Inequalities in Health Outcomes and Access to Services by Caste/ Ethnicity, Province, and Wealth Quintile in Nepal

DHS Further Analysis Reports No. 117

DHS Further Analysis Reports No. 117

Inequalities in Health Outcomes and Access to Services by Caste/Ethnicity, Province, and Wealth Quintile in Nepal

Umesh Ghimire[1]
Jyoti Manandhar[1]
Arun Gautam[2]
Sabita Tuladhar[3]
Yogendra Prasai[1]
Tesfayi Gebreselassie[4]

ICF
Rockville, Maryland, USA

January 2019

[1] New ERA
[2] Ministry of Health and Population, Nepal
[3] United States Agency for International Development (USAID)/Nepal
[4] The DHS Program, ICF

Corresponding author: Umesh Ghimire, New ERA, Rudramati Marga, Kalopul, Kathmandu, Nepal; email: creationumesh@gmail.com

Acknowledgments: The authors gratefully acknowledge Tom Fish, ICF, for creating health indicators for provinces in the 2011 DHS survey that are comparable to those in the 2016 survey. We extend our appreciation to the peer reviewers, Dr. Jennifer Yourkavitch (ICF), Mr. Giri Raj Subedi (Ministry of Health and Population), and Mr. Pradeep Poudel (Nepal Health Sector Support Program 3) for their time and efforts. Additionally, we thank Dr. Ramesh Kafle, Purbanchal University, Dr. Kristin Bietsch, Avenir Health, and Dr. Bill Winfrey, Avenir Health, for their support during the Nepal DHS Further Analysis Training, and Dr. Kerry MacQuarrie, Avenir Health, for her insight throughout the writing of this report. Special thanks to Jessica Williamson, Avenir Health, for developing graphics and tables in this study.

Editor: Diane Stoy

Document Production: Natalie Shattuck

This study was carried out with support provided by the United States Agency for International Development (USAID) through The DHS Program (#AID-OAA-C-13-00095). The views expressed are those of the authors and do not necessarily reflect the views of USAID or the United States Government.

This study is a further analysis of the 2016 Nepal Demographic and Health Survey (2016 NDHS). The 2016 NDHS was implemented by New ERA under the aegis of the Ministry of Health and Population of Nepal. Funding for the survey 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.

Additional information about the 2016 NDHS may be obtained from the Ministry of Health and Population, Ramshahpath, Kathmandu; telephone: +977-1-4262543/4262802; internet: http://www.mohp.gov.np; and New ERA, Rudramati Marg, Kathmandu, P.O. Box 722, Kathmandu 44600, Nepal; telephone: +977-1-4413603; email: info@newera.com.np; internet: http://www.newera.com.np.

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.

Recommended citation:

Ghimire, Umesh, Jyoti Manandhar, Arun Gautam, Sabita Tuladhar, Yogendra Prasai, and Tesfayi Gebreselassie. 2019. *Inequalities in Health Outcomes and Access to Services by Caste/Ethnicity, Province, and Wealth Quintile in Nepal*. DHS Further Analysis Reports No. 117. Rockville, Maryland, USA: ICF.

CONTENTS

TABLES

FIGURES

FOREWORD

The 2016 Nepal Demographic and Health Survey (NDHS) is the fifth 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, and support for report production from the United Nations Population Fund (UNFPA).

The standard format of the survey final report included only a descriptive presentation of findings and trends, and did not include analytical methods that can ascertain the significance of change and association among variables. Although largely sufficient, the final report is limited, particularly in providing answers to "why" – answers that are essential in reshaping important policies and programs. After the dissemination of the NDHS 2016, the MoHP and its 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, seven further analysis studies have been conducted by technical professionals from the MoHP and its partners who work directly on the given areas, with technical support and facilitation from research agencies.

The primary objective of the further analysis of the 2016 NDHS is to provide more in-depth knowledge and insights into key issues that emerged from the survey. This information provides guidance for planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. The long-term objective of the further analysis is to strengthen the technical capacity of local institutions and individuals for analyzing and using data from complex national population and health surveys to better understand specific issues related to country need.

The further analysis of the 2016 NDHS is the concerted effort of many individuals and institutions, and it is with great pleasure that I acknowledge the work involved in producing this useful document. The participation and cooperation of the members of the Technical Advisory Committee in the different phases of the survey are highly valued. I would like to extend my appreciation to USAID/Nepal for providing financial support for the further analyses. I would also like to acknowledge ICF for its technical assistance at all stages. My sincere thanks also go to the New ERA team for the overall management and coordination of the entire process. I would also like to thank the Public Health Administration Monitoring and Evaluation Division, as well as the Policy Planning and Monitoring Division, MoHP, for their efforts and dedication to the completion of this further analysis of the 2016 NDHS.

Dr. Pushpa Chaudhary
Secretary
Ministry of Health and Population

ACKNOWLEDGMENTS

The further analysis of the 2016 NDHS was conducted under the aegis of the Public Health Administration Monitoring and Evaluation Division (PHAMED) of the Ministry of Health and Population (MoHP). The United States Agency for International Development (USAID) provided financial support, with technical assistance provided by ICF. Additional support for report production was provided by the United Nations Population Fund (UNFPA). Overall coordination, facilitation, administration, and logistic support were provided by New ERA, a local research firm with extensive experience in conducting similar studies. The secondary analysis of the 2016 NDHS data has been conducted by technical professionals from the MoHP and Department of Health Services, USAID, and other partners who work directly on the given areas, with technical support and facilitation from ICF and New ERA.

I would like to express my deep appreciation for the contributions of many different stakeholders, and for their valuable input in the various phases of the study and the final report. My sincere gratitude goes to all members of the National Monitoring and Evaluation Technical Advisory Group at MoHP for their valuable input. I appreciate the leadership of Mr. Giri Raj Subedi, Sr. Public Health Administrator, and the entire team of the Policy Planning and Monitoring Division, PHAMED, and the Child Health Division for their contributions during the different phases of the study.

My special gratitude goes to the authors, Mr. Umesh Ghimire, Ms. Jyoti Manandhar, Mr. Arun Gautam, Mr. Yogendra Prasai, Ms. Sabita Tuladhar, and Dr. Tesfayi Gebreselassie, for their hard work in completing this report. I would also like to express my deep appreciation to the peer reviewers, Dr. Jennifer Yourkavitch (ICF), Mr. Giri Raj Subedi (MoHP), and Mr. Pradeep Poudel (Nepal Health Sector Programme 3), for their time and efforts.

The technical support provided by ICF is highly appreciated and acknowledged. My special thanks go to Drs. Tesfayi Gebreselassie and Kerry MacQuarrie for their technical support throughout the period.

My appreciation goes to the staff of New ERA, Mr. Yogendra Prasai, and the entire team of New ERA for excellently managing the further analysis activities.

Dr. Bikash Devkota
Chief, Policy Planning and Monitoring Division
Ministry of Health and Population

ABSTRACT

This study examines the differentials and trends in health outcomes and service utilization by caste/ethnicity, provinces, and wealth quintiles, and discusses gaps in the health indicators. The 2011 and 2016 Nepal DHS data were used to examine trends in the key indicators and to determine if changes over the two survey periods were statistically significant.

There are variations in the decline of fertility among different caste/ethnicity groups in Nepal. The Hill Brahmin, Hill Janajati, Terai Janajati, Terai/Madhesi Brahmin/Chhetri, and Newars have reached the replacement level fertility, whereas the Terai/Madhesi Dalits and Muslims continue to have much higher fertility than the national average. Increased use of modern contraceptives over the past 5 years is statistically significant only among Janajatis, while its decline is statistically significant among three caste/ethnicity groups – Newars, Terai/Madhesi Brahmin/Chhetri, and Hill Brahmins. The use of modern contraceptives has increased significantly in Province 1 but has decreased significantly in Province 3. By household wealth status, the increase is significant in the lowest and the second quintiles, while the decrease is significant in the fourth and the highest quintiles. The lowest percentage of having four or more antenatal care visits was observed among the Terai/Madhesi Dalit caste, in Province 6 (Karnali Province), and in the lowest wealth quintile. A similar pattern was observed with delivery assisted by a skilled birth attendant.

There were substantial differences in full immunization coverage of children age 6-59 months and childhood mortality by caste/ethnicity, provinces, and household wealth. The decline in full immunization coverage is significant among most of the caste/ethnicity groups and in all provinces except Provinces 3, 4, and 6. Childhood mortality is two times higher among Terai/Madhesi Dalits than the national average. Provinces 2, 5, 6, and 7, and the poorest households have the highest childhood mortality. Stunting is the highest among children from the Terai/Madhesi Dalits and the Terai/Madhesi Other caste/ethnicity group, in Province 6 (Karnali Province), and among households in the lowest wealth quintile. Anemia among children has increased significantly among Janajatis and in Provinces 1 and 2. Anemia in women has increased in almost all caste/ethnicity groups, provinces, and wealth quintiles. Hypertension in Nepal is more prevalent among the Newar caste group, in the wealthiest quintile, and in Province 4 (Gandaki Province).

The analysis by caste/ethnicity shows that the Terai/Madhesi Other and Terai/Madhesi Dalit consistently showed poor performance in most indicators. Health outcomes and service utilization are generally low in Province 2 and among women from the poorest households. The findings suggest that urgent efforts with explicit provincial strategies are needed to minimize the gap in health outcomes and service utilization of the Terai Madhesi caste groups and the poorest of the population.

KEY WORDS: inequality, health outcomes, health service utilization, Nepal

ACRONYMS AND ABBREVIATIONS

ANC	antenatal care
BCG	Bacillus Calmette–Guérin
BMI	body mass index
BP	blood pressure
CBS	Central Bureau of Statistics
CPR	contraceptive prevalence rate
DHS	Demographic and Health Survey
DoHS	Department of Health Services
DPT	diphtheria, pertussis, and tetanus
DV	domestic violence
FP	family planning
GESI	gender equality and social inclusion
GoN	Government of Nepal
GSEA	Gender and Social Exclusion Assessment
HDI	human development index
IMR	infant mortality rate
MAD	minimum acceptable diet
mCPR	modern contraceptive prevalence rate
MDG	Millennium Development Goals
MMR	maternal mortality ratio
MoH	Ministry of Health
MoHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
NHSS	Nepal Health Sector Strategy
NLSS	Nepal Living Standard Survey
NMR	neonatal mortality rate
NPC	National Planning Commission
PHCC	primary health care center
PNC	postnatal care
SBA	skilled birth attendant
SDG	Sustainable Development Goals
TFR	total fertility rate
U5	under 5
U5MR	under-5 mortality rate

UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization

1 BACKGROUND AND RATIONALE

1.1 Background

Nepal is a country with rich diversity based on its unique geography, and its multicultural and sociocultural norms, values, religions, castes, and ethnicities. Nepal is divided into seven federal provinces, three ecological belts – Hill, Mountain, and Terai – and 753 municipalities in 77 districts. Nepal has 125 castes/ethnicities, 123 languages spoken as mother tongue, and 10 religions (Central Bureau of Statistics 2011). Nepal also has social and economic disparities that stem from a hierarchical caste-based system, patriarchal thinking, and geographic and regional differences (Bennett 2005).

The National Health Policy of 2014 aims to provide health services through an equitable and accountable health system, and to increase access to quality health services for every citizen to ensure health as a fundamental human right for every citizen (MoHP 2015). The 2015 Constitution of Nepal established health as a fundamental right of its citizens (MoHP 2014/2015). The Nepal Health Sector Strategy 2016-2021 (NHSS) has adopted the vision and mission set forth by the National Health Policy 2014 and includes the constitutional provision that guarantees access to basic health services as a fundamental right of every citizen (MoH 2017).

In 2009, the Ministry of Health (MoH) developed the Health Sector Gender Equality and Social Inclusion (GESI) strategy, which was designed to create an enabling environment for mainstreaming GESI in Nepal's health sector; enhance the capacity of health service providers for providing equitable access and use of health services by poor, vulnerable, and marginalized groups; and improve health-seeking behavior of the poor, vulnerable, and marginalized people. The strategy has been translated into various programs and initiatives that are specific and sensitive to GESI principles and which identify GESI representatives and establish a GESI committee within in the Department of Health Services (DoHS)/MoHP. The government has introduced special programs and incentives, such as free health care programs and safe delivery incentive schemes, to reduce inequities in health (GoN/MoHP 2009).

In 2018, the MoHP revised the GESI strategy to meet the following overarching goals (MoHP 2018):

(i) align the strategy with the new federal governance structure of the country and the allocation of government responsibilities for delivering health services and achieving health and social development goals,

(ii) align the GESI strategy with the rights enshrined in the Constitution and Nepal's commitments to international human rights conventions,

(iii) contribute to achieve country's aims as expressed in the Sustainable Development Goals (SDG) and the Nepal Health Sector Strategy (2015-2020) by ensuring access to quality health services to the excluded or disadvantaged people such as those with disability, promoting gender equality and women's empowerment in the health sector including responding to survivors of gender-based violence and gender equality in the workplace, and by institutionalizing gender equality and social inclusion into health systems reform, and

(iv) leverage the institutional change process transforming the state to a federal republic so as to strengthen the importance and level of effort given to closing equity gaps in the health sector and upholding the right to health of all citizens.

In Nepal, there are disparities in access to and utilization of health services by geography, administrative boundary – previous development regions and the current provinces, caste/ethnicity, religion, and household wealth. In the new federal arrangement the local governments have the authority to plan, operate, and manage their own health systems, so that health services can be brought closer to homes of residents. This can eventually narrow the gaps in health service access and utilization.

Nepal is ranked 145th in the human development index (HDI), which reflects regional disparity, gender inequality, and social exclusion, as experienced by the country's most vulnerable groups (UNDP and GoN 2014). The findings from the Nepal Demographic and Health Surveys (NDHS) show that Nepal has made steady progress in improving overall health outcomes of mothers and children. Nepal is on track to meet the Nepal Health Sector Strategy 2016-2020 goal of reducing infant mortality and under-5 mortality, and has made some improvements in reducing malnutrition as well. There has been an increase in four or more antenatal care visits (ANC) and institutional delivery, although the use of modern contraceptives has remained constant at 43% since the 2006 NDHS (NPC 2015). However, equity is a major challenge in achieving universal health coverage. Health services have not reached the citizens of all regions, strata, and communities (MoHP 2014/2015). Citizens of all localities, levels, classes, groups, and communities do not have easy, affordable access to health care services as stated in the Constitution of Nepal (DoHS 2016/17). There are wide variations in the availability and utilization of health services, and health status across the different socioeconomic and geographical groups, which reflect the challenges of access and equity (GoN/MoHP 2013). To overcome existing health inequalities, the government and its partners are committed to improving the overall health outcomes of the entire population and achieving targets that are disaggregated by sex, wealth, geography, and ethnicity (MoHP 2015).

1.2 Caste/Ethnicity and Inequalities in Health

The traditionally entrenched caste system in Nepal has been a barrier to the ability of members of some castes and ethnic populations to access health care services. Lower-caste women are usually deprived of many socioeconomic opportunities, and are caught in a vicious cycle of poverty (Cox 1994). Data from the further analysis of NDHS 2011 clearly showed caste differentials in relation to health status in which Dalit and Janajati women have lower levels of utilization of all the essential health care services. Although the differences between the Hill and Terai Janajati are not large, the Terai/Madhesi Dalit are far behind the Hill Dalits in ANC visits and the recipient of iron tablets. These findings reveal high intragroup inequalities that must be seriously considered (Pandey et al. 2013).

This study uses 7 major caste/ethnicity categories, which have been divided further into 11 sub-categories as shown in Table 1. This grouping is based on the Gender and Social Exclusion Assessments of caste/ethnicity which were also used in the 2006 and 2011 NDHS further analyses.

Table 1 Caste and ethnic groups with regional divisions, Nepal 2001 Census

	Main Ethnic Groups	Ethnic Groups with Regional Divisions (11) and Social Groups (103), 2001 Census
Caste Group	1. Brahmin/Chhetri	**1.1 Hill Brahmin** Hill Brahmin **1.2 Hill Chhetri** Chhetri, Thakuri, Sanyasi **1.3 Terai/Madhesi Brahmin/Chhetri** Madhesi Brahmin, Nurang, Rajput, Kayastha
	2. Terai/Madhesi Other	**2.1 Terai/Madhesi Other** Kewat, Mallah, Lohar, Nuniya, Kahar, Lodha, Rajbhar, Bing, Mali, Kamar, Dhuniya, Yadav, Teli, Koiri, Kurmi, Sonar, Baniya, Kalwar, Thakur/Hazam, Kanu, Sudhi, Kumhar, Haluwai, Badhai, Barai, Bhediyar/Gaderi
	3. Dalits	**3.1 Hill Dalit** Kami, Damai/Dholi, Sarki, Badi, Gaine, Unidentified Dalits **3.2 Terai/Madhesi Dalit** Chamar/Harijan, Musahar, Dushad/Paswan, Tatma, Khatwe, Dhobi, Baantar, Chidimar, Dom, Halkhor
Adibasi/Janajatis	4. Newar	**4.1 Newar** Newar
	5. Janajati	**5.1 Hill/Mountain Janajati** Tamang, Kumal, Sunuwar, Majhi, Danuwar, Thami/Thangmi, Darai, Bhote, Baramu/Bramhu, Pahari, Kusunda, Raji, Raute, Chepang/Praja, Hayu, Magar, Chyantal, Rai,Sherpa, Bhujel/Gharti, Yakha, Thakali, Limbu, Lepcha, Bhote, Byansi, Jirel, Hyalmo, Walung, Gurung, Dura **5.2 Terai Janajati** Tharu, Jhangad, Dhanuk, Rajbanshi, Gangai, Santhal/Satar, Dhimal, Tajpuriya, Meche, Koche, Kisan, Munda, Kusbadiya/Patharkata, Unidentified Adibasi/Janajati
Others	6. Muslim	**6.1 Muslim** Madhesi Muslim, Churoute (Hill Muslim)
	7. Other	**7.1 Other** Marwari, Bangali, Jain, Punjabi/Sikh, Unidentified Others

Source: Bennett, Dahal, and Govindasamy (2008)

1.3 Provinces and Inequalities in Health

In September 2015, Nepal's Constitution set forth the current system of 7 provinces, which replaced an earlier system in which the country was divided into 14 administrative zones and 5 development regions. The 7 provinces are subdivided into 753 local governments, which include urban and rural municipalities. The demarcation of federal provinces grouped the existing districts, except for Rukum and Nawalparasi which are divided between two provinces (Constituent Assembly Secretariat 2015).

The local governments were formed after the three-tiered election in 2017 at the local, provincial, and federal levels. The 2016 NDHS includes representative samples for key indicators at the provincial and federal levels, which have been analyzed in the main report. This analysis includes NDHS 2011 data by province and trends of selected indicators. We use the nomenclature Province 1 – Province 7, since these are the province names that were in effect at the time of the survey.[1]

[1] Province 4 has since changed its name to Gandaki Province (July 2018), Province 6 to Karnali Province (February 2018), and Province 7 to Sudurpashchim Province (September 2018). The remaining four provinces have not adopted permanent names as of the time of this publication.

Figure 1 Map of Nepal

1.4 Household Wealth Quintile and Inequalities in Health

Nepal is one of the poorest countries in the world with almost one-fourth of its population living below the poverty line (CBS 2010-2011). The findings of the Nepal Living Standard Survey (NLSS) 2010/11 showed that poverty in rural Nepal is much higher than in urban areas (27% versus 16%). Similarly, a wide disparity in poverty exists among the different castes/ethnicities and geographic areas. A large proportion of the population in Nepal lives in a cycle of poverty and poor health that are inextricably linked.

Many studies have shown that countries with less income inequality are more likely to have better health than countries with greater income inequalities (Black et al. 2013; Houweling et al. 2007). In Nepal, the poor are generally concentrated in remote areas, which hinders access to basic health care services. In addition to caste/ethnicity and province, this report will also analyze the inequalities between household economics, health outcomes, and service utilization. The NDHS does not provide direct information on the respondents' income but uses the household wealth index, which is a composite measure of household wealth status.[2] The wealth index is calculated by using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles, materials used for housing construction, water access, and sanitation facilities. With these proxy indicators, households were classified into five quintiles (Rutstein and Johnson 2004).

1.5 Objectives of This Study

The primary objective of this study is to identify disparities in the utilization of health services and outcomes by caste/ethnicity, province, and household wealth status. The report compares key health

[2] Household Wealth Index Scores are derived using principal component analysis. National wealth quintiles are compiled by assigning the household score to each usual (de jure) household member, ranking each person in the household population by her or his score, and then dividing the distribution into five equal quintiles, with each comprising 20% of the population.

indicators from the NHSS Results Framework and the Sustainable Development Goals (SDG) with the 2011 and 2016 NDHS. The indicators used in this analysis include fertility, family planning (FP), maternal and child health services and utilization, childhood mortality, nutrition of women and children, and domestic violence. The three key equity-related predictor variables used in the study are caste/ethnicity, province, and household wealth status.

The caste/ethnicity categories are described in Table 1. Since the primary NDHS report does not include the data disaggregated by different caste/ethnicity groups, it is necessary to disaggregate the selected health-service utilization and outcomes by caste/ethnicity groups. Analysis of disparities in the utilization of health services and outcomes by provinces can be a key tool for resource allocation by the federal and provincial government. The findings will assist programmers and policy makers in achieving universal health coverage. Another important dimension of inequality is the analysis by household wealth because it is also very important to identify where the poor are lagging behind in seeking health services and in health outcomes.

2 DATA AND METHODS

2.1 Data

The NDHS 2011 and 2016 provided the data for this further analysis. Both surveys are nationally representative, population-based household surveys that collect a wide range of data on population, health, and nutrition. The DHS used five different questionnaires, from which information from the Household, Women's, and Biomarker Questionnaires were used to generate the results for this further analysis. Detailed explanations about the sample size, sampling design, sampling frame, and list of questionnaires are reported in the publicly available report of 2016 NDHS (Ministry of Health, New ERA, and ICF 2017).

Table 2 shows the number of households, women respondents age 15-49, children under age 5, and sample size for domestic violence among those age 15-49 and blood pressure among those age 15 and older in the 2011 and 2016 NDHS.

Table 2 Number of sample households, women respondents, number of children, respondents for domestic violence and blood pressure

Survey	Household *N*	Women *N*	Children *N*	Domestic violence *N*	Blood pressure	
					Men *N*	Women *N*
NDHS 2016	*11,040*	*12,862*	*4,887*	*4,444*	*6,394*	*8,769*
NDHS 2011	*10,826*	*12,674*	*5,269*	*4,197*	-	-

2.2 Indicators and Definitions

Table 3 provides the list of indicators and definitions used in this study.

Table 3 List of indicators and definitions

	Indicator	Definition
Fertility	**Total Fertility Rate (TFR)**	The average number of children a woman would have by the end of her childbearing years if she bore children at the current age-specific fertility rates.
Family Planning Service (FP)	**Modern Contraceptive Prevalence Rate (mCPR)**	Percentage of currently married or in-union women currently using modern methods of contraception.
	Unmet Need	Percentage of currently married women who do not want to become pregnant but are not using any contraceptive method.
Childhood Mortality	**Neonatal Mortality**	Probability of dying in the first month of life (5 years before the survey) per 1,000 live births.
	Infant Mortality	Probability of dying before the first birthday (5 years before the survey) per 1,000 live births.
	Under-5 (U5) Mortality	Probability of dying before the fifth birthday (5 years before the survey) per 1,000 live births.
Maternal Health Services	**Four or more Antenatal Care Visits (ANC)**	Percentage of women who received four or more antenatal care visits during her pregnancy among those who had a live last birth in the 5 years before the survey.
	Delivery attended by Skilled Birth Attendant (SBA)	Percentage of live births in the 5 years before the survey assisted by a skilled provider. Skilled provider includes doctor, nurse, and auxiliary nurse midwife.
	Institutional delivery	Percentage of live births in the 5 years before the survey delivered at a health facility.
	Postnatal Care (PNC) checkup within 2 days	Percentage of women age 15-49 who received postnatal care within 2 days of delivery for the recent birth in the past 2 years before the survey.

(Continued…)

Table 3—Continued

Indicators list		Definition
Child Health Service	All basic vaccinations	Percentage of children age 12-23 months who had received all eight basic vaccinations at any time before the survey (according to vaccination card or the mother's report). For full immunization, a child must receive at least: • One dose of Bacillus Calmette–Guérin (BCG) vaccine • Three doses of diphtheria, pertussis, and tetanus (DPT) vaccine • Three doses of polio vaccine, and • One dose of measles vaccine
	Vitamin A supplementation	Percentage of children age 6-59 months who received Vitamin A supplements in the 6 months before the survey.
	Treatment of diarrhea	Percentage of children with diarrhea in the 2 weeks before the survey who were taken for a treatment to a healthy facility.
Nutritional Status of Children	Any anemia	Percentage of children age 6-59 months classified as having anemia if hemoglobin level is below 11.0 g/dl.
	Stunting	Percentage of children whose height-for-age z-score is below minus two standard deviations (-2 SD) from the median of the reference population according to the WHO standard.
	Exclusive breastfeeding	Percentage of youngest children who are taking only mother's milk and are not taking any other milk, water, or complementary food until age 6 months.
	Minimum acceptable diet	Nonbreastfed children age 6-23 months are considered to be fed a minimum acceptable diet if they receive other milk or milk products at least twice a day, receive the minimum meal frequency, and receive solid or semisolid foods from at least four food groups, not including the milk or milk products food group.
Nutritional Status of Women	Any anemia	Percentage of women age 15-49 classified as having any anemia (<12.0 g/dl for nonpregnant women and <11.0 g/dl for pregnant women).
	Body Mass Index (BMI)	Percentage of women age 15-49 with BMI less than 18.5 expressed as the ratio of weight in kilograms to the square of height in meters (kg/m^2). Mean BMI for women excluding pregnant women and women with a birth in the 2 months before the survey.
Other Indicators	High blood pressure (BP)	Women/men age 15-69 classified as having hypertension if s/he has an average systolic blood pressure level ≥140 mmHg and/or an average diastolic blood pressure level ≥90 mmHg at the time of the survey, or his/her average blood pressure is <140/90 mmHg and s/he is currently taking antihypertensive medication to control blood pressure.
Domestic Violence (DV)	Ever experienced any physical or sexual or emotional violence	Percentage of women age 15-49 who have ever experienced any physical, sexual, or emotional violence since age 15.

2.3 Analysis

Data from 2011 and 2016 NDHS were used primarily to calculate levels and examine the changes in indicators over the 5-year period. Since blood pressure measurement was only included in the 2016 NDHS, this report does not include a comparison with 2011 NDHS. For the estimation of the childhood mortality rate, a synthetic probability model using Stata module '*syncmrates*' was used among births in the 10 years before the survey (Masset 2016). In this model, the probability of dying during the first month of life, first year of life, and within 5 years of birth was calculated and the results exponentiated. The total fertility rate (TFR) for the 3 years before the survey was calculated with the Stata module '*tfr2*' (Schoumaker 2012).

For this analysis, data from the 2011 and 2016 NDHS were re-tabulated and difference between the years was tested for statistical significance using a z-test disaggregated by caste/ethnicity, province, and wealth quintiles. All P-values were two-sided, with a $P < 0.05$ considered as a cutoff for statistical significance. The clustering effect was adjusted for all the analyses by using the complex survey '*svy*' command in Stata. All analyses were conducted by using Stata software, the Standard Edition version 15.1 (StataCorp 2017), and MS-Excel 2013.

3 RESULTS

3.1 Distribution of Women by Caste/Ethnicity, Province, and Household Wealth

Table 4 shows the distribution of women in the 2011 and 2016 NDHS by caste/ethnicity, province, and household wealth. The proportion of women in both surveys was quite similar with approximately one-third of the respondents from Brahmin/Chhetri caste, followed by Janajati. The Terai/Madhesi Other caste represents 8% in 2011 NDHS and 15% in 2016 NDHS.

The proportion of women age 15-49 across the seven provinces in the 2011 and 2016 NDHS showed that the percentage of women was highest in Province 1 in the 2011 NDHS, while Province 3 contributed the largest proportion of women (21%) in the 2016 NDHS. Both surveys have similar proportions of women distributed in the five wealth groups.

Appendix Table A1 and Appendix Table A2 present the distribution of household wealth quintile and province disaggregated by caste/ethnicity. Appendix Table A3 shows the summary outcomes in this study by background characteristics.

Table 4 Distribution of women by background characteristics, Nepal DHS 2011-2016

Background characteristics	2011 NDHS		2016 NDHS	
	%	*N (weighted)*	%	*N (weighted)*
Caste/Ethnicity				
Brahmin/Chhetri	34.7	*4,397*	31.7	*4,072*
Hill Brahmin	14.2	*1,805*	11.8	*1,512*
Hill Chhetri	19.2	*2,436*	18.2	*2,343*
Terai/Madhesi Brahmin/Chhetri	1.2	*156*	1.7	*217*
Terai/Madhesi Other	7.9	*1,003*	14.8	*1,908*
Dalit	14.0	*1,773*	12.4	*1,596*
Hill Dalit	9.6	*1,214*	8.1	*1,042*
Terai/Madhesi Dalit	4.4	*559*	4.3	*554*
Newar	4.3	*541*	5.0	*639*
Janajati	35.2	*4,467*	30.8	*3,961*
Hill Janajati	24.9	*3,154*	20.9	*2,694*
Terai Janajati	10.4	*1,313*	9.8	*1,266*
Muslim	3.7	*468*	5.0	*643*
Others	(0.2)	*25*	(0.3)	*43*
Province				
Province 1	22.2	*2,811*	16.9	*2,173*
Province 2	16.7	*2,117*	19.9	*2,563*
Province 3	18.7	*2,365*	21.2	*2,732*
Province 4	12.1	*1,532*	9.7	*1,249*
Province 5	15.6	*1,974*	17.7	*2,274*
Province 6	5.0	*631*	5.6	*724*
Province 7	9.8	*1,242*	8.9	*1,145*
Wealth quintile				
Poorest	16.7	*2,120*	16.9	*2,176*
Poorer	18.9	*2,393*	19.6	*2,525*
Middle	20.5	*2,600*	20.2	*2,595*
Richer	21.5	*2,722*	21.5	*2,765*
Richest	22.4	*2,839*	21.8	*2,801*
Total	**100**	***12,674***	**100**	***12,862***

Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.

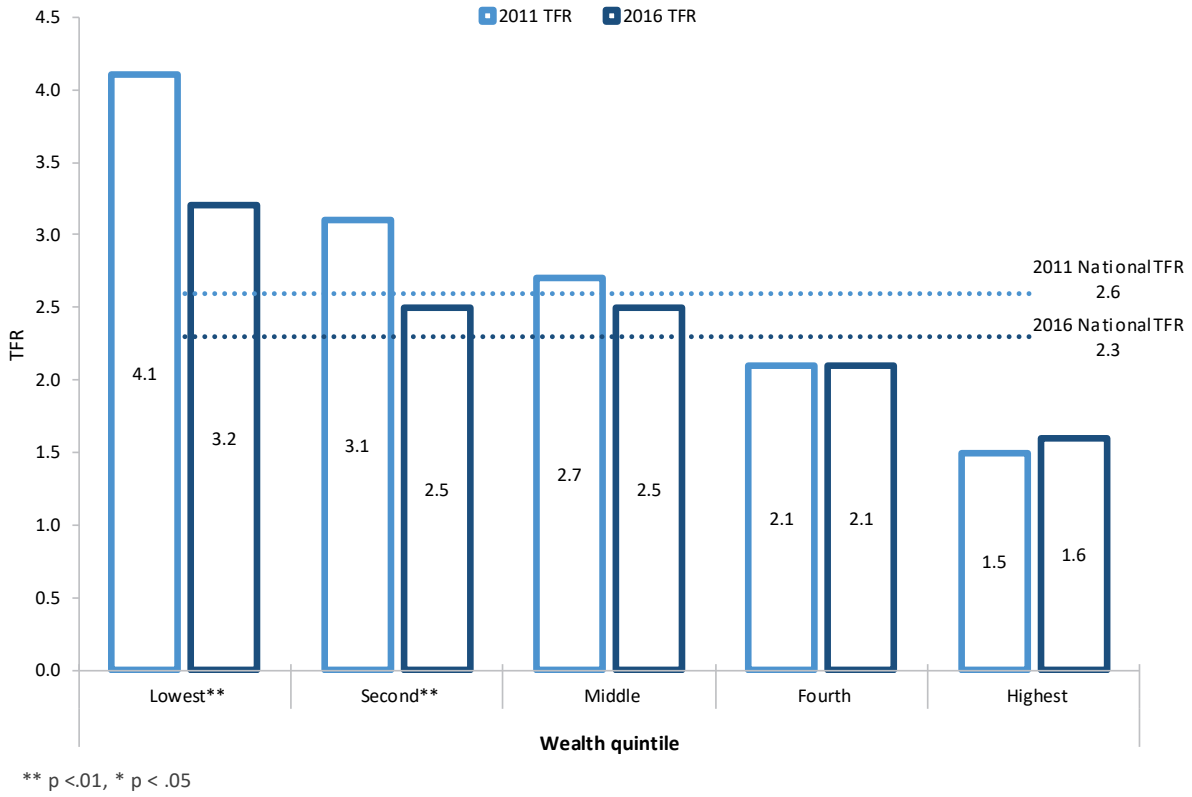
3.2 Fertility

Fertility is one of the important demographic and health indicators used in estimating population growth in a country. In 2016, the TFR in Nepal is 2.3, which means that a woman in Nepal would have an average of 2.3 children in her lifetime if she experienced the prevailing age-specific fertility rates.

Fertility differentials by caste/ethnicity shows that Terai/Madhesi Dalit (3.7), and Muslim (3.6) have higher fertility rates than the national average of 2.3. Terai/Madhesi Brahmin/Chhetri (1.5), and Newar (1.6) have the lowest TFR in Nepal. By province, the TFR ranges from a low of 1.8 children per women in Province 3 to a high of three children per woman in Province 2 (see Table 5).

In Figure 2, household wealth has an inverse association with fertility because women tend to have fewer children as household wealth increases. Women in the poorest wealth quintile (3.2) have twice as many children as women in the richest quintile (1.6).

Figure 2 Trends in total fertility rate by wealth quintile, Nepal DHS 2011-2016



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

Trends: The TFR in Nepal declined from 2.6 in 2011 to 2.3 in 2016. Results in Table 5 show a decreasing trend in TFR between the two NDHS for all caste/ethnicity groups except for the Newar, which remained stagnant at 1.6 births. Significant reduction in the TFR is more pronounced among the Muslims (from 5.0 in 2011 to 3.6 births in 2016), with a reduction of 1.4 births in 5 years. The decline in TFR from the 2011 to the 2016 NDHS is statistically significant among Brahmin/Chhetri, Dalit, Hill Janajati, and Muslim caste/ethnicity groups.

There has been a decline in TFR from the 2011 to the 2016 NDHS for all provinces except Province 3, where the TFR has remained at 1.8 children per woman. The largest reduction was found in Province 6 (Karnali Province), where there was a decline from 3.7 in 2011 to 2.8 in 2016. The decline in TFR is

statistically significant in Provinces 4, 6, and 7. Likewise, the decline in TFR among women in the poorest and poorer wealth quintiles was also significant.

Table 5 Trends in total fertility rate for the 3 years before the survey, by caste/ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	TFR		
	2011	2016	p-value
Caste/Ethnicity			
Brahmin/Chhetri	2.2	2.0	*
Hill Brahmin	1.8	1.7	
Hill Chhetri	2.5	2.3	
Terai/Madhesi Brahmin/Chhetri	2.0	1.5	
Terai/Madhesi Other	3.4	3.0	
Dalit	3.2	2.7	*
Hill Dalit	2.9	2.2	*
Terai/Madhesi Dalit	3.9	3.7	
Newar	1.6	1.6	
Janajati	2.4	2.1	*
Hill Janajati	2.5	2.2	*
Terai Janajati	2.2	2.0	
Muslim	5.0	3.6	*
Others	-	-	
Province			
Province 1	2.4	2.3	
Province 2	3.4	3.0	
Province 3	1.8	1.8	
Province 4	2.5	2.0	*
Province 5	2.6	2.4	
Province 6	3.7	2.8	**
Province 7	2.8	2.2	**
Wealth Quintile			
Poorest	4.1	3.2	**
Poorer	3.1	2.5	**
Middle	2.7	2.5	
Richer	2.1	2.1	
Richest	1.5	1.6	
Total	**2.6**	**2.3**	**

**p<0.01, *p<0.05
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.3 Family Planning

The government of Nepal is committed to FP 2020,3 which calls for equitable access to voluntary family planning. The government has committed to a number of financial, policy, and programmatic commitments, including raising the annual government allocation for FP (MoH 2017). Family planning prevents unintended pregnancies, reduces high-risk births, and protects the health of women and children. Evidence suggests that FP can avert more than 30% of maternal mortality and 10% of child mortality when pregnancies are spaced more than 24 months apart (Cleland et al. 2006).

3.3.1 Modern methods of contraception

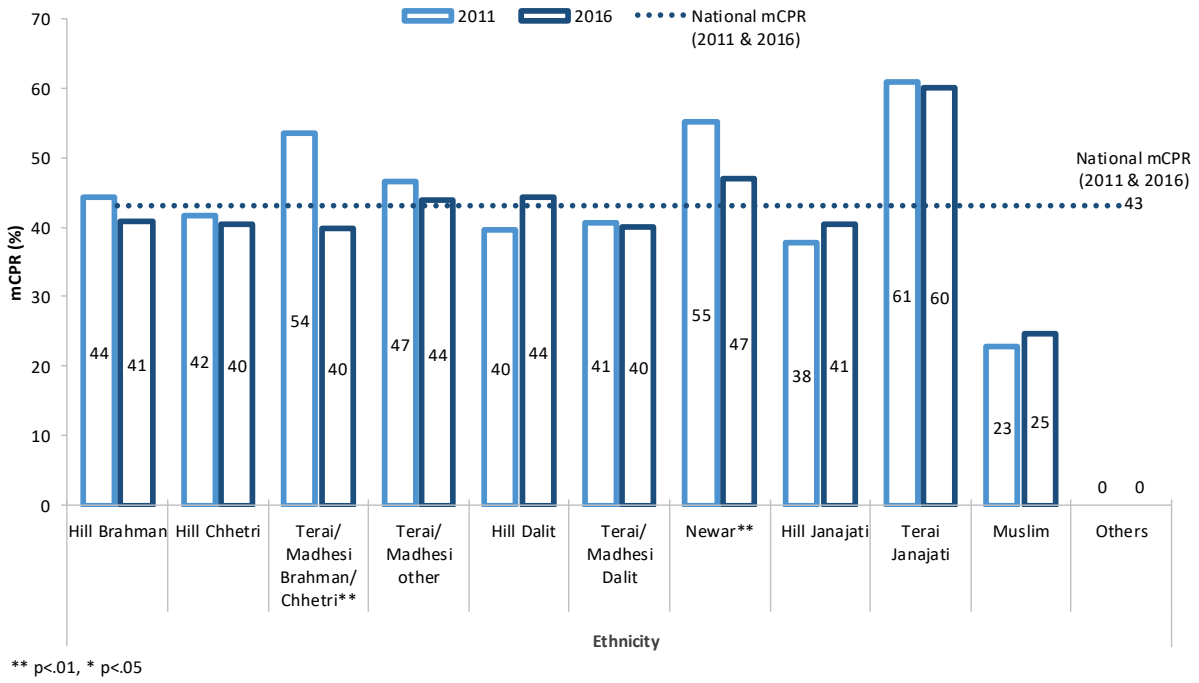
In 2016, the contraceptive prevalence rate (CPR) among currently married women was 43%. Modern contraceptive use was the lowest among Muslim women (25%) and the highest among women from the Terai Janajati ethnicity (60%). Use of modern contraceptives by province shows that the CPR is

[3] Family Planning 2020 (FP2020) is a global movement that supports the rights of women and girls to decide freely and for themselves whether, when, and how many children they want to have. FP2020 works with governments, civil society, multilateral organizations, donors, the private sector, and the research and development communities to enable 120 million more women and girls to use contraceptives by 2020.

the highest in Province 3 (49%) and lowest in Province 4 (37%, Gandaki Province). Only a small differential is observed in the use of modern contraceptives by household wealth. However, the use of modern contraceptives is the highest among women in the poorer quintile (45%) (see Table 6).

Trends: During the 5-year period (2011 to 2016), the use of modern contraceptives remained stagnant at 43%. Analysis by caste group shows that during the same period, the use of modern contraceptives decreased among all caste groups except for Hill Dalit, Hill Janajati, and Muslims. The largest decline in contraceptive use was among women from the Terai/Madhesi Brahmin/Chhetri caste/ethnicity (54% in 2011 versus 40% in 2016). The change in CPR among currently married women in the 5-year period is statistically significant among the Terai/Madhesi Brahmin/Chhetri and Newar castes.

Figure 3 Modern contraceptive prevalence rate by caste/ethnicity, Nepal DHS 2011-2016



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

In Table 6, the decline in the use of modern contraceptives from 2011 to 2016 was observed in all provinces except Province 6 and 7 (Karnali Province and Sudurpashchim Province). However, the decline is statistically significant only in Province 1 and 3. Similarly, by household wealth, the improvement in the use of modern contraceptive methods is observed in all wealth quintiles except for the poorest and poorer quintile groups. The change is statistically significant for all wealth quintiles except for the middle quintile.

3.3.2 Unmet need

The 2016 NDHS showed that 24% of currently married women have an unmet need for family planning,[4] which means that one in four women in Nepal do not want more children but are not using any family planning. Across different caste/ethnicity groups, unmet need ranges from the highest (32%) among the Hill Dalit to the lowest (15%) among Terai Janajati (Table 8).

[4] Proportion of women who (1) are not pregnant and not postpartum amenorrheic and are considered fecund and want to postpone their next birth for 2 or more years or stop childbearing altogether, but are not using a contraceptive method, or (2) have a mistimed or unwanted current pregnancy, or (3) are postpartum amenorrheic and their most recent birth in the last 2 years was mistimed or unwanted.

Women living in Province 4 (Gandaki Province, 30%) had the highest unmet need and those in Province 3 (20%) had the lowest unmet need. Similarly, unmet need is the highest among women in the poorest wealth quintile (27%) and is the lowest among those women in the richest quintile (21%).

Trends: Unmet need in Nepal has decreased significantly from 28% in 2011 to 24% in 2016. Unmet need has decreased in all caste/ethnicity groups except among the Terai/Madhesi Other caste group**,** which remained constant at 20%. Decline in unmet need between the year 2011 and 2016 NDHS is statistically significant among Brahmin/Chhetri, Dalit, Hill Janajati, and Muslim caste/ethnicity groups.

Unmet need by province shows a declining trend in all seven provinces, with the highest decline reported in Province 1 from 31% in 2011 to 25% in 2016. The decline is statistically significant in Provinces 1, 2, and 4. Similarly, unmet need decreased in all wealth quintiles over the 5-year period and is statistically significant for all except the richest quintile (Table 6).

Table 6 Percent distribution of currently married women age 15-49 using modern contraceptive method and unmet need for family planning, according to caste/ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	mCPR (%)			Unmet need (%)		
	2011	2016	p-value	2011	2016	p-value
Caste/Ethnicity						
Brahmin/Chhetri	43.1	40.5	*	26.7	24.7	
Hill Brahmin	44.3	40.8		24.4	22.1	
Hill Chhetri	41.7	40.4		28.8	27.0	
Terai/Madhesi Brahmin/Chhetri	53.6	39.8	*	19.9	16.7	
Terai/Madhesi Other	46.5	43.8		19.6	19.9	
Dalit	40.0	42.7		31.3	27.7	*
Hill Dalit	39.7	44.3	*	35.1	31.5	
Terai/Madhesi Dalit	40.7	40.0		23.7	21.5	
Newar	55.2	47.0	*	20.4	19.9	
Janajati	44.5	46.8		28.4	23.3	**
Hill Janajati	37.7	40.5		33.6	27.4	**
Terai Janajati	60.8	60.0		16.1	14.8	
Muslim	22.8	24.6		39.4	26.5	**
Others	-	(65.6)		-	(15.6)	
Province						
Province 1	34.9	40.1	**	31.2	24.9	**
Province 2	44.2	42.2		23.5	20.6	*
Province 3	55.6	49.2	**	20.8	19.8	
Province 4	39.9	37.3		35.4	30.0	**
Province 5	40.5	38.9		29.7	27.9	
Province 6	39.8	44.5		29.6	25.7	
Province 7	47.1	48.1		24.6	21.3	
Wealth Quintile						
Poorest	35.6	41.8	**	31.9	27.0	**
Poorer	41.1	44.8	*	28.6	23.7	**
Middle	43.3	42.6		28.9	24.3	**
Richer	45.3	41.7	*	26.8	23.8	*
Richest	48.9	43.0	**	22.4	20.5	
Total	**43.2**	**42.8**	**	**27.5**	**17.3**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

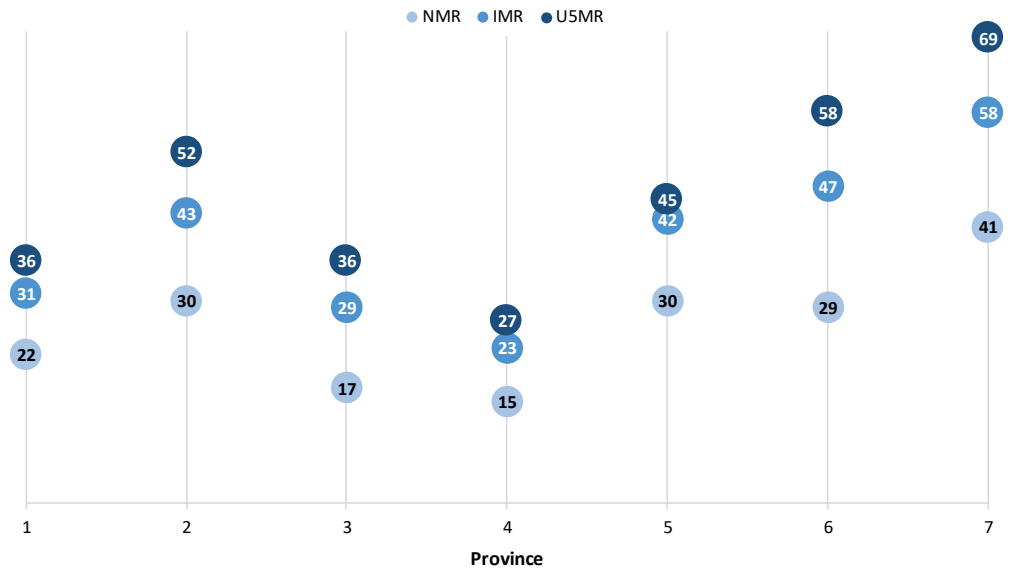
3.4 Early Childhood Mortality

Results in Table 7 show that in 2016, neonatal mortality (NMR) is the highest among the Terai/Madhesi Dalit caste/ethnicity group (41 deaths per 1,000 live births) and the lowest among the Hill Brahmin (10 deaths per 1,000 live births). Analysis by province indicates that Province 6 (Karnali Province) has the highest neonatal mortality (31 deaths per 1,000 live births) while Province 3 has the lowest (11 deaths per 1,000 live births). Table 9 also shows that as household wealth increases from the poorest to the richest quintile, the likelihood of neonatal death decreases. The infant mortality rate (IMR) and the

under-5 mortality rate (U5MR) are also the highest among the Terai/Madhesi Dalit (IMR 65 and U5MR 69 per 1,000 live births). The IMR and U5MR are the lowest among the Hill Brahmin (IMR 18 and U5MR 19 per 1,000 live births).

Figure 4 shows that the IMR and U5MR are the highest in Province 6, Karnali Province (IMR 41 and U5MR 51 per 1,000 live births) and the lowest in Province 4, Gandaki Province (IMR 18 and U5MR 23 per 1,000 live births). Household wealth has a direct relationship with all three measures of childhood mortality. The incidence of child mortality increases with the decrease in household wealth.

Figure 4 **Neonatal mortality rate (NMR), infant mortality rate (IMR), and under-5 mortality rate (U5MR) for 5-year period before the survey by province, Nepal DHS 2016**



Trends: During the 5-year period, there was a decreasing trend in NMR among all caste/ethnicity groups, however a significant decrease was reported among the Hill Chhetri and the Hill Janajati. The decrease in NMR is more pronounced among the Newars from 44 to 15 deaths per 1,000 live births. The IMR and U5MR both show a decreasing trend among all caste/ethnicity groups.

The NMR declined among all provinces with the exception of Province 6 (Karnali Province), where it increased from 28 deaths in 2011 to 31 deaths per 1,000 live births in 2016. However, a significant decline in NMR was reported in Province 2 and Province 4 (Gandaki Province). Similarly, the decrease is observed by household wealth, with significant decline in the middle wealth category. The IMR and U5MR by province and household wealth also showed a decreasing trend. It is worth noting that Province 4 (Gandaki Province) registered significant decline in all three childhood mortality measures.

Table 7 Neonatal mortality rate, infant mortality rate, and under-5 mortality rate for 5-year period before the surveys, by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background	NMR			IMR			U5MR		
	2011	2016	p-value	2011	2016	p-value	2011	2016	p-value
Caste/Ethnicity									
Brahmin/Chhetri	23	19		38	26	*	46	31	*
Hill Brahmin	13	10		24	18		31	19	
Hill Chhetri	29	17	*	44	25	**	52	31	**
Terai/Madhesi Brahmin/Chhetri	--	--		60	--		65	--	
Terai/Madhesi Other	37	19		52	31		69	45	
Dalit	39	30		56	46		65	51	
Hill Dalit	24	21		41	31		52	36	
Terai/Madhesi Dalit	64	41		80	65		87	69	
Newar	44	15		53	45		56	45	
Janajati	36	21	*	46	29	*	52	32	*
Hill Janajati	37	18	*	46	24	**	51	26	**
Terai Janajati	35	26		45	39		53	48	
Muslim	28	20		43	43		50	44	
Others	--	--		--	--		--	--	
Province									
Province 1	37	23		52	31		69	34	*
Province 2	45	24	*	54	38		68	48	
Province 3	24	11		31	25		35	27	
Province 4	38	12	**	44	18	**	52	23	*
Province 5	24	19		35	32		42	34	
Province 6	28	31		47	41		60	51	
Province 7	38	29		61	39		74	49	
Wealth Quintile									
Poorest	29	26		49	36		59	44	
Poorer	37	28		46	39		56	47	
Middle	42	15	**	53	29	**	61	34	**
Richer	35	22		46	36		53	40	
Richest	16	8		29	18		34	22	
Total	**32**	**21**	**	**45**	**32**	**	**54**	**39**	**

**p<0.01, *p<0.05
-- indicates that a figure is based on fewer than 100 unweighted cases and has been suppressed.

3.5 Utilization of Maternal Health Services

Health care service during pregnancy, delivery, and the postpartum period is very important for the wellbeing of both the mother and the child. Although the pregnancy-related mortality ratio in Nepal decreased almost by half, from 543 deaths per 100,000 live births in 1996 to 281 in 2006, the progress has been slow from 2006 to 2016. In 2016, the pregnancy-related mortality ratio was 259 and the maternal mortality ratio was 239 deaths per 100,000 live births.

3.5.1 Four or more antenatal care (ANC) visits

Table 8 presents the percentage of women who had a live birth in the 5 years before the survey with four or more ANC visits by caste/ethnicity, province, and household wealth. The analysis by caste/ethnicity shows that the proportion of women who received four or more ANC visits is lowest among Terai/Madhesi Dalit (45%) and Muslims (53%). In contrast, the Hill Brahmins (90%) and Newar (80%) caste have the highest proportion of women with four or more ANC visits. In the Dalit category, the number of women who received four or more ANC visits is much lower among the Terai/Madhesi Dalits (45%) compared to the Hill Dalits (74%). In the Janajati category, about three-quarters of the Terai Janajatis (75%) completed four or more ANC visits compared to the Hill Janajatis (68%). Similarly, four or more ANC visits are comparatively lower among women in Province 2 (53%) and Province 6 (Karnali Province, 52%). Completion of four or more ANC visits tends to increase consistently with the increase in household wealth.

Trends: The percentage of women who complete four or more ANC visits during pregnancy has increased significantly over the past 5 years from 50% in 2011 to 69% in 2016. Trends by caste/ethnicity shows a similar increase except among the Newar caste, which decreased from 83% in 2011 to 80% in 2016. Results by province also show a similar pattern. The analysis by household wealth indicates that the increase is more prominent among women in the poorest two quintiles, with the poorest from 28% to 57% and the poorer quintile from 39% to 65%. The change in the percentage of women receiving four or more ANC visits during pregnancy is statistically significant in all provinces, wealth quintiles except the highest quintile, and all caste/ethnicity groups except the Newar (see Table 8).

Table 8 Percentage of women age 15-49 who had a live birth in the 5 years before the survey with four or more antenatal care visits for the most recent live birth by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	Attended four or more ANC visits (%)		
	2011	2016	p-value
Ethnicity			
Brahmin/Chhetri	63.5	81.1	**
Hill Brahmin	80.6	89.7	**
Hill Chhetri	54.5	77.6	**
Terai/Madhesi Brahmin/Chhetri	(48.6)	(72.5)	*
Terai/Madhesi Other	35.9	58.8	**
Dalit	39.9	62.2	**
Hill Dalit	48.6	73.9	**
Terai/Madhesi Dalit	23.2	45.4	**
Newar	82.8	79.9	
Janajati	46.4	69.7	**
Hill Janajati	44.5	67.7	**
Terai Janajati	51.2	74.5	**
Muslim	34.8	52.5	**
Others	-	-	
Province			
Province 1	52.7	76.9	**
Province 2	33.5	53.4	**
Province 3	60.7	78.4	**
Province 4	53.0	76.7	**
Province 5	53.2	73.7	**
Province 6	39.9	52.2	**
Province 7	60.2	77.3	**
Wealth Quintile			
Poorest	28.3	56.7	**
Poorer	39.1	65.4	**
Middle	48.0	66.8	**
Richer	65.1	74.7	**
Richest	83.7	87.4	
Total	**50.1**	**69.4**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.5.2 Deliveries attended by an SBA and delivered in a health facility

Table 9 presents findings on delivery assisted by a skilled birth attendant (SBA) and institutional delivery by caste/ethnicity, province, and household wealth. Women from Hill Brahmin (85%) and Terai/Madhesi Brahmin/Chhetri (78%) caste fare far better than Hill Chhetri (60%) with having deliveries assisted by an SBA. The same is true with delivery in a health facility. Among the Dalits, delivery assisted by an SBA and institutional delivery are lower among the Terai/Madhesi Dalits compared to the Hill Dalits. Similarly, among the Janajati caste, the Terai/Madhesi Janajati caste have more deliveries assisted by SBA and institutional deliveries than the Hill Janajati.

Comparison by provinces shows that delivery assisted by SBA and institutional delivery are low in Province 2 (49% and 45%, respectively) and Province 6 (35% and 36%, respectively) compared to the

national average. In contrast, Province 3 has the highest percentage of women who gave birth assisted by an SBA and delivered at a health facility (70% and 71% respectively).

Trends: Results in Table 9 indicate that delivery assisted by an SBA increased significantly in the previous 5 years among all castes/ethnicities. The increase is most remarkable among the Terai Janajati (from 28% in 2011 to 73% in 2016). By province, the increase was more prominent in Province 7, Sudurpashchim Province (from 31% to 66%). Similar trends were observed for household wealth as well. The increase in delivery attended by an SBA over the two NDHS is statistically significant among all the castes/ethnicities, provinces, and wealth quintiles. The percentage of deliveries in health facilities substantially increased for all castes/ethnicities except for the Newar. Increase in delivery in health facilities is statistically significant for all provinces and wealth quintiles. With caste/ethnicity, the increase is significant for all castes/ethnicities except for Terai/Madhesi Brahmin/Chhetri and the Newar.

Table 9 **Percentage of women age 15-49 who had a live birth in the 5 years before the survey having deliveries attended by a skilled birth attendant and percentage delivered in a health facility for the most recent birth, by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016**

Background	Delivery attended by SBA[1] (%)			Delivered in health facility (%)		
	2011	2016	p-value	2011	2016	p-value
Ethnicity						
Brahmin/Chhetri	45.5	67.8	**	44.1	68.4	**
Hill Brahmin	64.9	85.0	**	62.3	84.8	**
Hill Chhetri	35.2	59.5	**	34.4	61.0	**
Terai/Madhesi Brahmin/Chhetri	(59.6)	78.3	*	(57.4)	72.2	
Terai/Madhesi Other	39.3	48.4	**	37.9	48.1	**
Dalit	26.8	47.9	**	26.4	45.4	**
Hill Dalit	29.6	54.1	**	29.2	53.3	**
Terai/ Madhesi Dalit	22.2	40.5	**	21.8	35.8	**
Newar	71.7	76.0		68.0	74.6	
Janajati	28.8	59.0	**	28.9	57.9	**
Hill Janajati	28.9	52.9	**	28.7	52.4	**
Terai Janajati	28.4	72.7	**	29.7	70.2	**
Muslim	32.9	52.9	**	32.3	51.6	**
Others	-	-		-	-	
Province						
Province 1	43.9	63.1	**	41.4	62.2	**
Province 2	29.8	48.6	**	28.6	44.6	**
Province 3	44.0	69.9	**	45.1	70.7	**
Province 4	40.0	69.9	**	42.6	68.3	**
Province 5	35.9	56.6	**	34.6	59.4	**
Province 6	20.3	35.3	**	20.7	35.6	**
Province 7	30.7	66.0	**	29.0	66.4	**
Wealth Quintile						
Poorest	10.7	33.9	**	11.4	33.9	**
Poorer	23.7	48.0	**	23.3	46.6	**
Middle	35.9	59.4	**	35.4	57.6	**
Richer	53.0	70.0	**	51.9	69.5	**
Richest	81.5	88.7	**	77.9	89.6	**
Total	**36.0**	**58.0**	**	**35.3**	**57.4**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1]Skilled birth attendant includes doctor, nurse, and auxiliary nurse midwife.

3.5.3 Women receiving postnatal checkups (PNC)

Table 10 shows the proportion of women who received postnatal checkups (PNC) within 2 days of giving birth by caste/ethnicity, province, and household wealth. Within the caste/ethnicity groups, there were very large variations in PNC service utilization within 2 days of delivery. The Hill Brahmins (84%)

have the highest proportion and Terai/Madhesi Dalits have the lowest proportion (39%) of PNC within 2 days of delivery. The PNC within 2 days is the highest in Province 4 (Gandaki Province, 68%) and the lowest in Province 6 (Karnali Province, 39%). The proportion of women receiving PNC visits tends to increase consistently with an increase in household wealth.

Trends: The proportion of women who receive postnatal checkups within 2 days increased from 45% in 2011 to 57% in 2016. The increase is reported for all caste/ethnicity groups except among the Newar. Between 2011 and 2016, the change was statistically significant in all caste/ethnicity groups except for Terai/Madhesi Brahmin/Chhetri, Terai/Madhesi Other, Terai/Madhesi Dalit, Terai Janajati, Newar, and Muslim. By province and household wealth, there was a remarkable increase in PNC visits in Provinces 3 and 4 (an increase of about 20 percentage points from 2011 to 2016) and among women in the poorest quintile. A statistically significant increase in PNC visits within 2 days of birth was reported in all provinces except Province 2 and Province 6 (Karnali Province), and in all the wealth quintiles except for the richest quintile (see Table 10).

Table 10 Percentage of women age 15-49 who had a live birth in the 5 years before the survey, who received a postnatal care checkup during the first 2 days after birth by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background	PNC check during the first 2 days after birth (%)		
	2011	2016	p-value
Ethnicity			
Brahmin/Chhetri	54.3	69.3	**
Hill Brahmin	69.1	84.2	**
Hill Chhetri	46.1	61.8	**
Terai/Madhesi Brahmin /Chhetri	-	-	
Terai/Madhesi Other	42.3	47.5	
Dalit	36.6	49.3	**
Hill Dalit	37.4	57.3	**
Terai/Madhesi Dalit	35.6	38.5	
Newar	75.4	69.4	
Janajati	38.3	54.6	**
Hill Janajati	33.8	51.4	**
Terai Janajati	51.3	61.8	*
Muslim	43.1	50.5	
Others	-	-	
Province			
Province 1	52.5	61.5	**
Province 2	39.1	45.1	
Province 3	46.0	67.3	**
Province 4	47.2	68.3	**
Province 5	43.7	59.9	**
Province 6	30.6	38.5	
Province 7	46.5	57.6	*
Wealth Quintile			
Poorest	16.7	36.7	**
Poorer	35.7	49.5	**
Middle	48.2	55.5	*
Richer	59.1	68.6	**
Richest	82.1	81.2	
Total	**44.5**	**56.7**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.6 Child Health Service Utilization

3.6.1 Vaccination

In the 2016 NDHS, 22% of children did not receive all eight basic vaccinations by the age 12-24 months. This is a drop of 9 percentage points from 2011 (87%) to 2016 (78%). The coverage of all basic vaccinations is lowest among all Terai/Madhesi caste/ethnic groups.

Results in Table 11 show that all basic vaccinations coverage is lowest among Terai/Madhesi Other caste (64%), Terai/Madhesi Dalit (65%), and Muslim (68%). All basic vaccinations coverage is higher among Hill Brahmin (95%), Hill Chhetri (83%), and Hill Janajati (85%).

There is wide disparity in immunization coverage by province, with the highest proportion of children who received all basic vaccinations in Province 4 (Gandaki Province, 93%) and the lowest in Province 2 (65%). By household wealth, there was no specific pattern for all basic vaccinations observed, although the highest coverage was among children in the richer quintile (85%) and the lowest was among children in the middle quintile (71%).

Trends: All basic vaccinations coverage in Nepal decreased from 87% in 2011 to 78% in 2016. The decline is statistically significant among Terai/Madhesi Other, Terai/Madhesi Dalit, and both Janajati caste groups. Similarly, all basic vaccinations coverage declined in all provinces except in Province 4 (Gandaki Province) where it remained stagnant at 93% in both surveys. The largest decline was in Province 2 (14 percentage points) and Province 5 (13 percentage points). The decline in the all basic vaccinations coverage rate is statistically significant in Provinces 1, 2, 5, and 6, and among all wealth quintiles except the poorer wealth quintile (see Table 11).

3.6.2 Vitamin A Supplementation

Results in Table 11 show that 83% of children age 6-59 months received Vitamin A supplements in the 6 months before the survey in 2016. Children from the Terai/Madhesi Other (76%), Terai/Madhesi Dalit (82%), Terai Janajati (82%), Muslims (72%), and Newars (82%) have Vitamin A coverage below the national average. Examination of Vitamin A supplementation by province indicates that Province 2 has the lowest coverage among all provinces. Although there is little disparity among children in different wealth quintiles, 86% of children in the poorest quintile received Vitamin A supplementation versus 80% of children from households in the middle quintile.

Trends: There was an overall decrease in the coverage of Vitamin A supplementation in Nepal from 87% in 2011 to 83% in 2016. The coverage either declined or remained stagnant for all caste/ethnicity groups. The decrease in Vitamin A supplementation was statistically significant among the Terai Janajati and Muslim caste groups. The reduction is especially great among the Muslims (87% to 72%) in 2016. The change in the percentage of children who received Vitamin A supplementation in Provinces 1, 2, and 3 was statistically significant over the two survey periods. Decrease in Vitamin A supplementation was statistically significant for all wealth quintiles except for the lowest and the richest quintiles.

3.6.3 Diarrhea

In the 2016 NDHS, of the 8% of under-5 children who suffered from diarrhea in the 2 weeks before the survey, 64% sought advice or treatment for diarrhea. Province 3 (32%) and the poorest quintile (55%) had the lowest proportion of children who sought treatment for diarrhea.

The change in seeking treatment for diarrhea between the two NDHS is significant for all caste/ethnicity groups with the exception of Hill Chhetri, Terai/Madhesi Brahmin/Chhetri, and Newar. Similarly, the percentage increase in seeking treatment for diarrhea is statistically significant in Provinces 1, 2, and 5.

Table 11 Percentage of children age 12-23 months who received all basic vaccinations, percentage of children age 6-59 months who received Vitamin A supplements in the 6 months before the survey, and percentage of children under age 5 who had sought treatment by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	All basic vaccinations[1] (%)			Vitamin A supplement U5 (%)			Treatment of diarrhea (%)		
	2011	2016	p-value	2011	2016	p-value	2011	2016	p-value
Ethnicity									
Brahmin/Chhetri	90.7	87.3		89.6	87.7		42.7	58.0	*
Hill Brahmin	93.9	94.8		89.4	88.6		41.1	-	
Hill Chhetri	89.9	83.4		90.3	88.4		43.1	51.9	
Terai/Madhesi Brahmin/Chhetri	-	-		(78.6)	(71.1)		-	-	
Terai/Madhesi Other	82.0	64.3	**	75.1	75.8		40.2	70.7	**
Dalit	85.7	73.2	**	85.9	84.4		38.1	(75.9)	**
Hill Dalit	87.0	78.2		86.1	86.1		39.8	(72.5)	**
Terai/Madhesi Dalit	83.8	65.1	*	85.6	82.2		35.9	-	**
Newar	(92.3)	-		89.5	81.6		-	-	
Janajati	93.5	82.8	**	88.4	84.1	**	32.9	62.8	**
Hill Janajati	93.0	85.0	*	87.8	85.2		32.4	59.3	**
Terai Janajati	94.8	77.6	**	89.8	81.6	**	34.5	(74.2)	**
Muslim	57.4	68.1	0.16	87.3	71.9	**	40.7	(84.8)	**
Others	-	-		-	-		-	-	
Province									
Province 1	87.3	79.4	*	90.3	84.9	**	40.2	65.7	**
Province 2	79.3	65.2	**	82.6	74.0	**	29.2	68.2	**
Province 3	91.3	85.3		87.9	83.4	*	28.1	32.1	
Province 4	92.6	92.7		88.0	87.1		54.3	-	
Province 5	91.0	78.3	**	83.1	85.5		41.7	82.4	**
Province 6	76.5	74.9		87.3	89.6		34.3	-	**
Province 7	93.7	83.4	*	90.5	87.1		52.0	(66.7)	
Wealth Quintile									
Poorest	84.5	76.6	*	86.6	85.7		32.7	54.7	**
Poorer	83.9	77.2		87.2	82.1	**	38.7	61.0	**
Middle	84.0	70.9	**	86.2	79.8	**	38.9	75.2	**
Richer	91.5	84.8	*	88.0	81.6	**	44.1	66.8	**
Richest	95.7	81.6	**	86.2	83.7		37.1	59.0	*
Total	**87.0**	**77.8**	**	**86.8**	**82.5**	**	**38.0**	**64.4**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] BCG, three doses of DPT-HepB-Hib (pentavalent), three doses of oral polio vaccine, and one dose of measles/rubella.

3.7 Nutrition of Children

Poor nutrition poses a great risk to Nepal's development and to the wellbeing and potential of its people (Pomeroy-Stevens et al. 2016). The increased prevalence of anemia among children under age 5 is of great concern. The prevalence of anemia increased to 53% in 2016 from 46% in 2011. One sign of chronic malnutrition is stunting, or being too short for one's age. Despite a considerable decline in the past 20 years, slightly more than one-third of children (36%) are still stunted.

3.7.1 Anemia

Table 12 presents the prevalence of any anemia and stunting among children by caste/ethnicity, province, and household wealth. By caste/ethnicity, the prevalence of any anemia is comparatively higher among children from Terai/Madhesi Dalit (68%), Terai Janajati (69%), and Terai/Madhesi Other (60%) caste/ethnicity groups, when compared to the other caste/ethnicity groups. By province, the prevalence of any anemia was the highest among children in Province 2 (59%) and the lowest in

Province 3 (43%). By household wealth, children from the richest quintile had the lowest proportion of any anemia (41%) and those from the middle quintile had the highest (60%), which indicated no consistent association of wealth and anemia.

Trends: The prevalence of any anemia increased in almost all caste/ethnicity groups except the Hill Brahmin (from 42% in 2011 to 38% in 2016) and Hill Dalit (from 51% in 2011 to 47% in 2016). The prevalence of anemia increased noticeably among the Terai Janajati from 55% to 69%. The Terai/Madhesi Brahmin/Chhetri, Newar, Janajati, and Terai Janajati caste group showed a statistically significant increase in anemia over the two surveys.

The prevalence of any anemia increased in all provinces with a statistically significant change in Provinces 1 and 2. By household wealth, the proportion of women with any anemia increased among all wealth quintiles except those in the poorer quintile, in which it remained stagnant at 50%. The increase is the largest among women in the richer quintile by 15 percentage points from 43% in 2011 to 58% in 2016. However, the increase is statistically significant only among women in the middle and the richer wealth quintiles (see Table 12).

3.7.2 Stunting

In 2106, approximately one-third (36%) of the children under age 5 in Nepal were stunted, which is defined as low height for age. Stunting is comparatively lower among the Newar (22%) and Terai Janajati (25%) compared to other caste/ethnicity groups. Stunting among children is highest in Province 6 (Karnali Province) at 55%.

Trends: In the 5-year period, stunting has decreased among children of all caste/ethnicity except among the Terai/Madhesi Dalit, which showed an increase from 40% in 2011 to 44% in 2016 and among Muslims from 32% to 39%. The decrease in stunting among children is pronounced among the Hill Dalit with nearly 13 percentage points (from 50% to 31%). A statistically significant decrease in stunting was observed among children from the Hill Chhetri, Dalit, and Hill Dalit subcategories, and the Terai Janajati. Overall, stunting decreased in all provinces except in Province 6 (Karnali Province) and among all wealth quintiles except for the poorest quintile, which showed a statistically significant change (see Table 12).

Table 12 Percent distribution of children age 6-59 months who had any anemia, and percentage of children who were stunted by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	Any anemia (%)			Stunting (%)		
	2011	2016	p-value	2011	2016	p-value
Ethnicity						
Brahmin/Chhetri	41.6	46.2		37.9	34.4	
Hill Brahmin	42.0	39.2		32.4	34.1	
Hill Chhetri	41.5	47.2		41.9	34.9	*
Terai/Madhesi Brahmin/Chhetri	(42.3)	(76.9)	**	(17.2)	(27.6)	
Terai/Madhesi other	53.6	60.3		45.7	42.0	
Dalit	53.9	55.0		46.8	40.0	
Hill Dalit	51.2	45.8		50.4	36.8	**
Terai/Madhesi Dalit	60.2	67.8		39.9	44.1	
Newar	(25.5)	40.6	**	29.6	22.2	
Janajati	44.0	50.2	*	40.0	32.0	**
Hill Janajati	39.5	42.1		43.1	35.2	*
Terai Janajati	54.6	67.9	*	32.9	25.4	
Muslim	56.3	58.5		32.2	38.7	
Others	-	-		-	-	
Province						
Province 1	45.1	55.2	**	45.1	32.6	**
Province 2	51.1	59.4	*	51.1	37.0	**
Province 3	37.6	42.8		37.6	29.4	*
Province 4	40.3	46.2		40.3	28.9	*
Province 5	50.1	53.4		50.1	38.5	**
Province 6	48.6	48.4		48.6	54.5	
Province 7	49.4	49.8		49.4	35.9	**
Wealth Quintile						
Poorest	45.3	48.7		45.3	49.2	
Poorer	49.6	49.6		49.6	38.7	**
Middle	51.4	59.9	*	51.4	35.7	**
Richer	43.2	58.4	**	43.2	32.4	**
Richest	37.5	41.2		37.5	16.5	**
Total	**46.2**	**52.7**	**	**40.5**	**35.8**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.7.3 Exclusive breastfeeding

Results in Table 13 show that in 2016 two-thirds (66%) of the children under age 6 months were exclusively breastfed, which is a 4 percentage-point decrease compared to 2011. The proportion of children exclusively breastfed is the highest among Hill Chhetri (72%). The decrease was statistically significant among the Dalit and Terai/Madhesi Dalit caste groups. Data by province indicates that exclusive breastfeeding is lowest in Province 3 (58%), although the decrease is statistically significant only in Province 2. Exclusive breastfeeding is lowest among the richer and the richest wealth quintiles, although the trend is not statistically significant.

3.7.4 Minimum Acceptable Diet (MAD)

The proportion of children age 6-23 months who received the minimum acceptable diet is also lowest among the Terai/Madhesi Dalits (17%) and the Muslims (21%). The MAD ranges from a high of 52% in Province 4 (Gandaki Province) to a low of 20% in Province 2. The percentage of children who receive the minimum acceptable diet increased steadily with the increase in household wealth, from 31% in the poorest quintile to 50% in the richest quintile.

Trends: The minimum acceptable diet given to children age 6-23 months has increased significantly from 24% in 2011 to 36% in 2016. This increase is found in all caste/ethnic groups. The percentage increase in the minimum acceptable diet among children age 6-23 months is statistically significant in all caste groups except for Newar caste. The change in MAD is statistically significant in Provinces 2,

5, and 6. By household wealth, the trend is significant for all wealth quintiles, except the richer quintile (see Table 13).

Table 13 Percent distribution of children age 0-5 months who were exclusively breastfed and percentage of children age 6-23 months taking minimum acceptable diet by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	Exclusive breastfeeding (%)			Minimum acceptable diet (%)		
	2011	2016	p-value	2011	2016	p-value
Ethnicity						
Brahmin/Chhetri	63.9	69.2		36.9	52.4	**
Hill Brahmin	61.2	(64.6)		45.5	59.5	*
Hill Chhetri	65.9	72.4		32.8	50.6	**
Terai/Madhesi Brahmin/Chhetri	-	-		-	-	
Terai/Madhesi Other	(77.1)	63.7		7.0	23.6	**
Dalit	82.4	58.4	**	16.1	32.9	**
Hill Dalit	71.8	(67.4)		21.5	43.2	**
Terai/Madhesi Dalit	91.7	(52.2)	**	5.2	17.2	*
Newar	-	-		(30.8)	36.5	
Janajati	67.9	67.4		24.6	34.4	**
Hill Janajati	58.7	61.6		27.5	36.9	*
Terai Janajati	(89.2)	(79.5)		15.9	29.0	**
Muslim	(51.7)	(67.6)		9.9	21.4	*
Others	-	-		-	-	
Province						
Province 1	63.6	55.1		31.0	33.9	
Province 2	85.1	60.0	**	5.3	20.0	**
Province 3	48.1	58.0		35.1	44.0	
Province 4	67.6	(72.9)		43.3	52.2	
Province 5	61.7	75.0		21.2	42.8	**
Province 6	(69.6)	(71.2)		14.6	40.3	**
Province 7	78.3	(83.6)		24.8	35.6	
Wealth Quintile						
Poorest	74.0	71.3		13.7	30.8	**
Poorer	72.7	62.2		19.3	33.5	**
Middle	73.8	73.3		21.1	28.0	*
Richer	69.5	60.1		33.9	41.4	
Richest	44.2	59.7		40.4	49.9	*
Total	**69.6**	**66.1**		**24.0**	**35.7**	**

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.8 Nutritional Status of Women

3.8.1 Anemia in women

According to the 2016 NDHS, 41% of women were anemic in Nepal. Table 14 shows that there is substantial difference in the prevalence of both anemia and body mass index (BMI) of women by caste/ethnicity, province, and wealth quintile. Compared to the Hill Dalit (30%) and Hill Janajati (28%), the Terai/Madhesi Dalit (56%), and Terai Janajati (66%) have a higher proportion of anemia in women. Among the provinces, anemia prevalence is the highest in Province 2 (58%) and the lowest in Province 4 (Gandaki Province, 28%).

A total of 17% of women in Nepal are considered thin with a BMI less than 18.5. The percentage is high among the Terai/Madhesi Dalit (40%) and lowest among the Hill Janajatis (9%). Similarly, Province 2 has the highest (29%) proportion of thin women and Province 4 (Gandaki Province) the lowest (8%).

Trends: In Table 14, the prevalence of anemia among women age 15-49 increased from 35% in 2011 to 41% in 2016. Except among women from Terai/Madhesi Dalit and Muslim castes, the prevalence has increased in all caste/ethnic groups. The increase is more pronounced among women from the Terai/Madhesi Other caste group with an increase of 16 percentage points from 40% in 2011 to 56% in 2016.

Overall, anemia status among women age 15-49 has increased over the 5 years, with the trend statistically significant among Hill Chhetri, Terai/Madhesi Other, Newar, and the Terai Janajati sub-caste category and in all provinces except Province 7 (Sudurpashchim Province). Similarly, there is significant increase in anemia status among women belonging to all wealth quintiles, except the poorest quintile.

3.8.2 Body mass index

The proportion of thin women with a BMI lower than 18.5 has decreased from 18% to 17%. The proportion of thin women has decreased slightly among all caste/ethnic groups except for the Newar and Hill Janajati. The change in women's BMI is statistically significant among the Hill Dalit and Terai Janajati castes. The decrease in the proportion of women with BMI lower than 18.5 is statistically significant in the richest wealth quintile only (see Table 14).

Table 14 Percentage of women age 15-49 with any anemia and body mass index, by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016

Background characteristics	Anemia (%)			BMI Thin (< 18.5) (%)		
	2011	2016	p-value	2011	2016	p-value
Ethnicity						
Brahmin/Chhetri	31.6	36.5	**	16.3	15.2	
Hill Brahmin	34.8	37.2		17.0	13.9	
Hill Chhetri	27.9	34.8	**	15.1	15.4	
Terai/Madhesi Brahmin/Chhetri	47.3	50.4		24.7	22.4	
Terai/Madhesi Other	40.2	55.6	**	32.6	27.9	
Dalit	37.5	38.4		25.9	21.1	*
Hill Dalit	29.2	29.5		18.0	11.8	**
Terai/Madhesi Dalit	57.7	56.3		44.6	40.2	
Newar	17.1	26.4	*	8.1	9.4	
Janajati	36.5	39.7	*	13.9	12.4	
Hill Janajati	27.6	28.1		8.4	9.2	
Terai Janajati	56.0	66.3	**	25.9	19.6	*
Muslim	54.8	51.8		36.5	31.4	
Others	-	(44.0)		-	(12.0)	
Province						
Province 1	34.3	43.3	**	13.5	13.0	
Province 2	48.7	57.8	**	32.5	29.1	
Province 3	23.2	29.0	**	12.5	11.6	
Province 4	33.9	28.0	*	7.8	8.1	
Province 5	38.3	43.5	*	20.4	19.0	
Province 6	27.8	34.9	*	20.8	15.2	
Province 7	35.9	39.3		23.9	22.1	
Wealth Quintile						
Poorest	34.5	32.3		21.5	19.1	
Poorer	35.4	41.5	**	21.2	21.1	
Middle	38.6	49.0	**	21.5	21.3	
Richer	35.5	43.4	**	16.6	17.3	
Richest	31.2	36.0	*	11.9	8.6	*
Total	**35.0**	**40.8**	**	**18.2**	**17.3**	

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

3.9 Blood Pressure

The module on blood pressure was added in the 2016 NDHS. Results show that the prevalence of hypertension is comparatively higher among men (23%) than among women (17%) age 15 and older.

Results in Table 15 show that the prevalence by caste/ethnicity indicates that the Newars are more susceptible to hypertension with 34% men and 23% women categorized as hypertensive. Among the Brahmin/Chhetri, the rate of hypertension is much higher among both the Terai/Madhesi Brahmin/Chhetri men (31%) and Terai/Madhesi Brahmin/Chhetri women (22%) as compared to the Hill Brahmin and Hill Chhetri. Although the Terai/Madhesi Dalit and Terai Janajatis fared poorly on many health indicators, they have the lowest percentage of men and women suffering from hypertension compared to the other groups.

By province, the prevalence of hypertension among men is the lowest (18%) in Province 2 and the highest (31%) in Province 4. Among women, the prevalence is the highest (24%) in Province 4. Women in Province 6 (Karnali Province) and Province 7 (Sudurpashchim Province) experience the least hypertension (10%).

The prevalence of hypertension is high among both men (32%) and women (24%) in the richest quintile, and lowest among the men (19%) and women (14%) in the middle quintile.

The test of difference in hypertension between men and women showed that the increase in the proportion of raised blood pressure among men is statistically significant in all the caste/ethnicity groups except for Terai/Madhesi Brahmin/Chhetri, Muslim, and Other caste group. Similarly, the difference is statistically significant between men and women for all provinces and wealth quintiles.

Table 15 Prevalence of hypertension among men and women age 15 and above, by ethnicity, province, and wealth quintile, Nepal DHS 2016

Background characteristics	Raised BP[1] (%)		
	Men (%)	Women (%)	p-value
Ethnicity			
Brahmin/Chhetri	23.3	14.3	**
Hill Brahmin	23.5	16.6	**
Hill Chhetri	22.3	12.0	**
Terai/Madhesi Brahmin/Chhetri	31.1	21.5	
Terai/Madhesi Other	16.4	12.8	*
Dalit	24.8	15.3	**
Hill Dalit	26.9	18.2	**
Terai/Madhesi Dalit	21.5	9.8	**
Newar	34.3	22.6	**
Janajati	24.2	16.2	**
Hill Janajati	28.0	18.3	**
Terai Janajati	16.2	11.4	*
Muslim	12.4	13.1	
Others	(17.2)	(23.3)	
Province			
Province 1	20.8	17.7	*
Province 2	17.6	13.1	**
Province 3	28.7	19.1	**
Province 4	30.7	23.8	**
Province 5	24.9	18.8	**
Province 6	21.8	10.1	**
Province 7	18.2	10.2	**
Wealth Quintile			
Poorest	21.4	14.9	**
Poorer	23.1	16.9	**
Middle	19.4	14.2	**
Richer	20.9	14.6	**
Richest	31.5	23.6	**
Total	**23.4**	**16.8**	**

**p<0.01, *p<0.05
[1] A person is classified as having raised blood pressure if he has an average systolic blood pressure level ≥140 mmHg and/or an average diastolic pressure level ≥90 mmHg at the time of the survey, or his average blood pressure is <140/90 mmHg and he is currently taking antihypertensive medication to control his blood pressure.
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.

3.10 Domestic Violence

In Nepal, 22% of women age 15-49 have ever experienced physical violence, 7% have ever experienced sexual violence, and 12% have ever experienced emotional violence (Ministry of Health, New ERA, and ICF 2017).

3.10.1 Experience of physical, sexual, or emotional violence

Results in Table 16 indicate that the proportion of ever-married women ever experiencing physical, sexual, or emotional violence by caste/ethnicity is highest among the Terai/Madhesi Dalit (46%). Such violence is comparatively higher among all Terai/Madhesi caste groups. Hill Brahmin (13%) and Hill Chhetri (16%) are the least likely to ever experience violence.

Women in Province 2 (37%) are two times more likely to ever experience physical, sexual, or emotional violence compared to women in Province 4 (Gandaki Province, 16%). Women's experience of physical, sexual, or emotional violence tends to be high among women in the middle wealth quintile.

Trends: Results in Table 16 show that the percentage of women who experienced physical, sexual, or emotional violence declined significantly from 32% in 2011 to 26% in 2016. This proportion has declined among all caste/ethnicity groups except among the Newars, in which it increased from 21% in

2011 to 29% in 2016. The overall decrease is statistically significant among all caste/ethnicity except among Terai/Madhesi Other, Hill Dalit, Terai/Madhesi Dalit, and the Newar. By province, the decrease is statistically significant in all provinces except in Provinces 2, 4, and 6. Similarly, all other wealth quintiles except for the richer quintile showed a statistically significant decline in physical, sexual, or emotional violence.

3.10.2 Ever sought help to stop the violence

In Nepal, among the women who have experienced physical or sexual violence, only 22% women ever sought help to stop physical or sexual violence. The Terai/Madhesi Dalit have the highest proportion reporting the experience of physical or sexual violence, but have the lowest percentage (12%) of women who sought help to stop the violence. In contrast, Hill Dalits (32%) have the highest proportion of women seeking help to stop the violence. The proportion of women who ever sought help to stop physical or sexual violence is the highest in Province 4 (Gandaki Province, 39%) and the lowest in Province 2 (15%). Although women in the middle quintile have the highest proportion of ever experiencing physical, sexual, or emotional violence, they are the least likely to seek help to stop the violence (Table 16).

Trends: Help-seeking behavior among women who have experienced physical or sexual violence has slightly decreased from 23% in 2011 to 22% in 2016. The proportion seeking help has declined among Hill Brahmin, Terai/Madhesi Other, Terai/Madhesi Dalit, and Newar. The decline is statistically significant among the Terai/Madhesi Other and Terai/Madhesi Dalit. Help-seeking among Muslims has increased over the years and the trend is statistically significant.

Table 16 **Percentage of ever-married women age 15-49 who have ever experienced physical, sexual, or emotional violence committed by their current or most recent husband, and percent distribution of women age 15-49 who have ever experienced physical or sexual violence by their help-seeking behavior by ethnicity, province, and wealth quintile, Nepal DHS 2011-2016**

Background characteristics	Ever experienced physical, sexual, or emotional violence (%)			Among those who experienced physical or sexual violence, ever sought help from any source (%)		
	2011	2016	p-value	2011	2016	p-value
Ethnicity						
Brahmin/Chhetri	24.7	15.8	**	24.5	25.1	
Hill Brahmin	21.5	12.5	**	34.7	26.2	
Hill Chhetri	25.9	16.2	**	21.0	24.6	
Terai/Madhesi Brahmin/Chhetri	(73.7)	35.0	**	-	-	
Terai/Madhesi Other	45.5	39.3		26.4	15.4	*
Dalit	38.1	35.5		23.9	22.2	
Hill Dalit	36.1	29.4		23.0	31.8	
Terai/Madhesi Dalit	45.7	45.7		(29.6)	11.8	**
Newar	20.7	28.8		(19.6)	22.3	
Janajati	33.0	23.5	**	22.4	25.8	
Hill Janajati	25.7	19.8	**	25.8	26.8	
Terai Janajati	50.8	31.6	**	17.1	24.2	
Muslim	55.9	41.3	*	7.7	21.2	*
Others	-	-		-	-	
Province						
Province 1	34.1	21.6	*	29.7	31.9	
Province 2	43.9	37.1		16.3	14.6	
Province 3	26.1	25.9	*	24.5	22.8	
Province 4	22.7	15.5		(22.3)	38.9	
Province 5	33.8	28.8	**	20.9	19.3	
Province 6	30.3	19.1		13.7	(24.6)	
Province 7	25.6	21.6	*	24.5	21.8	
Wealth Quintile						
Poorest	34.2	24.4	*	19.2	26.6	
Poorer	34.8	28.5	*	24.3	24.6	
Middle	38.2	32.1	*	20.4	18.9	
Richer	32.0	26.6		27.3	20.1	
Richest	19.6	19.1	**	23.1	22.4	
Total	**31.5**	**26.3**	*	**22.8**	**22.2**	

**p<0.01, *p<0.05
Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

4 DISCUSSION AND CONCLUSION

Diversity in geography, caste/ethnicity, languages, cultural norms, and values are the distinct characteristics of Nepal that affect the health and well-being of the Nepalese. The socioeconomic status of people also has an effect on health outcomes that varies by caste/ethnicity and place of residence. According to the 2014 Human Development Index Report, the gaps between urban and rural areas and caste/ethnicity in Nepal have not changed (National Planning Commission and United Nations Development Programme 2014). Nepal has recently transitioned into a federalized system in which authority is delegated to the local governments that plan and execute health services. This has brought a new paradigm to the health system and has created opportunities for narrowing the gaps in health indicators among the various caste/ethnicity and socioeconomic groups.

The 2016 NDHS is the first survey of its kind designed to produce provincial estimates. The main report presents data by provinces that shows the inequality in health outcomes and service utilization by provinces, although the analysis of health indicators by caste/ethnicity was not reported. The 2016 NDHS primary report's analysis of indicators by wealth quintiles found inequalities in health outcomes and service utilization according to household possessions. The purpose of this study was to examine the trend and differentials in health outcomes and service utilization by province, caste/ethnicity, and household wealth and to discuss the gaps in health indicators.

4.1 Fertility

During the last 5-year period from 2011 to 2016, the TFR in Nepal has decreased from 2.6 to 2.3 children per woman. Nepal is close to achieving the replacement level fertility of 2.1 children per woman. However, there are significant variations in the TFR by the three study variables. Although Muslims represent only about 4% of the country's total population, the reduced fertility has contributed to reducing the TFR (CBS 2011). In 2011, TFR among Muslims was 5 children per woman, which has come down significantly by 1.4 children per woman to the current level of 3.6 children per woman. Despite this achievement, Muslims still have the second highest TFR in Nepal in 2016. This suggests that reproductive health programs with comprehensive reproductive and family planning services must address barriers to care.

The Terai/Madhesi Dalits caste/ethnicity group, which comprised 4.4% of the country's population, had the highest TFR (3.7) in 2016 (Ministry of Health, New ERA, and ICF 2017), and there was no significant decline in TFR over the 5-year period. This suggests that reproductive health programs have not effectively reached some population groups. Another interesting result is that four caste/ethnicity groups (Janajatis, Hill Brahmin, Terai Madhesi/Brahmin Chhetri, and the Newars) reached replacement level fertility in 2016. In summary, analyses by caste/ethnicity indicate that although fertility is declining in Nepal, there are considerable variations in the pace of fertility decline among different caste/ethnicity groups. Thus, a different approach is needed to address the reproductive health needs of the entire population.

Analysis of the predictors of fertility based on 2006 NDHS data shows that the rise in the proportion of unmarried women, increase in the median age at first marriage among women, and increasing access to abortion services are associated with declining fertility rates (Karki and Krishna 2008). Another study based on DHS data from six countries in Asia (including Nepal) shows that fertility decline among the majority of the poor women across Asian countries is accompanied by high prevalence of contraceptive use, followed by changing marriage patterns and induced abortions (Majumder and Ram 2015). In

Nepal, access to and utilization of maternal child health and FP services have increased tremendously, while maternal and child mortality and demand for children have declined in the past 20 years, both of which could have also contributed to further fertility decline.

The largest decline in TFR was observed in Province 6 (Karnali Province), which includes some of the most inaccessible districts in Nepal. Various partners have been supporting the Government of Nepal (GoN) in improving access to health services in this province, and this may have contributed to the decline in fertility. In Province 2, the TFR declined significantly over the past 5 years, although it has the highest TFR among all the provinces in 2016. Province 2 is populated by the Terai Madhesi/Dalits, Terai Madhesi, and Muslims caste/ethnicity groups, all of which have a high TFR. Although the national family planning program and health development partners has been continuously working to improve modern contraceptive methods choices in Province 2, gaps exist. Province 2 is one of the regions in Nepal where child marriage is high (CBS 2014). Identifying and improving barriers to reproductive health services including FP and addressing issues on child marriages in Province 2 is important. Examination of the TFR by household wealth shows a significant decline in TFR among the lowest, second, and the middle quintiles. In 2016, the TFR was the highest, with 3.2 children per woman among women in the poorest quintile further indicating that equity is an issue that needs to be addressed.

4.2 Family Planning and Unmet Need

Family planning (FP) continues to be a priority program of the GoN. The GoN is committed to the goals of FP2020 which include "leaving no one behind" and "reaching the unreached" in providing FP services. The stagnation of the modern CPR at around 44% since 2006 is a major challenge to achieving the SDG target of 60% by 2030.

Increase in the use of modern CPR over the past 5 years is statistically significant only among Janajatis (45% in 2011 to 47% in 2016), while the decline in modern contraceptive use is statistically significant among three caste/ethnicity groups: Newars (55% to 47%), Terai/Madhesi Brahmin/Chhetri (54% to 40%), and Hill Brahmins (44 to 41%). Use of modern contraceptives significantly increased in Province 1, but significantly decreased in Province 3. Findings by household wealth showed that increase in use is significant in the poorest and the poorer quintiles, whereas decrease in use is significant in the richer and the richest quintiles. A health facility survey conducted in 2015 shows that 97% of health facilities in Nepal offer family planning services including, counselling, prescribing or providing methods. The MoHP envisions providing five family planning contraceptive methods (male condoms, oral pills, injectable, intrauterine contraceptive device, and implants) in all health facilities, but in 2015, only four out of ten health facilities meet this standard. These five methods plus male and female sterilization are available in only three out of ten health facilities. These results indicate that access to modern contraceptive choices is still an issue, which needs to be addressed by family planning programs. In addition, the increase in migration of particularly the male members of the households is higher among Newars, and Brahmin/Chhetris from both Hill and Terai, which might have contributed to the declining modern CPR use (CBS 2014). Another dimension of this analysis is that the use of modern contraceptives is declining among the rich and the advantaged caste/ethnicity groups such as the Brahmin Chhetri and the Newars whose education level is generally high.

The use of modern contraceptives has remained stagnant from 2006 to 2016, while the use of traditional contraception methods has increased more than twofold over the same period. The use of traditional FP methods increased from 4% in 2006 to 7% in 2011, and increased further to 10% in 2016. Due to the small sample size, disaggregation by caste/ethnicity groups was not possible in this study, although this is an important area for further research.

The current family planning program in Nepal does not account for the use of traditional methods because of lower reliability and other factors. A study conducted in three districts in Eastern Nepal in 2016 shows that use of traditional family planning methods has been underreported in the NDHS because traditional methods are not considered part of the family planning program. In reality, use of traditional methods could be greater than what is reported in the NDHS (Staveteig et al. 2018). As global dialogue on family planning has shifted to focus on modern methods, traditional methods have been excluded from the broad-scale FP2020 initiative. This is an area that needs to be reviewed by the family planning program managers and policy makers, particularly to consider the increasing use of traditional methods by specific caste/ethnicity groups and geographic regions.

Over the 5-year period, the unmet need for family planning among Muslims has significantly declined by 12 percentage points. Despite these gains, Muslims have the lowest modern CPR and one of the highest unmet needs (27% in 2016). This indicates that family planning programs need to target the geographic areas where Muslims reside, and also work with religious leaders to educate people about family planning and how to access it, and to change social norms. Hill Dalits have the highest unmet need in 2016 at about 32%. Interestingly, modern CPR among Terai/Madhesi Brahmin/Chhetri has decreased by nearly 14% with a 2% decline in unmet need.

Nepal is undergoing a unique phenomenon in which the modern CPR has stagnated but the TFR is declining uniformly. According to the Bongaarts proximate determinants of fertility model, an increase in contraception use results in a decrease in fertility rates (Bongaarts 1978). In 2006, the TFR was 3.1 children per woman and the modern CPR was 44%, whereas in 2016, the TFR dropped significantly to 2.3 children per woman and modern CPR stagnated at 43%. This calls for further study that might consider other important factors such as migration that results in spousal separation, increasing numbers of unmarried residents, increased access to abortion services, and a broader reproductive health and family planning program. Above all, addressing the inequality issues in family planning service utilization is necessary. Targeted family planning interventions with broader reproductive health messages are needed to reach specific groups of residents.

4.3 Early Childhood Mortality

Infant and child mortality rates reflect a country's socioeconomic status and quality of life (UNDP 2007). Nepal was successful in attaining the Millennium Development Goal (MDG) target of reducing U5MR to 54 deaths per 1,000 live births by 2015. The new challenge is to achieve the SDG target of reducing U5MR from 39 to 28 deaths per 1,000 live births by 2030 (NPC 2015). The NMR, which contributed to 61% of all under-5 deaths in 2011, has decreased to 54%, and the current NMR is 21 deaths per 1,000 live births (Ministry of Health, New ERA, and ICF 2017). Greater success in reducing under-5 mortality can be achieved by accelerating interventions that contribute to the survival of newborns.

Inequalities in childhood mortality by caste/ethnicity groups are sizable in Nepal. The highest childhood mortality was found among the Terai/Madhesi Dalits, with all three indicators above the national average. The high mortality rates need to be addressed by intensifying public health programs focused on this population group. Maternal service utilization is also lowest in this caste/ethnicity group, which might have contributed to the high neonatal mortality. Transportation and road networks may not be a problem in the Terai plain lands, although social taboos and overall status of women might be associated with childhood mortalities. No specialized services for newborns and the poor quality of maternal care at health facilities could have contributed to the high mortality.

The Hill Brahmin followed by the Newars had the lowest NMR in 2016. The greatest decline in NMR was among the Newars (44 to 15 per 1,000 live births from 2011 to 2016). Neonatal mortality is above the national average in Provinces 1, 2, 6 and 7, and among the poor households. The GoN has recently offered all types of neonatal care services free of cost in the health facilities. This should contribute to increased care-seeking practices among the poorest of the population. However, there is also a need to guarantee quality; providing free health services without maintaining quality will not help in reducing neonatal deaths. Both supply side and demand side interventions with a focus on quality are essential to achieve this goal.

4.4 Maternal Health Service Utilization

Nepal has made good progress in improving access to maternal health services over the past 20 years. As a result, Nepal was close to achieving the MDG goal of reducing maternal mortality by three-quarters. Between 2011 and 2016, the proportion of pregnant women with four or more ANC visits has improved by nearly 40% and institutional births by more than 60%. However, the increases have not been uniform across all the caste/ethnicity groups, provinces, and household wealth categories. The Terai/Madhesi Dalit group still has the lowest four or more ANC visits (46%) and SBA delivery (41%), although this has doubled over the past 5 years. The analysis by provinces showed that Province 6 (Karnali Province) has the lowest percentage of pregnant women with four or more ANC (52%) visits, although ANC service is available in all health facilities (Aryal et al. 2018). Similarly, birth at health facilities is also lowest at 36%. This indicates that increased service availability at health facilities does not ensure use of the services. In many areas within Province 6 (Karnali Province) the geography is extremely difficult, which results in problems with health worker retention and health facility readiness. Province 2, where geography and transportation are not difficult, has the second-lowest proportion of women attending four or more ANC visits (53%) and institutional births (45%), despite having these services available in 94% of health facilities in the province (Aryal et al. 2018). These findings show that beyond access to transportation and service availability, there are other factors that encourage women to use maternal health services. Analysis by household wealth shows that despite the free maternity service, four or more ANC visits and delivery at health facility are low among the poorest segment of the population. This could be due to lack of knowledge of the free maternity services among these populations, unavailability of 24-hour maternal services and/or health workers, and lack of trust in the health system.

4.5 Child Health Service Utilization

4.5.1 All basic vaccinations

Despite the government's relentless effort to intensify the immunization coverage in the country, the findings in this study reveal that there is a need to increase efforts to make sure that no child fails to receive all basic vaccinations. The significant decline in all basic vaccinations coverage between the 2011 and 2016 NDHS received great attention from the GoN and its external development partners. All basic vaccinations coverage among the Terai/Madhesi Other is particularly worrisome and indicates that the vaccination programs must be strengthened in order to increase the coverage among this caste/ethnic group. This decline was significant among most of the caste/ethnicity groups and in all provinces except Provinces 3, 4 and 6. The decline was the highest in Province 2, and coverage declined in all wealth quintiles.

A study conducted in Indonesia found that socioeconomic factors were strongly associated with the likelihood of not being immunized and that children who were not immunized were geographically

clustered and lived among the most deprived populations (Herliana and Douiri 2017). A study conducted in Nepal showed that the inequity in vaccination was observed between poorest and richest quintiles (Kc et al. 2017). However, this report showed that the decline was found in all caste/ethnicity and all wealth groups in Nepal.

Nepal's routine immunization program is one of the country's mature, successful public health programs. The current decline warrants a cautious inspection of the immunization program, making sure that vaccines are available all year round, community mobilization activities are provided to educate mothers, and adequate counsel on immunization schedule is available to all postnatal contacts. The immunization program should also develop a special approach among the Terai/Madhesi community, in Province 2, and among women in the poorest quintile of household wealth. Immunization reminder calls, either by phone messages or in person, for families whose children have due dates for immunization may help to ensure full vaccination coverage.

4.5.2 Diarrhea

Diarrhea is one of the major killers among under-5 children in Nepal. The 2016 NDHS showed 8% of under-5 children suffered from diarrhea in the 2 weeks before the survey, from which 64% sought advice or treatment. Findings on treatment-seeking practice for diarrhea by caste/ethnicity shows an increase for certain groups, which likely results from increased access to child services for sick children in the public sector; the growing number of medical shops, pharmacies, and private hospitals; and increased awareness. Disaggregated analysis of treatment-seeking practice for ARI was not conducted due to the small sample size.

4.6 Nutritional Status of Children and Women

The 2016 NDHS shows that nutrition of women and children has improved, although there are still areas for improvement. The GoN's Multi-sector Nutrition Plan II aims to reduce stunting among children from 35.8% in 2016 to 28% in 2022. The plan also aims to reduce wasting from 9.7% in 2016 to 7% in 2022. Stunting is highest among the Terai/Madhesi Dalits (44%) followed by Terai/Madhesi Others (42%) caste group, and there has not been significant decline in stunting rates among these groups during the 5-year period. The stunting rate, however, has declined significantly among the Hill Dalits and the Janajatis. Stunting is the highest in Province 6 (Karnali Province) and there has not been significant decline in the stunting rate during the previous 5 years. Analysis by household wealth indicates that stunting increases with the decrease in household wealth from the richest to the poorest quintiles. The stunting rate is as low as 16% among children from the richest quintile. One of the biggest achievements in nutrition is the improvement in the consumption of a minimum acceptable diet, which has increased in all the caste/ethnicity groups, wealth quintiles, and all provinces except Provinces 1 and 4. Nationally, this indicator has significantly increased from 24% to 36% during the past 5 years.

In Nepal, exclusive breastfeeding declined between 2011 and 2016 (from 70% to 66%). This decline was significant only among the Terai/Madhesi Dalit and in Province 2. A study conducted in Ethiopia shows that feeding other than breast milk in the first 6 months of life was associated with the perception that breast milk alone is not sufficient for the child (Lenja et al. 2016). The significant decline in exclusive breastfeeding rates among the Terai/Madhesi Dalits could be due to similar perceptions about the quantity of breast milk, as well as lower education level and awareness among women. In Nepal, women in the richest wealth quintiles have shown significant increase in exclusive breastfeeding rates, which confirms that education could be an important factor that influences exclusive breastfeeding practice. It is important to evaluate socioeconomic factors like the mother's ethnicity and economic status when designing special awareness programs and formulating strategies that promote exclusive

breastfeeding practice. In addition, conducting further research to investigate barriers to excusive breastfeeding practices is important.

Associations of exclusive breastfeeding with mother's employment that were examined in Ethiopia showed that the exclusive breastfeeding status of unemployed mothers was significantly better than that of employed mothers (Chekol et al. 2017). In Nepal, women's employment has increased. Often for the working women, there is no enabling environment at workplace to continue breastfeeding, which might have resulted in a decline in exclusive breastfeeding practices (CBS 2011).

Anemia among children and mothers is a major concern for policymakers and health program implementation. For more than a decade, the MoHP has been implementing nationwide interventions that can decrease anemia such as iron supplementation for pregnant and postpartum women and deworming for children and pregnant women. However, anemia among children has increased significantly among the Janajatis and in Provinces 1 and 2. Among women, anemia has increased in almost all caste/ethnicity groups, provinces, and wealth quintiles. Further exploration and additional research on the different types of anemia and their association with other factors is essential to understand and address the increasing trend of anemia among children and women in Nepal.

4.7 Blood Pressure

Hypertension or high blood pressure is a chronic disease that can usually be controlled with medication, proper diet, and lifestyle changes. Hypertension is not detected until it is measured, meaning symptoms are rare. The majority of the population in Nepal are unaware that they have high blood pressure until it reaches a life-threatening stage.

Hypertension in Nepal is more prevalent among the Newar caste group, in the richest quintile, and in Province 4 (Gandaki Province). The GoN has aimed to reduce the prevalence of high blood pressure among the people age 15-69 from 26% to 22% by 2020 (MoH 2017). All health facilities, including those at the primary level, should be equipped with basic medical equipment, such as a blood pressure measuring device, health workers trained in taking blood pressure, and medication for the treatment of high blood pressure. In addition, it is very critical for the health workers to be trained in counseling about the value of adopting a healthy diet, doing regular physical exercise, reducing the salt content in food, and quitting tobacco and alcohol in the prevention of hypertension and its consequences, such as heart attack, stroke, kidney damage, and blindness.

4.8 Domestic Violence

Violence against women affects all spheres of a woman's life – her autonomy, her productivity, her capacity to care for herself and her children, her overall health status, and her quality of life (Krantz 2002). Domestic violence is a problem worldwide that affects millions. Evidence shows that domestic violence is one of the most common forms of violence against women (UNODC 2018).

Approximately one-fourth of Nepalese women reported ever experiencing physical, sexual, or emotional violence in the 2016 NDHS. This has decreased significantly over the last 5-year period, with significant decline among Janajatis and the Brahmin/Chhetris. This decline is significant in all provinces except Provinces 2 and 6 and in all wealth quintiles except the richer households. Provinces 2 and 6, which have poor indicators of family planning, maternal service utilization, and mortality, have not made good progress in violence experienced by women.

Domestic violence is a complex problem that many women endure, and they stay silent because they perceive such violence as a private family matter that should remain inside the family (Basu, Jaising, and Collective 2005). Findings from the 2016 NDHS show that only 22% of women who have experienced physical or sexual violence come forward to seek help to stop the violence. This indicates a need to increase awareness and strengthen support networks that provide victims with easy access to services. The One–Stop Crisis Management Center, available in all hospitals, provides services to women who are suffering from any type of violence. The National Women's Commission of Nepal has also established a 24-hour toll-free helpline, "*Khabar Garaum 1145* (inform us)," for gender-based violence survivors. Anyone can call, report incidents of abuse, and connect with service providers that provide shelter, legal aid, and psychosocial counselors. The irony is that most women are unaware of these services. This indicates the need for a rigorous awareness and publicity effort, especially among populations in need. In addition, expanding services such as the One-Stop Crisis Management Center at the lowest level of health facilities like health posts and PHCCs could also extend services to the most needy and marginalized women.

4.9 Conclusions

The analysis of key indicators by caste/ethnicity, provinces, and household wealth consistently showed that inequality persists in health outcomes and service utilization and that this inequality is often undetected in the aggregated national data. The analysis of caste/ethnicity shows that two caste/ethnicity groups, the Terai/Madhesi Other and Terai/Madhesi Dalit, consistently showed poor achievement on most indicators, while the Terai/Madhesi Brahmin/Chhetri showed improved results. These three castes/ethnicities have their origin in Terai and most reside in the Terai districts. The Terai covers 17% of the total land of Nepal, in which almost 50% of Nepal's total population live. Province 2, which includes most of the Terai plain land in Nepal, has poor indicators despite having fewer challenges related to geographic constraints, access to health facilities, and the retention of health workers. Although access is not very difficult in Province 2 or the Terai, maternal and child health service availability and facility readiness for service provision is comparatively low in Province 2 and Terai as a whole (NHFS 2015). The Terai/Madhesi Dalits and Terai/Madhesi Other castes reside primarily in the Terai and in Province 2. The Terai castes/ethnicity groups have sociocultural practices that are barriers to service utilization and the adoption of health practices. This indicates the need for exploring sociocultural barriers related to poor service utilization, and approaches for improving the service availability and readiness in health facilities. It is also important to note that the experience of violence is also greater among women living in Province 2.

This analysis also shows that public health programs have not yet reached and satisfactorily met the needs of the poorest segment of the population of Nepal. Health outcomes and service utilization are generally low among the poorest women. The current priority of GoN should be targeted to those groups that face specific barriers and have unique health needs. A general program approach cannot address these issues. In the federalized system, there are more opportunities to address the geographic and caste/ethnicity-specific issues through the formulation of local plans and better allocation of the available resources. To achieve this, the newly formed local governments should work with the local health facilities and the provincial and federal governments to reduce the equity gaps in health outcomes in relation to caste/ethnicity, socioeconomic status, and geography.

REFERENCES

Aryal, K. K., R. Dangol, P. Gartoulla, and G. R. Subedi. 2018. *Health Services Availability and Readiness in Seven Provinces of Nepal*. DHS Further Analysis Reports No. 115. Rockville, Maryland, USA: ICF. https://dhsprogram.com/pubs/pdf/FA115/FA115.pdf.

Basu, A. 2005. "Violence against Women: A Statistical Overview, Challenges and Gaps in Data Collection and Methodology and Approaches for Overcoming Them." Paper presented at the *Expert Group Meeting, UN Division for the Advancement of Women, Geneva, Switzerland*, April 11-14, 2005.

Bennett, L. 2005. "Gender, Caste and Ethnic Exclusion in Nepal: Following the Policy Process from Analysis to Action." Paper presented at *Arusha New Frontiers of Social Policy*, *Development in a Globalizing World, World Bank Conference*, *Washington, DC*, December 12-15, 2005. http://siteresources.worldbank.org/INTRANETSOCIALDEVELOPMENT/Resources/Bennett.rev.pdf

Bennett, L., D. R. Dahal, and P. Govindasamy. 2008. *Caste, Ethnic and Regional Identity in Nepal: Further Analysis of the 2006 Nepal Demographic Health Survey*. Calverton, Maryland, USA: Macro International Inc. https://dhsprogram.com/pubs/pdf/FA58/FA58.pdf.

Black, R. E., C. G. Victora, S. P. Walker, Z. A. Bhutta, P. Christian, M. De Onis, M. Ezzati, et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *The Lancet* 382 (9890): 427-451. https://doi.org/10.1016/S0140-6736(13)60937-X.

Bongaarts, J. 1978. "A Framework for Analyzing the Proximate Determinants of Fertility." *Population and Development Review* 4 (1): 105-132. https://www.jstor.org/stable/1972149.

Central Bureau of Statistics. 2011a. *National Population and Housing Census 2011*. (National Report.) Kathmandu, Nepal: Central Bureau of Statistics. http://cbs.gov.np/sectoral_statistics/population/national_report.

Central Bureau of Statistics. 2011b. *Nepal Living Standards Survey 2010-2011, NLSS III.* Kathmandu, Nepal: Central Bureau of Statistics. http://cbs.gov.np/nada/index.php/catalog/37.

Chekol, D. A., G. A. Biks, Y. A. Gelaw, and Y. A. Melsew. 2017. "Exclusive Breastfeeding and Mothers' Employment Status in Gondar Town, Northwest Ethiopia: A Comparative Cross-Sectional Study." *International Breastfeeding Journal* 12: 27. https://doi.org/10.1186/s13006-017-0118-9.

Cleland, J., S. Bernstein, A. Ezeh, A. Faundes, A. Glasier, and J. Innis. 2006. "Family Planning: The Unfinished Agenda." *Lancet* 368 (9549): 1810-27. https://doi.org/10.1016/S0140-6736(06)69480-4.

Constituent Assembly Secretariat. 2015. Constitution of Nepal (Unofficial Translation). *Kathmandu, Nepal.* http://www.icnl.org/research/library/files/Nepal/Nepalconst.pdf.

Department of Health Services. 2016/17. *Annual Report 2073-74 (2016/17)*. Kathmandu, Nepal: Department of Health Services. http://dohs.gov.np/wp-content/uploads/2018/04/Annual_Report_2073-74.pdf.

Cox, T. 1994. "The Current Socioeconomic Status of Untouchables in Nepal." *Occasional Papers in Sociology and Anthropology*, 4: 90-109.

Ministry of Health and Population. 2009. *Health Sector Gender Equality and Social Inclusion Strategy.* Kathmandu, Nepal: Ministry of Health and Population. https://www.rti.org/sites/default/files/resources/30_nepal_healthgenderequality.pdf.

Ministry of Health and Population. 2013. *Nepal Health Sector Programme II – Mid-Term Review*. Kathmandu, Nepal: Ministry of Health and Population. http://www.heart-resources.org/wp-content/uploads/2013/06/NHSP-II-MTR-Report-FINAL-15-02-13.pdf.

Herliana, P., and A. Douiri. 2017. "Determinants of Immunisation Coverage of Children Aged 12-59 Months in Indonesia: A Cross-Sectional Study." *BMJ Open* 7 (12): e015790. http://dx.doi.org/10.1136/bmjopen-2016-015790.

Houweling, T.A.J., C. Ronsmans, O. M. Campbell, and A. E. Kunst. 2007. "Huge Poor-Rich Inequalities in Maternity Care: An International Comparative Study of Maternity and Child Care in Developing Countries." *Bulletin of the World Health Organization* 85 (10): 745-754. http://www.who.int/bulletin/volumes/85/10/06-038588.pdf.

Karki, Y, B., and R. Krishna. 2008. *Factors Responsible for the Rapid Decline of Fertility in Nepal – An Interpretation: Further Analysis of the 2006 Nepal Demographic and Health Survey.* DHS Further Analysis Reports No. 52. Calverton, Maryland, USA: Macro International. https://www.dhsprogram.com/publications/publication-FA52-Further-Analysis.cfm.

Kc, A., V. Nelin, H. Raaijmakers, H. J. Kim, C. Singh, and M. Målqvist. 2017. "Increased Immunization Coverage Addresses the Equity Gap in Nepal." *Bulletin of the World Health Organization* 95 (4):261-269. https://dx.doi.org/10.2471%2FBLT.16.178327.

Krantz, G. 2002. "Violence against Women: A Global Public Health Issue!" *Journal of Epidemiology and Community Health* 56 (4): 242-3. http://dx.doi.org/10.1136/jech.56.4.242.

Lenja, A., T. Demissie, B. Yohannes, and M. Yohannis. 2016. "Determinants of Exclusive Breastfeeding Practice to Infants Aged Less Than Six Months in Offa District, Southern Ethiopia: A Cross-Sectional Study." *International Breastfeeding Journal* 11: 32. https://doi.org/10.1186/s13006-016-0091-8.

Majumder, N., and F. Ram. 2015. "Explaining the Role of Proximate Determinants on Fertility Decline among Poor and Non-Poor in Asian Countries." *PloS One* 10 (2): e0115441. https://doi.org/10.1371/journal.pone.0115441.

Masset, E. 2016. *Syncmrates: Stata Module to Compute Child Mortality Rates Using Synthetic Cohort Probabilities.* Statistical Software Components S458149. Boston, MA: Boston College Department of Economics. https://ideas.repec.org/c/boc/bocode/s458149.html.

Ministry of Health. 2017. *Nepal Health Sector Strategy Implementation Plan 2016 – 2021.* Kathmandu, Nepal: Ministry of Health. http://nhsp.org.np/wp-content/uploads/formidable/7/NHSS_implementation_plan_2016_2021_february2017.pdf.

Ministry of Health and Population. 2014/2015. *National Health Policy 2071*. Kathmandu: Ministry of Health and Population.

Ministry of Health and Population. 2015. *Nepal Health Sector Strategy (2015-2020*). Kathmandu, Nepal: Ministry of Health and Population. http://nhsp.org.np/wp-content/uploads/2016/08/NHSS-English-Book-final-4-21-2016.pdf

Ministry of Health and Population. 2018. *Gender Equality and Social Inclusion Strategy of the Health Sector*. Kathmandu, Nepal: Government of Nepal.

Ministry of Health, New ERA, and ICF. 2017. *Nepal Demographic and Health Survey 2016*. Kathmandu, Nepal: Ministry of Health, Nepal. https://www.dhsprogram.com/pubs/pdf/fr336/fr336.pdf.

National Planning Commission. 2015. *Sustainable Development Goals, 2016-2030, National (Preliminary) Report*. Kathmandu, Nepal: National Planning Commission. http://www.np.undp.org/content/dam/nepal/docs/reports/SDG%20final%20report-nepal.pdf.

National Planning Commission, and United Nations Development Programme. 2014. *Nepal Human Development Report 2014: Beyond Geography, Unlocking Human Potential*. Kathmandu: National Planning Commission, Government of Nepal and United Nations Development Programme.

Pandey, J. P., M. R. Dhakal, S. Karki, P. Poudel, and M. S. Pradhan. 2013. *Maternal and Child Health in Nepal: The Effects of Caste, Ethnicity, and Regional Identity: Further Analysis of the 2011 Nepal Demographic and Health Survey*. Calverton, Maryland, USA: Nepal Ministry of Health and Population, New ERA, and ICF International. https://www.dhsprogram.com/pubs/pdf/FA73/FA73.pdf.

Pomeroy-Stevens, A., B. M. Shrestha, M. Biradavolu, K. Hachhethu, R. Houston, I. Sharma, and J. Wun. 2016. *Pathways to Better Nutrition in Nepal: Final Report*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project. https://www.spring-nutrition.org/sites/default/files/publications/reports/nepal_pbn_final_report.pdf.

Rutstein, S. O., and K. Johnson. 2004. "The DHS Wealth Index. DHS Comparative Reports No. 6." Calverton, Maryland, USA: ORC Macro. https://dhsprogram.com/pubs/pdf/cr6/cr6.pdf.

Schoumaker, B. 2013. "A Stata Module for Computing Fertility Rates and TFRs from Birth Histories: tfr2." *Demographic Research*, 28: 1093- 1144. https://www.demographic-research.org/volumes/vol28/38/28-38.pdf.

StataCorp. 2017. *Stata Statistical Software: Release 15*. College Station, TX: StataCorp LLC. https://www.stata.com/.

Staveteig, S., N. Shrestha, S. Gurung, and K. T. Kampa. 2018. *Barriers to Family Planning Use in Eastern Nepal: Results from a Mixed Methods Study*. DHS Qualitative Research Studies No. 21. Rockville, Maryland, USA: ICF. https://dhsprogram.com/pubs/pdf/QRS21/QRS21.pdf.

United Nations Development Programme. 2007. *Measuring Human Development: A Primer*. New York: UNDP. http://hdr.undp.org/sites/default/files/primer_complete.pdf.

United Nations Development Programme. 2014. Nepal Human Development Report 2014. *Beyond Geography Unlocking Human Potential.* New York: UNDP. http://www.hdr.undp.org/sites/default/files/nepal_nhdr_2014-final.pdf.

United Nations Office on Drugs and Crime. 2018. *Global Study on Homicide: Gender-related Killing of Women and Girls.* Vienna: UNODC. https://www.unodc.org/documents/data-and-analysis/GSH2018/GSH18_Gender-related_killing_of_women_and_girls.pdf

.

APPENDICES

Appendix Table A1 Distribution of household wealth quintile by caste/ethnicity, Nepal DHS 2011-2016

Caste/ethnicity	Poorest		Poorer		Middle		Richer		Richest		*N*	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Brahmin/Chhetri	14.0	20.4	14.1	16.3	17.4	13.2	23.1	18.4	31.5	31.7	*4,397*	*4,072*
Hill Brahmin	3.4	8.7	11.2	14.8	17.5	14.5	27.3	18.2	40.7	43.8	*1,805*	*1,512*
Hill Chhetri	22.6	29.7	16.9	18.4	17.9	11.9	19.7	17.9	22.8	22.0	*2,436*	*2,343*
Terai/Madhesi Brahmin/Chhetri	2.0	1.9	4.0	4.2	7.8	17.3	27.6	25.6	58.6	51.0	*156*	*217*
Terai/Madhesi Other	6.0	2.9	19.2	15.7	28.3	33.2	23.6	31.9	22.9	16.3	*1,003*	*1,908*
Dalit	29.3	26.3	26.3	26.3	22.6	20.6	15.2	20.9	6.6	5.9	*1,773*	*1,596*
Hill Dalit	33.4	36.2	22.7	19.7	20.1	13.1	14.8	23.0	9.0	8.0	*1,214*	*1,042*
Terai/Madhesi Dalit	20.5	7.6	34.1	38.7	28.2	34.7	16.0	17.0	1.2	2.1	*559*	*554*
Newar	1.3	6.8	5.7	13.9	8.4	8.0	23.4	16.0	61.1	55.3	*541*	*639*
Janajati	20.0	20.6	21.3	24.4	21.1	20.2	21.4	19.8	16.2	15.0	*4,467*	*3,961*
Hill Janajati	25.0	26.9	21.2	24.4	15.3	12.6	18.8	17.6	19.7	18.5	*3,154*	*2,694*
Terai Janajati	8.0	7.1	21.3	24.5	35.1	36.4	27.8	24.6	7.7	7.4	*1,313*	*1,266*
Muslim	5.6	1.7	28.0	12.5	33.9	38.0	23.5	27.4	9.0	20.3	*468*	*643*
Others	0.0	3.9	4.7	6.2	11.5	1.0	23.0	18.5	60.8	70.5	*25*	*43*
Total	**16.7**	**16.9**	**18.9**	**19.6**	**20.5**	**20.2**	**21.5**	**21.5**	**22.4**	**21.8**	***12,674***	***12,862***

Appendix Table A2 Distribution of province by caste/ethnicity, Nepal DHS 2011-2016

Background characteristics	Province 1		Province 2		Province 3		Province 4		Province 5		Province 6		Province 7		*N*	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Brahmin/Chhetri	21.0	15.1	5.9	3.6	19.4	25.0	15.1	10.4	15.0	17.7	8.1	11.4	15.6	16.8	*4,397*	*4,072*
Hill Brahmin	18.6	14.9	4.8	1.0	22.2	33.1	24.1	16.6	17.8	20.1	3.7	3.1	8.7	11.2	*1,805*	*1,512*
Hill Chhetri	22.1	15.9	4.4	0.9	18.2	21.0	9.2	7.2	12.7	15.4	11.8	17.8	21.5	21.7	*2,436*	*2,343*
Terai/Madhesi Brahmin/Chhetri	30.5	8.9	40.3	51.0	3.9	10.9	3.2	1.8	18.6	24.9	0.8	0.4	2.7	2.2	*156*	*217*
Terai/Madhesi Other	14.6	5.2	66.1	73.0	2.6	0.4	0.1	0.1	16.1	20.8	0.1	0.0	0.3	0.5	*1,003*	*1,908*
Dalit	14.6	10.4	27.8	24.4	9.4	16.2	12.4	14.1	14.2	17.8	9.4	7.6	12.2	9.4	*1,773*	*1,596*
Hill Dalit	19.4	11.3	2.7	1.7	13.0	22.9	18.1	21.7	15.6	17.0	13.7	11.6	17.4	13.9	*1,214*	*1,042*
Terai/Madhesi Dalit	4.1	8.7	82.3	67.1	1.5	3.6	0.0	0.0	11.2	19.5	0.1	0.2	0.7	0.9	*559*	*554*
Newar	14.4	16.6	5.9	0.5	57.7	71.3	7.2	8.7	14.1	2.8	0.1	0.0	0.6	0.0	*541*	*639*
Janajati	27.4	25.8	10.7	7.2	22.3	24.7	13.5	13.5	16.1	17.8	2.4	3.5	7.5	7.5	*4,467*	*3,961*
Hill Janajati	30.3	26.7	7.3	1.4	28.4	34.0	16.9	19.0	13.0	12.0	3.3	4.9	0.8	1.8	*3,154*	*2,694*
Terai Janajati	20.3	23.7	18.9	19.4	7.7	4.9	5.4	1.9	23.7	30.1	0.4	0.4	23.6	19.7	*1,313*	*1,266*
Muslim	37.6	23.4	41.0	53.2	1.0	0.3	0.2	0.7	20.0	21.9	0.2	0.0	0.1	0.4	*468*	*643*
Others	24.7	33.7	5.4	10.6	32.2	27.3	1.8	3.0	35.8	20.2	0.0	1.4	0.0	3.8	*25*	*43*
Total	**22.2**	**16.9**	**16.7**	**19.9**	**18.7**	**21.2**	**12.1**	**9.7**	**15.6**	**17.7**	**5.0**	**5.6**	**9.8**	**8.9**	***12,674***	***12,862***

Appendix Table A3 Summary table of indicators, Nepal DHS 2011-2016

Background characteristics	*Fertility*		*Family Planning Service (FP)*				*Childhood Mortality*						*Maternal Health Services*						*Child Health Service*							
	TFR		mCPR (%)		Unmet need (%)		NMR		IMR		U5MR		Four or more ANC visits (%)		Delivery attended by SBA# (%)		Delivery in health facility (%)		PNC check during the first 2 days after birth (%)		All basic vaccin-ation[1] (%)		Vitamin A supple-ment U5 (%)		Treatment of diarrhea (%)	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Ethnicity																										
Brahmin/Chhetri	2.2	2.0	43.1	40.5	26.7	24.7	23	19	38	26	46	31	63.5	81.1	45.5	67.8	44.1	68.4	54.3	69.3	90.7	87.3	89.6	87.7	42.7	58.0
Hill Brahmin	1.8	1.7	44.3	40.8	24.4	22.1	13	10	24	18	31	19	80.6	89.7	64.9	85.0	62.3	84.8	69.1	84.2	93.9	94.8	89.4	88.6	41.1	-
Hill Chhetri	2.5	2.3	41.7	40.4	28.8	27.0	29	17	44	25	52	31	54.5	77.6	35.2	59.5	34.4	61.0	46.1	61.8	89.9	83.4	90.3	88.4	43.1	51.9
Terai/Madhesi Brahmin/Chhetri	2.0	1.5	53.6	39.8	19.9	16.7	--	--	60	--	65	--	(48.6)	(72.5)	(59.6)	78.3	(57.4)	72.2	-	-	-	-	(78.6)	(71.1)	-	-
Terai/Madhesi Other	3.4	3.0	46.5	43.8	19.6	19.9	37	19	52	31	69	45	35.9	58.8	39.3	48.4	37.9	48.1	42.3	47.5	82.0	64.3	75.1	75.8	40.2	70.7
Dalit	3.2	2.7	40.0	42.7	31.3	27.7	39	30	56	46	65	51	39.9	62.2	26.8	47.9	26.4	45.4	36.6	49.3	85.7	73.2	85.9	84.4	38.1	(75.9)
Hill Dalit	2.9	2.2	39.7	44.3	35.1	31.5	24	21	41	31	52	36	48.6	73.9	29.6	54.1	29.2	53.3	37.4	57.3	87.0	78.2	86.1	86.1	39.8	(72.5)
Terai/Madhesi Dalit	3.9	3.7	40.7	40.0	23.7	21.5	64	41	80	65	87	69	23.2	45.4	22.2	40.5	21.8	35.8	35.6	38.5	83.8	65.1	85.6	82.2	35.9	-
Newar	1.6	1.6	55.2	47.0	20.4	19.9	44	15	53	45	56	45	82.8	79.9	71.7	76.0	68.0	74.6	75.4	69.4	(92.3)	-	89.5	81.6	-	-
Janajati	2.4	2.1	44.5	46.8	28.4	23.3	36	21	46	29	52	32	46.4	69.7	28.8	59.0	28.9	57.9	38.3	54.6	93.5	82.8	88.4	84.1	32.9	62.8
Hill Janajati	2.5	2.2	37.7	40.5	33.6	27.4	37	18	46	24	51	26	44.5	67.7	28.9	52.9	28.7	52.4	33.8	51.4	93.0	85.0	87.8	85.2	32.4	59.3
Terai Janajati	2.2	2.0	60.8	60.0	16.1	14.8	35	26	45	39	53	48	51.2	74.5	28.4	72.7	29.7	70.2	51.3	61.8	94.8	77.6	89.8	81.6	34.5	(74.2)
Muslim	5.0	3.6	22.8	24.6	39.4	26.5	28	20	43	43	50	44	34.8	52.5	32.9	52.9	32.3	51.6	43.1	50.5	57.4	68.1	87.3	71.9	40.7	(84.8)
Others	2.6	2.4	-	(65.6)	-	(15.6)	--	--	--	--	--	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Province																										
Province 1	2.4	2.3	34.9	40.1	31.2	24.9	37	23	52	31	69	34	52.7	76.9	43.9	63.1	41.4	62.2	52.5	61.5	87.3	79.4	90.3	84.9	40.2	65.7
Province 2	3.4	3.0	44.2	42.2	23.5	20.6	45	24	54	38	68	48	33.5	53.4	29.8	48.6	28.6	44.6	39.1	45.1	79.3	65.2	82.6	74.0	29.2	68.2
Province 3	1.8	1.8	55.6	49.2	20.8	19.8	24	11	31	25	35	27	60.7	78.4	44.0	69.9	45.1	70.7	46.0	67.3	91.3	85.3	87.9	83.4	28.1	32.1
Province 4	2.5	2.0	39.9	37.3	35.4	30.0	38	12	44	18	52	23	53.0	76.7	40.0	69.9	42.6	68.3	47.2	68.3	92.6	92.7	88.0	87.1	54.3	-
Province 5	2.6	2.4	40.5	38.9	29.7	27.9	24	19	35	32	42	34	53.2	73.7	35.9	56.6	34.6	59.4	43.7	59.9	91.0	78.3	83.1	85.5	41.7	82.4
Province 6	3.7	2.8	39.8	44.5	29.6	25.7	28	31	47	41	60	51	39.9	52.2	20.3	35.3	20.7	35.6	30.6	38.5	76.5	74.9	87.3	89.6	34.3	-
Province 7	2.8	2.2	47.1	48.1	24.6	21.3	38	29	61	39	74	49	60.2	77.3	30.7	66.0	29.0	66.4	46.5	57.6	93.7	83.4	90.5	87.1	52.0	(66.7)
Wealth Quintile																										
Poorest	4.1	3.2	35.6	41.8	31.9	27.0	29	26	49	36	59	44	28.3	56.7	10.7	33.9	11.4	33.9	16.7	36.7	84.5	76.6	86.6	85.7	32.7	54.7
Poorer	3.1	2.5	41.1	44.8	28.6	23.7	37	28	46	39	56	47	39.1	65.4	23.7	48.0	23.3	46.6	35.7	49.5	83.9	77.2	87.2	82.1	38.7	61.0
Middle	2.7	2.5	43.3	42.6	28.9	24.3	42	15	53	29	61	34	48.0	66.8	35.9	59.4	35.4	57.6	48.2	55.5	84.0	70.9	86.2	79.8	38.9	75.2
Richer	2.1	2.1	45.3	41.7	26.8	23.8	35	22	46	36	53	40	65.1	74.7	53.0	70.0	51.9	69.5	59.1	68.6	91.5	84.8	88.0	81.6	44.1	66.8
Richest	1.5	1.6	48.9	43.0	22.4	20.5	16	8	29	18	34	22	83.7	87.4	81.5	88.7	77.9	89.6	82.1	81.2	95.7	81.6	86.2	83.7	37.1	59.0
Total	**2.6**	**2.3**	**43.2**	**42.8**	**27.5**	**23.7**	**32**	**21**	**45**	**32**	**54**	**39**	**50.1**	**69.4**	**36.0**	**58.0**	**35.3**	**57.4**	**44.5**	**56.7**	**87.0**	**77.8**	**86.8**	**82.5**	**38.0**	**64.4**

Continued

Appendix Table A3—Continued

Background characteristics	*Nutritional Status of Children*								*Nutritional Status of Women*				*Other Indicators*		*Domestic Violence (DV)*			
	Any anemia among children (%)		Stunting (%)		Exclusive breastfeeding (%)		Minimal acceptable diet** (%)		Anemia (%)		BMI Thin (< 18.5) (%)		Raised BP[1] (%) 2016		Physical or sexual or emotional (%)		Help sought from any source (%)	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	Men	Women	2011	2016	2011	2016
Ethnicity																		
Brahmin/Chhetri	41.6	46.2	37.9	34.4	63.9	69.2	36.9	52.4	31.6	36.5	16.3	15.2	23.3	14.3	24.7	15.8	24.5	25.1
Hill Brahmin	42.0	39.2	32.4	34.1	61.2	(64.6)	45.5	59.5	34.8	37.2	17.0	13.9	23.5	16.6	21.5	12.5	34.7	26.2
Hill Chhetri	41.5	47.2	41.9	34.9	65.9	72.4	32.8	50.6	27.9	34.8	15.1	15.4	22.3	12.0	25.9	16.2	21.0	24.6
Terai/Madhesi Brahmin/Chhetri	(42.3)	(76.9)	(17.2)	(27.6)	-	-	-	-	47.3	50.4	24.7	22.4	31.1	21.5	(73.7)	35.0	-	-
Terai/Madhesi Other	53.6	60.3	45.7	42.0	(77.1)	63.7	7.0	23.6	40.2	55.6	32.6	27.9	16.4	12.8	45.5	39.3	26.4	15.4
Dalit	53.9	55.0	46.8	40.0	82.4	58.4	16.1	32.9	37.5	38.4	25.9	21.1	24.8	15.3	38.1	35.5	23.9	22.2
Hill Dalit	51.2	45.8	50.4	36.8	71.8	(67.4)	21.5	43.2	29.2	29.5	18.0	11.8	26.9	18.2	36.1	29.4	23.0	31.8
Terai/Madhesi Dalit	60.2	67.8	39.9	44.1	91.7	(52.2)	5.2	17.2	57.7	56.3	44.6	40.2	21.5	9.8	45.7	45.7	(29.6)	11.8
Newar	(25.5)	40.6	29.6	22.2	-	-	(30.8)	36.5	17.1	26.4	8.1	9.4	34.3	22.6	20.7	28.8	(19.6)	22.3
Janajati	44.0	50.2	40.0	32.0	67.9	67.4	24.6	34.4	36.5	39.7	13.9	12.4	24.2	16.2	33.0	23.5	22.4	25.8
Hill Janajati	39.5	42.1	43.1	35.2	58.7	61.6	27.5	36.9	27.6	28.1	8.4	9.2	28.0	18.3	25.7	19.8	25.8	26.8
Terai Janajati	54.6	67.9	32.9	25.4	(89.2)	(79.5)	15.9	29.0	56.0	66.3	25.9	19.6	16.2	11.4	50.8	31.6	17.1	24.2
Muslim	56.3	58.5	32.2	38.7	(51.7)	(67.6)	9.9	21.4	54.8	51.8	36.5	31.4	12.4	13.1	55.9	41.3	7.7	21.2
Others	-	-	-	-	-	-	-	-	-	(44.0)	-	(12)	(17.2)	(23.3)	-	-	-	-
Province																		
Province 1	45.1	55.2	45.1	32.6	63.6	55.1	31.0	33.9	34.3	43.3	13.5	13.0	20.8	17.7	34.1	21.6	29.7	31.9
Province 2	51.1	59.4	51.1	37.0	85.1	60.0	5.3	20.0	48.7	57.8	32.5	29.1	17.6	13.1	43.9	37.1	16.3	14.6
Province 3	37.6	42.8	37.6	29.4	48.1	58.0	35.1	44.0	23.2	29.0	12.5	11.6	28.7	19.1	26.1	25.9	24.5	22.8
Province 4	40.3	46.2	40.3	28.9	67.6	(72.9)	43.3	52.2	33.9	28.0	7.8	8.1	30.7	23.8	22.7	15.5	(22.3)	38.9
Province 5	50.1	53.4	50.1	38.5	61.7	75.0	21.2	42.8	38.3	43.5	20.4	19.0	24.9	18.8	33.8	28.8	20.9	19.3
Province 6	48.6	48.4	48.6	54.5	(69.6)	(71.2)	14.6	40.3	27.8	34.9	20.8	15.2	21.8	10.1	30.3	19.1	13.7	(24.6)
Province 7	49.4	49.8	49.4	35.9	78.3	(83.6)	24.8	35.6	35.9	39.3	23.9	22.1	18.2	10.2	25.6	21.6	24.5	21.8
Wealth Quintile																		
Poorest	45.3	48.7	45.3	49.2	74.0	71.3	13.7	30.8	34.5	32.3	21.5	19.1	21.4	14.9	34.2	24.4	19.2	26.6
Poorer	49.6	49.6	49.6	38.7	72.7	62.2	19.3	33.5	35.4	41.5	21.2	21.1	23.1	16.9	34.8	28.5	24.3	24.6
Middle	51.4	59.9	51.4	35.7	73.8	73.3	21.1	28.0	38.6	49.0	21.5	21.3	19.4	14.2	38.2	32.1	20.4	18.9
Richer	43.2	58.4	43.2	32.4	69.5	60.1	33.9	41.4	35.5	43.4	16.6	17.3	20.9	14.6	32.0	26.6	27.3	20.1
Richest	37.5	41.2	37.5	16.5	44.2	59.7	40.4	49.9	31.2	36.0	11.9	8.6	31.5	23.6	19.6	19.1	23.1	22.4
Total	46.2	52.7	40.5	35.8	69.6	66.1	24.0	35.7	35.0	40.8	18.2	17.3	23.4	16.8	31.5	26.3	22.8	22.2

Figures in parentheses are based on 25-49 unweighted cases and should be interpreted with caution.
- indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
-- indicates for childhood mortality rates that a figure is based on fewer than 100 unweighted cases and has been suppressed.