard, it is necessary for ORCs to assist community health promotion programs centred around PHCs' FCHV teams with a clinical approach and treatment, and to provide them with in-depth medical information if the need arises.

In this context, a flagship example is the health house project that was launched in 2019 by the Korea International Cooperation Agency, a Korean international organization. This project has been carried out in four rural mountain villages in Nepal. It organizes one health house for every 100 households and entrusts a five-member team, consisting of one FCHV and four community volunteers, with the role of monitoring local community public health. ORCs and PHCs jointly provide health check-up services and simple medical education to local schools, residents, and community health centres. To link these services and activities, it will be necessary to operate and manage community public health programs by integrating private health facilities, international organizations, and NGOs into a single local network centred on the MoHP.

This study had three main limitations. First, the participants were sampled not from the entire target population but from the residents of four districts in Nepal; hence, they may not be representative of all rural dwellers in Nepal. A follow-up study should be conducted for comparison using Nepal's national statistical data. Second, while ORCs provide health care services in all the four surveyed areas, considering that there are 18 ORCs operated by Dhulikhel Hospital across the country (see the appendix), it appears necessary to conduct additional research differentiating between the areas with and without ORCs. Third, given that Nepal's NSHI program has been implemented since 2016 and is still ongoing, some regions may have higher national health insurance coverage rates than others and, therefore, show patterns that differ from the results of this study. Thus, it is necessary to examine the determinants of decision-making pertaining to first-contact health facility, depending on whether the NSHI program has been implemented in a given area.

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## ETHICS STATEMENT

Provide the number of ethics approval(s) and the name of the body that issued it/them. If the study involved human participants, state the informed consent was obtained from all participants involved in the study or provide reasons why the consent from participants was waived. *(Delete if not relevant)*

## DATA AVAILABILITY

Provide details regarding the access to data supporting the reported results. If publicly available data were used, provide the link. *(Delete if not relevant)*

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## AUTHORSHIP CONTRIBUTIONS

HCL and EWN conceptualized the study. HYJ, BK, PS, and PSa were responsible for data curation. HCL, HYJ, and EWN performed formal analysis. HCL and EWN took care of funding the acquisition. HCL and EWN performed the methodologies mentioned. HCL and BS performed software analysis. HCL, HYJ, and EWN contributed to the original draft. All authors contributed to the writing (review and editing).

## DISCLOSURE OF INTEREST

The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and disclose no relevant interests.

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