Client Satisfaction and Quality of Curative Services for Sick Children in Nepal

Further Analysis of the 2015 Nepal Health Facility Survey

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ACRONYMS AND ABBREVIATIONS

AOR	adjusted odds ratio
AHW	auxiliary health worker
ANM	auxiliary nurse midwife
IMCI	integrated management of childhood illness
CB-IMNCI	Community-Based Integrated Management of Neonatal and Childhood Illness
CI	confidence interval
HA	health assistant
HP	health post
HTC	HIV testing and counseling
MoHP	Ministry of Health and Population
MBBS	Bachelor in Medicine and Bachelor in Surgery
NDHS	Nepal Demographic and Health Survey
NHFS	Nepal health facility survey
NHSS	Nepal health sector strategy
OR	odds ratio
ORS	oral rehydration solution
ORT	oral rehydration therapy
PCA	principle component analysis
PHCC	primary health care center
SARA	service availability and readiness assessment
SDG	sustainable development goal
SLC	school leaving certificate
SN	staff nurse
SPA	service provision assessment
UHC	urban health clinic
UHC	universal health coverage
WHO	World Health Organization

FOREWORD
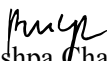
The 2015 Nepal Health Facility Survey (NHFS) is the first nationally representative comprehensive survey conducted as part of the worldwide Demographic and Health Surveys (DHS) project in the country. It combines the components of the Service Provision Assessment (SPA) survey of the Demographic and Health Surveys (DHS) Program, supported by the United States Agency for International Development (USAID); the World Health Organization (WHO) Service Availability and Readiness Assessment; the United Nations Population Fund (UNFPA) Facility Assessment for Reproductive Health Commodities and Services; and the Nepal-specific Service Tracking Survey, funded by the UK Department for International Development (DFID).

The standard format of the main report includes descriptive presentations of findings, without analytical and statistical methods to ascertain the significance of change, readiness index, and some causative association between variables. Although largely sufficient, the standard report is limited, particularly in providing answers to causation, which are essential in reshaping important policies and programs. After the dissemination of the 2015 NHFS, the Ministry of Health and Population (MoHP) and partners convened and agreed on key areas that are very important for assessing progress and gaps, and ascertaining determinants in MoHP high priority public health programs. In this context, further analyses have been conducted by technical professionals from the MoHP and the partners who are directly working on the focus areas with technical support and facilitation from research agencies.

The primary objective of the further analysis of the 2015 NHFS is to provide more in-depth knowledge and insights into key issues that emerged from the 2015 NHFS. This provides guidance in planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. The long-term objective of the further analysis is to strengthen the technical capacity of local institutions and individuals to analyze and utilize data from complex national population and health surveys in order to understand specific issues related to country need and situations. The further analysis includes topics on client satisfaction and quality of curative services for sick child, family planning, maternal health and health services availability and readiness in seven provinces of Nepal.

The further analysis of 2015 NHFS is the concerted effort of many individuals and institutions, and it is with great pleasure that I acknowledge the work that has produced this useful document. The participation and cooperation extended by the members of the Technical Advisory Committee in the different phases of the survey is highly regarded.

I would like to thank the Public Health Administration Monitoring and Evaluation Division (PHAMED) of MoHP for its effort and dedication to the completion of this further analysis of the 2015 NHFS. I extend my appreciation to USAID/Nepal for providing financial support for the further analysis. I would also like to acknowledge ICF for its technical assistance at all stages. My sincere thanks to the New ERA team for the overall management and coordination of the entire process.

Dr. Pushpa Chaudhary
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ABSTRACT

This study assessed the quality of care at health facilities in providing sick child care, using data from the 2015 Nepal Health Facility Survey. The measures of quality of care were divided into structure (infrastructure of the facility and availability of commodities), process (provider's performance), and outcomes (client's overall satisfaction with services). Associations between client satisfaction and structural and process attributes were analyzed using multiple regressions.

The average readiness score of health facilities to provide sick child services was 54.9, with some variation among different types of facilities, ecological regions, and provinces. The score was similar between public and private facilities. In examining process factors, we found that the large majority of children (86%) diagnosed with pneumonia received correct treatment, while less than half (44%) of those diagnosed with diarrhea received correct treatment.

Among the structural factors, such as frequency of services in a week, 24-hour availability of health workers, availability of an ORT corner and emergency transport, toilets for clients, etc.—though important aspects of quality of care—we found none significantly associated with client satisfaction. Process attributes, however, such as waiting time less than 30 minutes and receiving information from providers about the child's illness, were significantly associated with higher client satisfaction.

KEY WORDS: quality of care, service readiness, client satisfaction, sick child curative care, Nepal

EXECUTIVE SUMMARY

Nepal has made remarkable progress in reducing child mortality rates in the past two decades. An increase in access to child curative services in all public-sector facilities, however, has not been matched by improvements in the quality of care. Despite the fact that sick child outpatient services are freely available in public facilities, a growing number of people are seeking sick child services in the private sector. Improving the quality of care in health services remains a challenge. Assessment of client satisfaction and its association with factors related to service readiness and provision can help policymakers and program managers offer a higher quality of care and improve program performance.

The 2015 Nepal Health Facility Survey (NHFS) provides nationally representative data on child health services offered in formal sector health facilities of Nepal. This study uses data from the survey to examine the association of service-related factors with client's satisfaction for sick child curative services.

Methods

The study assessed three aspects of quality of care, as recommended in the Donabedian framework for assessing quality of care—structure, process, and outcome—as they relate to sick child services in Nepal. In addition, we examined a set of background attributes covering facility, provider, client and child characteristics that could affect quality of care. The structural characteristics assessed include the facility's management systems, service availability, physical infrastructure, and examination equipment. A service readiness score for child curative services was computed based on the five domains of readiness: guidelines and staff training; basic equipment; diagnostic test kit for malaria; medicines; and commodities. For measuring the process of care, we examined both compliance with CB-IMNCI protocol and interpersonal communication between clients. The outcome indicator examined—client satisfaction with sick child services—was measured as an index based on client's experience with 11 attributes faced at the health facility while receiving care. We used principle component analysis to examine the relationships between the variables. Analysis of structural and process attributes and client satisfaction was conducted at the facility level, provider level, and client level. Bivariate and multiple logistic regression analysis were used to assess the relationship between client satisfaction and structural and process aspects of quality of care at each level.

Results

Client satisfaction with child curative care is influenced by waiting time and by the relationship between provider and client. Clients who get service immediately or within 30 minutes of reaching the health facility are more likely to be satisfied with the care they receive compared with those who receive services after having to wait 30 minutes. Also, clients who receive information about the child's illness and care from the provider are more likely to be highly satisfied compared with those who do not receive information. Clients visiting private facilities are more likely to be satisfied with the child curative service received compared with those who receive services from public facilities, despite the fact that correct treatment for diarrhea and pneumonia was poor in private hospitals.

Conclusion

With the increase in access to curative child services, there needs to be matching improvements in quality of care. This is even more important in the private sector where care-seeking practices is

increasing. Reducing waiting time, improving the quality of counseling and providing caretaker with information on child's health care condition can improve client's satisfaction.

1   INTRODUCTION

Globally, substantial progress has been achieved in reducing child mortality in the past several decades. The total number of under-five deaths dropped from 12.6 million in 1990 to 5.6 million in 2016. In 2016, there were an estimated 15,000 under-five deaths per day, down from 35,000 deaths per day in 1990(UNICEF 2017). Child mortality differs substantially across regions and countries. In sub-Saharan Africa, for example, approximately one child in every 13 dies before the fifth birthday, compared with one in 189 in the world's high-income countries.

In 2016, neonatal deaths comprised 46% of all under-five deaths worldwide, an increase from 41% in 2000. The neonatal mortality ratio in 2016 was 19 deaths per 1,000 live births, about half the level in 1990, at 37 deaths per 1,000 live births. Globally in 2016, an estimated 2.6 million newborns died—an average of about 7,000 per day. Among the regions, Southern Asia and the sub-Saharan Africa have the highest neonatal deaths rates, at 39 and 38 deaths per 1,000 live births respectively. Almost half of these deaths occurred in five countries—India, Pakistan, Nigeria, the Democratic Republic of the Congo, and Ethiopia (WHO 2016).

If the momentum toward lower child mortality can be maintained, the global under-five mortality rate could be less than 25 deaths per 1,000 live births by 2030, as envisioned in the Sustainable Development Goals (SDGs). This could be possible, however, only if universal coverage for childhood services is achieved, while meeting international quality standards (WHO 2016).Most under-five deaths are caused by diseases and neonatal complications that are readily preventable or treatable with proven cost-effective interventions.

1.1   Trends in Childhood Mortality in Nepal

Nepal is one of the countries that have made significant reductions in child mortality. According to the Nepal Demographic Health Surveys (NDHS), Nepal reduced under-five mortality by 67% from 1996 to 2016, which is more than the global average reduction. Over the same period, infant and neonatal mortality in Nepal was reduced by nearly three-fifths. As Figure 1 shows, between 1996 and 2016 Nepal's under-five mortality rate declined from 118 to 39 deaths per 1,000 live births. Similarly, infant mortality fell from 78 deaths per 1,000 live births to 32 deaths per 1,000 live births, and neonatal deaths fell from 50 to 21 deaths per 1,000 live births. Between the surveys in 2006 and 2011, however, the pace of reduction for infant and neonatal deaths has been much slower. In fact, the neonatal mortality rate stagnated between 2006 and 2011. The 2016 NDHS found that about 54% of Nepal's under-five deaths are neonatal deaths (MoH, ERA, and ICF 2017).

Figure 1   Trends in Childhood Mortality in Nepal, 1996 to 2016

1996 NFHS 2001 NDHS 2006 NDHS 2011 NDHS 2016 NDHS

Neonatal mortality   Infant mortality   Under-5 mortality
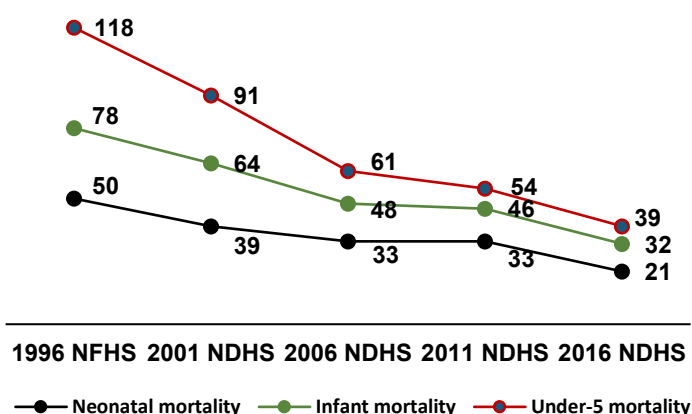
A number of interventions have contributed to the reduction of child mortality in Nepal. These include engaging communities to identify and treat diarrhea and pneumonia through Female Community Health Volunteers (FCHVs), addressing major childhood killer diseases using integrated approaches at health facilities, focusing on neonatal care and home-based preventive approaches, piloting of innovation and its scale-up based on evidence, and making other investments in maternal health, family planning, and access to safe water and sanitation. In the recent period, private sector health providers have also emerged and contributed to improving access to health services.

The Nepal Health Sector Strategy (NHSS) 2016-2021 guides priority activities in the health sector. Equitable access to health services and quality of care are two of the four approaches toward achieving universal health coverage. Sick child services constitute some of the basic health services that are provided free of cost at outpatient settings in government health facilities(MoH 2016).

The Ministry of Health and Population (MoHP) has adopted an integrated approach to identify, manage, and treat childhood diseases. To improve the treatment of sick children at the point of care as well as support the care-seeking behavior of families, the Child Health Division (CHD) of the Department of Health Services of the MoHP implemented the community-based Control of Diarrheal Disease and Acute Respiratory Infection (ARI) programs in 1990s, in which FCHVs were trained to manage diarrhea and pneumonia cases among under-five children. These two programs were later integrated and developed into the Community-Based Integrated Management of Childhood Illness (CB-IMCI) program in 1999. After successful piloting, the CB-IMCI was scaled-up in all 75 districts of Nepal by 2009/2010(DoHS 2015/2016).

The CB-IMCI package addressed the five childhood killer diseases or conditions—pneumonia, diarrhea, measles, malnutrition, and malaria—in an integrated way(MoH 2006). In mid-2000, neonatal survival emerged as a global priority, when it was realized that unless countries accelerated efforts to reduce neonatal deaths, the Millennium Development Goal of reducing under-five deaths by two-thirds would not be achieved. Nepal developed its first neonatal health strategy in 2006, and subsequently a Community-Based Newborn Care Package (CB-NCP) was piloted in 2008/2009. This package mobilized FCHVs to provide essential newborn care services and also to manage problems of birth asphyxia and low-birth weight. By 2014, this package was scaled-up in one-third of the country's districts (41 of 75)(MoH 2004, DoHS 2015/2016). In 2012, the CB-NCP program was assessed, and in 2014 some of its successful components were integrated into the CB-IMCI package. The result was the Community-Based Integrated Management of Neonatal Care and Childhood Illness (CB-IMNCI) package, which was rolled out throughout Nepal by 2017. In 2016-17, CHD also implemented facility-based IMNCI services in district and higher-level hospitals. This package focused on treatment of sick children in the in-patient wards of the primary health care centers and hospitals. Outpatient curative services for sick children provided through the CB-IMNCI package is free of cost in the public facilities below district level(DoHS 2015/2016).

Neonatal health has continued to remain the topmost priority for the MoHP, as 54% of under-five deaths occur the first 28 days of life(MoH, ERA, and ICF 2017). Recognizing a need to address neonatal mortality and morbidity, specialized neonatal services are provided in Specialized Neonatal Care Units (SNCU) and Neonatal Intensive Care Units (NICU). As of 2017, 13 SNCUs and 7 NICUs are functional in different hospitals, and eight SNCUs and four NICUs are in the process of establishment in Nepal. In 2016, the Government of Nepal decided to provide newborn care services free of cost in the public health facilities. Following this, all public-sector hospitals in Nepal have been providing free newborn care services.

The MoHP target is to reduce under-five mortality to 28 deaths per 1,000 live births by 2021, and to 20 deaths per 1,000 live births by 2030(MoH 2016, WHO 2016). Similarly, Nepal's goal for neonatal mortality reductions by 2021 and 2030 are 17.5 and 12 deaths per 1,000 live births respectively(MoH 2016, WHO 2016). The MoHP has also developed a long-term action plan to improve neonatal health—the Nepal Every Newborn Action Plan (NENAP)—aligning with the global Every Newborn Action Plan (ENAP), NHSS 2016-2021, and the SDGs(MoH 2016, 2014). For Nepal to achieve these ambitious targets, it is important to identify the bottlenecks of further mortality reduction, to make services for under-five children and newborns available at all levels of the health system, and particularly to improve the quality of care. The 2015 Nepal Health Facility Survey (NHFS) has shown that the overall quality of care at the health facilities of Nepal is not satisfactory(MoH et al. 2017).

In the private sector, the MoHP does not enforce the CB-IMNCI, and thus health workers are not trained on treatment and management protocols. Hence, the process and quality of care might be different in private hospitals than in the public sector. Given an increasing tendency among the general population to seek treatment for sick children in the private sector, the MoHP has paid greater attention to developing strategies to improve quality of care in the private sector. Implementation of CB-IMNCI strategy across the private sector could be one of the steps in achieving that goal.

1.2 Child Health Services Availability in Nepal

According to the 2015 NHFS, there are variations in the different type of child health services available at health facilities. Figure 2 shows that curative outpatient services are almost universal in all health facilities in Nepal, while child vaccination and growth monitoring are available in 87% and 93% of health facilities respectively.

Figure 2   Availability of child health services in Nepal
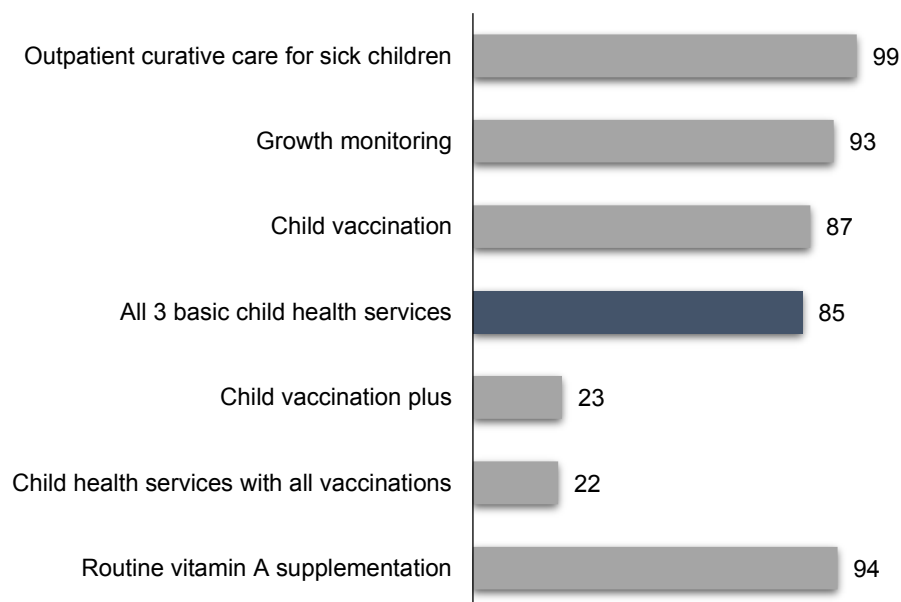
1.3 Sick Child Curative Service Availability in Nepal

Figure 3 shows availability of sick child curative services (outpatient only) by facility types (8). Of 940 health facilities[1]surveyed in 2015 in Nepal, outpatient curative care for sick children is available in all Zonal and above hospitals, Primary Health Care Centers (PHCCs), and Health Posts (HPs), while 9 in 10 private hospitals provide this service.

Figure 3   **Sick child curative service availability by facility types in Nepal, 2015**
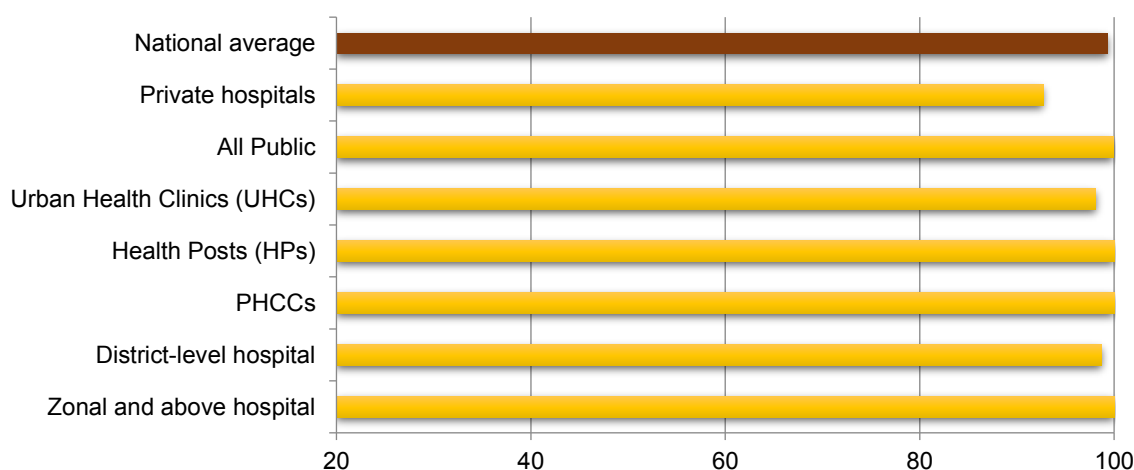
1.4 Health Facility Readiness and Quality of Care for Sick Child Services in Nepal

The NHFS final report provided information on the availability of curative services for sick children and on the readiness status of the facilities to provide the services. Data from client-provider interactions and exit interviews are also available that show different dimensions of quality of curative care provided at facilities. Compliance to protocols, timely delivery of services, child's history taking, and counseling are some of the areas of quality of care (QoC) that need to be improved. The final report has presented these data descriptively. The relationships between service availability, facility readiness, the process of care, and clients' experience of care have not been examined. This study will examine the associations between facility-level factors and client satisfaction, as an indicator of quality of care.

1.5 Conceptual Framework of the Study

The most common framework for assessing quality of care in health services is that of Donabedian, who posited three dimensions for service provision (Donabedian 1988).

1. Structure: the attributes of settings where care is delivered
2. Process: whether or not good medical practices are followed
3. Outcome: impact of the care on client's health status

The context or the structure in which health care is delivered affects processes and outcomes. For instance, if the facility is at an unpleasant place to be, people may not come, workers may not do a good

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[1]Excludes HIV testing and counselling centers and two central level hospitals which were not asked to provide sick child treatment services

job, and children may not be immunized. Outcomes indicate the combined effects of structure and process. Structure and process are readily measured.

Based on the Donabedian framework and a review of the literature, this study conceptualizes that client satisfaction with child curative care services may be influenced by background characteristics of caregivers themselves and the type of health facility, as well as structures available for sick child services and the process of care provided at the health facility. For this, the study examined the association of selected socio-demographic characteristics of clients, such as age, caste/ethnicity, education, child's sex, along with the type of facility visited, with client satisfaction with services received. Under structure attributes, the study examined how availability of trained providers, guidelines, medicines, supplies, and equipment at the health facility, the provider's occupational category and work experience, and the number of days that services were available in a week affected client satisfaction. Also, under process of care for sick children, the study examined the association of such variables as assessing sick child's medical history, making a physical examination, providing counseling to clients, and offering correct treatment of pneumonia and diarrhea with client satisfaction.
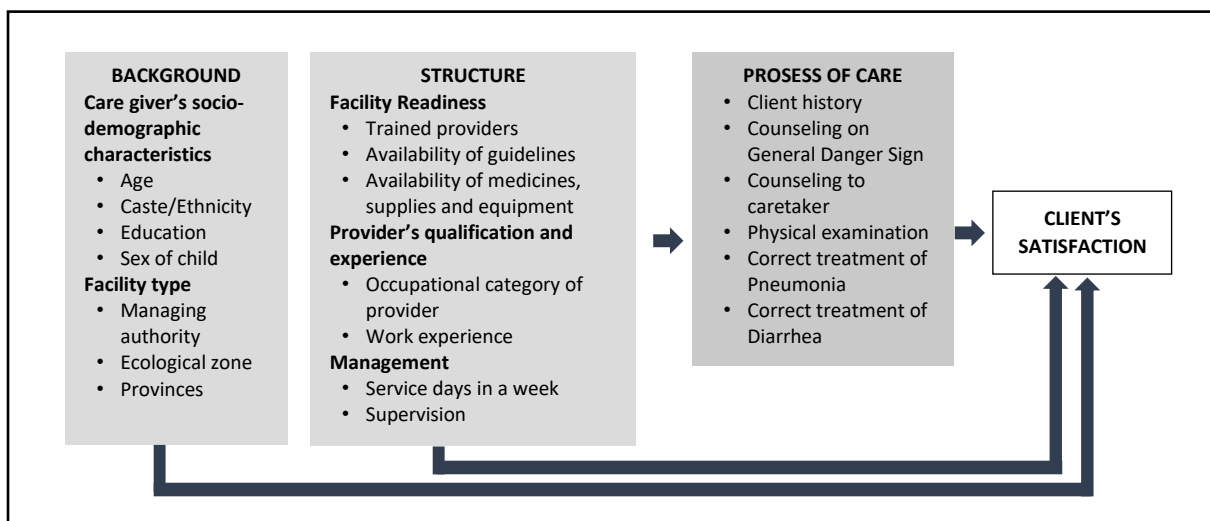
Review of the international literature suggests that clients who receive an explanation on the nature of the problem, receive a physical examination and advice on care from service providers, and have short waiting times at the health facility are more likely to be satisfied (Aldana, Piechulek, and Al-Sabir 2001). Facility characteristics, such as the type of facility, provider characteristics, such as work experience, and factors related to process of care are important predictors of client satisfaction(Wang 2014).

This study provides an insight into the quality of curative services provided to sick children in formal health facilities of Nepal. The study also offers evidence on the effect of the availability and readiness of child curative services. This objective of the study is to examine the level of client satisfaction with child curative services and to identify factors associated with client satisfaction in health facilities in Nepal. In light of this objective the analysis seeks to answer following questions:

- Are structural and background factors associated with process of care?
- Are structural and background factors associated with client satisfaction?
- Is process of care associated with client satisfaction?

- Which factors—service readiness, process of care, socio-demographic characteristics, or geographical location—are relatively more important for client satisfaction?

The study thus aims to examine the covariates associated with client's satisfaction in curative services for sick children to understand and identify areas that require further attention and improvements. The study also examines covariates associated with the process of care to sick children.

2   METHODS

This analysis uses data from the 2015 Nepal Health Facility Survey (NHFS), a nationally representative survey of formal health facilities. The data for the analysis of child health service provision were collected using the following methods:

1. The Inventory Questionnaire collected information on staffing, staff training, infrastructure, medicines, supplies, and services offered in health facilities,
2. Interview with sample of service providers at the facility collected required information on their qualifications, professional experience, and perceptions of the service delivery environment.
3. Observation of services provided to sick children to assess if the facilities and service providers adhered to service delivery guidelines and standards.
4. Exit interviews with the clients on the sick child service they received at the facility. This included their experience as service seekers at the facility, opinion on the instruction provided to them, and perception on the quality of treatment received.

2.1   Sample Size and Unit of Analysis

A total of 963 health facilities were successfully included in the survey. By design, the sample included all non-specialized government hospitals, all private hospitals with 100 or more inpatient beds, and all PHCCs. The remainder of the sample consisted of sampled health posts, private hospitals with at least 15 beds but fewer than 100 beds, stand-alone HTC sites, and UHCs.

The 2015 NHFS used a stratified random sample of 1,000 health facilities selected with equal probability systematic sampling. Stratification was achieved by separating the health facilities by facility type/management authority within each domain. The private hospitals were further stratified by number of beds within domain: 100 or more beds, and fewer than 100 beds, where applicable. The sample allocation featured a complex allocation by taking many factors into account. Since the 2015 NHFS sample was a stratified sample, sampling weights were calculated based on sampling probabilities separately for each sampling stratum. The NHFS final report provides more detail on the methodology used in this survey (MoH et al. 2017).

This study uses data from 934 health facilities that offered curative services for sick children. In these facilities 2,186 sick children were observed during service provision, and for each sick child observed one client (caretaker) was interviewed. The unit of analysis considered for this study is the sample of 2,186 sick child/clients. Complex sample design was accounted for in the analysis.

In this study, we used the terminology "child curative services" instead of "CB-IMNCI" because CB-IMNCI strategy is not followed in the private hospitals. In our analysis, we have samples from private hospitals too. For the public sector facilities curative service for sick children is the same as CB-IMNCI. In this study "Clients" refer to the caretakers of the sick child who accompanied the child to the facility.

2.2   Measurements of Quality of Care

The quality of care of the sick child services is mainly measured through two sets of variables, categorized as structural attributes and process attributes, as recommended by the Donabedian framework. According to the Donabedian framework, structural attributes of quality at the facility can be determined through physical infrastructure, examination equipment, management systems, availability of services, and the counseling environment. Previous studies(Wang 2014) and the WHO Service Availability and Readiness Assessment (SARA) manual were also used to guide the selection

of indicators for structural attributes. The structure attributes included in this study are categorized as following:

- Health facility readiness attributes: availability of IMNCI guideline, IMNCI trained staff, growth monitoring guideline, infant and child weighing scale, timer, thermometer, stethoscope, malaria test (applicable to 65 malaria high risk districts, out of 75), ORS, Amoxicillin, Cotrimoxazole, Paracetamol, Albendazole, Vitamin A, and zinc. Data for this component came from two tools of the 2015 NHFS: i) Inventory Questionnaire, which included interviews with the most knowledgeable service provider with observation of the items and medicines, and ii) Health Provider Questionnaire, which included interviews with health worker providing IMNCI services. These attributes were computed using a principal component analysis (PCA) model (poor, medium, and good) for the facility readiness composite index.

- Health facility management attributes: i) external supervision in last four months, ii) facility management meeting, iii) system for collecting opinion, and iv) supervision done and feedback received by providers. Data for these variables came from the Inventory Questionnaire.

- Quality assurance attributes: i) infection control, ii) quality assurance activities officially recorded, iii) availability of ORT corner, iv) protected client waiting area, v) staff available 24 hours, and vi) availability of emergency transport. Data for these variables came from the Inventory Questionnaire.

Guided by the Donabedian framework, we included nine variables as attributes of the process of care: i) history taking, ii) physical examination, iii) number of danger signs assessed, iv) provider recording in child health card, v) follow up of sick child discussed with caretaker, vi) waiting time, vii) paying for service, viii) distance to reach facility measured in terms of time take to reach the facility, and ix) diagnosis and treatment discussed with caretaker. Data for the process attributes came from observation of client-provider interactions and exit interviews with clients. The process of care is also treated as intermediate outcome in this study.

The outcome variable—client satisfaction—was measured using the responses about service quality in caretaker/client exit interviews for sick child services received. There were altogether 11 aspects of problems encountered by clients during the visit, which also represents client perceptions of the quality of visit. From these reports of encountered problems, a satisfaction variable was rated as a dichotomous index (no problems vs others). (See Annex 1 for the list of questions asked for the determination of client satisfaction). The responses after making the dichotomous rating were later aggregated in an index of client satisfaction using PCA. Variable loadings from the first component that resulted from the PCA were used to compute an index for client satisfaction. The index was made dichotomous (high satisfaction and low satisfaction), splitting at the median level. The clients who were not at all satisfied were included into low-satisfaction category.

STATA 15.0 software was used to run frequencies on the variables of interest to this analysis. The relevant facility, provider, and client weights were used to account for selection probabilities. PCA was used to construct facility readiness score as defined by WHO SARA (Annex 2), and the client satisfaction score. Cronbach's alpha was estimated before creating the scores (Annex 1).

The univariate and the bivariate analysis summarize the results in percentage. The bivariate analysis also uses chi-square statistics to measure the association of each of the independent variables with the outcome variable. The bivariate and multivariate logistic regression use the odds ratio to gauge the effect size of the independent variable on the outcome variable, and a P value derived from the t-

statistics measure the strength of the differences in the effect size across categories of variables considered.

This analysis used client satisfaction as the dependent variable, and three broad categories of independent variables: i) facility, provider, and client and child background characteristics, ii) structural factors, and iii) process of care. In bivariate analysis, the associations between the outcome variables and the three categories of independent variables were analyzed. Pearson chi-squared tests were done to test the association between the dependent and independent variables, while unadjusted odds ratios were run to find out the magnitude of the variables. Since numerous variables were included in the three categories of independent variables, the effect of multicolinearity was checked and those variables found to be highly correlated were dropped, but while dropping the variables the theoretical and practical evidence was checked with a literature search. Those dropped variables are facility type, frequency of child health services in a week, and sex of child. Treatment of pneumonia and diarrhea was also not taken for the regression modeling, due to small sample size. All remaining variables were modeled into the multivariate analysis, where logistic regression was applied.

Additionally, association of adherence to process of care with background characteristics and structural factors were also analyzed following the same methods as described above.

3 RESULTS

3.1 Client and Caretaker Characteristics

A total of 2,186 sick children whose consultation were observed and clients interviewed comprised the unit of analysis of this study. Table 1 presents the demographic characteristics of children and the clients. One-quarter of the sick children were age 12-23 months, and 19% were age 24-35 months. Children under age 6 months were only 13% of the total. Among all children, 55% were male and 45% were female. Nearly half (47%) of the clients were age 25-39, followed by 43% age 10-24. Nearly one-third (31%) of the clients were Bhramin/Chettri, followed by Janajatis (28%). Nearly two-fifths (37%) of the clients had no formal school education or had never been to school, while 30% had secondary or higher level of education. For the majority of clients (89%), it was their first visit to the facility for treatment of the child's sickness.

Table 1   **Distribution of clients/child by demographic and other characteristics**

	Percent	Number	CI
Child characteristics			
Age of child in months			
>6	13.2	287	11.5-15.0
6-11	17.3	377	15.3-19.5
12-23	25.0	547	23.0-27.0
24-35	18.8	410	16.7-21.1
36-47	14.3	312	12.4-16.5
48-49	11.5	250	9.8-13.4
Sex of child			
Female	44.6	976	41.7-47.7
Male	55.4	1,210	52.3-58.3
Caretaker characteristics			
Age of clients[1]			
10-24 years	43.4	917	40.5-46.3
25-39 years	46.8	989	43.6-49.9
40 years and above	9.9	208	7.9-12.2
Caste/ethnicity of clients[2]			
Bhramin/Chettri	30.6	668	27.8-33.5
Janajati	27.5	601	24.3-31.0
Terai and other Madhesh caste	21.4	469	18.1-25.2
Dalit/Muslim/others*	20.5	447	17.5-23.7
Education of clients			
Never been school	37.2	814	33.7-40.9
Less than 10 years of schooling	32.8	717	30.1-35.7
SLC and above	30.0	655	27.0-33.1
Time of visit			
First visit	89.1	1,947	86.8-91.0
Follow-up visit	10.9	239	9.0-13.2
Total		**2,186**	

[1] Don't know cases excluded from analysis (61 unweighted cases).
[2] 42 unweighted cases were missing.
* Others in the Caste/ethnicity of clients include Marwari, Bangali, Jain, Punjabi/Sikh, and unidentified others.

3.2   Distribution of Health Facilities and Service Providers

The 2,186 child analyzed in the survey came from 934 health facilities that were surveyed in 2015 NHFS and that provided sick child curative services. Table 2 shows the distribution of health facilities analyzed in this study and the service providers interviewed. On average, for every health facility surveyed, three service providers were interviewed. Findings reveal that 86% of facilities were health posts and urban health clinics, followed by private hospitals (7%) and PHCCs (5%).

About 70% of providers were in health posts and urban health clinics, followed by private hospitals (15%) and PHCCs (8%).

The fact that the great majority of facilities and providers were health posts and urban health posts is mainly because these types of facility comprise nearly 84% of all formal sector health facilities in Nepal.

Table 2	Distribution of facilities and providers used in the analysis		
		Percent (weighted)	**Number weighted**
Facilities			
Zonal and above hospitals		0.6	6
District level hospitals		1.7	15
Private hospitals		6.9	65
PHCCs		4.5	42
HPs/UHCs		86.2	805
	Total	**100.0**	**934**
Providers			
Zonal and above hospitals		2.2	62
District level hospitals		4.8	132
Private hospitals		14.9	406
PHCCs		8.1	222
HPs/UHCs		69.9	1,912
	Total	**100.0**	**2,735**

HPs and UHCs are merged due to similar characteristics in term of services and staffing pattern and low number of cases in UHCs.

3.3   Distribution of Sick Child by Facility and Provider Characteristics

Table 3 presents the child distribution by facility and provider characteristics. More than 8 in every 10 child received services from public health facilities, and 6 in every 10 from health post. Nearly half of the child (47%) were Terai residents, and one-fourth were in Province 2. About 7 in every 10 children were examined by paramedics/nurses, while slightly more than one-fourth of children (29%) were examined by pediatricians or MBBS doctors. About two-thirds of service providers (67%) had 10 years or less of working experience, while 62% of service providers reported that they had received child service specific supervision and feedback from higher institutions within the previous six months.

Table 3   Distribution of child by facility and provider characteristics

Background characteristics	Percent	Number	CI
Facility characteristics			
Facility type			
Zonal and above hospital	7.5	164	4.9-11.4
District-level hospital	10.8	235	8.3-13.8
Private hospitals	14.1	308	11.7-16.9
PHCCs	6.7	146	6.1-7.4
HPs/UHCs	60.9	1,332	57.8-64.0
Managing authority			
Public	85.9	1,878	83.1-88.3
Private	14.1	308	11.7-16.9
Ecological region			
Mountain	8.7	189	7.5-10.0
Hill	44.7	977	41.6-47.9
Terai	46.6	1,019	43.4-49.9
Provinces			
1	13.8	302	11.2-16.9
2	24.2	530	20.3-28.6
3	25.6	559	22.3-29.2
4	7.3	160	5.7-9.3
5	13.2	289	10.8-16.0
6	6.9	150	5.2-9.0
7	9.0	197	7.5-10.8
Provider characteristics			
Work experience of providers[1]			
0-5 years	40.4	866	35.4-45.6
6-10 years	26.5	354	13.0-20.7
More than 10 years	43.1	924	37.9-48.5
Category of service providers[1]			
Pediatrician	13.6	292	10.5-17.6
MBBS doctor	15.2	326	12.2-18.8
Paramedics/Nursing	69.7	1,494	66.3-72.9
Other clinical staff not listed above	1.5	31	0.7-2.9
Supervision and feedback received[2]			
Supervision with feedback received within 6 months	62.4	1,338	57.2-67.4
Supervision without feedback received within 6 months	7.1	152	5.2-9.7
Supervision not done within 6 months	30.5	653	25.8-35.6

[1] Don't know cases excluded from analysis (61 unweighted cases)
[2] 42 unweighted cases were missing.

3.4   Service Readiness to Provide Child Curative Care

The average child service readiness score represents the overall readiness status of the health facility to provide child curative care. The average readiness score is a composite indicator calculated from the range of indicators from four domains, as per the WHO SARA indicators. The four domains are i) guidelines (IMNCI/IMCI and growth monitoring) and staffed trained on IMNCI/IMCI, ii) basic equipment, iii) diagnostic test kit for malaria, and iv) commodities necessary for the treatment/management of sick children. Each domain carried equal weights.

Figure 4   Average service readiness score for sick child service
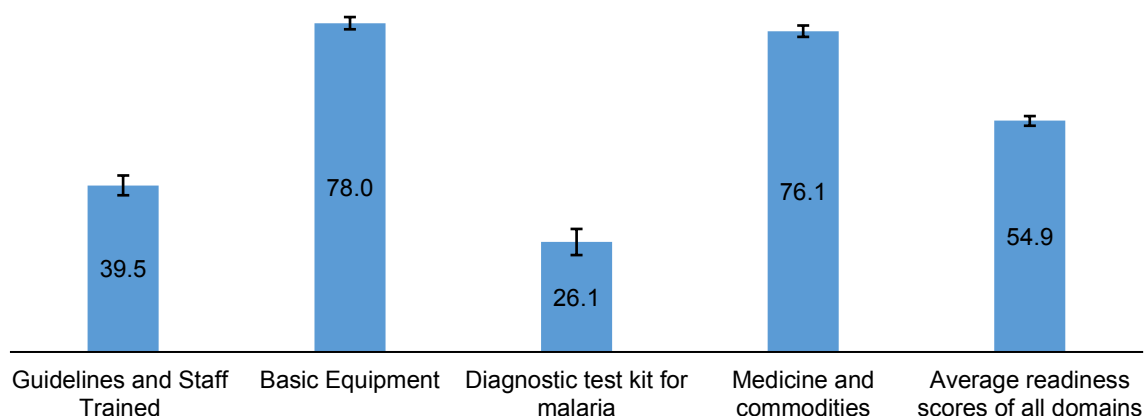
The average readiness score of health facilities to provide sick child services analyzed in the study was 54.9. As Figure 4 shows, of the four domains, the readiness score was lowest for diagnostic test kit (26.1) for malaria, and highest for basic equipment (78.0). Diagnostic test kit for malaria was accounted for only in malaria endemic districts (65 out of 75). Table 4 also shows that the mean readiness score was highest among district hospitals and PHCCs. No remarkable difference was observed in the mean readiness index of private and public health facilities. In district and private hospitals, the score for availability of guidelines and trained staff was less than 5. Scores for diagnostic test kit were highest for all facility types except HPs/UHCs among the four domains.

Table 4   Sick child service readiness score by domains and by facility characteristics

Background characteristics	Guidelines and staff trained	Basic equipment	Diagnostic test kit for malaria[1]	Medicine and commod-ities	Average readiness scores of all domains	Weighted number
Facility type						
Zonal and above hospital	15.8	73.1	74.3	63.0	56.5	6
District hospital	35.8	82.4	73.3	82.3	68.4	15
Private hospital	3.6	66.0	95.9	58.5	55.7	65
PHCC	43.2	81.8	61.6	78.3	66.2	42
HPs/UHC	42.4	78.8	17.4	77.4	53.9	806
Managing authority						
Public	42.1	78.9	20.9	77.5	54.8	65
Private	3.6	66.0	95.8	58.5	55.7	869
Ecological region						
Mountain	38.7	79.6	35.9	78.4	58.2	118
Hill	40.1	80.2	18.2	78.0	54.1	480
Terai	39.0	74.4	34.0	72.7	54.9	336
Province						
1	37.7	78.5	24.2	76.3	54.2	161
2	39.2	69.3	25.8	71.3	51.4	171
3	35.1	79.1	40.6	77.6	58.0	184
4	41.4	83.8	15.3	80.5	55.2	119
5	46.9	81.1	16.9	78.4	55.8	137
6	41.7	76.9	27.1	71.4	54.2	74
7	37.3	80.5	28.1	76.5	55.6	89
Total	**39.5**	**78.0**	**26.1**	**76.1**	**54.9**	**934**

[1] Diagnostic test kit for malaria is taken only in malaria endemic districts and the total number of facilities for this is 858.

Additional information on distribution of structural and process of care variables is provided in Annex 3.

3.5 Process of Care

3.5.1 History taking and examination

In order to assess the process of care, observation of sick child examination and case management by service providers was made based on the CB-IMNCI protocol for both public and private health facilities. History taking and assessment are two important components of IMNCI. History taking includes assessment of general danger signs, followed by assessment of major symptoms. In IMNCI there area set of physical examinations for sick children age 0-59 days and 2-59 months. Our analysis accounted for four physical examinations that are common to both age groups. These include: i) measuring body temperature/fever, ii) skin turgor for dehydration assessment among diarrhea cases, iii) weighing the child, and iv) counting respiration rate for all cases under age 2 months and only for sick children age 2-59 months with cough or respiratory problems. In addition, three physical examinations were included only for children age 2-59 months: i) examination of pallor on palm, ii) examination of conjunctiva, and iii) examination of ear pain/discharges. Altogether, seven physical examinations for sick children were taken into consideration.

Counseling clients, providing complete information about the disease, and giving instructions for follow up visits are also important components of CB-IMNCI that providers need to follow during service provision.

Figure 5 presents the findings on process of care for six components of the CB-IMNCI analyzed. Danger sign assessment was done for only 11% of sick children in our sample. Child history taking (at least three) and physical examination (at least five) of seven was done for only 30% and 41% of the sick children respectively.

Provider recording on the child health card was found in 69% of the observations of sick child examinations. Telling clients about follow-up visits, and providing information to clients about the child's illness was done for only around a quarter of cases.

Figure 5   Percentage of child receiving different services

3.5.2   Diagnosis and correct treatment for pneumonia and diarrhea

Of the 2,186 sick child cases analyzed, 177 were diagnosed with pneumonia. Of these cases, 92% were in public and 8% in private health facilities. Similarly, 356 cases were diagnosed with diarrhea, of which 97% were in public and 13% in private health facilities. We also examined the correct treatment provided to children with pneumonia and diarrhea based on the variables included in the survey. In this analysis, correct treatment of pneumonia is defined as the pneumonia cases prescribed with Cotrimoxazole tablets/syrup or Amoxicillin tablets/syrup. Similarly, correct treatment of diarrhea is defined as the diarrhea cases prescribed with the zinc and ORS. Figure 6 shows that correct treatment for pneumonia was more common than correct treatment for diarrhea. Overall, 86% of children diagnosed with pneumonia received correct treatment compared with only 44% of children diagnosed with diarrhea. Analysis by managing authority, however, shows that in private facilities very few child with pneumonia and diarrhea received correct treatment, while in the public sector more than 90% received correct treatment. However, these data need to be cautiously interpreted, as the number of cases observed in private facilities was small.

Figure 6   Percentage of child with diarrhea and pneumonia receiving correct treatment

95.8, n=162

86.3, n=177

91.8, n=310

44.2, n=356

4.2, n=15

8.2, n=46

Treatment of Pneumonia   Treatment of Diarrhea

■ Public ■ Private ■ Total
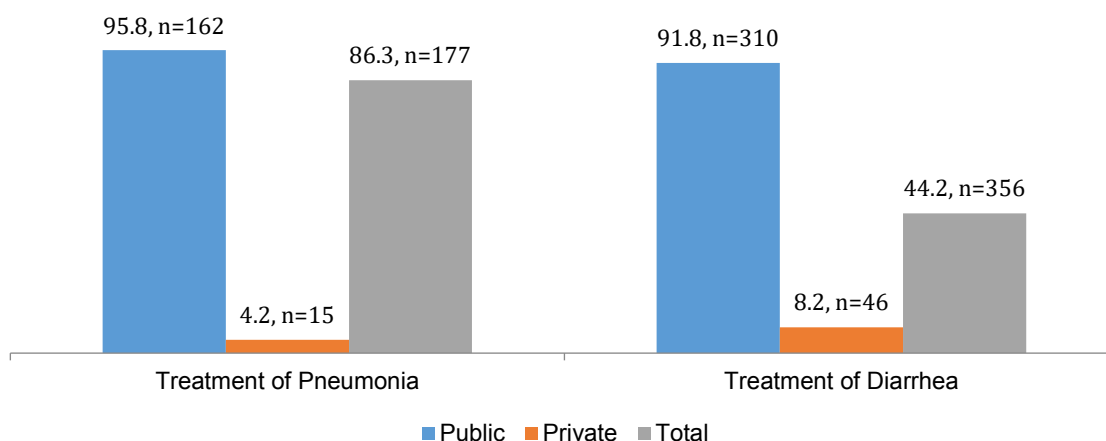
3.5.3   Adherence to process of care

The variable for adherence to process of care for sick child services was constructed using the six tracer items used to measure process of care. They are: i) at least three symptoms asked; ii) at least two general danger signs examined; iii) at least two types of information provided to caretaker; iv) at least five physical examinations completed; v) provider recorded on child health card; and vi) provider discussed follow-up visit with client. Using the variables, an index of adherence to process of care was developed, which had binary outcomes. The median of the index was taken as a cut-off point.

Figure 7   Adherence to process of care by health facility readiness

43.4

29.7   31.4   32.8

Poor   Medium   Good   Total
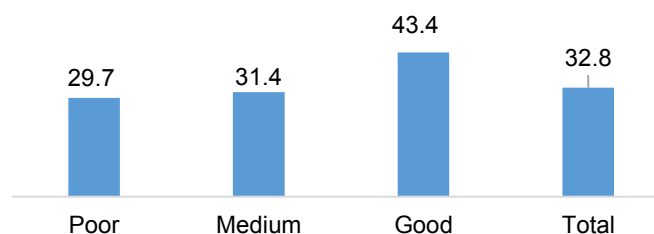
Figure 7 shows adherence to good process of care by facility's readiness to provide sick child services. On average, the adherence to process of care score of all the observations was only 32.8. The score declined as the facility readiness declined from good to poor. The child who received sick child services from the facilities with a good readiness score had the highest adherence to process of care, at 43.4.

3.6   Client Satisfaction

Client satisfaction—representing caretaker's satisfaction with the curative care offered for the sick child—has been categorized into high satisfaction and low satisfaction based on the median value computed with PCA on 11 common problems experienced by clients at health facilities. The 11 problems were recorded as four categories: i) major, ii) minor, iii) no problem, and iv) don't know. For our analysis the 11 problems were first made dichotomous by combining the three responses, major, minor, and don't know, into a low satisfaction category, while keeping the "no problem" category as representing high satisfaction, and then computed via PCA (see Annex 1). Figure 8 shows that the proportions of client with low satisfaction were similar to those of client who had high satisfaction.

Figure 8   Proportion of client satisfaction by facility types
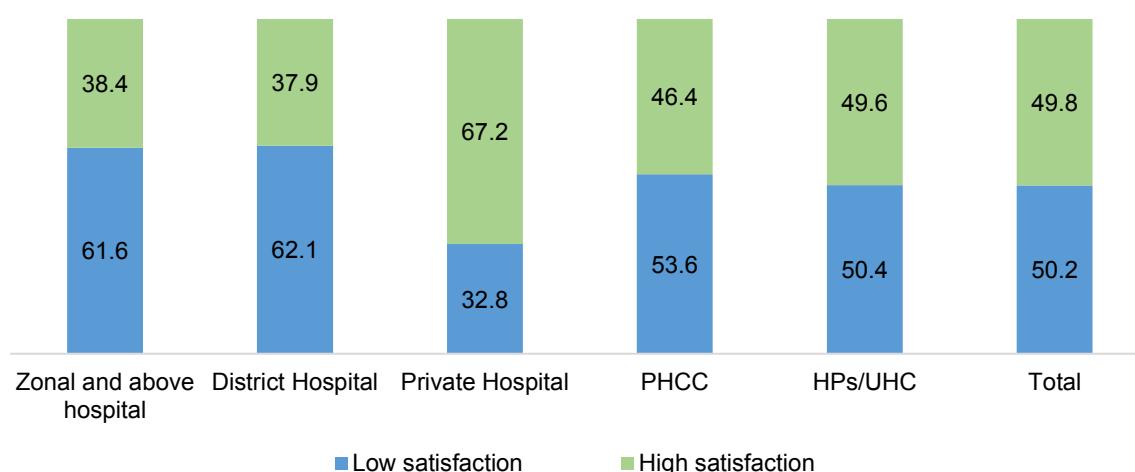
3.7   Bivariate Analysis

3.7.1   Bivariate association between adherence to process of care and background attributes related to facility, provider and client

The bivariate analysis on adherence to process of care shows that the provider's adherence with child curative care differed significantly by facility type, managing authority, ecological zone, and province.

As Table 5 shows, adherence to process of care was highest in private facilities, followed by lower-level public facilities such as PHCCs and HPs/UHCs. Adherence to process of care was highest for care provided to children of Janajatis, followed by Brahmin/Chhetri. Except for caste/ethnicity of clients and their children, none of the other characteristics of clients or providers were associated with adherence to process of care.

Table 5   Adherence to process of care by facility, provider, client, and child characteristics

Background characteristics	Adherence to process of care (%)	95% CI	p-value
Facility type			
Zonal and above hospital	31.2	23.7-39.9	0.002
District-level hospital	27.6	19.1-38.0	
Private hospitals	48.7	38.2-59.3	
PHCCs	33.4	28.4-38.7	
HPs/ UHCs	30.2	25.8-35.0	
Managing authority			
Public	30.2	26.8-33.9	
Private	48.7	38.2-59.3	0.001
Ecological region			
Mountain	38.7	30.5-47.6	
Hill	38.0	33.4-42.9	
Terai	26.7	21.7-32.4	0.002
Provinces			
1	40.9	31.1-51.4	0.000
2	16.2	10.6-24.0	
3	39.0	32.1-46.4	
4	37.8	28.1-48.6	
5	39.9	30.1-50.4	
6	29.3	21.2-38.9	
7	35.9	26.7-46.1	
Category of Service providers			
Pediatrician	41.5	33.5-49.9	0.099
MBBS doctor	31.3	24.0-39.7	
Paramedics/Nursing	30.7	26.6-35.0	
Others	49.0	21.2-77.4	

Background characteristics	Adherence to process of care (%)	95% CI	p-value
Work experience of providers			
0-5 years	33.2	28.1-38.7	0.07
6-10 years	40.7	40-49.1	
More than 10 years	29.0	24.2-34.2	
Clients age (in years)			
10-24	33.1	28.4-38.1	0.121
25-39	34.7	30.4-39.4	
40 and above	24.3	16.9-33.7	
Caste/Ethnicity of clients			
Brahmin/Chettri	35.8	31.2-40.6	0.000
Janajati	44.1	37.6-50.9	
Terai/Madhesh other caste	19.9	14.6-26.5	
Dalit/Muslim	26.8	20.9-33.7	
Education of clients			
Never been school	26.6	21.4-32.6	0.006
Less than ten years of schooling	35.4	30.6-40.4	
SLC and Above	37.7	32.6-43.2	
Sex of child			
Female	31.7	27.5-36.3	0.464
Male	33.7	29.7-38.0	
Clients' visit to the facility			
First visit	32.9	29.4-36.7	0.801
Follow-up visit	31.9	25.1-39.5	
HFs close to home			
Yes	40.7	32.0-50.0	0.054
No	31.7	28.2-35.4	

*** p<0.001; ** p<0.01; * p<0.05

3.7.2 Bivariate association between adherence to process of care and structure attributes

Thirteen variables were examined for structural factors in the bivariate analysis. Results show that only three variables are significantly associated with adherence to process of care (Table 6). Facilities providing fewer than two child health services have higher adherence to process of care. Similarly, facilities with a system for collecting clients' opinions also seem to have higher adherence to process of care. As could be expected, facilities with good readiness status seem to have higher adherence to process of care.

Table 6   Adherence to process of care by structural attributes

Structural characteristics	Adherence to process of care (%)	95% CI	p-value
Number of child health services[1]			
More than or equal to 2	32.0	28.7-35.5	0.018
Less than 2	52.8	35.3-69.6	
Frequency of child curative services in a week			
Less than 5 days	35.3	10.4-72.1	0.889
5 or more days	32.8	29.5036.3	
24 hours availability of HW			
Yes	31.6	27.4-36.2	0.327
No	35.0	30.0-40.4	
Availability of ORT Corner			
Yes	35.4	29.8-41.4	0.305
No	31.6	27.5-36.0	
Emergency Transport			
Yes	29.8	23.7-36.7	0.298
No	33.9	30.0-38.1	
Status of infection control items[2]			
Poor	30.8	26.5-35.4	0.186
Medium	37.4	31.3-43.9	
Good	31.5	22.7-41.9	
External supervision received by the facility in last 4 months[3]			
Yes	29.6	24.3-35.5	0.173
No	34.7	30.5-39.3	
Facility management meeting			
Never	34.3	26.9-42.5	0.876

	Adherence to process of care (%)	95% CI	p-value
Sometimes	34.2	24.9-44.9	
Regularly	32.3	28.3-36.6	
Structural characteristics			
System for collecting clients' opinion			
Yes	36.7	32.0-41.6	0.012
No	27.5	22.9-32.7	
Quality assurance activities officially recoded in past year			
Yes	30.1	26.3-34.2	0.009
No	40.5	33.9-47.4	
Protected client waiting areas			
Yes	19.2	11.7-29.9	0.008
No	35.1	31.5-38.8	
Facility readiness status			
Poor	29.7	24.3-35.7	
Medium	31.4	26.6-36.6	0.017
Good	43.4	36.1-51.1	
Supervision done and feedback received by the providers[4]			
Supervision done and feedback received within 6 months	31.2	27.0-35.8	
Supervision done but feedback not received within 6 months	39.1	27.2-52.5	0.480
Supervision not done within 6 months	33.6	27.6-40.1	

*** p<0.001; ** p<0.01; * p<0.05

[1] Number of child curative services includes availability of child curative, vaccination and growth monitoring services.

[2] Infection control items include soap, running water and alcohol-based hand disinfectant, waste receptacle, safety box, gloves, safety precaution guidelines, and needle destroyer.

[3] This includes whether the facility received any external supervision e.g. from the district, regional, and national office. This one is taken from the facility inventory questionnaire.

[4] This includes the personal supervision done and feedback received by the providers from a supervisor, either in the facility or from outside the facility. This one is taken from the health service providers interview

3.7.3 Bivariate association between client satisfaction and background attributes related to facility, provider, client and child

Bivariate analysis shows that client's satisfaction is associated with facility attributes at the 95% confidence interval (CI) (Table 7). Satisfaction of the client with sick child curative care differs significantly by facility type and by managing authority. Clients are more satisfied when the service is received from private facilities and lower-level public facilities such as HPs and UHCs than in higher-level or other public facilities. A greater proportion of clients from health facilities in Province 4 and 3 than in other provinces said they are highly satisfied with sick child services. There is no apparent significant association between client satisfaction and provider or child/client characteristics.

Table 7   Client satisfaction by facility, provider, client, and child characteristics

Background characteristics	High satisfaction (%)	95% CI	p-value
Facility type			
Zonal and above hospital	38.4	27.3-50.9	0.0000***
District-level hospital	37.9	31.0-45.3	
Private hospitals	67.2	57.3-75.9	
PHCCs	46.4	40.9-52.0	
HPs/ UHCs	49.6	44.3-54.9	
Managing authority			
Public	46.9	42.8-51.0	0.000*
Private	67.2	57.3-75.9	
Ecological region			
Mountain	43.7	34.0-53.9	0.079
Hill	54.2	49.0-59.3	
Terai	46.6	40.4-53.0	
Provinces			
1	42.0	34.3-50.2	0.013*
2	49.7	40.1-59.3	
3	56.9	49.7-63.9	
4	58.0	45.9-69.1	
5	53.1	42.8-63.2	
6	30.4	19.6-44.1	
7	44.7	34.6-55.1	
Category of service providers			
Pediatrician	55.5	44.2-66.2	0.541
MBBS doctor	47.5	39.9-55.3	
Paramedics/Nursing	49.0	44.2-53.8	
Others	49.5	32.2-66.8	
Work experience of providers			
0-5 years	47.1	41.7-52.5	0.410
6-10 years	53.8	46.6-60.9	
More than 10 years	50.5	43.7-57.3	
Clients age (in years)			
10-24	51.3	46.4-56.3	0.762
25-39	49.0	44.7-53.3	
40 and above	50.4	39.0-61.8	
Caste/Ethnicity of clients			
Brahmin/Chettri	49.7	43.9-55.6	0.360
Janajati	54.1	47.9-60.2	
Terai/Madhesh other caste	48.6	39.4-57.9	
Dalit/Muslim	45.2	38.1-52.4	
Education of clients			
Never been school	49.0	42.5-55.6	0.923
Less than 10 years of schooling	50.0	45.1-54.9	
SLC and above	50.4	44.9-55.9	
Sex of child			
Female	51.5	46.7-56.3	0.311
Male	48.3	43.4-53.3	
Clients' visit to the facility			
First visit	49.3	45.3-53.3	0.380
Follow-up visit	53.4	44.7-61.8	
HFs close to home			
Yes	49.2	45.2-53.1	0.446
No	54.1	42.0-65.7	

*** p<0.001; ** p<0.01; * p<0.05

3.7.4   Bivariate association between client satisfaction and structure attributes

As Table 8 shows, thirteen variables were examined for structural factors in the bivariate analysis. Although structural factors such as frequency of child curative services in a week, 24 hours' availability of health workers, availability of ORT corner and emergency transport, toilets for clients etc. are important aspects of service provision, none of the attributes was found to be significantly associated with the client satisfaction.

Table 8   Client satisfaction by structural attributes

Structural characteristics	High satisfaction (%)	95% CI	p-value
Number of child health services[1]			
More than or equal to 2	49.8	45.9-53.7	0.889
Less than 2	48.8	36.0-61.8	
Frequency of child curative services in a week			
Less than 5 days	23.2	6.0-58.6	0.110
5 or more days	49.9	46.1-53.7	
24 hours availability of health workers			
Yes	50.1	44.1-56.1	0.896
No	49.6	44.6-54.5	
Availability of ORT Corner			
Yes	49.2	44.4-54.0	0.661
No	51.0	44.7-57.2	
Emergency Transport			
Yes	48.0	43.9-52.1	0.152
No	54.6	46.5-62.5	
Status of infection control items[2]			
Poor	50.5	45.2-55.8	0.732
Medium	47.7	41.7-53.8	
Good	52.0	40.6-63.1	
External supervision received by the facility in last 4 months[3]			
Yes	47.2	43.0-51.5	0.118
No	54.0	46.7-61.2	
Facility management meeting			
Never	44.8	36.8-53.1	
Sometimes	48.4	37.6-59.4	0.476
Regularly	51.1	46.4-55.7	
System for collecting clients' opinion			
Yes	50.2	45.5-54.9	0.809
No	49.2	42.7-55.6	
Quality assurance activities officially recorded in past year			
Yes	50.2	43.6-56.8	0.875
No	49.6	44.9-54.2	
Protected client waiting areas			
Yes	51.6	47.5-55.5	0.027
No	38.9	29.3-49.4	
Facility readiness status			
Poor	50.1	43.4-56.9	
Medium	47.3	41.9-52.9	0.372
Good	54.9	46.9-62.7	
Supervision done and feedback received by the providers[4]			
Supervision done and feedback received within 6 months	50.2	45.2-55.2	
Supervision done but feedback not received within 6 months	47.3	34.0-61.0	0.910
Supervision not done within 6 months	49.1	42.4-55.7	

*** p<0.001; ** p<0.01; * p<0.05
[1] Number of child curative services includes availability of child curative, vaccination, and growth monitoring services.
[2] Infection control items include soap, running water and alcohol based hand disinfectant, waste receptacle, safety box, gloves, safety precaution guidelines, and needle destroyer.
[3] This includes whether the facility received any external supervision e.g. from the district, regional and national office. This one is taken from the facility inventory questionnaire.
[4] This includes the personal supervision done and feedback received by the providers from a supervisor, either in the facility or from outside the facility. This one is taken from the health service providers interview.

3.7.5   Bivariate association between client satisfaction and process attributes

Table 9 shows the association between process of care attributes and client's satisfaction. Among the different processes followed for the delivery of services to sick children, high satisfaction was significantly greater among clients who received information about the child's illness and who had a short waiting time to see the provider. Clients who received information about the child's illness and clients who had their sick child examined immediately (within 30 minutes) had higher satisfaction than those who did not receive information and those who had to wait more than 30 minutes. Other process attributes were not significantly associated with client satisfaction.

Table 9   Client satisfaction by process attributes

Process characteristics	High satisfaction (%)	95% CI	p-value
At least three main symptoms under child's history[1]			
Yes	52.9	46.8-58.9	0.215
No	48.4	44.0-52.9	
At least five physical examinations done[2]			
Yes	52.9	48.0-57.8	0.101
No	47.6	42.6-52.5	
At least any two danger signs asked/examined[3]			
Yes	45.7	36.3-55.5	0.404
No	50.2	46.2-54.3	
At least any two types of information provided to caretaker[4]			
Yes	53.2	47.2-59.0	0.227
No	48.8	44.3-53.2	
Provider discussed follow-up visits			
Yes	52.8	46.7-58.9	0.233
No	48.7	44.4-53.0	
Provider recorded on child health card			
Yes	49.2	44.6-53.8	0.658
No	51.1	44.2-57.9	
Treatment of pneumonia[5]			
Yes	57.6	44.2-69.9	0.294
No	71.5	48.3-87.1	
Treatment of diarrhea[6]			
Yes	48.3	37.7-59.1	0.997
No	51.0	42.2-59.7	
Caretaker received information about child illness			
Yes	51.5	47.4-55.5	0.69
No	40.8	32.8-49.2	
Waiting time			
More than 30 minutes	44.7	40.3-49.2	0.0000***
Immediate (within 30 minutes)	57.4	51.9-62.7	
Need to pay for services at HF			
Yes	50.8	44.5-57.1	0.710
No	49.3	44.7-54.0	

*** $p<0.001$; ** $p<0.01$; * $p<0.05$

[1] Symptoms under child's history includes 1) assessment of temperature/fever, 2) cough or difficult breathing, 3) diarrhea, and 4) ear pain/discharge.

[2] Physical examination: Based on IMNCI protocol using two under-five child categories—under age 2 months and 2-59 months; examination includes: measuring body temperature/fever for both age groups, respiration rate count per minute is taken for all underage months and only among cases with cough or respiratory problems for children age 2-59 months, examining of skin turgor for those having symptoms of diarrhea and examining pallor on palm, conjunctiva, and ear pain/discharges, and weighing the child for both groups.

[3] Danger signs include: unable to drink or breastfeed, vomiting everything, and convulsion.

[4] Information includes: illness of sick child, general information about feeding, extra fluids during illness, continue feeding during illness, and when to return.

[5] Treatment of pneumonia is calculated among those who were diagnosed as having pneumonia.

[6] Treatment of diarrhea is calculated among those who were diagnosed as having diarrheas.

3.7.6   Findings on adjusted association of adherence to process of care with background and structure attributes

The final model presents findings on the adjusted association of adherence to process of care with background characteristics of the facility, provider, and client (Table 10) and with structural attributes (Table 11). In this model, the significant association of process with facility type and with managing authority was lost. However, province of the country remained a strong factor in determining adherence to process of care. Providers in Province 2 had 50% lower odds of having adherence to process of care compared with Province 1 (the reference) (AoR=0.5, 95% CI=0.2-0.9). When controlling for the effects of other factors, caste/ethnicity and number of child health services available at the facility continued to remain as a strong determinant of adherence to process of care. Providers were more likely to adhere to process of care when they provided services to Janajatis compared with Brahmins/Chhetris (AoR=1.4, 95% CI=1.0-1.9).

Similarly for structural attributes, as Table 11 shows, facilities providing fewer than two child health services had 2.1 times higher odds of adhering to process of care (AoR=2.1, 95% CI=1.0-4.2), and facilities with good readiness status had 1.9 times higher odds of adhering to process of care compared with facilities with poor readiness (AoR=1.9, 95% CI=1.2-3.0).

Table 10   Adjusted associations between adherence to process of care and facility, provider, and client characteristics

Characteristics	Unadjusted OR	Adjusted OR	95% CI
Managing authority			
Private	ref		
Public	0.4***	0.7	0.4-1.1
Ecological region			
Mountain	ref		
Hill	1.5	0.9	0.6-1.6
Terai	1.1	0.8	0.4-1.5
Provinces			
1	ref		
2	1.4	0.5*	0.2-0.9
3	1.8**	0.7	0.4-1.3
4	1.9*	0.8	0.4-1.6
5	1.6	0.9	0.5-1.7
6	0.6	0.5	0.3-1.0
7	1.1	0.8	0.4-1.5
Category of service providers			
Pediatrician	ref		
MBBS	0.6	0.6	0.4-1.1
Paramedics/Nursing	0.6*	1.0	0.5-2.0
Others	1.4	2.0	0.5-8.3
Work experience (in years)			
0-5 years	ref		
6-10 years	1.3	1.3	0.9-2.0
More than 10 years	0.8	1.0	0.7-1.5
Age of clients (in years)			
10-24	ref		
25-39	1.1	0.9	0.7-1.2
40 and above	0.7	0.7	0.4-1.3
Caste/Ethnicity of clients			
Brahmin/Chettri	ref		
Janajati	1.4*	1.4*	1.0-1.9
Terai/Madhesh other caste	0.4***	0.7	0.4-1.2
Dalit/Muslim	0.7*	0.7	0.5-1.1
Education of clients			
Never been to school	ref		
Less than 10years of schooling	1.5*	1.0	0.7-1.4
SLC and above	1.7**	0.9	0.6-1.4
Follow-up visit (ref first visit)	1.0	0.9	0.6-1.3
HF close to home (ref HF far from home)	0.7	0.9	0.6-1.3
Need to pay for services	1.0	1.1	0.7-1.6

*** p<0.001; ** p<0.01; * p<0.05

Table 11   Adjusted associations between adherence to process of care and structural attributes

Structural attributes	Unadjusted OR	Adjusted OR	95% CI
Less than 2 types of sick child services available	1.0	2.1*	1.0-4.2
Staff available 24 hours	1.2	0.7	0.4-1.0
Availability of ORT corner	0.9	0.8	0.6-1.3
Emergency transport available	1.2	1.1	0.7-1.6
External supervision in last 4 months	1.3	1.2	0.8-1.7
Facility management meeting			
Facility management meeting, never	ref		
Facility management meeting, sometimes	1.0	0.8	0.5-1.5
Facility management meeting, monthly/regularly	0.9	0.9	0.6-1.4
System for collecting opinion	1.5*	1.1	0.8-1.5
Quality assurance activities officially recorded	1.6**	1.4	1.0-2.0
Protected client waiting area available	2.3***	1.6	1.0-2.6
Status of infection control items			
Poor	ref		
Medium	0.9	1.1	0.8-1.6
Good	1.1	0.7	0.4-1.2
Status of facility readiness			
Poor	ref		
Medium	1.8**	1.1	0.8-1.6
Good	0.4***	1.9	1.2-3.0
Supervision done and feedback received by providers			
Supervision done and feedback received within 6 months	ref		
Supervision done but feedback not received within 6 months	1.4	0.8	0.5-1.5
Supervision not done within 6 months	1.1	0.9	0.6-1.4

*** p<0.001; ** p<0.01; * p<0.05

3.7.7 Findings on adjusted association of client satisfaction with background, structure, and process attributes

Tables 12, 13, and 14 show the results from multivariate analysis models of client satisfaction on the background, structure, and process attributes. In this model, all the factors were included in analysis and the results were compared with those of bivariate models (unadjusted model).

Results from multivariate analysis show that those who received sick child care in public facilities had 70% lower odds of being highly satisfied compared with clients visiting private facilities (AoR=0.3, 95% CI=0.2-0.6). Similarly, clients in Province 6 (AoR=0.3, 95% CI=0.2-0.7) were less likely to be highly satisfied compared with Province 1. There was no significant association found between client's satisfaction and characteristics of providers or of the clients themselves.

Table 12   Adjusted associations between client satisfaction and facility, provider, and client characteristics

Characteristics	Unadjusted OR	Adjusted OR	95% CI
Managing authority			
Private	ref		
Public	0.4***	0.3***	0.2-0.6
Ecological region			
Mountain	ref		
Hill	1.5	1.1	0.7-1.8
Terai	1.1	0.8	0.5-1.4
Provinces			
1	ref		
2	1.4	1.5	0.9-2.6
3	1.8**	1.4	0.9-2.2
4	1.9*	1.3	0.7-2.6
5	1.6	1.4	0.8-2.3
6	0.6	0.3**	0.2-0.7
7	1.1	0.8	0.4-1.3
Category of service providers			
Pediatrician	ref		
MBBS	0.7	1.1	0.6-1.9
Paramedics/Nursing	0.8	1.3	0.7-2.6
Others	0.8	0.8	0.3-2.1

Characteristics	Unadjusted OR	Adjusted OR	95% CI
Work experience (in years)			
0-5 years	ref		
6-10 years	1.3	1.4	0.9-2.01
More than 10 years	1.1	0.7	0.7-1.6
Age of client (in years)			
10-24	ref		
25-39	0.9	0.8	0.6-1.1
40 and above	1.0	0.8	0.5-1.3
Caste/Ethnicity of client			
Brahmin/Chettri	ref		
Janajati	1.2	1.0	0.7-1.3
Terai/Madhesh other caste	1.0	0.8	0.5-1.4
Dalit/Muslim	0.8	0.8	0.5-1.1
Education of client			
Never been to school	ref		
Less than 10years of schooling	1.0	0.9	0.6-1.2
SLC and Above	1.1	0.7	0.5-1.0
Follow-up visit (ref first visit)	1.2	1.2	0.8-1.7
HF close to home (ref HF far from home)	0.8	1.0	0.6-1.6

*** p<0.001; ** p<0.01; * p<0.05

When controlling for the different factors—background, structure, and process of care—none of the structural factors was found to have a significant association with higher client satisfaction (Table 13).

Table 13   Adjusted associations between client satisfaction and structural attributes

Structural attributes	Unadjusted OR	Adjusted OR	95% CI
Less than 2 types of sick child services available	1.0	0.8	0.4-1.5
Staff available 24 hours	1.0	1.1	0.7-1.5
Availability of ORT corner	0.9	1.2	0.7-1.8
Emergency transport available	0.8	0.7	0.5-1.1
External supervision in last 4 months	0.8	0.8	0.6-1.1
Facility management meeting			
Facility management meeting, never	ref		
Facility management meeting, sometimes	1.2	1.4	0.8-2.3
Facility management meeting, monthly/regularly	1.3	1.3	0.9-1.9
System for collecting opinion	1.0	0.9	0.7-1.3
Quality assurance activities officially recorded	1.0	0.9	0.7-1.4
Protected client waiting area available	1.7*	1.6	1.0-2.6
Status of infection control items			
Poor	ref		
Medium	1.0	0.7	0.5-1.0
Good	1.2	0.9	0.5-1.6
Status of facility readiness			
Poor	ref		
Medium	0.9	0.9	0.6-1.3
Good	0.9	1.2	0.8-1.9
Supervision done and feedback received by providers			
Supervision done and feedback received within 6 months	ref		
Supervision done but feedback not received within 6 months	1.1	1.0	0.5-1.8
Supervision not done within 6 months	1.0	0.9	0.6-1.2

*** p<0.001; ** p<0.01; * p<0.05

As Table 14 shows, the process attributes of client waiting time less than 30 minutes and receiving information about the child's illness were significantly associated with higher client satisfaction. Clients who waited less than 30 minutes had 1.6 times higher odds of being highly satisfied compared with those who waited more than 30 minutes (AoR=1.6, 95% CI=1.3-2.1). Similarly, clients who received information on child illness had 1.7 times higher odds of higher satisfaction compared with those who did not receive this information (AoR=1.7, 95% CI=0.6-1.2).

Table 14   Adjusted association between client satisfaction and process attributes

Process characteristics	Unadjusted OR	Adjusted OR	95% CI
At least three client history asked	1.2	1.1	0.8-1.5
At least two danger signs asked/checked	0.8	0.7	0.5-1.2
At least five physical examination	1.2	1.1	0.8-1.4
Provider recorded on child health card	0.9	0.8	0.6-1.2
At least any 2 information provided to client	1.2	1.2	0.8-1.5
Provider discussed on follow-up visit	1.2	1.1	0.8-1.5
Immediate service or waiting time of less than 30 minutes	2.7***	1.6***	1.3-2.1
Client received information about child illness	1.5*	1.7**	1.2-2.4
Client need to pay for the service	1.1	0.8	0.6-1.2

*** p<0.001; ** p<0.01; * p<0.05

4 DISCUSSIONS AND CONCLUSIONS

This study examined the quality of curative services provided to sick children and its association with client's satisfaction. Quality of care was measured in structure, process, and outcome of the service provision, as recommended by Donabedian framework. In addition, the background characteristics of the facility, provider, client and child were included in the analysis as explanatory factors, along with the structural and process of care factors. Associations between the outcome—client satisfaction with services—and structural and process attributes of health facilities were analyzed using bivariate cross-tabulation and multiple regressions. Data from the nationally representative 2015 NHFS were used for all analyses, based on a sample of 2,186 sick children, 2,735 service providers, and 934 health facilities in Nepal.

The average health facility service readiness score for sick child curative care was 54.9, a level indicating that the issue of facility readiness needs more attention for improving overall quality of care. The average readiness scores for district hospitals and PHCCs were higher than the average for all facility types. Concerning service domains, private hospitals performed better for diagnostic kits for malaria, basic equipment, and medicines and commodities, but performed poorly for guidelines and training. Poor performance in the area of guidelines and trained staff in the private sector is unsurprising, because Nepal's CB-IMNCI strategy has not been enforced in the private sector, and therefore most service providers in private hospitals would not have received training on CB-IMNCI and would not have received the guidelines. A small proportion of private hospitals had CB-IMNCI guidelines and trained staff, which could be due to service providers from the public sector also serving in the private hospitals. In the Nepalese context, where care seeking for sick children is increasing in the private sector, as seen in the 2016 NDHS, the above findings indicate a need to introduce CB-IMNCI strategy in private hospitals as well as the public sector. Introducing CB-IMNCI strategy in the private sector hospitals would allow children to receive comprehensive treatment in a single visit to a health facility, and at the same time would reduce out-of-pocket expenditure by minimizing the number of visits to the hospitals.

A wide gap was observed in the process of care followed for the management of care for sick children at the facility. History taking, assessment of general danger signs, and physical examinations are generally not completed. If history taking, assessments, and examinations are not done properly, the diagnosis and treatment may be incorrect or incomplete. CB-IMNCI aims to address multiple diseases during a single visit to a facility. Correct treatment for diarrhea, measured as providing ORS and zinc to sick children diagnosed with diarrhea, was found to be low in the health facilities studied. This finding has also been verified by the 2016 Nepal Demographic and Health Survey (NDHS),which showed that only 10% of children with diarrhea received ORS and zinc(MoH, ERA, and ICF 2017). In our study, correct treatment for pneumonia, measured as cases provided with first line antibiotics, was nearly twice as high compared with correct treatment for diarrhea. For both diseases, correct treatment was much lower for private hospitals than for public hospitals, and this may be due to not implementing CB-IMNCI strategy in the private hospitals. Though the proportion of clients seeking care at private hospitals was only 14%, this is mainly because the data used in this analysis were derived from 2015 NHFS, and the overall proportion of private hospitals in the country was very small. It is evident from the population-based 2016 NDHS that care seeking for sick children has been increasing in the private sector. It is therefore imperative that improving the process of care at private hospitals receive greater attention by the concerned authorities. The findings also suggest that both supply-side and demand-side strategies are necessary to increase zinc use in diarrhea treatment.

Measuring client's satisfaction has been a contentious topic. Often it is found that exit interviews with clients on health facility premises or nearby produce a much higher level of client satisfaction than when measured through an indirect approach. However, when asked about other proxy questions related to client satisfaction, for instance service provider's behavior or waiting time to receive service, clients often report dissatisfaction. For instance, in the Service Tracking Surveys carried out in 2012 and 2013 in Nepal, client's satisfaction was 90% and 91% respectively(MoHP, HERD, and NHSSP 2012, 2013), despite the fact that there were several concerns about quality of care in the facilities surveyed. Hence in our analysis, instead of using a direct measure of client satisfaction for sick child services, we computed a composite index based on a list of 11 problems experienced by clients during their visit and categorized client satisfaction as either highly satisfied or less satisfied.

In bivariate analysis of client satisfaction with facility, provider, and client characteristics, client satisfaction was strongly associated with characteristics of the health facility. Client satisfaction was greater for private facilities and lower-level public facilities (HPs/UHCs). The positive association of client satisfaction with private facilities remained even after controlling for other factors in the regression model. In this analysis, private health facilities performed better in having a stock of medicines and diagnostics test kit for malaria compared with other facilities, which might have contributed to higher client satisfaction. A systematic review of public and private health systems in low- and middle-income countries has shown that private facilities usually provide services on time and also have good hospitality to patients compared with public facilities (Basu et al. 2012), which might be reasons that they have higher client satisfaction.

Client satisfaction was lower in the Province 6 compared with Province 1. This finding could be explained by the remoteness of Province 6. Province 6 comprises 10 districts (Rukum-west, Salyan, Surkhet, Dailekh, Jajarkot, Dolpa, Jumla, Kalikot, Mugu, and Humla), most of which are remote and in the hills or mountains. This means access to services is a challenge and service readiness and process of care could also be poor.

Qualifications and duration of work experience of service providers were not associated with client satisfaction. Nor was an association found between client satisfaction and the caste/ethnicity, education, or age of the client/caretaker. A study done in Nepal in maternal health service also shows that clients' caste/ethnicity is not associated with their satisfaction (Mehata et al. 2017).

Structural attributes such as facility readiness, infection control, facility management, and operation systems did not stand out as predictors of client satisfaction. This is difficult to explain, as studies in other parts of world show that when facility readiness is greater both process of care and client satisfaction are higher.

Process of care attributes appeared as strong predictors of client satisfaction. Clients who received information about the child's illness child tended to be highly satisfied with the services they received. Waiting time also stood out as a strong predictor of client satisfaction. When waiting time was shorter than 30 minutes clients were more satisfied than when they had to wait 30 minutes or more. Other studies in maternal health services in Nepal also show similar findings, that longer waiting time and overcrowding at facilities increase the likelihood of client dissatisfaction (Mehata et al. 2017).

Our study found a positive association between adherence to process of care and the facility's readiness to provide sick child curative services. The adherence to process of care declined as the facility readiness declined from good to poor. Facility readiness continued to be a strong explanatory variable for adherence to process of care even after controlling for the effects of other factors.

Facilities with higher readiness provide an enabling environment for providers to follow necessary procedures of care. Adherence to process of care was significantly lower in Province 2 than in Province 1. This association could be explained by the readiness factor. Overall readiness of health facilities to provide sick child services in Province 2 was lower than elsewhere, and this must have impacted compliance to process of care.

While there was no association found between client satisfaction and the caste/ethnicity of the client/child, the result was different when adherence to process of care was put as the outcome variable. Providers were found to adhere to process of care more when treating Janajati clients than when treating Brahmin/Chhetri clients.

Facilities providing only one child health service out of the three (curative, immunization, and growth monitoring) had greater adherence to care. This could be explained by the fact that lower-level facilities generally provide fewer services and therefore might attract fewer clients. Thus providers could have more time to spend with clients and also be able to follow the service protocols fully. However, this study could not establish provider's qualification and experience as predictors of adherence to process of care.

Overall, of all the variables examined in this study, only four attributes—managing authority, administrative boundary (province), information provided to client, and waiting time—stood out as determinants of high client satisfaction. It should be noted that this analysis alone is not sufficient to explain the overall quality of care of sick child services in Nepal. However, the study has provided some important information on the quality of sick child services provided in health facilities of Nepal. Some of the relationships, for instance higher client satisfaction in private hospitals despite problems of low readiness and incorrect treatment, suggest that there are other factors that could explain client satisfaction and quality of care. Waiting time appeared as a strong factor affecting client satisfaction. Therefore, optimum utilization of facilities at the peripheral level, minimizing overcrowding at higher-level facilities, and improving management practices should be focused on minimizing waiting time for clients. Province 6 has the most difficult terrain in Nepal. Improving access to service along with a focus on quality should be the highest priority in Province 6. Receiving information from the provider on the child's illness increases client's satisfaction. Provider's interpersonal communication skills need to be strengthened, motivating providers to spend adequate time for counseling and advising clients.

It is recommended that child health programs should emphasize both service readiness and process of care factors to improve client satisfaction. Both of these factors cover most of the dimensions of the quality of care as envisioned by the Government of Nepal in the NHSS 2016-2021. Further assessments on quality of care using both primary and secondary data will be required to better understand how different factors interact to impact adherence to process of care and overall client satisfaction.

REFERENCES

Aldana, Jorge Mendoza, Helga Piechulek, and Ahmed Al-Sabir. 2001. "Client satisfaction and quality of health care in rural Bangladesh." *Bulletin of the World Health Organization* 79(6):512-517.

Basu, Sanjay, Jason Andrews, Sandeep Kishore, Rajesh Panjabi, and David Stuckler. 2012. "Comparative performance of private and public healthcare systems in low-and middle-income countries: a systematic review." *PLoS medicine* 9(6):e1001244.

DoHS. 2015/2016. *Annual Report*. Kathmandhu, Nepal: Ministry of Health, Department of Health Services (DoHS).

Donabedian, Avedis. 1988. "Quality assessment and assurance: unity of purpose, diversity of means." *Inquiry*:173-192.

Mehata, Suresh, Yuba Raj Paudel, Maureen Dariang, Krishna Kumar Aryal, Susan Paudel, Ranju Mehta, Stuart King, and Sarah Barnett. 2017. "Factors determining satisfaction among facility-based maternity clients in Nepal." *BMC pregnancy and childbirth* 17(1):319.

MoH. 2004. National Neonatal Health Startegy 2004. Kathmandhu, Nepal: Ministry of Health.

MoH. 2006. CB-IMCI annual report Kathmandhu, Nepal: Child Health Division, Ministry of Health.

MoH. 2014. *Nepal's Every Newborn Action Plan*. Kathmandhu, Nepal: Ministry of Health (MoH).

MoH. 2016. *Nepal Health Sector Strategy Implementation Plan 2016 - 2021*. Kathmandhu, Nepal: Government of Nepal, Ministry of Health.

MoH, New ERA, Nepal Health Sector Support Program (NHSSP), and ICF. 2017. Nepal Health Facility Survey, 2015. Kathmandhu, Nepal: Ministry of Health.

MoH, New ERA, and ICF. 2017. Nepal Demographic and Health Survey, 2016. Kathmandhu, Nepal: Ministry of Health, Nepal.

MoHP, HERD, and NHSSP. 2012. Service Tracking Survey 2012. Kathmandhu, Nepal.

MoHP, HERD, and NHSSP. 2013. Service Tracking Survey 2013. Kathmandhu, Nepal.

UNICEF. 2017. *Levels & Trends in Child Mortality: Report 2017, Estimation. UN Inter-agency Group for Child Mortality Estimation*. New York: United Nations Children Fund (UNICEF).

Wang, Wenjuan. 2014. *Assessing the quality of care in family planning, antenatal, and sick child services at health facilities in Kenya, Namibia, and Senegal*.

WHO. 2016. *World health statistics 2016: monitoring health for the SDGs sustainable development goals*: World Health Organization.

ANNEX

Annex 1

Questions that were used to construct the client satisfaction score (the same for all services): whether each of the followings was a major problem (1=no, 0=yes)

1. Time you waited to see provider
2. Ability to discuss problems or concerns about your health with the provider
3. Amount of explanation you received about the problem or treatment
4. Privacy from having others hear your consultation discussion
5. Privacy from having others see your consultation discussion
6. Availability of medicines/methods at this facility
7. The hours of services at this facility i.e. when they open and close
8. The number of day's services is available to you
9. The cleanliness of the facility
10. How the staff treated you
11. Cost for services or treatments

Table A1   Internal reliability coefficients of the satisfaction index

Item	Observation	Internal reliability coefficient
1. Time you waited to see provider	2186	0.6683
2. Ability to discuss problems or concerns about your health with the provider	2186	0.6538
3. Amount of explanation you received about the problem or treatment	2186	0.6484
4. Privacy from having others hear your consultation discussion	2186	0.6539
5. Privacy from having others see your consultation discussion	2186	0.6539
6. Availability of medicines at this facility	2186	0.6640
7. The hours of services at this facility i.e. when they open and close	2186	0.6596
8. The number of days services are available to you	2186	0.6725
9. The cleanliness of the facility	2186	0.6539
10. How the staff treated you	2186	0.6636
11. Cost for services or treatments	2186	0.6837
		0.6827

Figure A1   Distribution of clients for sick children according to problem encountered on the day of visit at the health facility

Major   Minor   No Problem   Don't Know
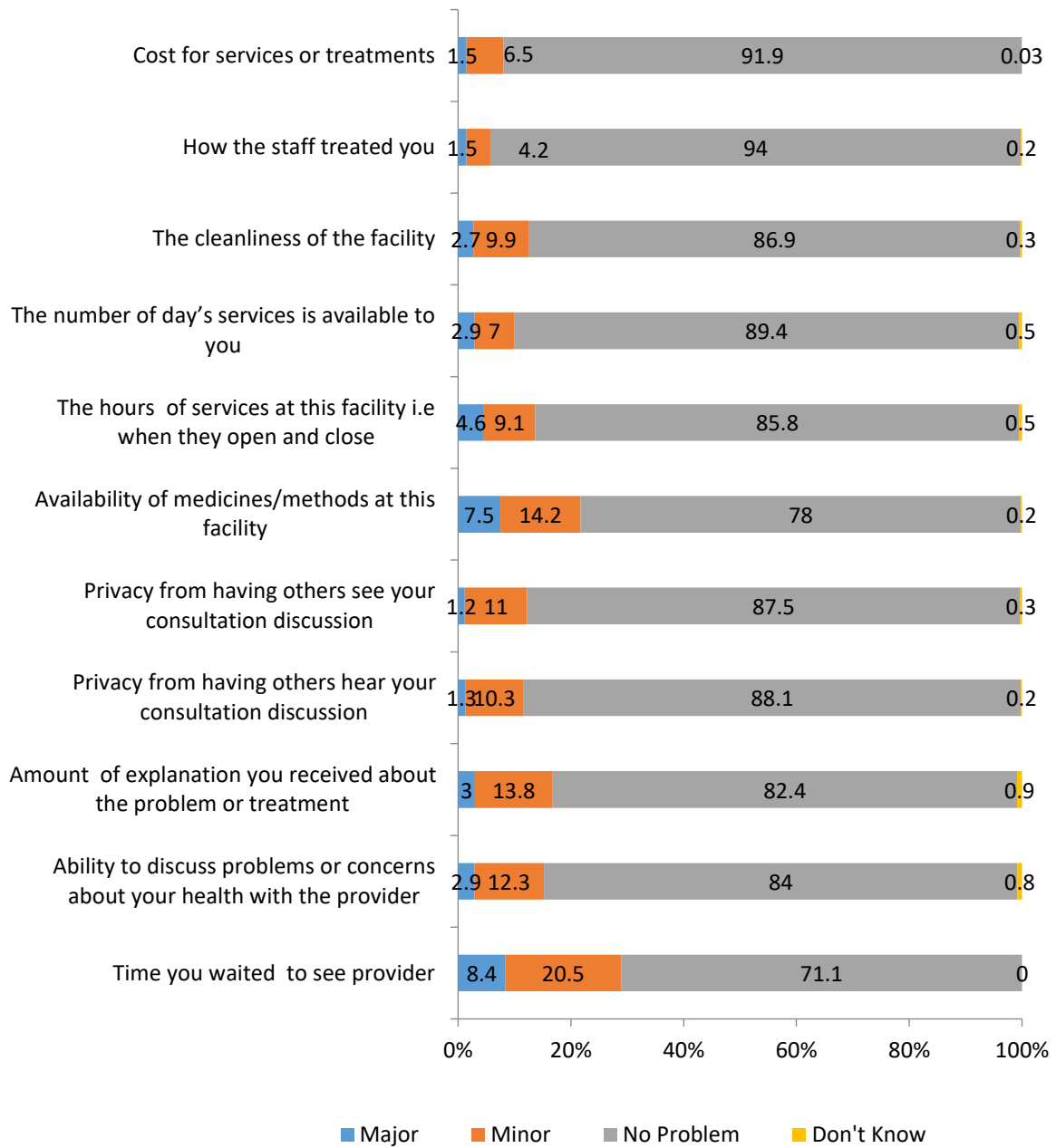
Annex 2   Variables included in the structure and process attributes in IMNCI services

Structure
A. Readiness Composite index:
    1.   IMNCI guideline
    2.   IMNCI trained staff
    3.   Growth monitoring guideline
    4.   Infant and child weighing scale
    5.   Timer
    6.   Thermometer
    7.   Stethoscope
    8.   Growth monitoring Charts
    9.   Malaria test (only from malaria risk districts)
    10. ORS
    11. Amoxicillin
    12. Cotrimoxazole
    13. Paracetamol
    14. Albendazole
    15. Vitamin A
    16. Zinc
B. External supervision in last 4 months
C. Facility management meeting
D. System for collecting opinion
E. Quality assurance activities officially recorded
F. Staff available 24 hours
G. Protected client waiting area
H. Availability of emergency transport
I. Availability of ORT corner
J. Infection control
H. Supervisor done and feedback received by providers

Process
1. Asked the symptoms of sick child
2. Physical examinations for sick child
3. Number of danger signs assessed
4. Provider recorded on child health card
5. Provider discussed on follow-up of sick child
6. Waiting time for checking the sick child
7. Need to pay for services
8. Information provided to caregiver by the provider

Annex 3

Table A2   **Distribution of structural attributes**

Structural characteristics	%	CI	N
Number of child health services			
More than or equal to 2	96.0	93.4-97.6	2,099
Less than 2	4.0	2.4-6.6	87
Frequency of child curative services in a week			
Less than 5	0.5	0.2-1.2	11
5 or more	99.5	98.8-99.8	2,175
24 hour staff availability			
Yes	35.3	31.3-39.7	773
No	64.7	60.3-68.7	1,413
24 hours availability of ORT Corner			
Yes	68.3	63.2-73.0	1,493
No	31.7	27.0-36.8	693
Emergency transport			
Yes	73.3	68.2-77.8	1,602
No	26.7	22.2-31.8	584
Status of infection control items			
Poor	61.4	55.9-66.6	1,341
Medium	30.2	25.4-35.5	661
Good	8.4	6.0-11.7	184
External supervision in the last 4 months			
Yes	62.6	56.5-68.3	1,369
No	37.4	31.7-43.5	817
Facility management meeting			
Never/no	15.4	11.6-20.1	336
Sometimes	12.8	9.7-16.6	279
Regularly/Monthly	71.9	66.6-76.6	1,571
System for collecting opinion			
Yes	58.1	52.8-63.2	1,270
No	41.9	36.8-47.2	916
Quality assurance activities official recorded in past year			
Yes	26.4	21.5-31.9	576
No	73.6	68.1-78.5	1,610
Protected client waiting area available			
Yes	85.9	81.5-89.3	1,877
No	14.1	10.7-18.5	309
Facility readiness status[1]			
Poor	39.4	34.0-45.2	862
Medium	43.0	37.4-48.8	940
Good	17.6	13.9-22.0	384
Supervision done*			
Supervision done and feedback received within 6 months	62.4	57.2-67.4	1,338
Supervision and feedback not received within 6 months	7.1	5.2-9.7	152
Supervision done within 7-12 months	30.5	25.8-35.6	653
Total			**2,186**

[1]This index was computed based on the HF readiness attributes: availability of IMNCI guideline, IMNCI trained staff, growth monitoring guideline, infant and child weighing scale, timer, thermometer, stethoscope, malaria test (applicable to 65 malaria high risk districts, out of 75), ORS, Amoxicillin, Cotrimoxazole, Paracetamol, Albendazole, Vitamin A and zinc. Data for this component came from two tools of 2015 NHFS: i) Inventory Questionnaire which included interviews with the most knowledgeable service provider with observation of the items and medicines, and ii) Health Provider Questionnaire which included interviews with service provider providing IMNCI services.
*42 unweighted cases were missing.

Table A3   Distribution of process of care attributes

Process of care attributes	%	%	N
At least three main symptoms under client history			
Yes	Z29.8	26.6-33.2	652
No	70.2	66.8-73.4	1,534
At least five physical examination done			
Yes	41.0	37.8-44.3	896
No	59.0	55.7-62.2	1,290
At least any 2 danger signs asked/examined			
Yes	10.6	8.7-12.9	233
No	89.4	87.1-91.3	1,953
At least any 2 information provided to caregiver			
Yes	22.5	19.7-25.5	491
No	77.5	74.5-80.3	1,695
Provider discussed follow-up visit			
Yes	25.8	22.7-29.1	563
No	74.2	70.9-77.3	1,623
Provider recorded on child health card			
Yes	68.8	63.8-73.4	1,504
No	31.2	26.6-36.2	682
Client received information about child health illness			
Yes	83.9	80.8-86.6	1,835
No	16.1	13.4-19.2	351
Waiting time			
More than 30 minutes	60.0	55.8-64.1	1,312
Immediately or less than 30 minutes	40.0	35.9-44.2	874
Need to pay for services			
Yes	30.1	26.6-33.7	657
No	69.9	66.3-73.4	1,529
Correct treatment of pneumonia[1]			
Yes	86.3	78.8-91.5	153
No	13.7	8.6-21.2	24
Correct treatment of diarrhea[2]			
Yes	44.2	48.4-63.0	199
No	55.8	37.0-51.6	157
Total			**2186**

[1] Correct treatment of pneumonia is calculated among those who were diagnosed as having pneumonia (N=177).
[2] Correct treatment of diarrhea is calculated among those who were diagnosed as having diarrhea (N=356).

Service readiness status of child curative care

Table A4   Service readiness scores for sick child services by background characteristics

Background characteristics	Guidelines and staff trained		Basic equipment		Diagnostic test kit for malaria		Medicine and commodities		Average readiness scores of all domains		Weighted number
	Mean	CI	Mean	CI	Mean	CI	Mean	CI	Mean	CI	
Facility type											
Zonal and above hospital	15.8	7.5-24.1	73.05	64.4-81.7	74.3	57.0-91.6	63.0	53.3-72.8	56.5	50.9-62.1	6
District hospital	35.8	30.2-41.5	82.4	79.1-85.8	73.3	63.0-83.6	82.3	78.5-86.03	68.4	65.2-71.7	15
Private hospital	3.6	1.6-5.5	66.0	63.2-68.9	95.9	91.7-99.9	58.5	50.6-66.5	55.7	52.8-58.7	65
PHCC	43.2	39.7-46.7	81.8	79.4-84.2	61.6	53.8-69.4	78.3	76.3-80.3	66.2	63.5-68.9	42
HPs/UHC	42.4	39.6-45.1	78.8	77.1-80.4	17.4	13.9-20.9	77.4	76.0-78.9	53.9	52.6-55.3	806
Managing authority											
Public	42.1	39.6-44.7	78.9	77.4-80.5	20.9	17.7-24.2	77.5	76.1-78.8	54.8	53.6-56.0	65
Private	3.6	1.6-5.5	66.0	63.2-68.9	95.8	91.7-99.9	58.5	50.6-66.5	55.7	52.8-58.7	869
Ecological region											
Mountain	38.7	33.0-44.5	79.6	76.9-82.3	35.9	26.4-45.4	78.4	74.8-81.9	58.2	54.9-61.5	118
Hill	40.1	36.4-43.8	80.2	78.2-82.3	18.2	14.6-21.7	78.0	76.3-79.8	54.1	52.6-55.6	480
Terai	39.0	35.5-42.6	74.4	71.8-77.0	34.0	27.8-40.2	72.7	70.0-75.3	54.9	52.8-57.0	336
Province											
1	37.7	31.5-43.8	78.5	76.0-81.0	24.2	16.6-31.7	76.3	73.3-79.4	54.2	51.6-56.6	161
2	39.2	34.6-43.8	69.3	64.7-73.8	25.8	17.7-34.0	71.3	67.2-75.5	51.4	48.5-54.3	171
3	35.1	29.1-41.1	79.1	76.5-81.7	40.6	32.1-49.2	77.6	74.5-80.8	58.0	54.9-61.0	184
4	41.4	33.6-49.2	83.8	79.1-88.5	15.3	9.0-21.6	80.5	77.6-83.5	55.2	52.2-58.2	119
5	46.9	41.2-52.6	81.1	77.6-84.6	16.9	10.0-23.7	78.4	75.4-81.4	55.8	53.7-57.9	137
6	41.7	32.3-51.1	76.9	72.5-81.3	27.1	15.7-38.4	71.4	66.8-76.1	54.2	49.7-58.7	74
7	37.3	31.3-43.2	80.5	76.4-84.6	28.1	19.7-36.4	76.5	72.5-80.6	55.6	52.2-58.9	89
Total	**39.5**	**37.2-41.9**	**78.0**	**76.6-79.5**	**26.1**	**23.0-29.2**	**76.1**	**74.8-77.5**	**54.9**	**53.7-56.0**	**934**