Prevalence of and Care Seeking for Diarrhea and Fever Among Children Under 5: An Intersectional Equity Analysis, 2011–2022 Nepal DHS Surveys

DHS Further Analysis Reports No. 158

Resham Khatri, Komal Prasad Dulal, Kapil Prasad Timelsena, Manoj Tamrakar, Sabita Tuladhar, Rebecca Rosenberg

September 2024

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Prevalence of and Care Seeking for Diarrhea and Fever Among Children Under 5: An Intersectional Equity Analysis, 2011–2022 Nepal DHS Surveys

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This is one of 11 reports from a further analysis activity undertaken as part of the follow-up to the 2022 Nepal Demographic and Health Survey (NDHS). ICF provided technical assistance for the activity while USAID Learning for Development coordinated the activity. USAID Learning for Development also provided quality assurance and led the analysis of eight of the 11 reports, coordination with government stakeholders, and dissemination. ICF led the analysis of three of the reports.

This report is a publication of The Demographic and Health Surveys (DHS) Program, which is designed to collect, analyze, and disseminate data on fertility, family planning, maternal and child health, nutrition, and HIV/AIDS. Funding was provided by USAID through The DHS Program (#720-OAA-18C-00083). The opinions expressed here are those of the authors and do not necessarily reflect the views of USAID or other cooperating agencies.

The 2022 NDHS was implemented by New ERA under the aegis of the Ministry of Health and Population of Nepal from January 5, 2022, to June 22, 2022. The funding for the NDHS was provided by USAID. ICF provided technical assistance through The DHS Program, a USAID-funded project providing support and technical assistance in the implementation of population and health surveys in countries worldwide.

The DHS Program assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. Additional information about The DHS Program can be obtained from ICF, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA; telephone: +1 301-407-6500; fax: +1 301-407-6501; email: info@DHSprogram.com; internet: www.DHSprogram.com.

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PREFACE

The 2022 Nepal Demographic and Health Survey (2022 NDHS) is the sixth survey of its kind implemented in the country as part of the worldwide Demographic and Health Surveys (DHS) Program. It was implemented under the aegis of the Ministry of Health and Population (MoHP) of the Government of Nepal with the objective of providing reliable, accurate, and up-to-date data for the country. The survey received funding from the United States Agency for International Development (USAID). 2022 NDHS information has assisted policymakers and program managers in policy formulation, monitoring, and designing programs and strategies for improving health services in Nepal. The 2022 NDHS is a key data source for tracking the progress of the Nepal Health Sector Strategic Plan 2023–2030 and the Sustainable Development Goal indicators.

The 2022 NDHS further analysis reports provide additional in-depth knowledge and insights into key issues that emerged from the 2022 NDHS. This information provides guidance for planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. This further analysis is also an important initiative to strengthen the technical capacity of Nepali professionals for analyzing and using large-scale data to better understand specific issues related to the country's needs. We are glad that in the sixth round of the NDHS, we were able to produce 11 further analysis reports. We urge that all policymakers, program administrators, program managers, health workers, and other key stakeholders optimally use the information from these reports in program planning and management. High-quality evidence should be the basis of our health programs planning, implementation, monitoring, and evaluation.

Finally, we would like to appreciate the leadership of the Policy Planning and Monitoring Division, and the efforts of the different individuals of the MOHP, and the Department of Health Services in generating these reports. We are thankful to USAID Nepal for their continued support in implementing the NDHS and further analysis studies in Nepal.

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FOREWORD

The 2022 Nepal Demographic and Health Survey (2022 NDHS) is the sixth nationally representative comprehensive survey conducted as part of the worldwide Demographic and Health Surveys (DHS) Program in the country. The survey was implemented by New ERA under the aegis of the Ministry of Health and Population (MoHP). Technical support for this survey was provided by ICF, with financial support from the United States Agency for International Development (USAID) through its mission in Nepal.

The standard format of the survey's final report included descriptive presentations of findings and trends but not of analytical methods that could ascertain the significance of differences and associations among variables. Thus, although largely sufficient, the final report is limited, particularly in providing answers to "why" questions-answers those are essential for reshaping important policies and programs. After the dissemination of the 2022 NDHS, the MoHP, USAID, and other health development partners convened and agreed on key areas that are necessary for assessing progress, gaps, and determinants in high-priority public health programs being implemented by the MoHP. In this context, 11 further analysis studies have been conducted by Nepali consultants under the direct leadership of the MoHP. The consultants were supported by USAID through the Leaming for Development Activity in Nepal and through The DHS Program.

The primary objective of the analysis studies was to provide more in-depth knowledge and insights into key issues that emerged from the 2022 NDHS. This information provides guidance for planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. One of the learning objectives is to strengthen the technical capacity of Nepali professionals for analyzing and using data from complex national population and health surveys to better understand specific issues related to country needs.

The further analysis of the 2022 NDHS was the concerted effort of many individuals and institutions, and it is with the great pleasure that we acknowledge the work involved in producing this useful document. The participation and cooperation of the officials of the MoHP and the Department of Health Services are highly valued. We would like to extend our appreciation to USAID Nepal for providing financial support for the further analysis. We would also like to acknowledge The DHS Program for its technical assistance at all stages. Our sincere thanks also goes to the USAID Learning for Development Activity team for the overall management and coordination of the entire process. Our special appreciation goes to the Policy Planning and Monitoring Division, MoHP, for their efforts and dedication to the completion of the further analysis of the 2022 NDHS.

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ACKNOWLEDGMENTS

The further analysis of the 2022 Nepal Demographic and Health Survey (2022 NDHS) was conducted under the aegis of the Policy Planning and Monitoring Division of the Ministry of Health and Population (MoHP). The United States Agency for International Development (USAID) provided financial support, with technical assistance provided by the Demographic and Health Surveys (DHS) Program. Overall coordination, recruitment of local consultants, facilitation, administration, and logistic support were provided by the USAID Learning for Development Activity.

I am indebted to Dr. Bikash Devkota, Additional Secretary of the MoHP, for his unwavering guidance throughout the analysis process. I would like to acknowledge the efforts of Dr. Push pa Raj Poudel, Mr. Ravi Kanta Mishra, Mr. Manoj Tamrakar from the Policy Planning and Monitoring Division/MoHP. My special gratitude goes to all the co-authors for their input, coordination, data analysis, and writing of reports. My special thanks go to the co-authors from the MoHP and the Department of Health Services (DoHS) who provided significant contribution to ensure that the analysis aligned with our data needs and to improve the quality of the reports. My sincere appreciation goes to the peer reviewers: Dr. Gunanidhi Sharma from MoHP, Kabita Aryal, Sagar Dahal, Dr. Abhiyan Gautam, Dr. Uttam Pachya, Dr. Poma Thapa, and Dr. Bibek Lal from the DoHS; Pradeep Poudel from USAID Learning for Development; Tirtha Tamang from the United Nations Population Fund; Milima Dangol; Bidur Bastola from the USAID Adolescent Reproductive Health project; Dr. Rahul Pradhan from the World Health Organization; Abhilasha Gurung, and Naveen Poudyal from the United Nations Children's Fund; and Dr. Saroj Dhakal, Dr. Jaganath Sharma, and Sabita Tuladhar from USAID for reviewing the reports.

Special thanks to Sabita Tuladhar from USAID for her continuous support of this process. My sincere appreciation to Dr. Kerry L. D. MacQuarrie from The DHS Program, Jade Lamb, Tarun Adhikari, Sagar Neupane, Lokesh Bhatta, and Alexandra Cervini from USAID Learning for Development for their hard work in supporting the completion of these 11 further analysis reports.

12.07.2024

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ABSTRACT

Nepal has made remarkable progress in preventing major childhood illnesses, such as diarrhea, acute respiratory infections, measles, malaria, and malnutrition, by implementing community-based child health programs. This study investigated trends in and determinants of key childhood illnesses and care-seeking practices based on socioeconomic and demographic factors in Nepal.

The trend analyses were conducted using data from the 2011 Nepal Demographic and Health Survey (NDHS) (n=5,140), the 2016 NDHS (n=4,887), and the 2022 NDHS (n=5,040) among children under 5 who had experienced diarrhea or fever in the 2 weeks prior to the survey. Determinants of care seeking were identified using data from the 2022 NDHS among children with diarrhea (n=524) and fever (n=1,159).

We found increasing trends in childhood diarrhea and fever prevalences, as well as decreasing trends in care-seeking practices for both illnesses. Among those who sought care, the majority sought care from private health facilities (HFs). Diarrhea was significantly less likely among children age 36–59 months, but significantly more likely among children from Bagmati and Karnali provinces and those from Hill and Terai ecoregions, than among respective reference groups. The only significant determinant of care seeking for diarrhea was birth order of children, with care seeking less likely among firstborn children than those born second. Care seeking for diarrhea in private HFs was significantly more likely among children in Lumbini province than among those in Sudurpaschim, and significantly more likely among those born to native Maithili speakers or speakers of other languages than among those born to native Nepali speakers.

Fever was significantly more likely among children age 6 months to 4 years, those born to native Nepali speakers, and those with a second birth order than among respective reference groups. The odds of care seeking for fever were significantly lower among children born to mothers with one or more disadvantages than among children born to mothers with no disadvantages; they were significantly higher among children from Madhesh province than among those from Sudurpaschim. Care seeking for fever in private HFs was significantly more likely among children born to mothers with one or no disadvantages, those in Lumbini and Madhesh provinces, those in urban areas, and those born to native Maithili speakers when compared with respective reference groups.

Multisectoral policies and actions such as interventions for safe drinking water, improved hygiene and sanitation, and better nutrition can be designed and implemented to address the root causes of childhood illnesses. HFs need strengthened capacity to ensure optimal quality of care. Nepal's Community-Based Integrated Management of Neonatal and Childhood Illnesses Program requires strengthening through system inputs, including provision of essential medicines and supplies, training of health staff, and regular availability of services. Programs that target marginalized populations with multiple disadvantages need to be designed and implemented in coordination with local governments. These programs should recruit health care providers who speak the local language and know the culture, identify local problems, address community health needs, and unlock the potential of health education, information, and communication programs in local languages in Madhesh and Lumbini provinces.

Key words: diarrhea, fever, prevalence, care-seeking behavior, intersectional equity, private health facilities

ACRONYMS AND ABBREVIATIONS

AOR	adjusted odds ratio
ARI	acute respiratory infection
CBAC	community-based acute respiratory infection and control of diarrheal disease
CB-IMCI	community-based integrated management of childhood illness
CB-IMNCI	community-based integrated management of neonatal and childhood illness
CB-NCP	community-based newborn care package
CDD	control of diarrheal disease
CI	confidence interval
DHS	Demographic and Health Surveys
DoHS	Department of Health Services
FCHV	female community health volunteer
HF	health facility
MoHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
U5MR	under-5 mortality rate
WHO	World Health Organization

1 INTRODUCTION

1.1 Intersectionality

According to Kimberle Crenshaw's theory of intersectionality, people can have multiple social processes and socially constructed identities created by differences in social groups and imbalances of power relations.[1] Intersectional structural inequities are created due to disproportionate power relations caused by social identities.[2] Some people may have multiple social identities that lead them to a disadvantage, while others may have overlapping privileges.[3,4] Social identities and social stratification are created by social position (for example, ethnicity, occupation, income, education level, and gender). A rich woman from an ethnic minority may have more disadvantages than a woman who belongs to a poor household but is of a privileged ethnicity, in terms of living conditions or access to health services. Comparative ethnic privileges stem from having greater access to and control over resources and power. People from underprivileged backgrounds often live in dire situations for decades.[5,6] Public policies, governance, resource allocation, and management of a country are crucial for reducing these intersectional structural disadvantages.[7] For example, Dalits in Nepal experience multiple forms of structural inequity, such as poverty, living in rural areas, experiencing negative behaviors from society or in public places/institutions, and facing barriers while accessing health services. Mitigating these inequities requires economic, legal, social, and behavioral approaches from government institutions, authorities, and policies.[8]

1.2 Intersectionality and Childhood Illnesses

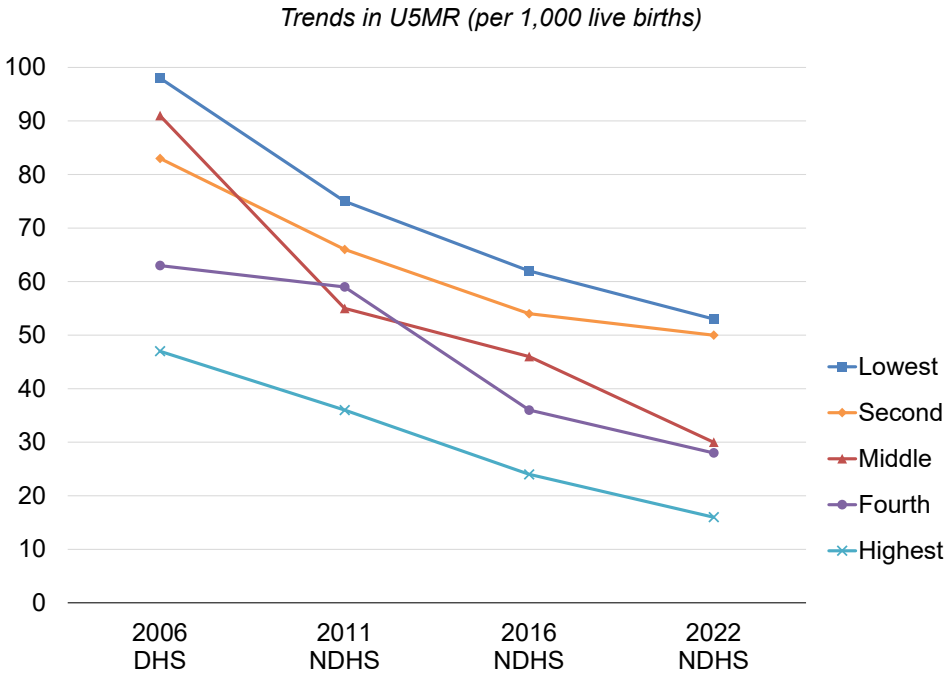
Nepal has diversity in ethnicities (142 ethnic groups) and languages (124 languages).[9] Collectively, more than two-thirds of those are from disadvantaged ethnic groups: Dalits (15%), indigenous groups (36%), and non-Dalit Terai caste groups (18%).[10,11] Society is implicitly stratified based on social gradients, including socioeconomic status, position, occupation, and ethnicity. Difficult geographic terrain further compounds these structural challenges. Nearly one-third of the total population is below the multidimensional poverty index. The social exercise of comparing disadvantages and multiple forms of marginalization further marginalizes those populations with lower social gradients. These structural disadvantages are the root cause of illness. For example, women who belong to households with multiple forms of disadvantages (for example, those who are poor, Dalit, have no education, and live in remote areas) generally have poor housing; experience food insecurity and thus have unhealthy food practices; and have less awareness of health, hygiene, and where to seek care while ill or experiencing health conditions.

These intersectional disadvantages influence the development of illnesses and care-seeking practices. For instance, poor hygiene and sanitation practices are underlying factors for diarrhea, while smoke from fuel burning, especially solid fuel, contributes to pneumonia. Children from underprivileged families are the victims of poor housing and living conditions, leading to a high burden of infectious childhood illnesses such as diarrhea and pneumonia, with a high incidence of predisposing undernutrition. The Institute of Heath Metrics and Evaluation estimates that 25% of children have diarrhea annually in Nepal.[12]

Nepal has made significant progress in reducing child mortality since the 1990s. From 1996 to 2022, the under-5 mortality rate (U5MR) (reported as deaths per 1,000 live births) decreased from 152 to 32.[13–17] Figure 1 shows trends in U5MR by wealth quintile, using Nepal Demographic and Health Survey (NDHS)

data. Although the overall U5MR has decreased over time, large equity gaps persist between the wealthiest and poorest groups. The ratio of U5MR among those in the lowest wealth quintile (98) to those in the highest wealth quintile (47) was 2.08 in 2006, increasing to 3.31 by 2022 with U5MRs of 53 among the lowest wealth quintile and 16 among the highest wealth quintile.[17] Gaps in equity may be even wider between households with intersectional disadvantages and those of comparative privilege, but little evidence about this is available in the literature.

Figure 1 Trends in under-5 mortality rate by wealth quintile, 2006–2022 Nepal DHS surveys



U5MR = under-5 mortality rate
Source: Figure created by authors using previous NDHS data[14–17]

During this same period, equity gaps were found in the uptake of routine health services.[18–20] Disadvantaged groups commonly experience childhood illnesses such as acute respiratory infections, diarrheal disease, measles, malnutrition, and malaria. Compared with children from socioeconomically privileged groups, children from marginalized groups face several contextual challenges (for example, lack of transportation facilities compounded by difficult geography, a perception of low risk of illnesses) that affect both demand for and use of health services.[21–24]

1.3 Nepal's Health System and Policy Context for Child Health

Nepal is a pioneer in designing and implementing community-based maternal and child health programs. Table 1 shows the chronological development of policies, programs, and strategies on child health and their major highlights since 1983. In the early 1980s, Nepal established the Control of Diarrheal Disease Program (the first of its kind), followed by the Acute Respiratory Infection Control Program and a pilot of the Community-Based Integrated Management of Childhood Illness Program, all of which were later rolled out nationwide. Several campaigns on child health are also being implemented now, including biannual

supplementation of vitamin A and distribution of single-dose albendazole tablets to children age 6–59 months. [23-25]

In Nepal, child health services (preventive, promotive, and treatment services) are available at the community level and in health facilities (HFs). A network of more than 52,000 female community health volunteers (FCHVs), who play a pivotal role in connecting communities and health systems in Nepal,[23] have supported the implementation of national immunization programs and child health campaigns As part of Nepal's basic health services package, child health services are free of cost in public HFs through publicly funded health programs.[26] Services that are free through the basic health services package are excluded from the national health insurance program, and thus are available as pay-for-service options in the public and private sector.[31]

Table 1 Major provisions for improving child health in Nepal in the past 3 decades

Year	Policies, programs, and strategies	Highlights
1983	• Control of Diarrheal Disease (CDD) Program	• Initiation of child survival interventions
1987	• Acute Respiratory Infection (ARI) Control Program	• Pilot of referrals from household and community levels for treatment
1993	• CDD reactivation	• Implementation of CDD at the community level
1995	• Community-based ARI and CDD (CBAC)	• ARI intervention combined with CDD and named the CBAC program
1997	• Community-based ARI control (six districts) • Pilot of community-based integrated management of childhood illness (CB-IMCI)	• Evaluation of referral intervention • Nutrition and immunization components incorporated into CBAC. • CBAC merged into CB-IMCI
1999	• Expansion of CB-IMCI (merged CBAC with CB-IMCI)	• Implementation of CB-IMCI
2004	• National Neonatal Health Strategy • Deworming program	• Policy provision for promotive, preventive, and treatment services for neonatal health • Distribution of single-dose albendazole tablets to children age 6–59 months biannually
2005	• Low osmolar oral rehydration solution and zinc supplementation pilot	• Pilot of low osmolar oral rehydration solution and zinc supplementation, incorporated into CB-IMCI
2005	• Pilot of Morang Innovative Neonatal Intervention	• Treatment of possible severe bacterial infection by community-based interventions
2006	• CB-IMCI plus newborn care • Child protection grants for infant and young child feeding counseling and food supplementation	• Newborn care components included in CB-IMCI • Implementation of infant and young child feeding programs
2007	• Free Health Care Policy • Community-Based Newborn Care Package (CB-NCP)	• Free health care services to poor and vulnerable citizens attending primary health care centers and district hospitals (up to 25-bed capacity) • Prevention and management of newborn infection; management hypothermia, low birth weight, and post-delivery asphyxia; and referral for sick newborns
2009	• Expansion of CB-IMCI in 75 districts • Roll out of CB-NCP • Nutrition Assessment and Gap Analysis	• Nationwide implementation of CB-IMCI • CB-NCP had incorporated seven strategic interventions • Scale-up of nutrition programs • Pilot of micronutrient powder • Pilot of community-based management of acute malnutrition
2011	• Inclusion of chlorhexidine in CB-NCP	• Implementation of a chlorhexidine component in the CB-NCP to prevent umbilical infections in newborns
2014	• Integration of CB-NCP and CB-IMCI into community-based integrated management of neonatal and childhood illness (CB-IMNCI) • Facility-based IMNCI program	• Expansion of CB-NCP in 41 districts • Training on and implementation of the CB-IMNCI program • Training of health care providers on CB-IMCI
2015	• Free newborn care policy integrated into Aama program	• Monetary incentive for the treatment of sick newborns in public health facilities
2016	• Every Newborn Action Plan • National Strategy for Reaching the Unreached (2016–2030) • Basic Health Care Strategy	• Vision to reduce preventable newborn deaths and establish newborn care corners in birthing centers • Special/sick newborn care units in hospitals and neonatal intensive care units in tertiary-level health facilities • Policy provision to address equity gaps in health services • Development of basic health services

ARI, acute respiratory infection; CBAC, community-based acute respiratory infection and control of diarrheal disease; CB-IMCI, community-based integrated management of childhood illness; CB-IMNCI, community-based integrated management of neonatal and childhood illness; CB-NCP, Community-Based Newborn Care Package; CDD, control of diarrheal disease; IMNCI = integrated management of neonatal and childhood illness

Source: Information collected after review of literature on child health policy development in Nepal[10,24–28]

1.4 Study Rationale

Nepal is committed to ensuring universal coverage of quality essential health services, including child health services, as prioritized in the Nepal Health Sector Strategic Plan (2023–2030).[29] The National Strategy for Reaching the Unreached (2016–2030) envisions achieving universal health coverage for disadvantaged populations by addressing health systems' demand- and supply-side challenges.[30] Despite these policies and programmatic provisions, persistent equity gaps remain, with a high burden of childhood illnesses and poor care-seeking practices in public HFs. Previous NDHS reports revealed that most children with childhood illnesses seek care in private HFs, but no further analyses have been conducted to understand which children are seeking care in private HFs.[14–17] For children from disadvantaged households, seeking care in private HFs may further increase structural inequity (for example, poverty) due to increased out-of-pocket expenditure in the context of lack of protection from financial risk.

Despite the availability of health services for childhood illnesses up to the community level in Nepal, limited evidence is available on trends in and determinants of common childhood illnesses in children under 5, such as diarrhea and fever. Furthermore, no analyses have been conducted on the prevalence of these illnesses among children with multiple or intersectional disadvantages, and no disaggregated analyses have been conducted on care seeking in private HFs by sociodemographic factors. Generating evidence in these research gaps could inform policy and programs in addressing these childhood illnesses and improving care-seeking practices. Additionally, the findings could provide insights to help policymakers develop strategies to reach the unreached populations in the federalized health system context of Nepal.

1.5 Objectives

This study aimed to investigate the equity gaps in key child health indicators (prevalence, care seeking, and care seeking in private HFs for diarrhea and fever) among children under 5, considering socioeconomic and demographic factors in Nepal. The specific objectives were:

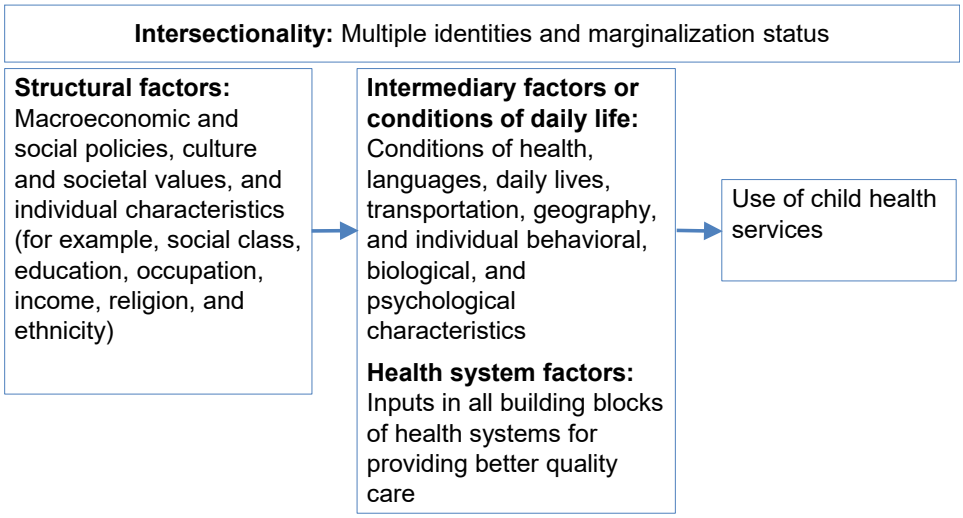
- To analyze the overall trends in prevalence of and care-seeking practices for fever and diarrhea in the three most recent NDHS surveys (2011, 2016, and 2022)
- To examine the prevalences of fever, diarrhea, and care-seeking practices in the most recent NDHS (2022)
- To investigate the determinants of care-seeking practices for fever and diarrhea in private HFs in the most recent NDHS (2022)

2 METHODS

2.1 Conceptual Framework

The conceptual framework used in this study, adapted and modified from Marmot[34] and the World Health Organization (WHO) social determinants of health framework,[35] is shown in Figure 2. According to the framework, structural factors (which depend on the social structure of the society and required political interventions) and intermediary factors (which are usually modifiable through multisectoral actions) are intricately linked. The factors overlap with an individual's multiple identities, thereby creating intersectional advantages and/or disadvantages (i.e., marginalization status). Structural factors, intermediary factors, and intersectional disadvantages all influence access to and use of health services, including care-seeking behaviors for childhood illnesses. Understanding levels of care seeking are important from a programmatic perspective, and understanding levels of care seeking in private HFs is important from a cost-of-care perspective. This study was conducted with these two perspectives in mind.

Figure 2 Conceptual framework to guide analysis



Source: Adapted and modified from Marmot 2018[34] and the social determinants of health framework[35]

2.2 Data Sources

National trend analyses of the prevalences of and care-seeking practices for diarrhea and fever were conducted using data from the 2011 Nepal Demographic Health Survey (NDHS) (n=5,140),[15] the 2016 NDHS (n=4,887),[16] and the 2022 NDHS (n=5,040)[17] among children under 5 who had diarrhea and/or fever in the 2 weeks prior to the survey. Determinants of prevalence and care seeking were identified using data from the 2022 NDHS among children with diarrhea (n=524) and fever (n=1,159), and among a subset of those who sought care for diarrhea (n=300) and fever (n=905). Detailed methods of the NDHS surveys have been previously described.[17]

This study was a secondary analysis of publicly available NDHS data obtained from The Demographic and Health Surveys (DHS) Program (www.dhsprogram.com). Before data were accessed, The DHS Program

approved the submitted registration form outlining the requested data and analysis plan. The DHS Program then authorized the research team to download and use the NDHS data for this research.

2.3 Study Variables

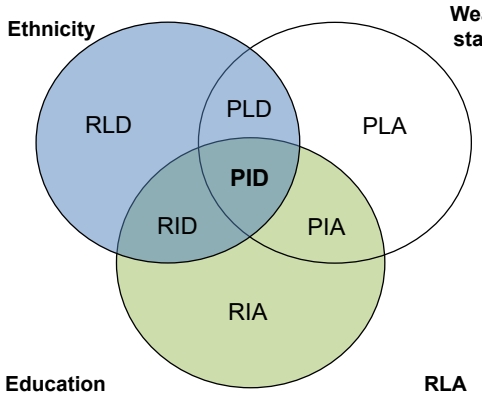
We examined the outcome variables of prevalence, care seeking, and care seeking in private HFs for diarrhea and fever (Box 1). Independent background variables were selected based on our conceptual framework. These variables comprised marginalization status as well as a variety of structural factors (religion, ethnicity, maternal education, wealth status, occupation, and sex of the child) and intermediary factors (maternal age, child age, province, place of residence, ecoregion, native language, and birth order of the child). Detailed categorization of each independent variable can be found in the Appendix (see Table A1).

Box 1 Outcome variables and categorization

- **Had diarrhea in the 2 weeks preceding the survey:** Yes/No
- **Sought treatment for diarrhea:** Yes/No
- **Care seeking for diarrhea in private health facility:** Yes/No
- **Had a fever in the 2 weeks preceding the survey:** Yes/No
- **Sought treatment for fever:** Yes/No
- **Care seeking for fever in private health facility:** Yes/No

Marginalization status was determined using three independent variables: education, wealth status, and ethnicity.[32] The Government of Nepal has categorized 142 ethnicities into six broad categories for reporting in the health management information system:[9] Dalits, disadvantaged Janajatis (indigenous), disadvantaged non-Dalit Terai caste groups, religious minorities (Muslims), relatively advantaged Janajatis, and Bramins/Chhetris (i.e., upper-caste groups). For this study, we merged these six categories into two groups according to their comparative privileges: disadvantaged ethnicities (Dalits, Muslims, Terai caste, and disadvantaged Janajatis) and advantaged ethnicities (Brahmins/Chhetris and advantaged Janajatis). Education was dichotomized into illiterate (those who cannot read and write) and literate (those who can read and write and have at least a primary education). The five wealth quintiles described in the 2022 NDHS were dichotomized into two groups, merging the lowest two quintiles (lower 40%) into "lower wealth status" and the highest three quintiles (upper 60%) into "upper wealth status." The three variables (two categories each) were then combined to create the new marginalization status variable. Eight original categories of marginalization status (Figure 3) were merged into four categories based on the number of disadvantages (multiple marginalizations) a woman could have: triple, double, single, and no disadvantages.

Figure 3 Intersections of ethnicity, education, and wealth status and multiple marginalization status



Variables:

Ethnicity: Advantaged and disadvantaged

Wealth status: Rich and poor

Education: No education (illiterate) and literate

New categories of marginalization status:

PID: Poor, illiterate, and disadvantaged ethnicity

PIA: Poor, illiterate, and advantaged ethnicity

PLD: Poor, literate, and disadvantaged ethnicity

RID: Rich, illiterate, and disadvantaged ethnicity

PLA: Poor, literate, and advantaged ethnicity

RIA: Rich, illiterate, and advantaged ethnicity

RLD: Rich, literate, and disadvantaged ethnicity

RLA: Rich, literate, and advantaged ethnicity

Source: Created by Khatri R using his research[33]

2.4 Data Analyses

Univariate (i.e., descriptive), bivariate, and multivariate analyses were performed. As this study was a further analysis of secondary data, quality was ensured only at the analysis stage. We applied sampling weight, primary sampling unit, and strata adjustments for all analyses.

Proportions for each outcome variable were described, and trends were analyzed by marginalization status. We reported the national average indicators as well as results by number of disadvantages. Associations between outcome variables and all independent background variables were also examined. Differences in proportions were assessed using chi-square tests. Initial unadjusted and adjusted logistic regression analyses were performed to assess the determinants for each outcome variable. Separate multivariable regression models were used for each outcome variable. For the multivariable regression analyses, variable categories with small sample sizes were merged.

Before running the final regression model, we checked for multicollinearity. Independent variables with variation inflation factors ≥5 were excluded. Adjusted odds ratios with 95% confidence intervals were reported for all independent variables retaining a p value <.05. We conducted a goodness of fit test using the Hosmer-Lemeshow test, with nonsignificant results (p>.05) indicating an adequate fit. The level of statistical significance was set at p<.05 (two-tailed) to identify the determinants associated with each outcome variable. All reported estimates were weighted unless otherwise indicated. All analyses were conducted using the "svy" command function to account for the clustering effect of the sampling design in Stata 17 (StataCorp, 2023).

3 RESULTS

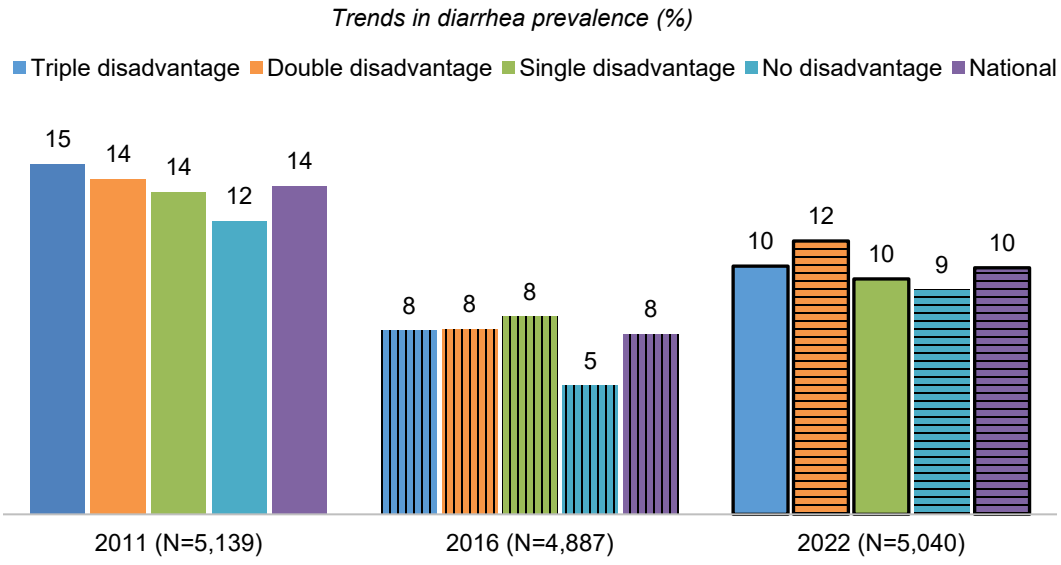
Following are the key findings of descriptive analyses and multivariable analyses. Results of more detailed descriptive analyses and of bivariable analyses can be found in the appendix.

3.1 Trends in Childhood Illnesses

3.1.1 Trends in prevalence of and care seeking for diarrhea

Figure 4 presents the prevalence of childhood diarrhea in the 2 weeks preceding the survey among children under 5, by marginalization status. Nationally, the prevalence of diarrhea decreased from 14% in 2011 to 8% in 2016 but then increased to 10% in 2022. Over the full study period (2011 to 2022), diarrhea prevalence at the national level declined significantly from 14% to 10%. Diarrhea prevalence declined among children of all four marginalization categories from 2011 to 2016, but significantly increased from 2016 to 2022 among those with double disadvantages and those with no disadvantages. Over the full study period (from 2011 to 2022), it declined significantly among children in all marginalization categories except those with no disadvantages. The prevalence of diarrhea was consistently lowest among children with no disadvantages; however, no notable gaps in diarrhea prevalence based on marginalization status were seen in 2022.

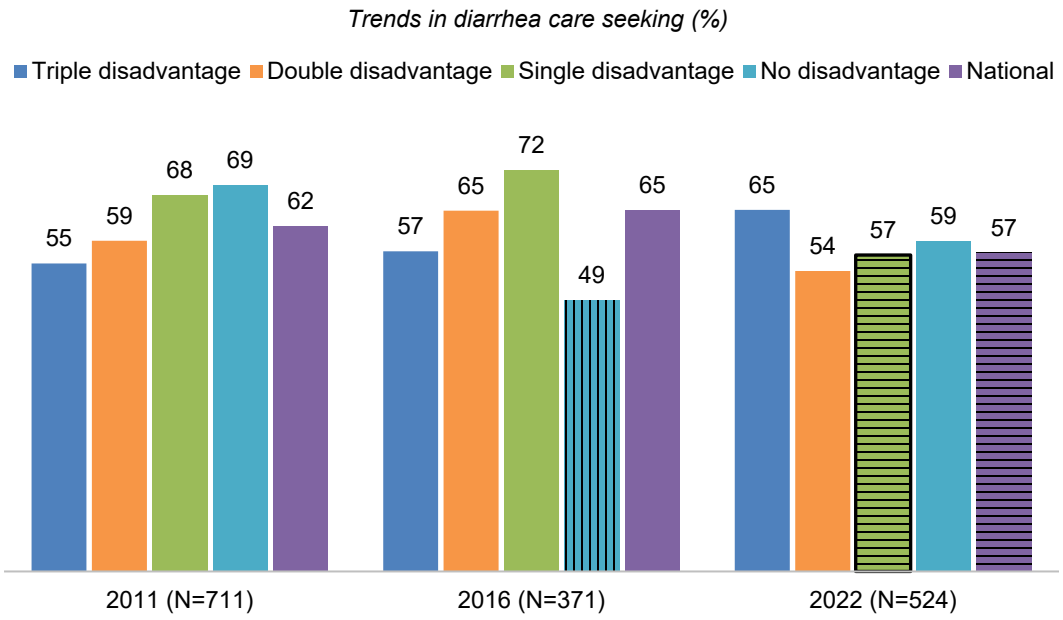
Figure 4 Trends in prevalence of diarrhea among children under 5, by marginalization status, 2011–2022 Nepal DHS surveys



Note: Each bar with vertical lines indicates a statistically significant change from 2011 to 2016. Each bar with horizontal lines indicates a statistically significant change from 2016 to 2022. Each bar with a thick black outline indicates a statistically significant change from 2011 to 2022.

Figure 5 presents care-seeking behavior among children under 5 who had diarrhea in the 2 weeks preceding each survey. Nationally, care-seeking among children with diarrhea did not change significantly from 2011 to 2022, but it did significantly decline in the most recent period (2016 to 2022), from 65% to 57%. Care seeking for diarrhea declined significantly from 2011 to 2022 among children with a single disadvantage, but no significant changes were found across children in other categories of marginalization status.

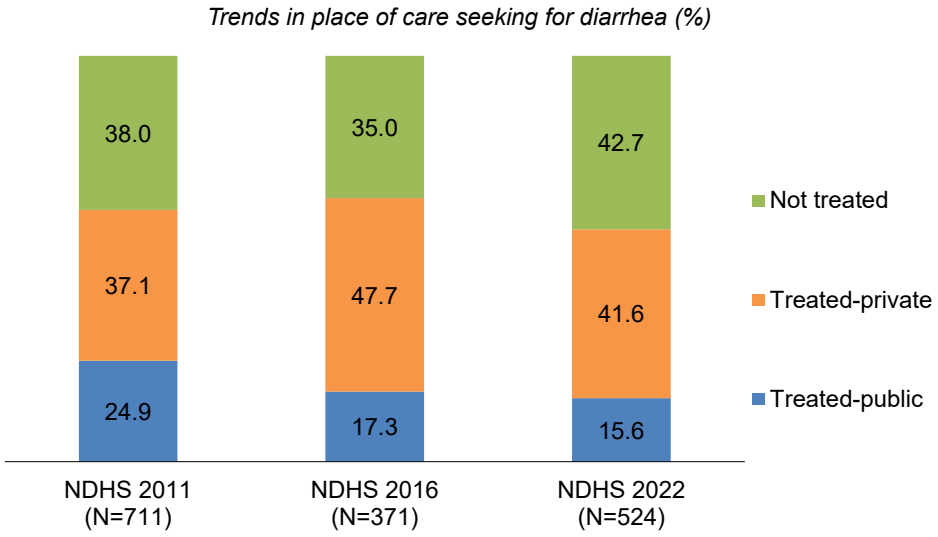
Figure 5 Trends in care seeking for diarrhea among children under 5, by marginalization status, 2011–2022 Nepal DHS surveys



Note: Each bar with vertical lines indicates a statistically significant change from 2011 to 2016. Each bar with horizontal lines indicates a statistically significant change from 2016 to 2022. Each bar with a thick black outline indicates a statistically significant change from 2011 to 2022.

Figure 6 shows where children under 5 who had diarrhea in the 2 weeks preceding the survey sought care, by facility type. The proportion who sought care in public health facilities (HFs) gradually declined from 24.9% in 2011 to 15.6% in 2022. Patterns were less evident among children who sought care in the private sector or did not seek care. The proportion of children with diarrhea who sought care in the private sector increased from 37.1% in 2011 to 47.7% in 2016 but decreased slightly to 41.6% in 2022. The proportion who did not seek care decreased from 38% in 2011 to 35% in 2016 before increasing to 42.7% in 2022.

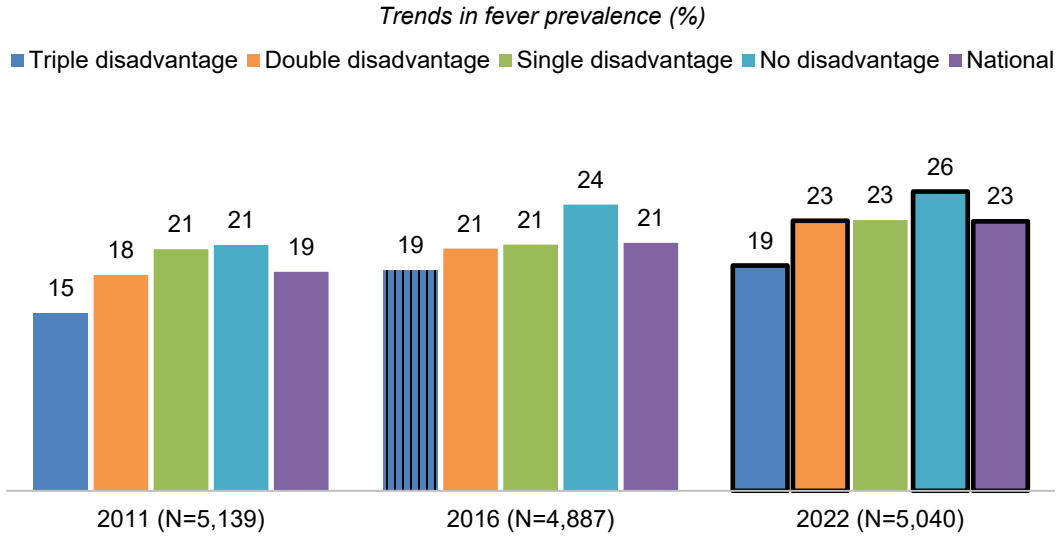
Figure 6 **Trends in place of care seeking for diarrhea among children under 5 with diarrhea, 2011–2022 Nepal DHS surveys**



3.1.2 Trends in prevalence of and care seeking for fever

Figure 7 shows the prevalence of fever in the 2 weeks preceding the survey among children under 5, by marginalization status. The national prevalence of fever increased from 19% in 2011 to 23% in 2022. The prevalence was lowest among children with triple disadvantages and highest among those with no disadvantages at all three time points. The prevalence of fever increased between 2011 and 2022 among children of all marginalization categories, except those with a single disadvantage. The gap in fever prevalence based on marginalization status remained relatively unchanged from 2011 to 2022.

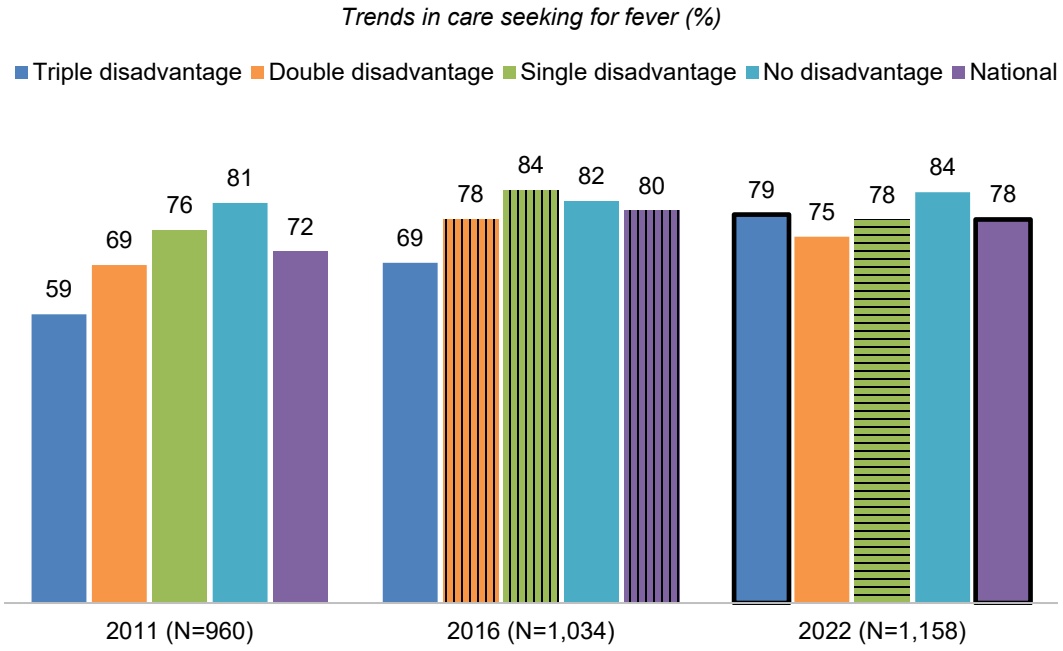
Figure 7 **Trends in prevalence of fever among children under 5, by marginalization status, 2011–2022 Nepal DHS surveys**



Note: Each bar with vertical lines indicates a statistically significant change from 2011 to 2016. Each bar with horizontal lines indicates a statistically significant change from 2016 to 2022. Each bar with a thick black outline indicates a statistically significant change from 2011 to 2022.

Figure 8 shows care-seeking behavior among children under 5 who had a fever in the 2 weeks preceding each survey, by marginalization status. Nationally, the proportion of children with fever who sought care increased from 72% in 2011 to 78% in 2022. Care seeking for fever also increased significantly from 59% in 2011 to 79% in 2022 among those with triple disadvantages. No other marginalized groups had significant changes in care-seeking behaviors between 2011 and 2022, but levels of care seeking for fever did decline significantly in the most recent period (2016 to 2022), from 84% to 78%, among those with a single disadvantage.

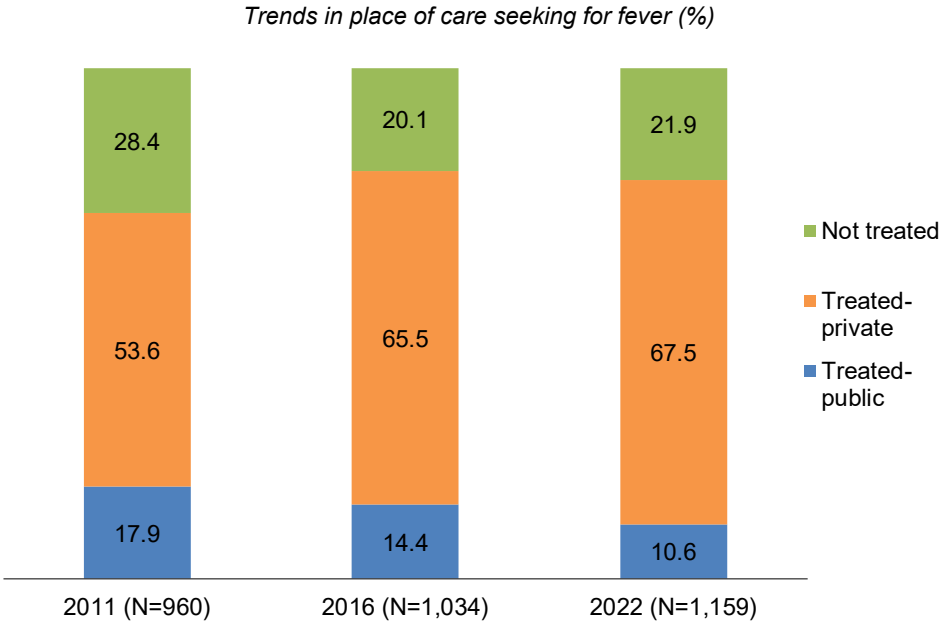
Figure 8 Trends in care seeking for fever among children under 5, by marginalization status, 2011–2022 Nepal DHS surveys



Note: Each bar with vertical lines indicates a statistically significant change from 2011 to 2016. Each bar with horizontal lines indicates a statistically significant change from 2016 to 2022. Each bar with a thick black outline indicates a statistically significant change from 2011 to 2022.

Figure 9 shows where children with fever sought care. The proportion who sought care in the private sector steadily increased from 53.6% in 2011 to 67.5% in 2022, while the proportion who sought care in the public sector declined from 17.9% in 2011 to 10.6% in 2022. The proportion of children with fever who did not seek care declined from 28.4% in 2011 to 20.1% in 2016, rebounding slightly to 21.9% in 2022.

Figure 9 Trends in place of care seeking for fever among children under 5 with a fever, 2011–2022 Nepal DHS surveys



3.2 Variables Associated with Prevalence of and Care Seeking for Childhood Illnesses

3.2.1 Background variables for children

Table 2 presents the distribution of children under 5 from the 2022 survey data, stratified by background variables. Of the 5,040 children included in the analysis, the largest proportions were male (52.4%), were age 36–47 months (20.8%), were born to mothers age 20–29 (65.2%), were Hindu (83.7%), were of Janajati ethnicity (28.1%), were born to mothers with secondary education (38.8%), were from the lowest wealth quintile (24.1%), had a single disadvantage (42%), were from Madhesh province (26.8%), lived in an urban area (65%), were born to native Nepali speakers (47.3%), and were firstborn (40.7%).

Table 2 Distribution of children under 5 by background variables, 2022 Nepal DHS

Variable	%	95% CI	N=5,040
Sex of the child			
Male	52.4	50.6–54.2	2,639
Female	47.6	45.8–49.4	2,401
Child age in months			
<6	10.6	9.7–11.5	533
6–11	8.6	7.7–9.6	434
12–23	19.0	17.9–20.2	959
24–35	21.1	19.9–22.4	1,066
36–47	20.8	19.6–22	1,048
48–59	19.8	18.7–21	1,000
Maternal age			
<20	19.7	18.3–21.2	994
20–29	65.2	63.6–66.8	3,286
≥30	15.1	13.8–16.4	761
Religion			
Hindu	83.7	80.8–86.2	4,218
Other	16.3	13.8–19.2	822
Ethnicity			
Brahmin	7.4	6.1–8.9	374
Chhetri	17.3	15.3–19.5	873
Madheshi	19.9	17.1–23.1	1,005
Dalit	18.6	16.1–21.3	935
Janajati	28.1	25.3–31.1	1,417
Newar	2.4	1.6–3.4	119
Muslim	6.3	4.2–9.2	317
Maternal education			
No education	22.5	20.1–25.0	1,133
Basic	34.5	32.5–36.5	1,737
Secondary	38.8	36.4–41.3	1,955
Higher	4.3	3.5–5.2	215
Wealth quintile			
Lowest	24.1	21.5–26.8	1,213
Second	20.6	18.4–22.9	1,037
Middle	20.8	18.9–22.9	1,048
Fourth	19.2	17.1–21.6	969
Highest	15.4	13.3–17.7	774
Disadvantages			
Triple	12.2	10.2–14.5	615
Double	30.0	27.6–32.4	1,510
Single	42.0	39.5–44.5	2,118
No	15.8	13.8–18.0	797

Continued…

Table 2—*Continued*

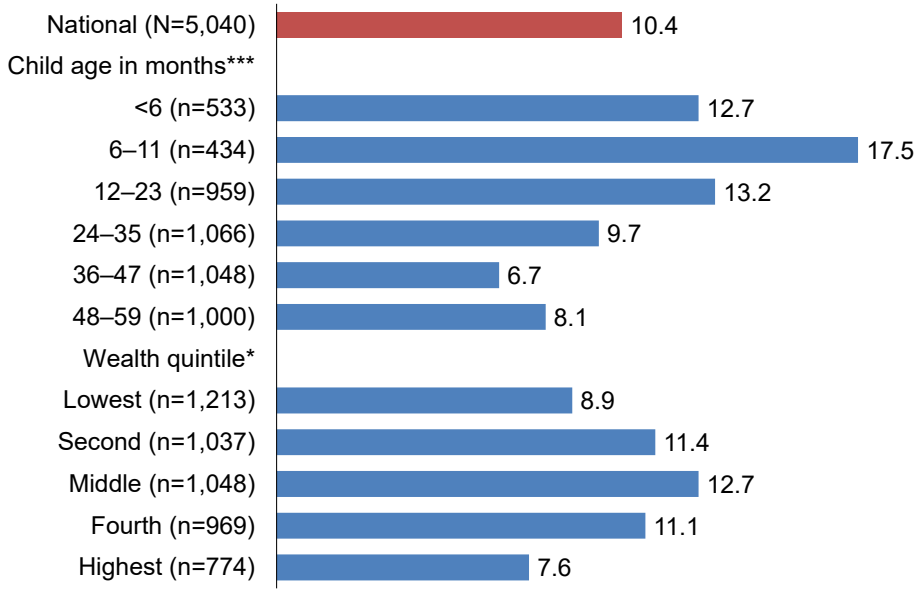
Variable	%	95% CI	N=5,040
Province			
Koshi	17.0	15.3–18.9	859
Madhesh	26.8	24.4–29.4	1,352
Bagmati	16.2	14.2–18.3	814
Gandaki	6.6	5.6–7.7	331
Lumbini	17.1	15.4–19	862
Karnali	7.4	6.6–8.3	371
Sudurpaschim	8.9	8.0–10.0	451
Place of residence			
Urban	65.0	62.7–67.3	3,276
Rural	35.0	32.7–37.3	1,764
Ecoregion			
Mountain	6.3	4.6–8.6	317
Hill	34.6	30.8–38.6	1,744
Terai	59.1	55.2–62.9	2,979
Native language			
Nepali	47.3	43.8–50.8	2,383
Maithili	20.0	16.1–24.5	1,006
Bhojpuri	9.2	6.2–13.5	466
Other	23.5	20.6–26.7	1,185
Birth order			
First	40.7	39.0–42.4	2,050
Second	34.0	32.5–35.5	1,715
Third or higher	25.3	23.5–27.1	1,275

CI = confidence interval

3.2.2 Prevalence of diarrhea

Figure 10 presents the background variables significantly associated with the prevalence of diarrhea among children under 5. Overall, 10.4% of the children had diarrhea in the 2 weeks preceding the survey. Children had a higher prevalence of diarrhea if they were age 6–11 months (17.5%) and if they were in the middle wealth quintile (12.7%) compared with the national average and with their respective reference groups. See Table A2 for findings on additional background variables.

Figure 10 Proportion of children under 5 with diarrhea in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS



* $p<.05$, *** $p<.001$

3.2.3 Care seeking for childhood diarrhea

Figure 11 presents the national average care-seeking behavior among children under 5 with diarrhea in the 2 weeks preceding the survey. Nearly three in five (57.2%) of children who had diarrhea sought care. The proportion who sought care was significantly lower among children with a second birth order (47.6%) when compared with the national average or the reference group. See Table A3 for detailed results for all background variables.

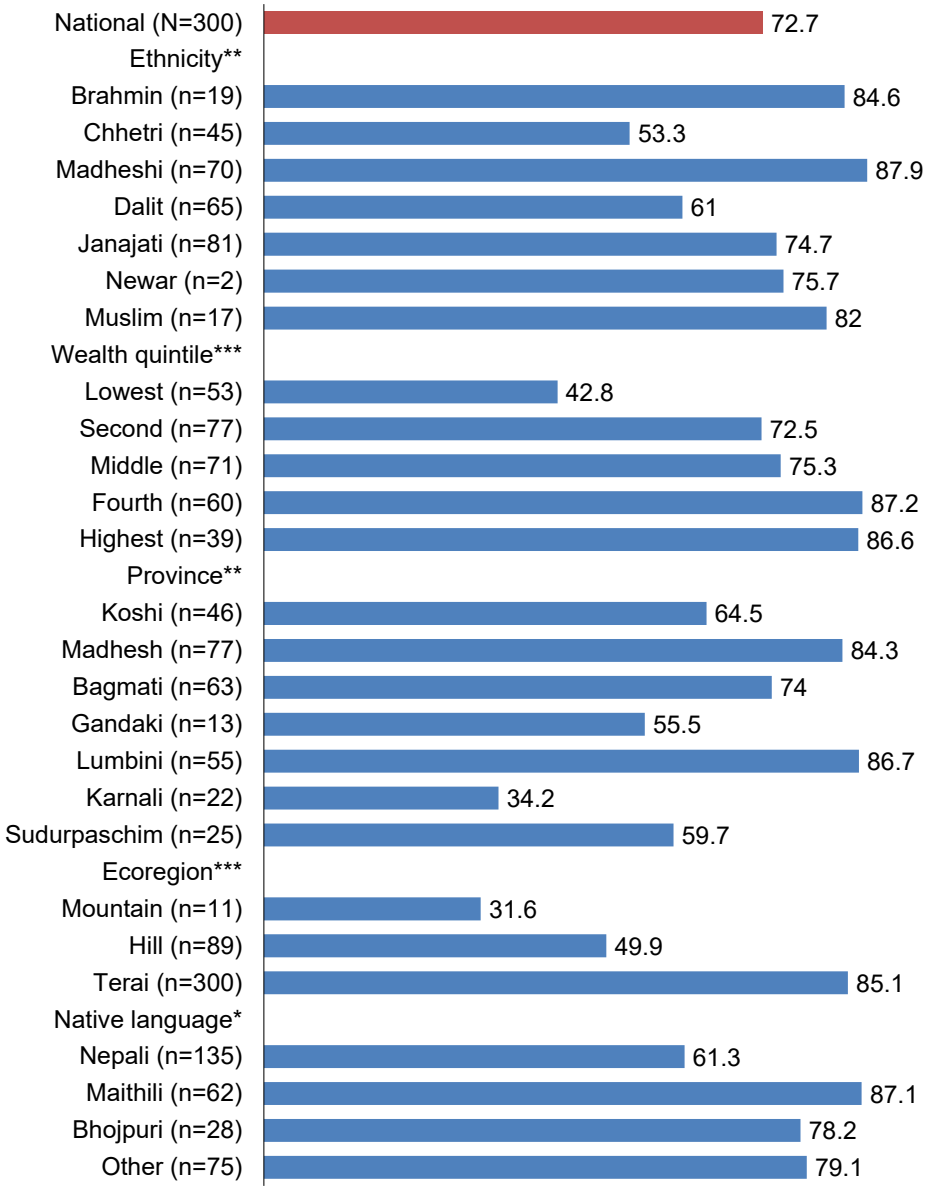
Figure 11 Proportion of children under 5 with diarrhea in the 2 weeks preceding the survey who sought care, by background variables, 2022 Nepal DHS

* $p<.05$

3.2.4 Care seeking for diarrhea in private health facilities

Figure 12 presents the background variables significantly associated with seeking care for diarrhea in private HFs. Overall, for children who had diarrhea and sought care, 72.7% attended private HFs. Children had significantly higher levels of care seeking in private HFs if they were born to mothers of Madheshi ethnicity (87.9%), were in the fourth wealth quintile (87.2%), were from Lumbini province (86.7%), were from the Terai ecoregion (85.1%), and were born to mothers who were Maithili speakers (87.1%) when compared with the national average and their respective references groups. See Table A4 for findings on additional background variables.

Figure 12 Proportion of children under 5 who sought care in private HFs, among those with diarrhea in the 2 weeks preceding the survey who sought care for diarrhea, by background variables, 2022 Nepal DHS

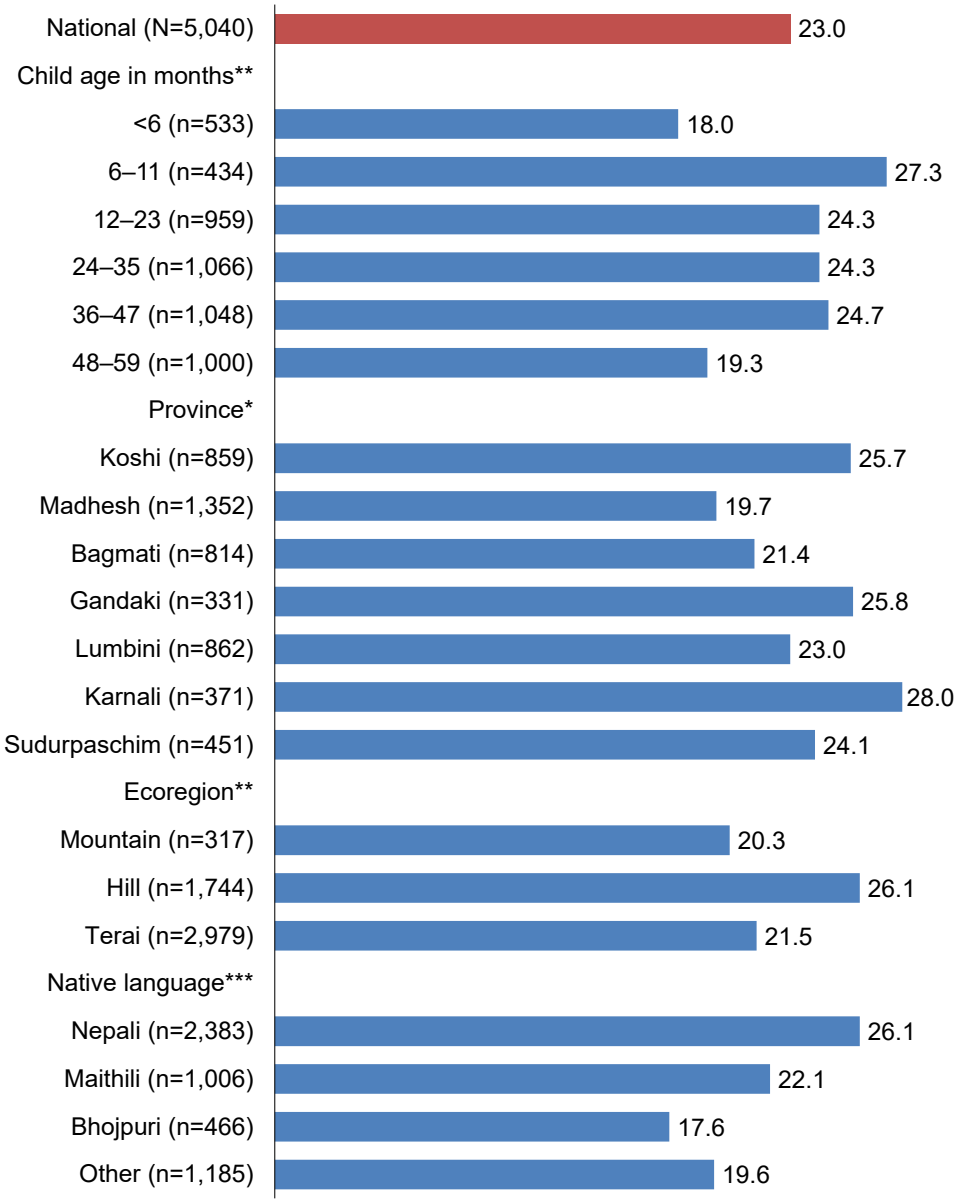


* $p<.05$, ** $p<.01$, *** $p<.001$

3.2.5 Prevalence of fever

Figure 13 presents the variables significantly associated with the prevalence of fever among children under 5 years old. Overall, 23% of children had a fever in the 2 weeks before the survey. The prevalence of fever was significantly higher among children age 6–12 months (27.3%), those from Karnali province (28%), those from the Hill ecoregion (26.1%), and those born to Nepali native speakers (26.1%) when compared with the national average and their respective reference groups. See Table A5 for results for additional background variables.

Figure 13 Proportion of children under 5 years old with a fever 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

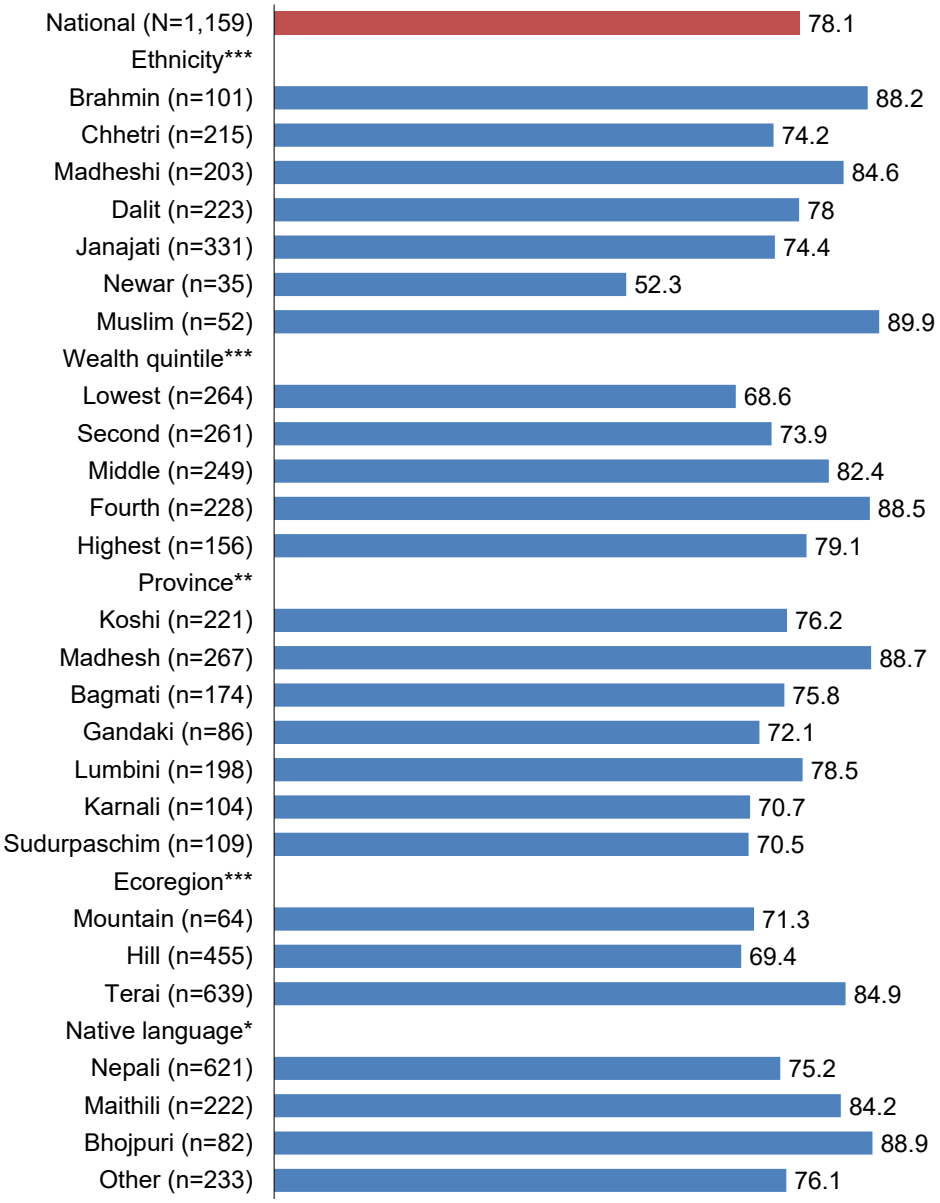


* $p<.05$, ** $p<.01$, *** $p<.001$

3.2.6 Care seeking for childhood fever

Figure 14 presents the background variables significantly associated with care seeking for fever among children under 5 years old. Overall, 78.1% of children with fevers sought care. The proportion of children who sought care was significantly lower among those of Newar ethnicity (52.3%), those in the lowest wealth quintile (68.6%), those from Sudurpaschim province (70.5%), those from the Hill ecoregion (69.4%), and those born to mothers who were native Nepali speakers (75.2%) when compared with the national average and their respective reference groups. See Table A6 for findings on additional background variables.

Figure 14 Proportion of children under 5 with a fever in the 2 weeks prior to the survey who sought care, by background variables, 2022 Nepal DHS

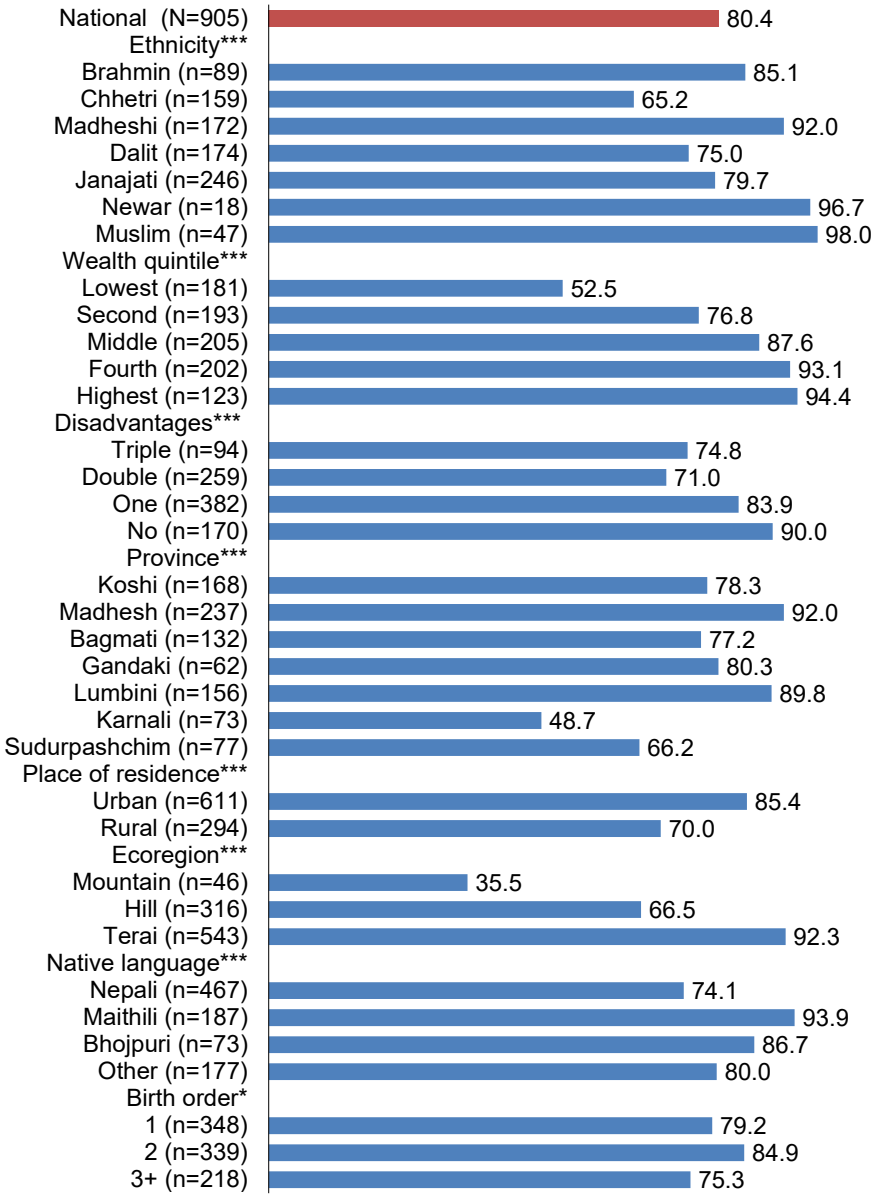


* $p<.05$, ** $p<.01$, *** $p<.001$.

3.2.7 Care seeking for fever in private health facilities

Figure 15 presents the variables significantly associated with seeking care for fever in private HFs, among children under 5 who had a fever and sought treatment. About 8 in 10 children with fevers who sought care attended private HFs (80.4%). The proportion of children who sought care at private HFs was significantly higher among those born to Muslim women (98%), those in the highest wealth quintile (98%), those with no disadvantages (90%), those living in Madhesh province (92%), those in urban areas (85.4%), those in Terai ecoregion (92.3%), those born to native Maithili speakers (93.9%), and those who were second in the birth order (84.9%) when compared with the national average and their respective reference groups. See Table A7 for findings on additional background variables.

Figure 15 **Proportion of children under 5 who sought care in private health facilities, among those with a fever in the 2 weeks preceding the survey who sought care, by background variables, 2022 Nepal DHS**



* $p<.05$, *** $p<.001$

3.3 Determinants of and Care Seeking for Diarrhea

3.3.1 Determinants of diarrhea

Table 3 presents determinants of the prevalence of diarrhea in the 2 weeks preceding the survey among children under 5. Compared with children younger than 6 months old, children 36–47 months old [adjusted odds ratio (AOR)=0.51; 95% confidence interval (CI)=0.33–0.78] and those 48–59 months old (AOR=0.62; 95% CI=0.42–0.93) had significantly lower odds of having diarrhea. The odds of diarrhea were also significantly higher if children were from Bagmati (AOR=2.15; 95% CI=1.35–3.42) or Karnali province (AOR=1.68; 95% CI=1.07–2.65) than if they were from

Sudurpaschim province, and were significantly higher if they were from the Hill (AOR=1.54; 95% CI=1.09–2.17) or Terai ecoregion (AOR=2.68; 95% CI=1.73–4.14) than if they were from the Mountain ecoregion. (See Table A8 for results of bivariable logistic regression analysis of diarrhea prevalence.)

Table 3 Determinants of diarrhea among children under 5, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–11	1.53	1.0–2.35
	12–23	1.09	0.76–1.58
	24–35	0.77	0.51–1.15
	36–47	0.51**	0.33–0.78
	48–59	0.62*	0.42–0.93
Sex of the child	Male	1.00	
	Female	0.95	0.76–1.17
Maternal age	<20	1.00	
	20–29	0.77	0.56–1.05
	≥30	0.72	0.45–1.16
Religion	Hindu	1.00	
	Other	0.86	0.62–1.18
Disadvantages	Triple	1.00	
	Double	1.06	0.72–1.57
	Single	0.80	0.54–1.19
	No	0.66	0.39–1.14
Province	Koshi	1.17	0.75–1.83
	Madhesh	0.78	0.44–1.39
	Bagmati	2.15**	1.35–3.42
	Gandaki	1.06	0.62–1.8
	Lumbini	0.95	0.61–1.46
	Karnali	1.68*	1.07–2.65
	Sudurpaschim	1.00	
Place of residence	Urban	1.00	
	Rural	0.85	0.65–1.12
Ecoregion	Mountain	1.00	
	Hill	1.54*	1.09–2.17
	Terai	2.68***	1.73–4.14
Native language	Nepali	0.97	0.71–1.33
	Maithili	0.99	0.64–1.52
	Bhojpuri	0.93	0.45–1.94
	Other	1.00	
Birth order	First	1.00	
	Second	1.09	0.87–1.36
	Third or Higher	1.02	0.71–1.45

* $p<.05$, ** $p<.01$, *** $p<.001$

AOR = adjusted odds ratio; CI = confidence interval

3.3.2 Determinants of care seeking for diarrhea

Table 4 shows the determinants of care seeking for diarrhea among children under 5 who had diarrhea in the 2 weeks prior to the survey. Regression analysis revealed significantly lower odds of care seeking for diarrhea among firstborn children (AOR=0.49; 95% CI=0.3–0.78) than among children of second birth order. (See Table A9 for results of bivariable logistic regression analysis of care seeking for diarrhea.)

Table 4 Determinants of care seeking among children under 5 who had diarrhea, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–11	0.96	0.45–2.08
	12–23	0.96	0.49–1.87
	24–35	0.62	0.28–1.36
	36–47	0.70	0.3–1.62
	48–59	1.02	0.43–2.45
Sex of the child	Male	1.00	
	Female	1.13	0.72–1.79
Maternal age	<20	1.00	
	20–29	0.76	0.43–1.34
	≥30	0.85	0.36–2.04
Religion	Hindu	1.00	
	Other	1.29	0.69–2.4
Disadvantages	Triple	1.00	
	Double	1.56	0.76–3.21
	Single	1.50	0.75–2.99
	No	1.25	0.52–3.02
Province	Koshi	1.00	
	Madhesh	1.22	0.45–3.33
	Bagmati	0.69	0.34–1.39
	Gandaki	1.07	0.38–3.02
	Lumbini	0.57	0.27–1.21
	Karnali	0.74	0.31–1.77
	Sudurpaschim	0.56	0.27–1.19
Place of residence	Urban	1.00	
	Rural	0.88	0.57–1.36
Native language	Nepali	1.00	
	Maithili	0.63	0.23–1.7
	Bhojpuri	0.46	0.16–1.33
	Other	0.78	0.43–1.43
Birth order	First	0.49**	0.3–0.78
	Second	1.00	
	Third or Higher	0.60	0.33–1.08

** $p<.01$

AOR = adjusted odds ratio; CI = confidence interval

3.3.3 Determinants of care seeking for diarrhea in private health facilities

Table 5 presents the determinants of care seeking for diarrhea children under 5 who sought care for diarrhea 2 weeks prior to the survey in private HFs. This analysis found higher odds of care seeking in private HFs if children were from Lumbini province (AOR=3.48; 95% CI=1.05–11.55) than if they were from Sudurpaschim province. Odds of care seeking in private HFs were also significantly higher among children born to native speakers of Maithili (AOR=4.38; 95% CI=1.15–16.76) or other languages (AOR=3.06; 95% CI=1.24–7.56) than among those born to native Nepali speakers.

Table 5 Determinants of care seeking in private health facilities among children under 5 who had diarrhea and sought care, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–11	2.29	0.85–6.15
	12–23	2.04	0.74–5.65
	24–35	0.92	0.3–2.87
	36–47	1.36	0.5–3.65
	48–59	1.07	0.34–3.36
Sex of the child	Male	1.00	
	Female	1.17	0.59–2.33
Maternal age in years	<20	1.00	
	20–29	1.13	0.43–2.95
	≥30	0.62	0.16–2.41
Religion	Hindu	1.00	
	Other	0.69	0.26–1.84
Disadvantages	Triple	1.00	
	Double	0.73	0.21–2.61
	Single	1.21	0.35–4.18
	No	2.45	0.54–11.18
Province	Koshi	0.95	0.3–3.01
	Madhesh	1.78	0.46–6.93
	Bagmati	2.15	0.55–8.48
	Gandaki	0.87	0.15–5.06
	Lumbini	3.48*	1.05–11.55
	Karnali	0.46	0.19–1.14
	Sudurpaschim	1.00	
Place of residence	Urban	1.00	
	Rural	0.66	0.32–1.34
Native language	Nepali	1.00	
	Maithili	4.38*	1.15–16.76
	Bhojpuri	1.74	0.28–10.89
	Other	3.06*	1.24–7.56
Birth order	First	1.00	
	Second	0.93	0.45–1.92
	Third or higher	1.61	0.54–4.86

* $p<.05$

AOR = adjusted odds ratio; CI = confidence interval

3.4 Determinants of and Care Seeking for Fever

3.4.1 Determinants of fever

Table 6 shows the determinants of fever among children under 5. Compared with children under 6 months old, children 6–47 months old were at significantly higher odds of having fever: those 6–11 months old (AOR=1.69; 95% CI=1.21–2.37), 12–23 months old (AOR=1.5; 95% CI=1.14–1.99), 24–35 months old (AOR=1.51; 95% CI=1.11–2.05), and 36–47 months old (AOR=1.49; 95% CI=1.11–1.99). Additionally, the odds of fever were significantly higher among children born to native Nepali-speaking mothers than among those born to mothers who spoke other languages (AOR=1.42; 95% CI=1.13–1.78), and significantly higher among children who were second in birth order than among firstborn children (AOR=1.22; 95% CI=1.02–1.45). (See Table A10 for results of bivariable logistic regression analysis of fever prevalence.)

Table 6 Determinants of fever among children under 5, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–11	1.69**	1.21–2.37
	12–23	1.5**	1.14–1.99
	24–35	1.51**	1.11–2.05
	36–47	1.49**	1.11–1.99
	48–59	1.10	0.81–1.49
Sex of the child	Male	1.00	
	Female	0.93	0.8–1.08
Maternal age	<20	1.00	
	20–29	0.97	0.79–1.20
	≥30	0.91	0.66–1.24
Religion	Hindu	1.00	
	Other	1.00	0.79–1.27
Disadvantages	Triple	1.00	
	Double	1.19	0.87–1.63
	Single	1.16	0.86–1.58
	No	1.19	0.82–1.72
Province	Koshi	1.08	0.78–1.48
	Madhesh	0.72	0.49–1.07
	Bagmati	0.82	0.60–1.10
	Gandaki	1.02	0.72–1.43
	Lumbini	0.95	0.71–1.27
	Karnali	1.08	0.82–1.42
	Sudurpaschim	1.00	
Place of residence	Urban	1.00	
	Rural	0.92	0.77–1.1
Native language	Nepali	1.42**	1.13–1.78
	Maithili	1.41	0.97–2.04
	Bhojpuri	1.12	0.73–1.73
	Other	1.00	
Birth order	First	1.00	
	Second	1.22*	1.02–1.45
	Third or higher	1.11	0.88–1.39

* $p<.05$, ** $p<.01$

AOR = adjusted odds ratio; CI = confidence interval

3.4.2 Determinants of care seeking for fever

Table 7 presents the determinants of care seeking among children under 5 who had a fever in the 2 weeks prior to the survey. Results of regression analysis found significantly lower odds of care seeking if the children had one or more forms of disadvantages. For example, children with triple disadvantages were 0.42 times less likely to seek care for fever (CI=0.19–0.9) than were children with no disadvantages. We also observed significantly higher odds of care seeking among children living in Madhesh province (AOR=2.91; 95% CI=1.47–5.75) than among those living in Koshi province. (See Table A11 for results of bivariable logistic regression analysis of care seeking for fever.)

Table 7 Determinants of care seeking among children under 5 who had a fever, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–11	1.19	0.56–2.54
	12–23	1.01	0.50–2.04
	24–35	1.03	0.50–2.09
	36–47	0.90	0.45–1.8
	48–59	0.76	0.38–1.55
Sex of the child	Male	1.00	
	Female	1.01	0.77–1.33
Maternal age	<20	1.00	
	20–29	0.85	0.53–1.38
	≥30	0.71	0.35–1.46
Religion	Hindu	1.00	
	Other	1.19	0.72–1.95
Disadvantages	Triple	0.42*	0.19–0.90
	Double	0.42**	0.24–0.73
	Single	0.56*	0.34–0.92
	No	1.00	
Province	Koshi	1.00	
	Madhesh	2.91**	1.47–5.75
	Bagmati	0.81	0.44–1.46
	Gandaki	0.80	0.39–1.64
	Lumbini	1.10	0.60–2.01
	Karnali	0.82	0.46–1.47
	Sudurpaschim	0.72	0.39–1.34
Place of residence	Urban	1.00	
	Rural	0.86	0.62–1.20
Native language	Nepali	1.00	
	Maithili	0.82	0.52–1.30
	Bhojpuri	0.72	0.37–1.41
	Other	0.96	0.36–2.57
Birth order	First	1.00	
	Second	1.13	0.77–1.65
	Third or higher	1.22	0.72–2.07

* $p<.05$, ** $p<.01$

AOR = adjusted odds ratio; CI = confidence interval

3.4.3 Determinants of care seeking for fever in private health facilities

Table 8 presents the determinants of care seeking in private HFs among children under 5 who had fever and sought care. Significantly higher odds of care seeking for a fever in private HFs were found among children born to mothers with fewer disadvantages, including those with single (AOR=4.58; 95% CI=2.03–10.30) or no (AOR=10.98; 95% CI=4.22–28.57) disadvantages, when compared with children with triple disadvantages. Household location was also significantly associated with care seeking for a fever in private HFs; we found higher odds of care seeking if children were from Madhesh (AOR=3.64; 95% CI=1.52–8.72) or Lumbini (AOR=4.69; 95% CI=2.06–10.67) province than if they were from Koshi province, and higher odds if children were from urban areas (AOR=2.28; 95% CI=1.48–3.5) than if they were from rural areas. Compared with children whose mothers were native Nepali speakers, children born to Maithili-speaking mothers (AOR=5.65; 95% CI=2.39–13.34) or speakers of other languages (AOR=1.82; 95% CI=1.0–3.29) also had higher odds of seeking care in private HFs.

Table 8 Determinants of care seeking in private health facilities among children under 5 who had a fever and sought care, 2022 Nepal DHS

Variable	Categories	AOR	95% CI
Child age in months	<6	1.00	
	6–12	1.15	0.48–2.79
	12–23	1.10	0.49–2.45
	24–35	0.66	0.31–1.42
	36–47	0.93	0.43–2.01
	48–59	0.61	0.26–1.44
Sex of the child	Male	1.00	
	Female	0.87	0.59–1.29
Maternal age	<20	1.00	
	20–29	0.66	0.38–1.15
	≥30	1.19	0.54–2.59
Religion	Hindu	1.00	
	Other	1.64	0.88–3.07
Disadvantages	Triple	1.00	
	Double	1.61	0.73–3.57
	Single	4.58***	2.03–10.30
	No	10.98***	4.22–28.57
Province	Koshi	1.07	0.49–2.35
	Madhesh	3.64**	1.52–8.72
	Bagmati	.98	0.43–2.23
	Gandaki	1.80	0.68–4.75
	Lumbini	4.69***	2.06–10.67
	Karnali	.56	0.28–1.12
	Sudurpaschim	1.00	
Place of residence	Urban	2.28***	1.48–3.50
	Rural	1.00	
Native language	Nepali	1.00	
	Maithili	5.65***	2.39–13.34
	Bhojpuri	1.63	0.60–4.43
	Other	1.82*	1.00–3.29
Birth order	First	1.00	
	Second	1.63	1.00–2.68
	Third or higher	0.93	0.51–1.72

* $p<.05$, ** $p<.01$, *** $p<.001$

AOR = adjusted odds ratio; CI = confidence interval

4 DISCUSSION

4.1 Increasing Trends in Prevalence of Childhood Illnesses

Our findings showed that the prevalence of fever rose from 19% in 2011 to 21% in 2016 and then to 23% in 2022. Similarly, the prevalence of diarrhea rose from 8% in 2016 to 10% in 2022. Because these illnesses are largely preventable, these findings suggest underlying challenges in the non-health sector, including issues with water and sanitation, waste management, housing and living standards, and health literacy.[36,37] More than 80% of the transmission of communicable diseases can be attributed unsafe water, unhygienic food, and other environmental factors.[38]

Increasing trends in common childhood illnesses such as diarrhea, which can be caused by several waterborne and foodborne diseases, is a major public health concern.[39] Yet, the social determinants of health that contribute to diarrhea prevalence are a neglected paradigm in Nepal.[39] In contrast, fever manifests in several childhood infections, especially acute respiratory infections (ARIs). Furthermore, the increased prevalence of fever in recent years could be due to the perceived severity and awareness of fever during the COVID-19 pandemic. Studies from other low- and middle-income countries from Africa and Asia have revealed prevalences of fever that are even higher than those in Nepal.[40,41]

Childhood disease conditions like diarrhea and fever manifest in poor living conditions; in those with poor personal hygiene, socioeconomic status, waste management, water and sanitation, indoor and outdoor pollution, and nutrition; and in children who are highly susceptible to the disease conditions. Although education and counseling on personal hygiene and nutrition are a major component of community-based integrated management of neonatal and childhood illness (CB-IMNCI) and other child health programs, these programs tend to focus on treatment during the provision of care. Because childhood illnesses like diarrhea and fever are rooted in underlying social determinants of health (for example, poor living conditions, poor water and sanitation facilities, and poor household waste management), multisectoral policies do focus on prevention. However, service providers still tend to focus on treatment to ensure better results per the expectations of mothers/caretakers. Additionally, anecdotal evidence suggests that families and communities in Nepal consider health care to be for the provision of medicine (through doctors and HFs) for people who are sick rather than to be for health promotion and prevention.

The increased prevalence of childhood illnesses is a burden to the health system.[26] The Institute of Heath Metrics and Evaluation has estimated that around 20%–30% of all children under 5 in Nepal suffer from childhood diarrhea annually.[12] Furthermore, an estimated 10% of deaths are caused by diarrhea.[42] In low and lower income countries, infants and younger children commonly suffer from ARIs, which are associated with poor housing, lack of ventilation in housing, indoor air pollution, and passive smoking.[43] Fever is often the first symptom of infection or malnutrition, including respiratory or intestinal infections.[41]

In our study, young children age 6 months to 4 years were more likely than older children to suffer from fever, while children age 3–5 had a higher prevalence of diarrhea. Children of second birth order were significantly more likely than those of first birth order to have either illness. Those born to native Maithili speakers were also significantly more likely to have fever, and those from Karnali or Bagmati province and

those from the Hill or Terai ecoregion were significantly more likely to have diarrhea, when compared with their respective reference groups.

One explanation for the higher prevalence of diarrhea among older children might be that as older children move around and start to walk, they interact more with their surroundings and can pick up available materials. Water, sanitation, and personal hygiene require improvement at this stage. Inadequate water and sanitation facilities, contaminated sources of water, the provision of unsafe drinking water, and improper disposal of children's feces could be contributing to the high prevalence of diarrhea.

Recommendations: At the program and policy levels, addressing the underlying factors for childhood illnesses will require multisectoral actions, especially beyond the health sector. These include actions to improve water and sanitation, as well as education to improve health literacy on the value of nutritious diets, hygiene, reductions in indoor pollution, and vaccinations (for example, for rotavirus). At the service delivery level, through the CB-IMNCI program, awareness and health information must be imparted to mothers via communication platforms (for example, print, digital, and social media) in local languages. The program interventions should focus on targeting children from Karnali province, those with a second or higher birth order, younger groups, and disadvantaged groups. Furthermore, prevention is better than a cure, so multisectoral policies and actions need to focus on preventing and lowering the prevalence of childhood illnesses. The implementation of multisectoral policies is vital for addressing their underlying factors.

4.2 Declining Trends in Care Seeking Among Disadvantaged Groups

Overall, we found decreasing trends in care seeking for both diarrhea and fever in the past two surveys. Among the children under 5 years who sought care, the proportion seeking care in public HFs is decreasing. We also found an increasing trend in the proportion of children who did not seek care for their illnesses. The proportion of children from disadvantaged families was higher than the proportion from privileged groups. Poor care-seeking practices mean affected children are not getting needed treatment and advice, which might be a reason for morbidities and mortalities among children from disadvantaged families and communities. Children born with more than one form of disadvantage were significantly less likely to seek care for a fever than were children with no disadvantages. According to other research from Nepal, some disadvantaged groups may not reach HFs for treatment at all, while others who attend HFs may face a lack of trained staff or lack of essential medicines for treating childhood illness.[44]

We found that levels of care seeking in public HFs were also declining, especially among disadvantaged groups. Evidence suggests that irregular and interrupted service availability, lack of after-hours services, and distance to HFs could be potential reasons for our findings.[45] Medical halls (run by private providers or government health workers) are open in every corner of many villages.[46] However, mothers and caretakers usually seek care in the private HFs in cases of childhood illness. Since its inception in the 1990s, the CB-IMNCI Program in Nepal has been one of the most successful programs in treating major fatal childhood diseases (for example, diarrhea, ARIs, malaria, measles, and malnutrition).[47,48] During the COVID-19 pandemic, both care seeking for and delivery of routine services were hampered, including vaccinations (with some children missing their vaccinations).[49] Nonetheless, declining levels of care seeking in public HFs indicates that the CB-IMNCI Program has some challenges in delivering health service interventions for children with illnesses. Communities might have poor trust in public HFs and care providers or experience limited availability of essential drugs, lack of uninterrupted health services in HFs,

or suboptimal quality of care.[50] The Government of Nepal has invested millions of rupees in the CB-IMNCI Program, but declining levels of care seeking in public HFs could hamper the program in reaching its target.

Recommendations: At the program and policy levels, in the context of increased rates of no treatment and decreased rates of care seeking in public HFs, future studies are warranted to determine the underlying factors behind these trends. The CB-IMNCI Program needs to be assessed, particularly focusing on investment and outputs (in terms of service delivery and care seeking). Trust in the public health system and the quality of health care delivery need to be improved by strengthening the health system and increasing the supply of essential medicines and trained health care workers. At the service delivery level, quality of care for the treatment of sick children needs to improve, including compliance to standards, protocols, and guidelines, particularly in public HFs. Public HFs should be equipped with essential medicines, trained health workers, and uninterrupted availability of health services. Our analysis was based on a national-level survey, so the context and patterns of diseases might differ at the subnational and local levels and vary by communities and locality. Thus, local health systems and health care providers should work closely with communities, including female community health volunteers who could help identify children with fevers and refer them to public HFs. Designing and implementing tailored programs is essential for targeting marginalized groups, as is coordinating with local governments.

4.3 Increasing Trends in Care Seeking in Private Health Facilities

We found an increasing trend in seeking care in private HFs. Among children who sought care for their illness, nearly three in four (73%) of those with diarrhea and four in five (80%) of those with fever sought care in private HFs. According to the results of the 2021 Nepal Health Facility Survey, however, even 20% of sick children attending public HFs paid for sick child care.[51] Anecdotal evidence suggests that, despite the availability of child health services and medical halls in front of local HFs, patients lack trust in local pubic HFs or believe that they will receive poor quality care and medicines, or that they will not receive immediate treatment for childhood illnesses. Additionally, opening hours of public HFs are limited (usually 10 am to 5 pm, but closing at 2 pm in some cases). Unavailability of after-hours services also pushes caretakers toward private HFs, including for sick child care. Mothers/caretakers do not want to take risks with their children; therefore, they may seek private health services. Mothers/caretakers who perceive that firstline antibiotics for treating childhood illnesses are not available in public HFs may seek care in privately owned medical halls next to the public HFs in search of immediate outcomes. One study in western Nepal reported that among those who sought care for childhood illnesses, two in five visited pharmacies directly, especially if their children had a fever.[52]

Despite free treatment for childhood illnesses in public HFs through the CB-IMNCI Program, a higher proportion of children in our study sought care in the private sector, with this trend increasing over time. Care seeking in the private sector has several implications. First, private health care services, including basic health services, are not free. Thus, care seeking for childhood illnesses in private HFs could lead to financial burdens for families and communities. Second, although private health care providers are trained on IMNCI in some areas/districts of Nepal, the CB-IMNCI Program is not implemented in all private HFs; thus, the provision of care in private HFs can differ from the CB-IMNCI treatment protocol.[26] In these cases, the treatment of childhood illnesses does not adhere to the national standards. Third, private HFs in Nepal are poorly regulated and lack accreditation and monitoring. Due to poor or no regulatory mechanisms, care providers in private HFs or dispensaries may overtreat and overprescribe compared with

what is specified in the national standards.[53] In many instances, care providers in private HFs prescribe antibiotics beyond those recommended in the CB-IMNCI treatment protocol and order unnecessary laboratory tests.[46] These practices might lead to financial burdens for disadvantaged and socially excluded families, and excessive use of antibiotics for common childhood illnesses leads to antibiotic resistance. Finally, we showed that children from Lumbini and Madhesh provinces (located in the Terai ecoregion, where much of the disadvantaged Madheshi and Tharu population reside), children born to native Maithili speakers, those in urban areas, and younger children were among the most likely to seek care in private HFs. This could be due to urgency, poor trust in government systems, or perceived lack of immediate care and treatment in public HFs.

Recommendations: At the program and policy levels, families and communities can choose where their children are cared for and treated. The government should ensure the availability of care and treatment in public HFs and develop the public's trust in the system. Policies for regulating and monitoring private providers through prescription-based care practices is essential. Future studies can be conducted on why mothers visit private HFs for childhood illnesses, including how much cost they incur. Research on the use of antibiotics in treating childhood illnesses would also be informative. At the service delivery level, recommendations include health education, information, and communication programs in local languages, and recruitment of health workers who speak the native languages in the Terai ecoregion. Although providers from private HFs are trained in some districts, the CB-IMNCI Program has not been implemented (as expected) in private HFs. Thus, this program needs to be rolled out in private HFs for the treatment of childhood illnesses through the CB-IMNCI protocol.

4.4 Study Limitations

The team had to merge some categories of variables with small sample sizes, especially children with at least one disadvantage. As variable categories with small cell values have some limitation the regression analysis in terms of effect size and confidence intervals of estimates. We originally wanted to explore care seeking for ARIs, but due to a small sample size (n=73), ARI cases were not included in this analysis. Cost of care is an important aspect of sick child care. Although we found evidence that families are paying for sick child care in public HFs, due to data limitations we could not analyze who was paying for the care of diarrhea and fever in these facilities.

5 CONCLUSION

5.1 Key Findings

- In the two most recent surveys (2016 and 2022), childhood diarrhea prevalence increased from 8% to 10% and childhood fever prevalence increased from 21% to 23%. In contrast, the proportion of children who sought care decreased from 65% to 57% for diarrhea and from 80% to 78% for fever.
- The proportion of sick children who did not seek treatment increased from 35% in 2016 to 43% in 2022 for diarrhea, and from 20% in 2016 to 22% in 2022 for fever.
- Between 2011 and 2022, the proportion of care-seeking children who sought care in public health facilities (HFs) decreased from 25% to 16% for diarrhea and from 18% to 11% for fever. The proportion who sought care in private HFs was high and increased during the same period.
- According to data from the 2022 survey, the likelihood of diarrhea was highest among children age 36–59 months. Children from Bagmati and Karnali provinces and those from Hill and Terai ecoregions were also significantly more likely than their respective reference groups to have experienced diarrhea in the 2 weeks prior to the survey.
- Care seeking for diarrhea was significantly less likely among firstborn children than among those with a second birth order.
- Care seeking for diarrhea in private HFs was significantly more likely among children in Lumbini province and among those born to native Maithili-speaking mothers or mothers who spoke other languages, when compared with reference groups.
- In 2022, fever was significantly more likely among children age 6 months to 4 years, children born to native Nepali speakers, and children who were second in the birth order, when compared with their respective reference groups.
- Care seeking for fever was significantly less likely if children had at least one disadvantage but significantly more likely if children were from Madhesh province, compared with reference groups.
- The odds of care seeking for fever in the private sector were higher among children from households with one or no disadvantages, children from Madhesh and Lumbini provinces, children from urban areas, and children born to Maithili-speaking mothers or mothers who spoke other languages, when compared with reference groups.

5.2 Key Recommendations

Based on our results, policy formation, program implementation, and service delivery should focus on children with structural disadvantages to modify living conditions, housing, behaviors, and awareness through fundamental non-health-sector policies and actions. Health systems should cover disadvantaged people, collaborate with non-health sectors, and deliver quality health services for children. Low-cost but highly effective interventions are crucial for reaching universal health coverage, as opposed to very effective, sophisticated, high-cost treatment interventions for the few who can afford them. Many illnesses, including childhood illnesses such as diarrhea and fever, are manifestations of poor living conditions and unsafe environmental factors that are further compounded by structural inequities (for example, poverty and lack of income). Thus, it is imperative to focus on the underlying social determinants that are influencing poor health among disadvantaged groups. To address the burden of childhood illnesses and move toward managing them, we recommend the following:

- As the prevalence of childhood illnesses is increasing, health interventions should focus on children with structural disadvantages (for example, those with multiple forms of disadvantages).
- Our findings of low levels of care seeking point to poor performance of public HFs. The government has invested millions of rupees in the management of the Community-Based Integrated Management of Neonatal and Childhood Illness Program. However, this program must be revisited to ensure that high quality services, including essential medicines, for childhood illnesses are available in public HFs without interruption.
- Because child health services are included in the basic health services package (free in public HFs), increased levels of care seeking for diarrhea and fever in private HFs has cost implications. Care seeking in private HFs further marginalizes and increases the financial burden on disadvantaged populations. The Community-Based Integrated Management of Neonatal and Childhood Illness Program needs to be implemented in private HFs.
- Future policies and programs should take different languages into account, and service delivery approaches should be revised accordingly.

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APPENDIX

Table A1 Description of variables included in the analysis

Variable	Categories	Definition
Maternal age	15–19, 20–34, ≥35	Age of mothers at the time of interview
Age of child in months	<6, 6–11, 12–23, 24–35, 36–47, 48–59	Child's age in months
Religion	Hindu, Other	Buddha, Islam, Kirat, Christian, etc.
Ethnicity	Brahmin, Chhettri, Madhes, Dalit, Janajati, Newar, Muslim	Categorized into seven ethnicities, others were merged into the Madheshi caste
Education	No education, Basic, Secondary, Higher	Based on years of schooling: No education (illiterate), Basic (classes 1–8), Secondary (classes 9–12), Higher (class 13 or higher)
Wealth quintile	Lowest (poorest), Second (poor), Middle, Fourth (richer), Highest (Richest)	Five quintiles constructed based on several assets items in the households
Disadvantages	Triple (illiterate, poor, and disadvantaged ethnicity), Double (any two of illiterate, poor, and disadvantaged ethnicity), Single (any one of illiterate, poor, and disadvantaged ethnicity), No (rich, literate, and advantaged ethnicity)	An intersectional variable created using wealth status (rich and poor), ethnicity (disadvantaged and privileged groups), and education (no education and with education)
Province	Koshi, Madhesh, Bagmati, Gandaki, Lumbini, Karnali, Sudurpaschim	Seven provinces
Place of residence	Urban, Rural	Whether respondents lived in rural or urban areas at the time of the survey
Ecoregion	Mountain, Hill, Terai	Three regions, horizonal division
Sex of the child	Male, Female	Sex of the index child
Occupation	Not working, Agriculture, Manual labor (skilled and unskilled), Working paid (service and business)	Maternal occupation
Native language	Nepali, Bhojpuri, Maithili, Other	Categorization of maternal native languages into four groups
Birth order	First, Second, Third or higher	Birth order of the most recent child

Table A2 Percentage of children under 5 who had diarrhea in the 2 weeks prior to the survey, 2022 Nepal DHS

Variable	%	95% CI	N=5,040	*p* value
National average	**10.4**	**9.2–11.8**	**5,040**	
Sex of the child				.617
Male	10.6	9.2–12.3	2,639	
Female	10.1	8.5–12.1	2,401	
Child age in months				<.001
<6	12.7	9.4–16.9	533	
6–12	17.5	13.3–22.6	434	
12–23	13.2	10.7–16.1	959	
24–35	9.7	7.7–12.1	1,066	
36–47	6.7	5.1–8.8	1,048	
48–59	8.1	6.3–10.3	1,000	
Maternal age				.259
<20	12.1	9.6–15.2	994	
20–29	10.0	8.6–11.6	3,286	
≥30	9.9	7.6–12.7	761	
Religion				.935
Hindu	10.4	9.1–11.9	4,218	
Other	10.3	7.9–13.3	822	
Ethnicity				.177
Brahmin	7.0	4.6–10.5	374	
Chhetri	8.4	6.8–10.5	873	
Madheshi	12.1	8.7–16.6	1,005	
Dalit	12.0	9.6–15.0	935	
Janajati	10.6	8.7–12.8	1,417	
Newar	11.3	6.0–20.5	119	
Muslim	8.4	5.1–13.6	317	
Education				.435
No education	11.3	8.9–14.4	1,133	
Basic	10.7	9.0–12.8	1,737	
Secondary	9.9	8.5–11.5	1,955	
Higher	7.4	4.2–12.9	215	
Wealth quintile				.013
Lowest	8.9	7.4–10.6	1,213	
Second	11.4	9.1–14.1	1,037	
Middle	12.7	10.1–15.7	1,048	
Fourth	11.1	9.0–13.6	969	
Highest	7.6	5.5–10.4	774	
Disadvantages				.509
Triple	10.5	7.6–14.2	615	
Double	11.5	9.5–13.9	1,510	
Single	9.9	8.4–11.7	2,118	
No	9.5	7.3–12.2	797	
Province				.403
Koshi	11.0	8.6–14.0	859	
Madhesh	10.0	7.1–14.0	1,352	
Bagmati	13.0	9.7–17.2	814	
Gandaki	7.8	5.2–11.5	331	
Lumbini	9.8	7.5–12.6	862	
Karnali	10.4	8.5–12.6	371	
Sudurpaschim	8.8	6.5–11.8	451	
Place of residence				.103
Urban	11.1	9.4–13.1	3,276	
Rural	9.1	7.7–10.8	1,764	
Ecoregion				.059
Mountain	6.9	5.1–9.2	317	
Hill	9.5	8.0–11.4	1,744	
Terai	11.3	9.5–13.4	2,979	

Continued…

Table A2—*Continued*

Variable	%	95% CI	N=5,040	*p* value
Native language				.933
Nepali	10.1	8.7–11.8	2,383	
Maithili	11.0	8.1–14.8	1,006	
Bhojpuri	9.8	5.0–18.3	466	
Other	10.7	8.8–13.0	1,185	
Birth order				.648
First	10.6	9.0–12.5	2,050	
Second	10.7	8.9–12.8	1,715	
Third or higher	9.6	7.7–11.9	1,275	

CI = confidence interval

Table A3 **Distribution of children under 5 who sought care for diarrhea in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS**

Variable	%	95% CI	N=524	*p* value
National average	**57.2**	**51.9–62.3**	**524**	
Sex of the child				.622
Male	58.5	51.2–65.5	281	
Female	55.6	47.1–63.8	243	
Child age in months				.767
<6	55.1	39.1–70.1	68	
6–12	53.2	41.3–64.8	76	
12–23	55.9	45.6–65.8	126	
24–35	63.5	52.8–73.1	103	
36–47	61.6	46.8–74.5	71	
48–59	52.7	39.0–66.0	81	
Maternal age				.97
< 20	56.1	45.3–66.4	121	
20–29	57.5	51.5–63.3	329	
≥30	57.4	44.3–69.4	75	
Religion				.291
Hindu	58.3	52.4–64.0	440	
Other	51.2	39.7–62.7	85	
Ethnicity				.094
Brahmin	72.4	52.5–86.1	26	
Chhetri	61.0	48.9–71.9	74	
Madheshi	57.8	46.9–68.0	122	
Dalit	58.0	47.3–67.9	112	
Janajati	53.9	44.7–62.8	150	
Newar	18.0	4.70–49.5	13	
Muslim	64.1	44.8–79.7	27	
Maternal education				.056
No education	59.5	49.1–69.1	128	
Basic	55.4	47.2–63.3	186	
Secondary	54.7	46.7–62.4	194	
Higher	90.3	71.6–97.2	16	
Wealth quintile				.245
Lowest	49.5	40.2–58.9	107	
Second	64.9	54.4–74.1	118	
Middle	53.5	41.4–65.2	133	
Fourth	56.0	45.0–66.5	107	
Highest	66.2	48.8–80.1	59	
Disadvantages				.571
Triple	64.9	51.1–76.5	64	
Double	53.9	45.2–62.4	174	
Single	56.8	49.0–64.2	210	
No	59.3	46.3–71.1	76	
Province				.525
Koshi	48.7	36.9–60.6	95	
Madhesh	56.8	45.3–67.6	135	
Bagmati	59.3	47.2–70.4	106	
Gandaki	48.7	27.8–70.0	26	
Lumbini	65.0	51.7–76.4	84	
Karnali	56.4	42.6–69.3	38	
Sudurpaschim	62.6	51.1–72.8	40	
Place of residence				.686
Urban	56.5	49.8–63.0	364	
Rural	58.7	50.6–66.3	161	
Ecoregion				.405
Mountain	50.8	32.0–69.5	22	
Hill	53.6	45.9–61.1	166	
Terai	59.4	52.4–66.0	336	

Continued…

Table A3—*Continued*

Variable	%	95% CI	N=524	*p* value
Native language				.905
Nepali	55.8	48.6–62.8	241	
Maithili	56.1	43.6–67.9	111	
Bhojpuri	61.7	45.1–76.0	46	
Other	59.0	48.4–68.9	127	
Birth order				.011
First	62.3	54.5–69.5	218	
Second	47.6	40.1–55.3	183	
Third or higher	62.3	52.3–71.4	123	

CI = confidence interval

Table A4 Distribution of children under 5 who had diarrhea and sought care for diarrhea in private health facilities, by background variables, 2022 Nepal DHS

Variable	%	95% CI	N=300	*p* value
National average	**72.7**	**65.4–78.9**	**300**	
Sex of the child				.95
Male	72.5	63.6–79.9	165	
Female	72.9	62.0–81.5	135	
Child age in months				.431
<6	69.4	47.9–84.9	37	
6–12	81.6	66.8–90.8	40	
12–23	79.6	69.6–87.0	71	
24–35	65.4	51.3–77.2	66	
36–47	71.8	53.3–85.0	43	
48–59	67.5	48.0–82.4	43	
Maternal age				.628
<20	69.3	55.9–80.2	68	
20–29	74.9	65.4–82.5	189	
≥30	68.0	48.8–82.5	43	
Religion				.433
Hindu	73.6	66.1–79.9	256	
Other	67.3	49.6–81.2	43	
Ethnicity				.005
Brahmin	84.6	63.8–94.5	19	
Chhetri	53.3	38.6–67.4	45	
Madheshi	87.9	74.0–94.9	70	
Dalit	61.0	46.0–74.2	65	
Janajati	74.7	61.9–84.3	81	
Newar	75.7	20.9–97.3	2	
Muslim	82.0	50.7–95.2	17	
Maternal education				.139
No education	77.8	64.4–87.2	76	
Basic	63.3	51.0–74.1	103	
Secondary	77.2	67.5–84.6	106	
Higher	79.3	45.8–94.5	14	
Wealth quintile				<.001
Lowest	42.8	30.7–55.9	53	
Second	72.5	57.7–83.6	77	
Middle	75.3	59.5–86.3	71	
Fourth	87.2	71.0–95.0	60	
Highest	86.6	68.4–95.1	39	
Disadvantages				.638
Triple	74.9	55.4–87.7	42	
Double	67.8	56.1–77.6	94	
Single	73.0	61.0–82.4	119	
No	79.8	62.2–90.5	45	
Province				.004
Koshi	64.5	44.5–80.5	46	
Madhesh	84.3	68.9–92.8	77	
Bagmati	74.0	52.7–87.9	63	
Gandaki	55.5	19.3–86.7	13	
Lumbini	86.7	72.8–94.0	55	
Karnali	34.2	22.7–48.0	22	
Sudurpaschim	59.7	43.7–73.9	25	
Place of residence				.225
Urban	75.2	65.2–83.0	206	
Rural	67.2	57.5–75.6	94	
Ecoregion				<.001
Mountain	31.6	11.3–62.8	11	
Hill	49.9	37.2–62.7	89	
Terai	85.1	76.4–91.0	200	

Continued…

Table A4—*Continued*

Variable	%	95% CI	N=300	*p* value
Native language				.045
Nepali	61.3	51.2–70.5	135	
Maithili	87.1	76.4–93.3	62	
Bhojpuri	78.2	39.3–95.2	28	
Other	79.1	65.3–88.4	75	
Birth order				.801
First	72.2	62.2–80.3	136	
Second	70.8	58.7–80.5	87	
Third or higher	75.7	61.9–85.6	77	

CI = confidence interval

Table A5 Percentage of children under 5 who had a fever in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	%	95% CI	N=5,040	*p* value
National average	**23.0**	**21.5–24.5**	**5,040**	
Sex of the child				.333
Male	23.6	21.7–25.7	2,639	
Female	22.3	20.3–24.4	2,401	
Child age in months				.003
<6	18.0	14.7–21.7	533	
6–12	27.3	22.6–32.5	434	
12–23	24.3	21.4–27.5	959	
24–35	24.3	21.3–27.7	1,066	
36–47	24.7	21.8–27.8	1,048	
48–59	19.3	16.7–22.3	1,000	
Maternal age				.882
< 20	22.5	19.9–25.4	994	
20–29	23.2	21.4–25.2	3,286	
≥30	22.5	19.0–26.5	761	
Religion				.433
Hindu	23.2	21.7–24.9	4,218	
Other	21.7	18.3–25.5	822	
Ethnicity				.054
Brahmin	26.9	21.8–32.8	374	
Chhetri	24.6	21.9–27.6	873	
Madheshi	20.2	17.0–23.8	1,005	
Dalit	23.8	20.8–27.1	935	
Janajati	23.3	20.8–26.1	1,417	
Newar	29.1	19.4–41.2	119	
Muslim	16.5	11.5–23.1	317	
Maternal education				.063
No education	19.9	17.1–23.1	1,133	
Basic	22.6	20.6–24.8	1,737	
Secondary	25.1	22.9–27.4	1,955	
Higher	23.3	16.5–31.9	215	
Wealth quintile				.301
Lowest	21.8	19.5–24.3	1,213	
Second	25.2	22.3–28.3	1,037	
Middle	23.8	20.6–27.4	1,048	
Fourth	23.6	20.2–27.3	969	
Highest	20.1	16.3–24.7	774	
Disadvantages				.143
Triple	19.2	15.5–23.6	615	
Double	23.0	20.8–25.5	1,510	
One	23.1	20.9–25.5	2,118	
No	25.5	22.1–29.3	797	
Province				.033
Koshi	25.7	21.8–30.2	859	
Madhesh	19.7	17.0–22.7	1,352	
Bagmati	21.4	18.0–25.3	814	
Gandaki	25.8	20.9–31.5	331	
Lumbini	23.0	19.3–27.3	862	
Karnali	28.0	25.1–31.1	371	
Sudurpaschim	24.1	20.7–27.9	451	
Place of residence				.517
Urban	23.3	21.5–25.3	3,276	
Rural	22.3	20.0–24.8	1,764	
Ecoregion				.005
Mountain	20.3	16.0–25.4	317	
Hill	26.1	23.8–28.5	1,744	
Terai	21.5	19.5–23.6	2,979	

Continued…

Table A5—*Continued*

Variable	%	95% CI	N=5,040	*p* value
Native language				<.001
Nepali	26.1	23.9–28.3	2,383	
Maithili	22.1	18.8–25.8	1,006	
Bhojpuri	17.6	14.0–21.9	466	
Other	19.6	17.0–22.6	1,185	
Birth order				.085
First	22.0	20.0–24.1	2,050	
Second	25.0	22.7–27.6	1,715	
Third or higher	21.8	19.2–24.6	1,275	

CI = confidence interval

Table A6 Distribution of children under 5 who sought care for fever in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	%	95% CI	N=1,159	*p* value
National average	**78.1**	**75.1-80.8**	**1,159**	
Sex of the child				.902
Male	78.2	74.4-81.6	624	
Female	77.9	74.0-81.4	535	
Child age in months				.892
<6	78.9	68.4-86.6	96	
6–12	80.5	71.3-87.3	118	
12–23	79.1	73.0-84.1	233	
24–35	79.2	73.0-84.2	259	
36–47	77.0	70.7-82.3	259	
48–59	74.9	66.9-81.5	193	
Maternal age				.493
< 20	79.0	72.4-84.4	224	
20–29	78.7	75.0-82.0	764	
≥30	74.1	65.9-80.9	171	
Religion				.919
Hindu	78.1	74.8-81.2	981	
Other	77.7	70.1-83.9	178	
Ethnicity				<.001
Brahmin	88.2	79.7-93.4	101	
Chhetri	74.2	67.4-80.1	215	
Madheshi	84.6	76.7-90.1	203	
Dalit	78.0	71.1-83.5	223	
Janajati	74.4	68.9-79.3	331	
Newar	52.3	36.4-67.8	35	
Muslim	89.9	78.8-95.5	52	
Maternal education				.456
No education	82.2	76.4-86.9	226	
Basic	76.9	72.2-81.1	393	
Secondary	77.6	73.1-81.6	490	
Higher	72.8	53.3-86.2	50	
Wealth quintile				<.001
Lowest	68.6	62.2-74.4	264	
Second	73.9	67.3-79.6	261	
Middle	82.4	76.1-87.3	249	
Fourth	88.5	83.2-92.3	228	
Highest	79.1	69.2-86.4	156	
Disadvantages				.182
Triple	79.1	69.6-86.2	118	
Double	74.6	69.4-79.1	348	
One	78.0	73.4-82.1	489	
No	83.6	76.4-89.0	203	
Province				.004
Koshi	76.2	69.7-81.6	221	
Madhesh	88.7	83.0-92.7	267	
Bagmati	75.8	66.5-83.2	174	
Gandaki	72.1	59.0-82.2	86	
Lumbini	78.5	69.2-85.6	198	
Karnali	70.7	63.4-77.1	104	
Sudurpaschim	70.5	60.9-78.5	109	
Place of residence				.061
Urban	79.9	76.0-83.3	765	
Rural	74.6	70.1-78.6	394	
Ecoregion				<.001
Mountain	71.3	62.6-78.7	64	
Hill	69.4	64.3-74.2	455	
Terai	84.9	81.2-88.0	639	

Continued…

Table A6—*Continued*

Variable	%	95% CI	N=1,159	*p* value
Native language				.013
Nepali	75.2	70.7-79.2	621	
Maithili	84.2	77.7-89.1	222	
Bhojpuri	88.9	79.3-94.3	82	
Other	76.1	69.5-81.6	233	
Birth order				.838
First	77.2	72.7-81.2	451	
Second	78.9	74.2-82.9	429	
Third or higher	78.3	72.8-82.9	278	

CI = confidence interval

Table A7 Distribution of children under 5 who had a fever and sought care for a fever in private health facilities, by background variables, 2022 Nepal DHS

Variable	%	95% CI	N=905	*p* value
National average	**80.4**	**77.0–83.4**	**905**	
Sex of the child				.139
Male	82.2	78.3–85.5	488	
Female	78.3	73.3–82.6	417	
Child age in months				.285
<6	82.3	70.4–90.1	76	
6–12	84.7	75.7–90.7	95	
12–23	84.7	78.7–89.2	185	
24–35	76.0	68.3–82.2	205	
36–47	80.6	74.3–85.7	199	
48–59	77.2	68.7–83.9	145	
Maternal age				.959
< 20	80.7	74.7–85.5	177	
20–29	80.5	76.3–84.1	601	
≥30	79.4	69.9–86.5	127	
Religion				.638
Hindu	80.1	76.5–83.2	766	
Other	82.3	71.8–89.5	138	
Ethnicity				<.001
Brahmin	85.1	73.5–92.1	89	
Chhetri	65.2	57.1–72.5	159	
Madheshi	92.0	84.9–95.9	172	
Dalit	75.0	65.7–82.5	174	
Janajati	79.7	72.5–85.4	246	
Newar	96.7	79.3–99.6	18	
Muslim	98.0	87.9–99.7	47	
Maternal education				.368
No education	76.2	67.9–83.0	186	
Basic	82.0	77.0–86.1	302	
Secondary	82.0	77.0–86.1	380	
Higher	72.1	47.6–88.0	36	
Wealth quintile				<.001
Lowest	52.5	45.1–59.8	181	
Second	76.8	68.2–83.6	193	
Middle	87.6	80.9–92.1	205	
Fourth	93.1	87.5–96.3	202	
Highest	94.4	85.0–98.1	123	
Disadvantages				<.001
Triple	74.8	62.2–84.2	94	
Double	71.0	63.8–77.2	259	
One	83.9	79.6–87.5	382	
No	90.0	83.4–94.1	170	
Province				<.001
Koshi	78.3	67.8–86.1	168	
Madhesh	92.0	86.1–95.5	237	
Bagmati	77.2	65.7–85.7	132	
Gandaki	80.3	66.6–89.3	62	
Lumbini	89.8	83.2–94.0	156	
Karnali	48.7	38.2–59.3	73	
Sudurpaschim	66.2	54.9–75.8	77	
Place of residence				<.001
Urban	85.4	81.1–88.8	611	
Rural	70.0	64.0–75.5	294	
Ecoregion				.000
Mountain	35.5	24.8–48.0	46	
Hill	66.5	60.2–72.3	316	
Terai	92.3	88.6–94.8	543	

Continued…

Table A7—*Continued*

Variable	%	95% CI	N=905	*p* value
Native language				<.001
Nepali	74.1	69.2–78.5	467	
Maithili	93.9	87.7–97.1	187	
Bhojpuri	86.7	74.9–93.4	73	
Other	80.0	71.6–86.5	177	
Birth order				<.001
First	79.2	74.2–83.5	348	
Second	84.9	80.2–88.6	339	
Third or higher	75.3	68.3–81.2	218	

CI = confidence interval

Table A8 Bivariable logistic regression analysis of children under 5 who had diarrhea in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude odds ratio	95% CI
Child age in months	<6		
	6–12	1.46	0.97–2.20
	12–23	1.04	0.72–1.51
	24–35	0.74	0.49–1.11
	36–47	0.50**	0.33–0.76
	48–59	0.60*	0.41–0.89
Sex of the child	Male		
	Female	0.95	0.76–1.17
Maternal age	<20		
	20–29	0.80	0.61–1.06
	≥30	0.79	0.54–1.17
Religion	Hindu		
	Other	0.99	0.73–1.33
Ethnicity	Brahmin		
	Chhetri	1.22	0.78–1.92
	Madheshi	1.83*	1.04–3.21
	Dalit	1.81*	1.10–2.97
	Janajati	1.57	0.98–2.52
	Newar	1.69	0.73–3.94
	Muslim	1.22	0.61–2.45
Maternal education	No education		
	Basic	0.94	0.71–1.25
	Secondary	0.86	0.64–1.16
	Higher	0.63	0.33–1.21
Wealth quintile	Lowest		
	Second	1.32	0.97–1.79
	Middle	1.49*	1.09–2.03
	Fourth	1.28	0.95–1.73
	Highest	0.85	0.57–1.26
Disadvantages	Triple		
	Double	1.11	0.77–1.61
	Single	0.94	0.65–1.37
	No	0.90	0.57–1.40
Province	Koshi		
	Madhesh	0.90	0.56–1.43
	Bagmati	1.21	0.79–1.85
	Gandaki	0.68	0.41–1.13
	Lumbini	0.87	0.59–1.30
	Karnali	0.93	0.66–1.33
	Sudurpaschim	0.78	0.51–1.19
Place of residence	Urban		
	Rural	0.80	0.62–1.05
Ecoregion	Mountain		
	Hill	1.43	0.98–2.08
	Terai	1.73**	1.19–2.51
Native language	Nepali		
	Maithili	1.10	0.75–1.61
	Bhojpuri	0.97	0.46–2.02
	Other	1.06	0.82–1.38
Birth order	First		
	Second	1.01	0.81–1.25
	Third and higher	0.90	0.68–1.18

* $p<.05$, ** $p<.01$

CI = confidence interval

Table A9 Bivariable logistic regression analysis of children under 5 who had diarrhea and sought care for diarrhea in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude odds ratio	95% CI
Child age in months	<6	1.00	
	6–12	1.08	0.48–2.41
	12–23	0.97	0.48–1.94
	24–35	0.70	0.31–1.59
	36–47	0.77	0.33–1.76
	48–59	1.10	0.46–2.65
Sex of the child	Male	1.00	
	Female	1.13	0.70–1.81
Maternal age	< 20	1.00	
	20–29	0.95	0.59–1.51
	≥30	0.95	0.48–1.91
Religion	Hindu	1.00	
	Other	1.33	0.78–2.27
Ethnicity	Brahmin	1.00	
	Chhetri	1.67	0.57–4.91
	Madheshi	1.91	0.73–5.02
	Dalit	1.90	0.70–5.16
	Janajati	2.24	0.93–5.41
	Newar	11.90**	2.13–66.36
	Muslim	1.46	0.46–4.64
Maternal education	No education	1.00	
	Basic	1.18	0.72–1.95
	Secondary	1.22	0.72–2.06
	Higher	0.16**	0.04–0.62
Wealth quintile	Lowest	1.00	
	Second	0.53*	0.29–0.96
	Middle	0.85	0.47–1.55
	Fourth	0.77	0.43–1.38
	Highest	0.50	0.22–1.13
Disadvantages	Triple	1.00	
	Double	1.58	0.79–3.13
	Single	1.41	0.73–2.70
	No	1.27	0.60–2.69
Province	Koshi	1.00	
	Madhesh	0.72	0.37–1.41
	Bagmati	0.65	0.33–1.29
	Gandaki	1.00	0.36–2.78
	Lumbini	0.51	0.25–1.06
	Karnali	0.73	0.35–1.53
	Sudurpaschim	0.57	0.29–1.11
Place of residence	Urban	1.00	
	Rural	0.92	0.60–1.40
Ecoregion	Mountain	1.00	
	Hill	0.90	0.38–2.08
	Terai	0.71	0.31–1.63
Native language	Nepali	1.00	
	Maithili	0.99	0.55–1.76
	Bhojpuri	0.78	0.38–1.61
	Other	0.88	0.51–1.50
Birth order	First	1.00	
	Second	1.82**	1.22–2.71
	Third and higher	1.00	0.59–1.68

* $p<.05$, ** $p<.01$

CI = confidence interval

Table A10 Bivariable logistic regression analysis of children under 5 who had diarrhea and sought care for diarrhea in private health facilities in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude odds ratio	95% CI
Child age in months	<6	1.00	
	6–12	1.96	0.70–5.50
	12–23	1.72	0.65–4.56
	24–35	0.83	0.29–2.42
	36–47	1.12	0.40–3.11
	48–59	0.92	0.29–2.88
Sex of the child	Male	1.00	
	Female	1.02	0.56–1.84
Maternal age	< 20	1.00	
	20–29	1.32	0.66–2.65
	≥30	0.94	0.34–2.59
Religion	Hindu	1.00	
	Other	0.74	0.35–1.58
Ethnicity	Brahmin	1.00	
	Chhetri	0.21*	0.06–0.73
	Madheshi	1.32	0.31–5.66
	Dalit	0.28	0.08–1.04
	Janajati	0.54	0.15–1.93
	Newar	0.57	0.04–8.72
	Muslim	0.83	0.13–5.35
Maternal education	No Education	1.00	
	Basic	0.49	0.22–1.08
	Secondary	0.97	0.44–2.14
	Higher	1.09	0.22–5.53
Wealth quintile	Lowest	1.00	
	Second	3.52**	1.52–8.16
	Middle	4.06**	1.72–9.58
	Fourth	9.10***	2.90–28.59
	Highest	8.62***	2.57–28.95
Disadvantages	Triple	1.00	
	Double	.71	.26–1.90
	Single	.91	.33–2.51
	No	1.33	.39–4.55
Province	Koshi	1.00	
	Madhesh	2.94	0.88–9.82
	Bagmati	1.56	0.45–5.45
	Gandaki	0.69	0.11–4.33
	Lumbini	3.58*	1.07–11.96
	Karnali	0.29*	0.11–0.78
	Sudurpaschim	0.82	0.29–2.32
Place of residence	Urban	1.00	
	Rural	0.68	0.36–1.28
Ecoregion	Mountain	1.00	
	Hill	2.15	0.51–9.03
	Terai	12.34***	3.03–50.33
Native language	Nepali	1.00	
	Maithili	4.25***	1.85–9.81
	Bhojpuri	2.27	.39–13.02
	Other	2.40*	1.07–5.35
Birth order	First	1.00	
	Second	0.94	0.52–1.69
	Third and higher	1.20	0.55–2.63

* $p<.05$, ** $p<.01$, *** $p<.001$

CI = confidence interval

Table A11 Bivariable logistic regression analysis of children under 5 who had a fever in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude ratio	95% CI
Child age in months	<6	1.00	
	6–12	1.71**	1.23–2.37
	12–23	1.47**	1.11–1.93
	24–35	1.47*	1.09–1.97
	36–47	1.50**	1.12–1.99
	48–59	1.09	0.81–1.48
Sex of the child	Male	1.00	
	Female	0.93	0.80–1.08
Maternal age	< 20	1.00	
	20–29	1.04	0.87–1.25
	≥30	1.00	0.77–1.31
Religion	Hindu	1.00	
	Other	0.91	0.73–1.15
Ethnicity	Brahmin	1.00	
	Chhetri	0.89	0.65–1.21
	Madheshi	0.69*	0.49–0.97
	Dalit	0.85	0.61–1.18
	Janajati	0.83	0.60–1.13
	Newar	1.12	0.61–2.05
	Muslim	0.54*	0.32–0.89
Maternal education	No education	1.00	
	Basic	1.17	0.95–1.45
	Secondary	1.34**	1.08–1.67
	Higher	1.22	0.77–1.95
Wealth quintile	Lowest	1.00	
	Second	1.20	0.97–1.50
	Middle	1.12	0.89–1.40
	Fourth	1.10	0.87–1.40
	Highest	0.90	0.67–1.21
Disadvantages	Triple	1.00	
	Double	1.26	0.94–1.69
	Single	1.26	0.94–1.69
	No	1.44*	1.04–1.99
Province	Koshi	1.00	
	Madhesh	0.71*	0.53–0.94
	Bagmati	0.79	0.58–1.07
	Gandaki	1.01	0.71–1.43
	Lumbini	0.86	0.63–1.18
	Karnali	1.12	0.86–1.46
	Sudurpaschim	0.92	0.68–1.23
Place of residence	Urban	1.00	
	Rural	0.94	0.79–1.12
Ecoregion	Mountain	1.00	
	Hill	1.39*	1.01–1.90
	Terai	1.07	0.78–1.47
Native language	Nepali	1.00	
	Maithili	0.81	0.64–1.01
	Bhojpuri	0.61***	0.45–0.81
	Other	0.69***	0.56–0.85
Birth order	First	1.00	
	Second	1.18*	1.01–1.40
	Third and higher	0.99	0.81–1.20

* $p<.05$, ** $p<.01$, *** $p<.001$

CI = confidence interval

Table A12 Bivariable logistic regression analysis of children under 5 who had a fever and sought care for fever in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude odds ratio	95% CI
Child age in months	<6	1.00	
	6–12	1.11	0.53–2.29
	12–23	1.01	0.52–1.97
	24–35	1.02	0.53–1.95
	36–47	0.90	0.47–1.71
	48–59	0.80	0.41–1.55
Sex of the child	Male	1.00	
	Female	0.98	0.75–1.29
Maternal age	< 20	1.00	
	20–29	0.98	0.66–1.47
	≥30	0.76	0.44–1.31
Religion	Hindu	1.00	
	Other	0.98	0.62–1.54
Ethnicity	Brahmin	1.00	
	Chhetri	0.39**	0.19–0.79
	Madheshi	0.74	0.32–1.70
	Dalit	0.48*	0.23–0.99
	Janajati	0.39**	0.20–0.75
	Newar	0.15***	0.06–0.36
	Muslim	1.19	0.40–3.52
Maternal education	No education	1.00	
	Basic	0.72	0.47–1.10
	Secondary	0.75	0.49–1.14
	Higher	0.58	0.23–1.47
Wealth quintile	Lowest	1.00	
	Second	1.30	0.84–2.00
	Middle	2.14**	1.32–3.47
	Fourth	3.52***	2.09–5.91
	Highest	1.73	0.96–3.13
Disadvantages	Triple	1.00	
	Double	0.78	0.44–1.36
	Single	0.94	0.54–1.64
	No	1.35	0.69–2.65
Province	Koshi	1.00	
	Madhesh	2.46**	1.38–4.38
	Bagmati	0.98	0.56–1.73
	Gandaki	0.81	0.41–1.58
	Lumbini	1.15	0.64–2.06
	Karnali	0.75	0.47–1.21
	Sudurpaschim	0.75	0.44–1.28
Residence	Urban	1.00	
	Rural	0.74	0.54–1.01
Ecoregion	Mountain	1.00	
	Hill	0.91	0.57–1.45
	Terai	2.26***	1.40–3.64
Native language	Nepali	1.00	
	Maithili	1.76*	1.09–2.84
	Bhojpuri	2.63*	1.22–5.69
	Other	1.05	0.69–1.58
Birth order	First	1.00	
	Second	1.10	0.79–1.55
	Third and higher	1.06	0.73–1.54

* $p<.05$, ** $p<.01$, *** $p<.001$

CI = confidence interval

Table A13 Bivariable logistic regression analysis of children under 5 who had a fever and sought care for a fever in private health facilities in the 2 weeks prior to the survey, by background variables, 2022 Nepal DHS

Variable	Categories	Crude odds ratio	95% CI
Child age in months	<6	1.00	
	6–12	1.19	0.50–2.83
	12–23	1.19	0.55–2.57
	24–35	0.68	0.32–1.45
	36–47	0.90	0.42–1.92
	48–59	0.73	0.32–1.67
Sex of the child	Male	1.00	
	Female	0.78	0.56–1.09
Maternal age	< 20	1.00	
	20–29	0.99	0.65–1.51
	≥30	0.93	0.50–1.70
Religion	Hindu	1.00	
	Other	1.16	0.62–2.18
Ethnicity	Brahmin	1.00	
	Chhetri	0.33**	0.15–0.72
	Madheshi	2.02	0.73–5.58
	Dalit	0.53	0.22–1.25
	Janajati	0.69	0.30–1.56
	Newar	5.19	0.60–44.95
	Muslim	8.78*	1.12–69.16
Maternal education	No education		
	Basic	1.42	0.87–2.31
	Secondary	1.42	0.85–2.36
	Higher	0.80	0.26–2.47
Wealth quintile	Lowest	1.00	
	Second	2.98***	1.80–4.96
	Middle	6.36***	3.54–11.43
	Fourth	12.21***	5.96–25.02
	Highest	15.25***	4.89–47.56
Disadvantages	Triple	1.00	
	Double	0.83	0.43–1.57
	Single	1.76	0.90–3.43
	No	3.02**	1.33–6.88
Province	Koshi	1.00	
	Madhesh	3.18**	1.40–7.25
	Bagmati	0.94	0.43–2.06
	Gandaki	1.13	0.46–2.76
	Lumbini	2.42*	1.10–5.33
	Karnali	0.26***	0.13–0.52
	Sudurpaschim	0.54	0.26–1.11
Place of residence	Urban	1.00	
	Rural	0.40***	0.27–0.60
Ecoregion	Mountain	1.00	
	Hill	3.60***	1.99–6.52
	Terai	21.72***	11.15–42.31
Native language	Nepali	1.00	
	Maithili	5.39***	2.40–12.14
	Bhojpuri	2.28*	1.00–5.16
	Other	1.40	0.83–2.35
Birth order	First	1.00	
	Second	1.47	0.98–2.21
	Third and higher	0.80	0.52–1.23

* $p<.05$, ** $p<.01$, *** $p<.001$

CI = confidence interval