

# Equity Analysis of Health Care Utilization and Outcomes

August 2008



Health Sector Reform Support Programme



**IRTI**  
INTERNATIONAL

**HSRSP Report No. 2.8-08-08**

# **Equity Analysis of Health Care Utilization and Outcomes**

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*Trend analysis of inequality by wealth quintile  
and caste/ethnic group from 1996 to 2006*

Ministry of Health and Population  
Government of Nepal  
August 2008



This report examines the health care utilization and outcomes across various economic and ethnic/caste groupings, looking particularly at family planning, maternal health, child health, mortality, and birth size. Funding was provided by the U.K. Department for International Development through the Health Sector Reform Support Programme. RTI International provided technical assistance. The opinions expressed herein are those of the authors and do not necessarily reflect the views of DFID.

The Health Sector Reform Support Programme aims to provide policy and strategy support to the Ministry of Health and Population (MoHP) in implementing its sector reform agenda. Additional information on HSRSP is available by contacting: Mr. Devi Prasad Prasai, Health Economist or Dr. Rob Timmons, Team Leader at: HSRSP, Ministry of Health and Population, P.O. Box 8975, EPC 535, Kathmandu, Nepal. (telephone: 977-1-426-6180; fax: 977-1-426-6184; email: [hsrsp@np-hsr.rti.org](mailto:hsrsp@np-hsr.rti.org))

Suggested citation:

RTI International, 2008. *Equity Analysis of Health Care Utilization and Outcomes*. Research Triangle Park, NC, USA.

## **Acknowledgments**

We gratefully acknowledge the contributions of New ERA for compiling the data used for this analysis. Specifically, we would like to thank Dr. Prakash Dev Pant. Additionally, we would like to thank Jacob Kasell for his contributions as fact-checker and editor.

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## Executive Summary

With the Government of Nepal's adoption of a targeted health care policy that seeks to assist those most in need of support, it has become necessary to have a better understanding of who exactly that is. While past surveys and studies have lent some insight into inequity, there is virtually no information on the trends of health care service utilisation and outcomes *across* castes/ethnicities and income groups.

Using the national demographic health surveys from 1996, 2001, and 2006, the data were analysed to reveal the trends in health service utilisation and outcomes over the last decade in specific areas indicative of health care provision: family planning, maternal health, child health, under-five, infant and neonatal mortality, and birth weight or size at birth.

Unequal access and utilisation have decreased significantly for some services and health outcomes have improved. However, not all citizens of Nepal have equal access to health centres or routinely scheduled services. Between 1996 and 2006, differences between castes, ethnicities, and wealth quintiles decreased in contraceptive use, childhood immunisation, diarrhoeal disease control, and treatment for acute respiratory infection. Differences in under-five and infant mortality rates between castes, ethnic groups and wealth quintiles decreased. Disparities between castes, ethnic groups, and wealth quintiles in birth weight or size at birth have also diminished. However, disparities increased in antenatal care and deliveries attended by skilled birth attendants. At the same time, differences in neonatal mortality rates between Brahmins/Chhetris and Dalits, and between Newars and Janajatis have increased.

## 1. Background

According to Amartya Sen, “health is among the most important conditions of human life and a critically significant constituent of human capabilities which we have reason to value” (O’Donnell et al., 2007). Thus, health care inequalities tend to be seen not simply as inequalities but as inequities. Some commentators, including Nobel Prize winners James Tobin (1970) and Amartya Sen (2002), argue that inequalities in health are especially worrisome—more worrisome than inequalities in most other spheres. In Nepal, inequalities between the poor and the better-off persist in health care utilization. The richest fifth of society spends 25 times more than what the poorest spend on health care utilisation (Prasai, et al., 2006). Although the poor tend to suffer higher rates of mortality and morbidity than the better-off, their care utilisation is at a far lower level.

In recent years, health equity has gained the attention of high level policymakers, program managers and civil society, becoming an important goal in Nepal’s health sector. Nepal’s poverty rate, as measured by “less than adequate consumption,” has fallen from 42 percent in 1995 to 31 percent in 2003 (National Living Standards Survey, 2003/04), driven by international remittances, urbanisation, a falling dependency ratio, and improved rural infrastructure and entrepreneurial activity.<sup>1</sup> Inequality, however, has intensified, with the Gini coefficient (a common measure of inequality) rising from 34.2 to 41.4 over the same time period—the worst in Asia. Inequality in the economic sector may be reflected in health care service utilisation and health outcomes.

Little effort has been made to assess inequity in access to and utilisation of health care services. Analysis of the National Living Standard Survey of 2003/04 and of the Nepal Demographic and Health Survey (NDHS) from 2006 provided insights into inequity and inequalities of health care utilisation and outcomes, but there is virtually no information on the trends of health care service utilisation and outcomes *across* income groups.

The aim of the second Long-Term Health Plan (1997-2017) is to improve the health status of poor and marginalised groups. Nepal’s Three-Year Interim Plan, for example, identifies the acceleration of pro-poor and broad-based economic growth as critical strategies in achieving national policy objectives (National Planning Commission, 2007). The Interim Plan has put great emphasis on inclusive growth which involves a pace and pattern of economic development that broadly enhances the ability of all women and men to participate in, contribute to, and benefit from increased economic opportunities.<sup>2</sup> The government’s Three-Year Interim Plan envisions social services and economic growth that are employment-generating, pro-poor, and broad-based so that they mostly benefit women, Dalits, Adivasi Janajatis (indigenous peoples), youth, and Madhesis (people of the plains). The Nepal Health

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<sup>1</sup> Resilience Amidst Conflict (2006). The larger decline in urban poverty reflects higher education levels, higher economic returns to skills, and wider opportunities for gainful employment in these areas. Increased urbanisation shifted the labour force to higher productivity jobs in the urban centres.”

<sup>2</sup> See OECD (2007), page 21 for a similar definition in terms of pro-poor growth.

Sector Programme - Implementation Plan 2004-2010 (NHSP-IP) emphasizes increasing access to and utilisation of essential health care services, particularly by poor and marginalised groups. Health care services are to be expanded and extended to benefit historically disadvantaged groups and geographic areas the most. In this context, who benefits from public health care services has remained a common concern of civil society, the government, and external development partners (EDPs). Further analysis of NDHS 2006 showed that Dalits - especially Dalits from the Terai - Muslims, Terai Madhesis, and other castes all have consistently low indicators across most dimensions covered by the NDHS survey. Together, these groups make up some 28 percent of Nepal's population (Bennett and Dahal, 2007). But the trends of service utilisation and health outcomes for these groups have not been analysed adequately, and, therefore, policy decisions on the basis of cross-sectional information alone may not be well informed.

## 2. Methodology

This study analyzes the trends in inequality in health care utilisation and outcomes between caste/ethnic groups and wealth quintiles, as well as within caste/ethnic groups. For the purpose of analysis, equity is defined as “equal utilization of health care for those in equal need of health care” (Oliver and Mossialos, 2004), and “unequal use for unequal need” (Raine, 2002), meaning those with greater needs receive more treatment. The data from the three cross-sectional NDHSs carried out in 1996, 2001, and 2006 are compared. The methodology, survey instruments, and respondent populations are consistent across the surveys. Further analysis of all three surveys was performed using the same definition of wealth quintiles, caste, and ethnic groups, revealing trends within these categories. Poverty in this study is measured by wealth grouped into five categories (poorest to richest), while caste/ethnicity is grouped into seven broad categories (Bennett, 2008). Based on the 2001 census data, the breakdown of the total population is as follows:

**Table 2.1: Distribution of caste/ethnic groups**

Caste/Ethnic Group	Percent of total population
Brahmins/Chhetris	32
Dalits	12
Janajatis	32
Other Terai Groups/Madhesis	14
Newars	5
Muslims	4
Others (Marwari, Jaine, Punjabi/Sikh, Bengali, unidentified)	1

It should further be noted that comparisons between Brahmins/Chhetris and Dalits are meant to compare the highest castes to the lowest, and that Newars compose the highest Janajati group, hence the comparisons between them. Percentage point differences, ratios, rates, and percent change are used as summary measures to interpret and explain the results of the



study. Family planning, maternal and newborn care, immunisation, and treatment of sick children (Countdown 2008 Equity Analysis Group, 2008; Houweling, Kunst, & Mackenbach, 2003) are included in the analysis. The trends of health care utilisation and health outcomes were analysed using the following indicators:

### Health care service utilisation

1. Family Planning: Measured by use of modern contraception by currently married women of reproductive age.
2. Maternal Health: Measured by reproductive health service utilization by women of reproductive health, including antenatal visits, place of delivery, and assistance during delivery.
3. Child Health: Measured by fully immunised children, diarrhoea, and treatment of acute respiratory infection (ARI).

### Health outcomes

4. Mortality: Under-five, infant, and neonatal mortalities are calculated using birth history information employing the mortality estimation method of the demographic health surveys.
5. Smaller babies: Child's weight and size at birth to determine the proportion of smaller-than-average babies.

## 3. Results

### 3.1 Equity in contraceptive use

Current use of contraceptives is defined as the proportion of women who reported the use of a family planning method at the time of interview. Table 3.1 shows inequality in current use of contraceptives has gradually been reduced between the richest and poorest quintiles, decreasing from 29 percent in 1996 to 24 percent in 2006. Marked progress has been achieved in the contraceptive use rate among the second-poorest quintile, increasing from 18 percent in 1996 to 41 percent in 2006, an increase of 128 percent over the last decade compared to a 20 percent increase between the richest quintiles.

**Table 3.1: Trends in contraceptive use by wealth quintile in percentage**

Wealth quintile	1996	2001	2006	Change in percentage points
First (poorest)	16.3	23.7	30.2	13.9
Second	18.2	29.8	40.5	22.3
Third	24.5	31.7	46.8	22.3
Fourth	27.8	39.8	48.2	20.4
Fifth (wealthiest)	44.6	54.8	53.9	9.3
Difference between poorest and richest quintiles	28.3	31.1	23.7	-4.6

Table 3.2 reveals that inequality in contraceptive use (current use) has been reduced markedly between caste/ethnic groups over the last decade: the difference between Brahmins/Chhetris and Dalits in contraceptive use was 12.4 percent in 1996, while it now stands at 3.3 percent. The decline in the difference in contraceptive use between Brahmins/Chhetris and Dalits indicates that more Dalits benefited from the family planning programme in the last decade. Contraceptive use among Dalits, Janajatis, and Other Terai Groups/Madhesi increased disproportionately. In the case of Dalits, contraceptive use more than doubled in 10 years compared to a 40 percent increase among Brahmins/Chhetris, suggesting a more equitable distribution of family planning services. The contraceptive prevalence rate of Janajatis and Other Terai Groups/Madhesi almost doubled compared to only a 15.5 percent increase for Newars. Unfortunately, contraceptive use among Muslims changed only marginally from 10.3 percent to 16.4 percent in the last decade.

The difference in contraceptive use between Newars and all Janajatis has decreased sharply in the last ten years, falling from 23.6 percent in 1996 to 8.8 percent in 2006, a decrease of 168 percent. Inequality has been dramatically narrowing between these two groups.

**Table 3.2: Trends in contraceptive use by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	31.4	40	43.9	12.5
Dalits	19	27.5	40.6	21.6
Janajatis	24.9	37.1	47.2	22.3
Other Terai Groups/Madhesi	22.4	32.2	44.3	21.9
Newars	48.5	49.6	56	7.5
Muslims	10.3	10.8	16.4	6.1
Others	12.6	51.4	51.9	39.3
Total	26	35.4	44.2	18.2
Difference between Brahmins/Chhetris and Dalits	12.4	12.5	3.3	-9.1
Difference between Newars and Janajatis	23.6	12.5	8.8	-14.8

Table 3.3 shows the trends in contraceptive use between the poorest and richest quintiles by caste/ethnic group and Table 3.4 shows the difference between the poorest and richest by caste/ethnic group. Inequality has been falling within all caste/ethnic groups, except for Muslims. Among Other Terai Groups/Madhesi, the difference between the poorest and richest quintiles in contraception use fell to 12.3 percent in 2006 from 18.1 in 1996, and among Dalits, the difference narrowed to 14.7 percent in 2006 from 21.7 in 1996, indicating that more poor Other Terai Groups/Madhesi and Dalits benefited from the family planning programme. In the case of Brahmins/Chhetris, the difference between the poorest and richest quintiles in the rate of contraceptive use fell to 25.4 percent in 2006 from 29 in 1996, indicating that more poor than rich Brahmins/Chhetris benefited from the programme. In the case of Muslims, the disparity has widened rather than narrowed: the difference between the

poorest and richest quintiles of Muslims for contraceptive use increased considerably to 37.9 percent in 2006, up from 7.7 in 1996.

**Table 3.3: Trends in contraceptive use for poorest and richest quintiles and caste/ethnic group in percentage**

Caste/ethnic group	Wealth quintile	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	Poorest	17.2	24.5	28.6	11.4
	Richest	46.2	58.2	54	7.8
Dalits	Poorest	14.1	20.5	29.9	15.8
	Richest	35.8	42.5	44.6	8.8
Janajatis	Poorest	19.2	25.6	32.6	13.4
	Richest	31.1	50.3	51.4	20.3
Other Terai Groups/ Madhesis	Poorest	19.4	25.7	40.4	21.0
	Richest	37.5	49.1	52.7	15.2
Newars	Poorest	13.6	23.3	26.3	12.7
	Richest	62	63.1	66.7	4.7
Muslims	Poorest	7.3	7.1	3.8	-3.5
	Richest	15	28.6	41.7	26.7
Others	Poorest	7.4	25	25	17.6
	Richest	55.6	62.5	59.5	3.9
Total	Poorest	16.3	23.7	30.2	13.9
	Richest	44.6	54.8	53.9	9.3

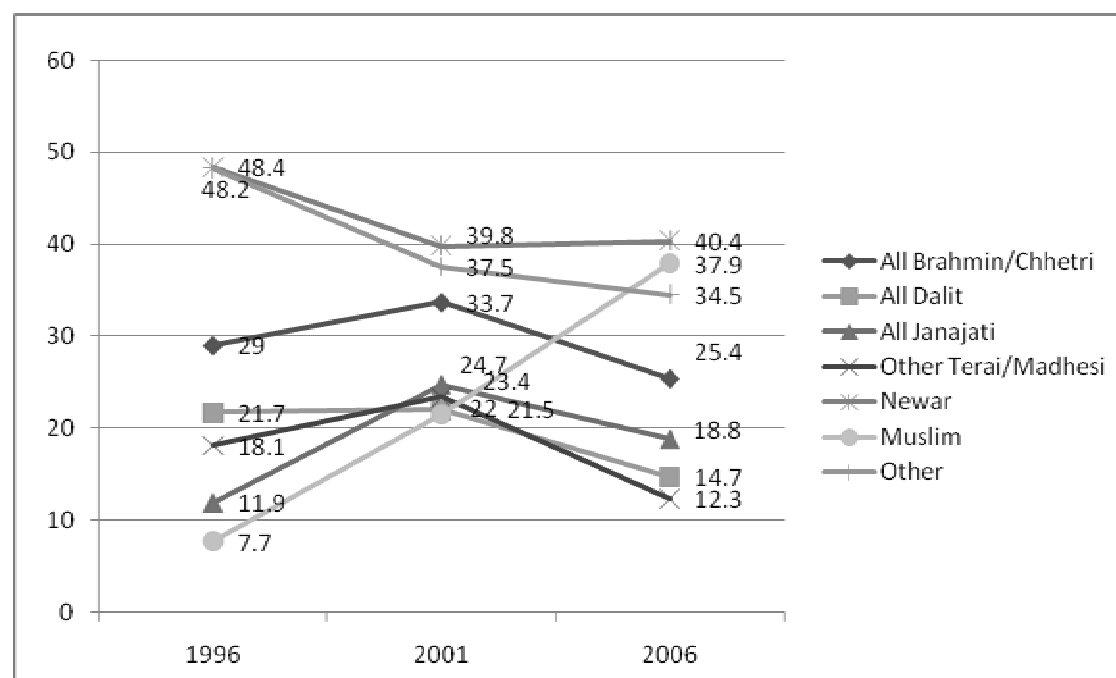
At the national level, contraceptive use has been increasing more rapidly among the poorest than among the richest. Notably, the trend among the poorest Muslims has been the opposite, with contraceptive use declining to nearly half the rate of use ten years earlier. In the case of the poorest quintile of Dalits, contraception use increased from 14.1 percent to 29.9 percent, a difference of 15.8 percentage points compared to a difference of only 8.8 percentage points for the richest Dalits. The poorest Dalits benefited more than the richest from the family planning programme. Among the poorest Other Terai Groups/Madhesis, contraceptive use increased from 19.4 percent to 40.4 in the decade, a difference of 21 percentage points, compared to a difference of 15.2 percentage points among the richest Other Terai Groups/Madhesis. However, for Janajatis, intra-ethnic inequality has increased for contraceptive use. The rate of use among the richest Janajatis increased from 31.1 percent to 51.4, a difference of 20.3 percentage points, compared to an increase of 13.4 percentage points among the poorest quintile of the same group. Inequality has been reduced among Brahmins/Chhetris. Contraceptive use among the poorest Brahmins/Chhetris increased greater than among the wealthiest.

**Table 3.4: Difference in contraceptive use between richest and poorest quintile in caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006
Brahmins/Chhetris	29	33.7	25.4
Dalits	21.7	22	14.7
Janajatis	11.9	24.7	18.8
Other Terai Groups/Madhesi	18.1	23.4	12.3
Newars	48.4	39.8	40.4
Newars	48.2	37.5	34.5
Muslims	7.7	21.5	37.9
Others	48.2	37.5	34.5
Total	28.3	31.1	23.7

Table 3.4 confirms that the differences in contraceptive use between the poorest and richest have decreased for castes/ethnic groups and nationwide, but not for Janajatis and Muslims. In fact, the disparity has increased dramatically for Muslims from 7.7 percent to 37.9 percent.

Again, it is evident from Figure 3.1 that inequity between the richest and poorest quintiles in contraception use decreased within castes/ethnic groups, except for Muslims, and, that for the most part, there was a sharper decline between 2001 and 2006.

**Fig. 3.1: Difference between poorest and richest quintiles in contraceptive use by caste/ethnic group in percentage.**

### 3.2 Equity in ANC Utilisation

Table 3.5 shows the trend in 4th antenatal care (ANC) visits provided by doctors and nurses by wealth quintile. Inequality has gradually grown in 4 or more ANC visits between 1996 and

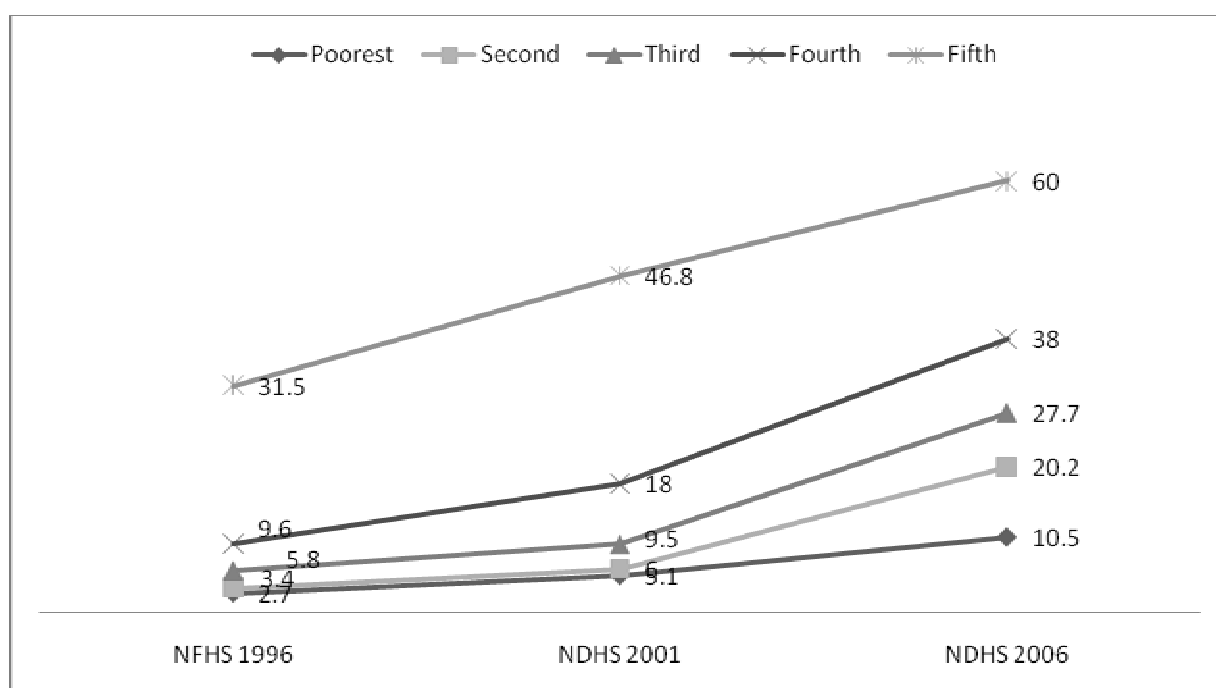
2006. The difference between the poorest and richest increased from 29 to 50 percent. ANC utilisation increased by almost four fold in the poorest quintile, although still very low, compared to utilisation almost doubling among the richest.

**Table 3.5: Trends in 4 or more ANC visits by wealth quintile in percentage**

Wealth quintile	1996	2001	2006	Change in percentage points
First (poorest)	2.7	5.1	10.5	7.8
Second	3.4	6.0	20.2	16.8
Third	5.8	9.5	27.7	21.9
Fourth	9.6	18.0	38.0	28.4
Fifth (richest)	31.5	46.8	60.0	28.5
Total	8.8	14.3	29.4	20.6
Difference between poorest and richest quintiles	28.8	41.7	49.5	20.7

Figure 3.2, below, shows the trend in 4 or more ANC visits by wealth quintile. The wealthier have been far more likely to benefit from 4 or more ANC visits than the poorer and the gap has widened over the 10 years.

**Figure 3.2: Trends in 4 or more ANC visits by wealth quintile in percentage**



Inequality has also been increasing in 4 or more ANC visits between caste/ethnic groups, as seen in Table 3.6. The difference between Brahmins/Chhetris and Dalits in ANC care utilisation has increased from 10 to 19 percent in the last decade. Wide differences are also seen between Newars and other Janajatis, which increased from 27 to 32 percent between 1996 and 2006. Less progress has been seen among Other Terai Groups/Madhesi, who

increased utilisation from six to 18 percent in the last decade. ANC care among Muslims increased markedly from two percent in 1996 to 18 percent in 2006.

**Table 3.6: Trends in 4 or more ANC visits by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	14.0	20.5	39.9	25.9
Dalits	4.4	9.8	21.4	17.0
Janajatis	5.1	10.9	26.1	21.0
Other Terai Groups/Madhesis	6.1	8.2	17.9	11.8
Newars	32.2	41.2	57.9	25.7
Muslims	2.3	9.1	18.3	16.0
Others	6.6	31.3	29.0	22.4
Total	8.8	14.3	29.4	20.6
Difference between Brahmins/Chhetris and Dalits	9.6	10.7	18.5	8.9
Difference between Newars and Janajatis	27.1	30.3	31.8	4.7

Table 3.7 shows that the richest Brahmins/Chhetris, Dalits, Janajatis, and Newars have benefited far more than the poorest from 4 or more ANC visits. The same is true for Other Terai Groups/Madhesis in 1996 and 2001 but data are unavailable for the poorest in 2006. The richest Muslims have benefited more from at least 4 ANC visits compared to the poorest, but use is increasing for both and the gap seems to be closing. The gap between the poorest and richest nationwide continues to be vast.

**Table 3.7: Trends in 4 or more ANC visits by wealth quintile and caste/ethnic group in percentage**

Caste/ethnic group	Wealth quintile	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	Poorest	4.5	6.7	10.4	5.9
	Richest	36.5	57.1	69.8	33.3
Dalits	Poorest	1.6	5.3	9.6	8.0
	Richest	9.1	30.0	49.0	39.9
Janajatis	Poorest	1.7	2.6	11.4	9.7
	Richest	15.1	32.1	53.3	38.2
Other Terai Groups/Madhesis	Poorest	3.0	7.3	NA	NA
	Richest	41.4	29.8	37.3	-4.1
Newars	Poorest	NA	4.3	10.5	6.2*
	Richest	58.5	72.6	71.4	12.9
Muslims	Poorest	3.2	3.8	26.7	23.5
	Richest	7.7	20.0	38.5	30.8
Others	Poorest	3.0	NA	NA	NA
	Richest	20.0	60.0	37.5	17.5
Total	Poorest	2.7	5.1	10.5	7.8
	Richest	31.5	46.8	60.0	28.5

\*Change in percentage points between 2001 and 2006.

### 3.3 Equity in the use of Doctors, Nurses, and ANMs during delivery

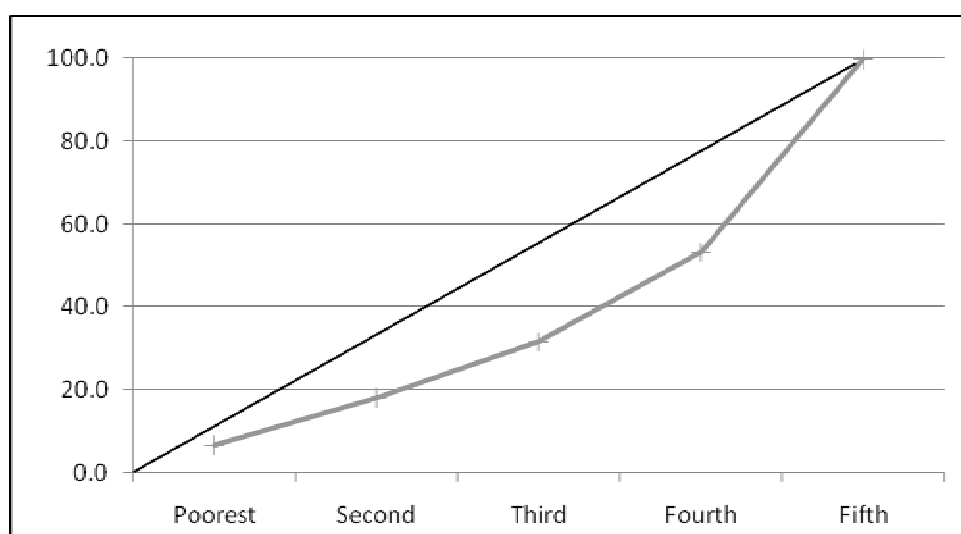
Inequity has been widening markedly in utilisation of skilled birth attendants (SBAs) - doctors, nurses, and auxiliary nurse midwives (ANMs) - during delivery. The difference between the poorest and richest quintiles grew from 32 percent in 1996 to 53 percent in 2006. The greatest rate of change was observed in the fourth quintile, which changed by more than 200 percent, from 7 to 23 percent in the last decade. Although the rates of change among the poorest and second quintiles are large, the percentages of deliveries attended by SBAs remain very low. Details are given in Table 3.8.

**Table 3.8: Trends in deliveries attended by doctor, nurses, and ANMs by wealth quintile in percentage**

Wealth quintile	1996	2001	2006	Change in percentage points
First (poorest)	2.6	2.5	4.8	2.2
Second	4.9	4.7	10.1	5.2
Third	6.1	6.7	12.4	6.3
Fourth	7.0	12.6	22.9	15.9
Fifth (wealthiest)	35.0	43.9	57.8	22.8
Total	9.0	10.8	18.7	9.7
Difference between poorest and richest quintiles	32.4	41.4	53.0	20.6

Figure 3.3 shows the inequality by wealth quintile in the use of SBAs during deliveries represented by a Lawrence curve plotted using the 2006 data. The poorest quintile uses only 6.4 percent of total SBA-assisted delivery services while the wealthiest uses 46.6 percent, revealing a high degree of inequality in service utilization.

The Safe Delivery Incentive Programme was introduced in 2006 to promote the use of SBAs, particularly by the poor and excluded groups. Since the introduction of the Safe Delivery Incentive Programme, the utilisation of SBAs during delivery has increased more sharply and is expected to enrol more poor mothers in the future.

**Figure 3.3: Inequality in SBA-assisted delivery care utilisation in percentage**

Inequality across ethnic groups has been increasing in proportion to deliveries conducted by SBAs, as seen in Table 3.9. The difference between Dalits and Brahmins/Chhetris has increased from 5.7 percentage points in 1996 to 15.1 in 2006. Among Newars, the proportion of deliveries conducted by SBAs increased from 31 percent in 1996 to 49.7 percent in 2006, compared to an increase from 5.4 percent to 14.3 percent for Janajatis. The rate of increase among Janajatis is greater but utilisation of SBAs is still low. A large increase was seen in the proportion of deliveries conducted by SBAs among “other” ethnic groups as well, increasing from 2.6 to 36.1 percent between 1996 and 2006.

**Table 3.9: Trends in deliveries attended by doctors, nurses, and ANMs by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	12.3	15.6	25.6	13.3
Dalits	6.6	6.5	10.5	3.9
Janajatis	5.4	8.0	14.3	8.9
Other Terai Groups/Madhesi	8.3	7.6	15.8	7.5
Newars	31	31.7	49.7	18.7
Muslims	5.8	7.4	13.2	7.4
Others	2.6	35	36.1	33.5
Total	9.0	10.8	18.7	9.7
Difference between Brahmins/Chhetris and Dalits	5.7	9.1	15.1	9.4
Difference between Newars and Janajatis	25.6	23.7	35.4	9.8

There is more or less the same trend of inequality between the castes/ethnic groups for utilisation of institutional delivery services as there is for SBA-assisted deliveries in general. The difference between Brahmins/Chhetris and Dalits in institutional delivery has increased from 5.7 percent in 1996 to 15.4 percent in 2006. In 2006, the difference in institutional



deliveries between Newars and other Janajatis rose to 34 percent from 25 percent in 1996. The greatest change was observed among the Others group (one percent of the population), indicating that more women of this group benefited from the programme. Details are given in Table 3.10.

**Table 3.10: Proportion of Institutional deliveries by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	10.6	15.6	24.1	13.5
Dalits	4.9	7.1	8.7	3.8
Janajatis	4.4	9.2	14.1	9.7
Other Terai Groups/Madhesi	6.3	7.4	14.7	8.4
Newars	29	28.7	48.1	19.1
Muslims	4.6	6.9	12.5	7.9
Others	2.0	5.5	36.1	34.1
Total	7.5	11.2	17.7	10.2
Difference between Brahmins/Chhetris and Dalits	5.7	8.5	15.4	9.7
Difference between Newars and Janajatis	24.6	19.5	34	9.4

Table 3.11 shows the inequality within ethnic groups for SBA-assisted delivery services. It is evident from the data that in all ethnic groups, the richest quintile benefited disproportionately. Among the wealthiest Brahmins/Chhetris, the use of SBAs during delivery increased from 39 to 66.3 percent from 1996 to 2006 compared to 3 percent to 5.3 percent by the poorest quintile of the same group. This shows that, as with other excluded groups, poor Brahmins have barely benefited from the safe motherhood programme. Wider disparities still were noticed among Janajatis in service utilization of SBAs during delivery, for which utilization among the richest increased to 54 percent from 17 percent, but the poorest Janajatis use of SBAs remained very low, increasing less than a percentage point from 2 to 2.7 percent. In the case of Dalits, the poorest quintile benefited disproportionately, but the use of SBAs also remains low.

**Table 3.11: Trends in deliveries attended by doctors, nurses, and ANMs by caste/ethnic group and wealth quintile in percentage**

Caste/ethnic group	Wealth quintile	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	Poorest	3.0	3.7	5.3	2.3
	Richest	39	51.8	66.3	27.3
Dalits	Poorest	2.8	3.0	8.0	5.2
	Richest	31.3	33.3	27.3	-4.0
Janajatis	Poorest	2.0	1.5	2.7	0.7
	Richest	17.4	26.6	53.7	36.3
Other Terai Groups/Madhesi	Poorest	4.2	1.1	6	1.8
	Richest	44.8	47.1	41.9	-2.9
Newars	Poorest	NA	NA	3.6	3.6
	Richest	55.8	73.3	73.7	17.9
Muslims	Poorest	1.6	2.3	NA	-1.6
	Richest	42.9	23.8	50	7.1
Others	Poorest	NA	NA	NA	NA
	Richest	NA	NA	NA	NA
Total	Poorest	2.6	2.5	4.8	2.2
	Richest	35	43.9	57.8	22.8

### 3.4 Equity in the utilisation of immunisation services

Children age 12-23 months who have received one dose of BCG, three doses each of DPT and polio vaccines, and one dose of the measles vaccine are considered fully immunised. BCG is given at birth or at first clinical contact, DPT and polio vaccines require three doses at approximately 6, 10, and 14 weeks of age, and measles vaccine is given soon after the child reaches nine months of age. The analysis shows that overall, 80 percent of children age 12-23 months were fully immunised at the time of the 2006 survey.

Table 3.12 shows that inequality in the use of the immunisation services has decreased between caste/ethnic groups over the last decade: the difference between Brahmins/Chhetris and Dalits was 20 percentage points in 1996, but decreased to 17 percentage points in 2006. The difference between Newars and Janajatis in the use of the immunisation services has fallen from 23 percentage points in 1996 to 13 percentage points in 2006. Among the Other Terai Groups/Madhesi, the proportion of fully immunised children increased from 30 percent in 1996 to 73 percent in 2006. The highest increase in the proportion of fully immunised children was among Muslims, in which it increased from 15 percent in 1996 to 75 percent in 2006. The proportion of fully immunised children among Dalits increased from 31 percent in 1996 to 70 percent in 2006 and from 51 percent to 87 percent among Brahmins/Chhetris in the same period. The growing proportion of fully immunised children among the traditionally disadvantaged, such as Muslims, Other Terai Groups/Madhesi, and Dalits shows improvement in the distribution of immunisation service.

**Table 3.12: Proportion of fully immunised children 12-23 months by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	51	75	87	36
Dalits	31	59	70	39
Janajatis	49	70	84	35
Other Terai Groups/Madhesis	30	51	73	43
Newars	72	82	97	25
Muslims	15	39	75	60
Others	27	NA	91	64
Total	43	65	82	39
Difference between Brahmins/Chhetris and Dalits	20	16	17	-3
Difference between Newars and Janajatis	23	12	13	-10

Table 3.13 shows the disparity between the poorest and richest quintiles for fully immunised children. Inequality has gradually decreased between the richest and poorest quintiles. The disparity between the poorest and richest quintiles for fully immunised children decreased from 43 percentage points in 1996 to 28 percentage points in 2006. Considerable progress has been achieved, particularly among children in the second and third quintiles, in which the proportion of fully immunised children increased from 34 percent in 1996 to 82 percent in 2006 and from 42 percent to 87 percent, respectively. The change in percentage of these two quintiles is more than twice the change of the richest.

**Table 3.13: Proportion of fully immunised children 12-23 months by wealth quintile in percentage**

Wealth quintile	1996	2001	2006	Change in percentage points
First (poorest)	30	55	67	37
Second	34	55	82	48
Third	42	63	87	45
Fourth	49	79	89	40
Fifth (wealthiest)	73	86	95	22
Total	43	65	82	39
Difference between poorest and richest quintiles	43	31	28	-15

Table 3.14 shows the proportion of fully immunised children increased by 83 percentage points compared to 47 percentage points for the richest Muslims. The poorest Muslims benefited more from the immunisation services. Among the poorest Other Terai Groups/Madhesis, fully immunised children increased by 35 percentage points in the last decade, compared to 37 points among the richest Other Terai Groups/Madhesis. For Janajatis, intra-ethnic inequality has decreased slightly for fully immunised children, the ratio among the poorest Janajatis increasing by 28 percentage points compared to an increase of 27 among the richest quintile of the same group. Inequality has been reduced among Brahmins/Chhetris

as well. For the poorest Brahmins/Chhetris, the proportion of fully immunised children increased by 35 percentage points compared to an increase of 27 percentage points among the wealthiest Brahmins/Chhetris.

**Table 3.14: Trends of fully immunised children by wealth quintile and caste/ethnic group in percentage**

Caste/ethnic group	Wealth quintile	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	Richest	70	94	97	27
	Poorest	38	62	73	35
Dalits	Richest	100	73	50	-50
	Poorest	19	62	54	35
Janajatis	Richest	70	92	97	27
	Poorest	39	54	67	28
Other Terai Groups/Madhesi	Richest	63	57	100	37
	Poorest	25	35	60	35
Newars	Richest	85	92	100	15
	Poorest	100	100	75	-25
Muslims	Richest	NA	33	80	47
	Poorest	17	43	100	83
Others	Richest	100	NA	100	0
	Poorest	17	NA	NA	NA
Total	Richest	73	86	95	22
	Poorest	30	55	67	37

Table 3.15 shows the disparity between the richest and poorest quintiles within caste/ethnicity for fully immunised children. Inequality has been falling within caste/ethnic groups except among Other Terai Groups/Madhesi and Newars. Among Dalits, the difference narrowed to -4 percentage points in 2006 from 81 in 1996, indicating that many more poor Dalits benefited from the EPI. In the case of Brahmins/Chhetris, the difference between the richest and poorest quintiles for fully immunized children fell to 24 percentage points in 2006 from 32 in 1996, indicating that more poor than rich Brahmins/Chhetris benefited from the programme as well. Inequality has only marginally decreased among Janajatis.

**Table 3.15: Disparity in fully immunised children between richest and poorest quintiles by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	32	32	24	-8
Dalits	81	11	-4	-85
Janajatis	31	38	30	-1
Other Terai Groups/Madhesi	38	22	40	2
Newars	-15	-8	25	40
Muslims	NA	67	-5	-72*
Others	83	NA	NA	NA
Total	43	31	28	-15

\*Change in percentage points between 2001 and 2006.

### 3.5 Equity in treatment of diarrhoeal diseases and acute respiratory infections (ARI)

Diarrhoea is a common cause of illness among children, but in the last few decades the incidence of diarrhoea has declined dramatically. Poor children are more likely to get diarrhoeal disease because of exposure to risk factors and poor hygiene and sanitation conditions. Table 3.16 shows the incidence of diarrhoea across wealth quintiles. The decrease in diarrhoeal disease is most notable among the bottom three quintiles where it decreased by 17-18 percentage points, indicating that more poor children benefited from the control of diarrhoeal disease programme (later included in IMCI).

**Table 3.16: Incidence of reported diarrhoeal episode within the last two weeks in percentage**

Wealth quintile	1996	2001	2006	Change in percentage points
First (poorest)	29.9	22.3	12.6	-17.3
Second	28.1	21.4	11.1	-17.0
Third	28.4	22.2	10.1	-18.3
Fourth	26.3	17.9	11.0	-15.3
Fifth (wealthiest)	22.2	15.1	11.3	-10.9
Total	27.5	20.4	11.9	-15.6
Difference between poorest and richest quintiles	-7.7	-7.2	-1.3	-6.4

The incidence of diarrhoea has decreased sharply among Dalits, from 30 percent in 1996 to nine percent in 2006. As seen in Table 3.17, there is virtually no inequality among ethnic groups in the incidence of diarrhoea.

**Table 3.17: Incidence of reported diarrhoeal episode within the last two weeks by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	29.8	16	11.2	-18.6
Dalits	30.1	20.9	9.1	-21.0
Janajatis	26.6	19.8	12.2	-14.4
Other Terai Groups/Madhesi	20.5	25.4	9.4	-11.1
Newars	23.7	23.1	13.7	-10.0
Muslims	31.4	29.2	13.4	-18.0
Others	29.3	10	18.5	-10.8
Total	27.5	20.4	11.9	-15.6
Difference between Brahmins/Chhetris and Dalits	-0.3	-4.9	2.1	-2.4
Difference between Newars and Janajatis	-2.9	3.3	1.5	-4.4

The percentage of Dalit children with diarrhoea who were taken to care providers increased from 12 percent in 1996 to 30 percent in 2006, indicating that more Dalits benefited from treatment. Similar trends are seen in the case of Brahmins/Chhetris. See details in Table 3.18.

**Table 3.18: Children with diarrhoea taken to care providers in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	18.4	27.7	36.3	17.9
Dalits	11.8	21.7	29.9	18.1
Janajatis	13.6	23.1	20.6	7.0
Other Terai Groups/Madhesis	8.7	14.8	16.7	8.0
Newars	10.9	19.0	28.0	17.1
Muslims	11.8	11.6	41	29.2
Others	7.1	33.3	NA	NA
Total	13.8	21.2	26.9	13.1
Difference between Brahmins/Chhetris and Dalits	6.6	6.0	6.4	-0.2
Difference between Newars and Janajatis	-2.7	-4.1	7.4	10.1

Table 3.19 shows inequality in the treatment provided by care providers for acute respiratory illness (ARI). The difference between Dalits and Brahmins/Chhetris in treatment benefits for ARI has decreased from 5.9 percentage points in 1996 to -10.5 percentage points in 2006. There was a similar trend in the difference between Newars and Janajatis. It is evident from the table that inequity has been decreasing since 1996, when only 16 percent of Dalits benefited from treatment. In 2006, the figure for Dalits stood at 54.1 percent, a change of 38.1 percentage points compared to a 21.7 percentage point change for Brahmins/Chhetris. Similar trends are seen among Muslims, for which the percentage of treatment increased from 11.5 in 1996 to 46.7 in 2006. These trends indicate that inter-caste/ethnic equity in the treatment of ARI has been improving.

**Table 3.19: Children benefiting from treatment for acute respiratory illness (ARI) by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Change in percentage points
Brahmins/Chhetris	21.9	27	43.6	21.7
Dalits	16	30.3	54.1	38.1
Janajatis	18.3	24.4	37.8	19.5
Other Terai Groups/Madhesis	15	24.4	53.3	38.3
Newars	23.5	37.3	25.0	1.5
Muslims	11.5	17.3	46.7	35.2
Others	4.9	12.5	50.0	45.1
Total	18.2	23.7	42.9	24.7
Difference between Brahmins/Chhetris and Dalits	5.9	-3.3	-10.5	-16.4
Difference between Newars and Janajatis	5.2	12.9	-12.8	-18.0

### 3.6 Equity in health outcomes

For the purposes of analysis, under-five mortality, infant mortality and neonatal mortality rates, and size at birth were used as indicators of health outcomes.

#### 3.6.1 Under-five mortality rate

The under-five mortality rate has decreased among all wealth quintiles, as has the disparity between the poorest and richest quintiles. The under-five mortality of the poorest quintile fell by 40.1 percent and by 40.5 percent for the richest over the decade. The greatest decline was in the second quintile, in which under-five mortality decreased by 47.1 percent. The difference between the richest and poorest quintiles was 87 per 1,000 live births in 1996, but fell to a difference of 51 per 1,000 live births in 2006, indicating a marked improvement in the health outcome of children under five years.

**Table 3.20: Trends in Under-five mortality per 1,000 live births by wealth quintile**

Wealth quintile	1996	2001	2006	Percent Change
First (poorest)	166	135	98	-40.1
Second	157	121	83	-47.1
Third	159	109	91	-42.8
Fourth	106	92	63	-40.6
Fifth (wealthiest)	79	59	47	-40.5
Total	118	91	61	-48.3
Difference between poorest and richest quintiles	87	76	51	-41.4

Table 3.21 shows inequalities between castes/ethnic groups in the under-five mortality. The disparity between Brahmins/Chhetris and Dalits has narrowed to 14 per 1,000 live births in 2006 from 45 in 1996, a 69 percent decrease. Under-five mortality among Dalits was cut almost by half from 1996 to 2006. The disparity between Newars and Janajatis decreased by only 14 percent. The largest decrease in under-five mortality was among Muslims, a 57 percent decrease from 158 per 1,000 live births in 1996 to 68 in 2006.

**Table 3.21: Trends in Under-five mortality per 1,000 live births by caste/ethnic group**

Caste/ethnic group	1996	2001	2006	Percent Change
Brahmins/Chhetris	125	98	76	-39.2
Dalits	170	129	90	-47.1
Janajatis	126	108	80	-36.5
Other Terai Groups/Madhesi	164	130	86	-47.6
Newars	83	84	43	-48.2
Muslims	158	99	68	-57.0
Total	118	91	61	-48.3
Difference between Brahmins/Chhetris and Dalits	45	31	14	-68.9
Difference between Newars and Janajatis	43	24	37	-14.0

### 3.6.2 Infant and neonatal mortality rate

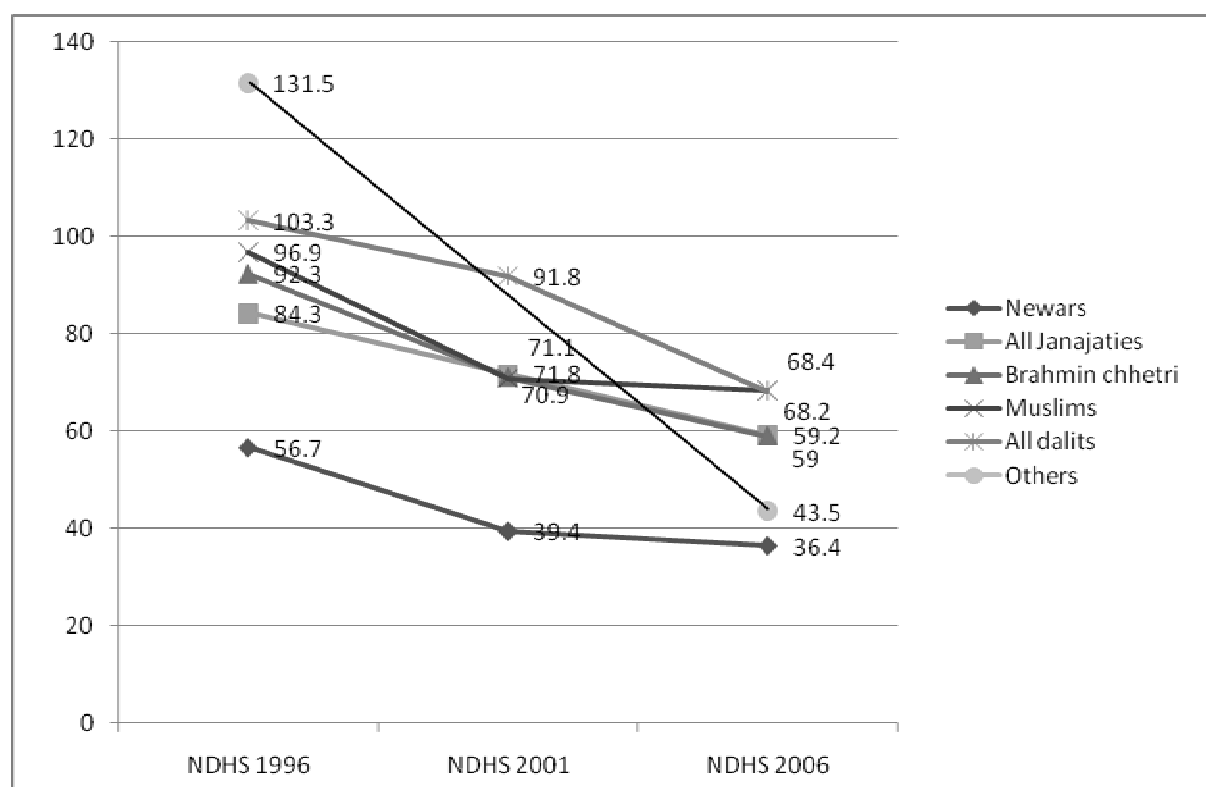
Inter-caste/ethnic inequality in the infant mortality rate (IMR) as seen in Table 3.22 has gradually decreased over the past decade. The disparity in the IMR between Brahmins/Chhetris and Dalits has narrowed from 11 per 1,000 live births in 1996 to 9 per 1,000 live births in 2006. There are similar differences between Newars and Janajatis, for which the IMR fell from a difference of 28 per 1,000 live births in 1996 to 23 in 2006. The IMR among Dalits fell by 34 per 1,000 live births and among Muslims by 29 per 1,000 live births, which indicate improvements in equity for infant mortality.

**Table 3.22: Trends in infant mortality per 1,000 live births by caste/ethnic group**

Caste/ethnic group	1996	2001	2006	Percent Change
Brahmins/Chhetris	92.3	71.1	59	-36.1
Dalits	103.3	91.8	68.2	-34.0
Janajatis	84.3	71.8	59.2	-29.8
Other Terai Groups/Madhesi	104.8	98.3	63.8	-39.1
Newars	56.7	39.4	36.4	-35.8
Muslims	96.9	70.9	68.4	-29.4
Others	131.5	NA	43.5	-48.1
Total	79	64	48	-31
Difference between Brahmins/Chhetris and Dalits	11.0	20.7	9.2	-16.4
Difference between Newars and Janajatis	27.6	32.4	22.8	-17.4

Figure 3.4 shows the trend in infant mortality rates by caste/ethnic group, illustrating a sharp decline in the IMR among Dalits, declining from 103 per 1,000 live births in 1996 to 68 per 1,000 live births in 2006. A similar reduction in the IMR was noticed among Muslims. The highest decline, however, was among the one percent of the population, the Others group (Marwari, Jaine, Punjabi/Sikh, Bengali, and unidentified), for which the IMR plummeted from 132 per 1,000 live births in 1996 to 44 in 2006. There was a slower rate of decline in the IMR among Newars and Brahmins/Chhetris. The second-highest reduction in infant mortality was among the Other Terai Groups/Madhesi, for which the IMR decreased by 39 percent. These trends indicate a move towards more equitable health outcomes.



**Figure 3.4: Trends in infant mortality rate per 1,000 live births by caste/ethnic group**

However, inter-caste/ethnic inequality in neonatal mortality, as shown on Table 3.23, has increased over the last decade. The difference between Brahmins/Chhetris and Dalits in neonatal mortality has widened from 4 per 1,000 live births in 1996 to 10 per 1,000 live births in 2006. Similarly, a considerable disparity can be seen in neonatal mortality between Newars and Janajatis. Among Newars and the Others group, there has been a 50 percent reduction in the neonatal mortality rate compared to 32 percent for all Janajatis, 25 percent for Dalits, and 15 percent for Muslims.

**Table 3.23: Trends in neonatal mortality per 1,000 live births by caste/ethnic group**

Caste/ethnic group	1996	2001	2006	Percent change
Brahmins/Chhetris	54.2	43.7	33.8	-37.6
Dalits	58.1	53.7	43.7	-24.8
Janajatis	52.3	46.4	35.7	-31.7
Other Terai Groups/Madhesis	79.8	60.6	44.3	-44.5
Newars	47.8	21.5	24.1	-49.6
Muslims	65.3	42.7	55.8	-14.6
Others	64.6	NA	32	-50.5
Total	49.9	38.8	33.0	-33.9
Difference between Brahmins/Chhetris and Dalits	3.9	10.0	9.9	153.9
Difference between Newars and Janajatis	4.5	24.9	11.6	157.8

### 3.6.3 Birth Weight or Size at Birth

In the absence of information on birth weight, mother's estimate of the size of the baby was used as the proxy indicator of low birth weight. The disparity between the poorest and richest quintiles having low birth weight or smaller than average babies decreased from 11.2 percent in 1996 to 7.6 percent in 2006, indicating a trend towards fewer inequalities. In the last decade, the proportion of low birth weight or smaller than average children decreased by 20 percent in the poorest quintile compared to 12 percent among the richest quintile. The difference in low birth weight or smaller than average babies born to the poorest and richest quintiles has decreased by 32 percent or 3.6 percentage points. Details are given in Table 3.24.

**Table 3.24: Low birth weight or smaller than average children at birth by wealth quintile in percentage**

Wealth quintile	1996	2001	2006	Percent change	Change in percentage points
First (poorest)	29.1	24.6	23.4	-19.6	-5.7
Second	26.2	22.3	18.8	-28.2	-7.4
Third	25.8	21.4	19	-26.4	-6.8
Fourth	25.2	17.9	16.8	-33.3	-8.4
Fifth (wealthiest)	17.9	15.8	15.8	-11.7	-2.1
Total	25.5	21.1	19.2	-24.7	-6.3
Difference between poorest and richest quintiles	11.2	8.8	7.6	-32.1	-3.6

As seen in Table 3.25 there is virtually no difference between Brahmins/Chhetris and Dalits in the proportion of low weight or smaller than average children at birth. The disparity

between Newars and Janajatis is greater but has decreased from 9.8 percent in 1996 to 5.9 percent in 2006, indicating a trend of decreasing inequality in birth outcomes.

**Table 3.25: Low birth weight or smaller than average children at birth by caste/ethnic group in percentage**

Caste/ethnic group	1996	2001	2006	Percent change	Change in percentage points
Brahmins/Chhetris	25.3	24.8	21.2	-16.2	-4.1
Dalits	25.6	22.3	20.2	-21.1	-5.4
Janajatis	29.2	20.3	19	-34.9	-10.2
Other Terai Groups/Madhesi	19.1	16.7	15.2	-20.4	-3.9
Newars	19.4	15.3	13.1	-32.5	-6.3
Muslims	23.9	19.8	18.4	-23.0	-5.5
Others	30.7	21.1	23.5	-23.5	-7.2
Total	25.5	21.1	19.2	-24.7	-6.3
Difference between Brahmins/Chhetris and Dalits	0.3	-2.5	-1	-433.3	-1.3
Difference between Newars and Janajatis	9.8	5	5.9	-39.8	-3.9

## 4. Conclusion

Unequal access and utilisation have decreased significantly for some services and health outcomes have improved. However, not all citizens of Nepal have equal access to health centres or routinely scheduled services.

Between 1996 and 2006, differences between castes, ethnicities, and wealth quintiles decreased in contraceptive use, childhood immunisation, diarrhoeal disease control, and treatment for acute respiratory infection. Differences in under-five and infant mortality rates between castes, ethnic groups and wealth quintiles decreased. Disparities between castes, ethnic groups and wealth quintiles in birth weight or size at birth have also diminished. However, disparities increased in antenatal care and deliveries attended by skilled birth attendants. At the same time, differences in neonatal mortality rates between Brahmins/Chhetris and Dalits, and between Newars and Janajatis increased.

**Inequalities have fallen among castes/ethnic groups, except Muslims, for contraceptive use.** Among the Dalits and Other Terai Groups and Madhesi, the differences between the poorest and richest quintiles in contraceptive use rate fell, indicating that more poor benefited from the family planning programme. However, the disparity between poor and wealthy Muslims has widened considerably, from 8 percentage points to 38 percentage points. In fact, contraceptive use among poor Muslims decreased between 1996 and 2006.

**Inequality in the use of immunisation services has decreased between caste/ethnic groups** over the last decade. The disparity between the poorest and richest quintiles for fully

immunised children decreased from 43 percentage points in 1996 to 28 percentage points in 2006.

**Disparities increased between castes/ethnicities for antenatal care (at least four visits).**

Visits by wealthier castes/ethnicities have increased much more rapidly. Utilization of antenatal care increased to 18 percent in the poorest quintile but to 84 percent among the richest.

**Inequity has increased markedly in deliveries assisted by skilled birth attendants**

(doctors, nurses, and auxiliary nurse-midwives) between the poorest and richest quintiles.

The 2006 survey shows deliveries assisted by skilled attendants among the poorest quintile represent only 6.4 percent, whereas assisted deliveries among the wealthiest represent 46.6 percent. Disparities have grown between the wealthier castes/ethnicities and poorer ones in institutional delivery services as well.

The incidence of diarrhoea has decreased sharply among Dalits, from 30 percent in 1996 to 9 percent in 2006. **There is virtually no inequality among ethnic groups in the incidence of diarrhoea.**

**Inter-caste/ethnic equity in the treatment of ARI has improved.** In 1996

Brahmins/Chhetris were more likely to benefit from treatment of acute respiratory infection than Dalits—22 percent compared to 16 percent, respectively. However, 10 years later, 54 percent of Dalits were benefiting from treatment, whereas treatment of Brahmins/Chhetris increased to 44 percent. A similar trend is observed between the Newars and Janajatis, and treatment of ARI among Muslims rose from about 12 percent in 1996 to 47 percent in 2006.

**The trends in the under-five and infant mortality rates by caste/ethnic group show a sharp decline** among Dalits from 170 per 1,000 live births in 1996 to 90 in 2006 and from 103 per 1,000 live births to 68, respectively. Similar reductions in the under-five and infant mortality rates occurred among Other Terai Groups/Madhesi and Muslims. **Inter-caste/ethnic inequalities in neonatal mortality increased over the decade.**

**The proportion of low birth weight or smaller than average children at birth has decreased by 20 percent among the poorest** compared to 12 percent among the richest.

There is virtually no difference between Dalits and Brahmins/Chhetris in the proportion of low birth weight or smaller than average children.

Gains have been made in reducing inequalities in access to and utilisation of health care services between castes and ethnic groups, as well as between poor and wealthier citizens in Nepal since 1996. Health outcomes have also improved for the poor and marginalised. However, inequalities in access and use persist and are increasing for some services.

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