

MATERNAL AND CHILD HEALTH

The Safe Motherhood Program in Nepal has adopted two major strategies to improve maternal health—provide around-the-clock essential obstetric services and ensure the presence of skilled attendants at deliveries, especially at-home deliveries (Ministry of Health, 2001). In recognizing that the majority of women do not have access to maternal health care services due to social, economic, and political reasons, the Ministry of Health is emphasizing a multisectoral approach that encompasses medical interventions and nonhealth programs that promote access to and utilization of services. Based on the National Health Policy, the Safe Motherhood National Plan of Action (1994-1997) was developed. Ten districts were initially selected for the program, and in the first phase, the program was launched in three districts. After the evaluation of the first phase, six more districts were incorporated in the second phase by 2001. In conjunction with the Ministry of Health's efforts, several other programs to support safe motherhood have been initiated by international organizations like the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), the Department for International Development (DFID), U.S. Agency for International Development (USAID), and German Agency for Technical Cooperation (GTZ) in several targeted districts. These include the promotion of maternal health programs through the construction of maternity facilities, human resource development, and the provision of essential obstetric care kits and maternal and child health equipment to primary health centers and hospitals. USAID supports the Safe Motherhood Program with the maternal and child health workers (MCHWs) refresher training curriculum, the National Safe Motherhood Subcommittee and regular newsletter, the National Safe Motherhood IEC strategy, postabortion care training as part of emergency obstetric care, and the Birth Preparedness Package for families to plan for normal births and emergencies.

This chapter presents the survey findings in four areas of importance to maternal and child health: antenatal, delivery, and postnatal services; characteristics of the newborn; vaccination coverage; and common childhood illnesses and their treatment. Combined with information on maternal and childhood mortality, this information can be used to identify subgroups of women and children who are “at risk” because of low levels of use or nonuse of maternal and child health services and to provide information to assist in the planning of appropriate improvements in services.

9.1 ANTENATAL CARE

ANTENATAL CARE COVERAGE

The maternal health care services that a mother receives during her pregnancy and at the time of delivery is important for the well being of the mother and her child. Antenatal care (ANC) can be assessed according to the type of service provider, number of visits made, the stage of pregnancy at the time of first visit, services and information provided during ANC checkups (including whether tetanus toxoid vaccinations were received). Information on ANC coverage was collected from women who had a live birth in the five years preceding the survey. For women with two or more live births during the five-year period, the data refer to the most recent birth only.

Table 9.1 and Figure 9.1 show the percent distribution of mothers who had a live birth in the five years preceding the survey by source of antenatal care received during pregnancy according to

Table 9.1 Antenatal care

Percent distribution of women who had a live birth in the five years preceding the survey by antenatal care (ANC) provider during pregnancy for the most recent birth, according to background characteristics, Nepal 2001

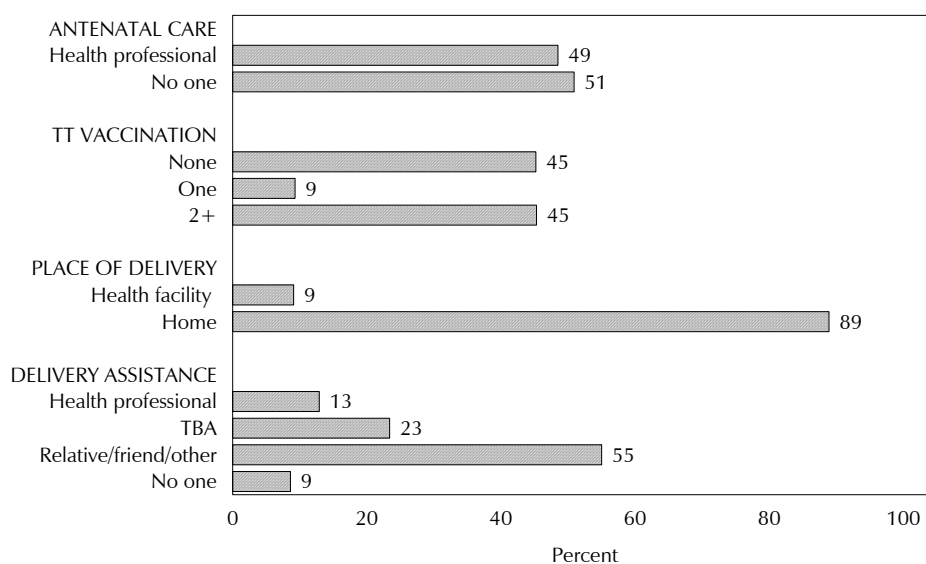
Background characteristic	Doctor	Nurse/auxiliary nurse midwife	Health assistant/auxiliary health worker	Maternal child health worker	Village health worker	Traditional birth attendant/other	No one	Total	Number of women
Age									
<20	21.5	13.4	13.8	4.4	5.8	0.4	40.7	100.0	773
20-34	17.2	11.7	10.8	3.2	6.7	0.6	49.8	100.0	3,419
35-49	6.5	5.7	8.6	2.5	4.7	0.4	71.6	100.0	553
Birth order									
1	27.4	14.8	13.6	4.0	4.8	0.4	35.0	100.0	993
2-3	18.5	13.6	11.7	3.9	6.9	0.5	44.9	100.0	1,900
4-5	11.3	8.3	9.4	2.0	6.0	0.9	62.1	100.0	1,107
6+	5.4	5.3	8.2	3.0	7.5	0.2	70.4	100.0	746
Residence									
Urban	54.5	20.2	4.3	0.8	1.1	1.3	17.6	100.0	332
Rural	13.8	10.6	11.5	3.5	6.7	0.5	53.4	100.0	4,414
Ecological zone									
Mountain	5.5	7.0	13.8	3.0	1.2	0.1	69.3	100.0	361
Hill	15.8	10.3	10.4	4.6	2.8	0.1	56.0	100.0	1,979
Terai	19.0	12.8	11.1	2.2	10.1	1.0	43.9	100.0	2,405
Development region									
Eastern	17.1	17.0	15.4	1.7	2.0	1.2	45.7	100.0	1,102
Central	18.6	7.8	10.1	2.3	13.2	0.6	47.4	100.0	1,535
Western	22.9	12.7	12.1	6.1	2.8	0.0	43.5	100.0	914
Mid-western	7.1	8.4	8.4	5.2	5.5	0.3	64.9	100.0	693
Far-western	11.1	11.0	5.8	2.2	2.6	0.2	67.0	100.0	502
Subregion									
Eastern Mountain	8.3	7.3	21.8	3.1	1.6	0.0	58.0	100.0	74
Central Mountain	5.7	12.2	18.7	5.2	2.2	0.4	55.7	100.0	122
Western Mountain	4.2	3.1	6.6	1.4	0.3	0.0	84.3	100.0	166
Eastern Hill	12.7	17.1	13.0	3.2	3.8	0.0	50.2	100.0	347
Central Hill	22.7	12.7	11.3	2.0	3.1	0.2	48.0	100.0	484
Western Hill	24.2	11.8	13.1	8.1	1.8	0.0	41.0	100.0	521
Mid-western Hill	3.8	3.6	6.2	5.8	3.3	0.4	77.0	100.0	405
Far-western Hill	7.9	2.8	5.4	2.5	1.7	0.0	79.6	100.0	223
Eastern Terai	20.3	18.0	15.9	0.7	1.1	1.9	42.1	100.0	681
Central Terai	18.1	4.7	8.3	2.1	19.9	0.9	46.0	100.0	930
Western Terai	21.2	13.9	10.7	3.3	4.1	0.0	46.8	100.0	393
Mid-western Terai	14.8	18.7	15.0	5.2	11.2	0.2	34.8	100.0	222
Far-western Terai	18.2	25.8	3.5	2.3	4.7	0.6	44.5	100.0	179
Education									
No education	9.5	8.7	10.7	2.9	6.9	0.5	60.8	100.0	3,437
Primary	22.3	17.7	12.1	4.6	7.0	0.5	35.5	100.0	684
Some secondary	42.8	20.4	11.9	4.5	3.1	1.2	16.0	100.0	439
SLC and above	65.8	14.9	10.1	3.1	0.9	0.0	5.2	100.0	186
Total	16.6	11.3	11.0	3.3	6.3	0.5	50.9	100.0	4,745

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation. Total includes women with missing information on antenatal care provider who are not shown separately. SLC = School Leaving Certificate

selected background characteristics. Interviewers were instructed to record all persons a woman had seen for antenatal care for the most recent birth. But in the table, only the provider with the highest qualifications is listed if the woman had seen more than one provider.

Overall, one in two pregnant women received antenatal care. Twenty-eight percent of mothers received antenatal care either from a doctor (17 percent) or a nurse or auxiliary nurse midwife (11 percent). Another 11 percent of mothers received antenatal care from a health assistant (HA) or auxiliary health worker (AHW). Village health workers (VHWs) provided antenatal care to 6 percent of women and maternal and child health workers (MCHWs) provided care to 3 percent of mothers. Traditional birth attendants (TBAs) provided antenatal care to less than 1 percent of mothers.

Figure 9.1 Antenatal Care, Tetanus Toxoid (TT) Vaccinations, Place of Delivery, and Delivery Assistance



Note: Health professional refers to doctor, nurse/auxiliary nurse midwife, health assistant/auxiliary health worker, maternal child health worker, village health worker.
TBA = Traditional birth attendant

Nepal 2001

Comparison with the 1996 Nepal Family Health Survey results shows that there were some improvements in the utilization of antenatal services during the last five years. The percentage of women receiving antenatal services from a doctor, nurse, or auxiliary nurse midwife (ANM) has increased from 24 percent in 1996 to 28 percent in 2001. At the same time, the percentage of mothers receiving antenatal care from a HA or AHW increased from 2 percent to 11 percent. The percentage of mothers who did not receive any antenatal care dropped from 56 percent to 51 percent over the same period.

Younger women are more likely to use antenatal services than older women. This is especially true for care from doctors, nurses or ANMs and HAs or AHWs. Similarly, lower birth order is associated with greater use of antenatal services provided by medically trained personnel. Perhaps this pattern occurs because young women tend to be more educated than older women and are thus more likely to know that antenatal care from medically trained personnel is superior in quality. Also older women who have given birth previously may feel less need for ANC services. There are large differences in the use of antenatal care services between urban and rural women. Overall, 82 percent of women from urban areas utilize antenatal care services, compared with 47 percent of their rural

counterparts. Urban women use doctors and nurses or ANMs much more often than rural women, whereas rural women are more likely to use HAs or AHWs and MCHWs for antenatal care.

Utilization of antenatal care services is higher in the *terai* and in the Western, Eastern, and Central development regions than in the other regions. Similarly, women from the *terai* subregions and Western and Central hills use ANC services more often and from doctors and nurses or ANMs than in other areas. Women from the Western mountains are least likely to obtain ANC services, while women from the Mid-western *terai* are most likely to use ANC services. Reported use of doctors for antenatal care should be viewed with caution because in most rural areas, nurses and paramedical personnel are regarded as doctors and health posts and subhealth posts are regarded as hospitals.

The utilization of antenatal care services is positively associated with mother's level of education. Ninety-five percent of women with an SLC and above received antenatal care services, compared with 39 percent of women with no education. Use of a doctor for antenatal care increases from 10 percent among uneducated women to 66 percent among women who have completed their SLC.

Antenatal care can be more effective in avoiding adverse pregnancy outcomes when it is sought early in the pregnancy and continues through to delivery. The National Safe Motherhood Program guidelines in Nepal recommend at least four visits during pregnancy. The first visit should be made soon after the woman realizes she is pregnant. The second visit should be made between the fifth and the seventh month of pregnancy. The third visit should be made at the beginning of the ninth month, and the last visit should be made the same week that the baby is due. Additional visits should be made if any problems or danger signs arise.

Table 9.2 indicates that most Nepalese women who receive antenatal care get it at a relatively late stage in their pregnancy and do not make the minimum recommended number of antenatal visits. Only one in seven (14 percent) women make four or more visits during their entire pregnancy. Urban women are four times more likely than rural women to have made four or more ANC visits. Sixteen percent of women reported that their first visit occurred at less than four months of pregnancy. Forty-one percent of urban women, compared with 15 percent of rural women, made their first antenatal visit when they were less than four months pregnant. Among women who received antenatal care, the median duration of pregnancy at first visit was five months.

Table 9.2 Number of antenatal care visits and timing of first visit

Percent distribution of women who had a live birth in the five years preceding the survey by number of antenatal care (ANC) visits for the most recent birth, and by the timing of the first visit according to residence, Nepal 2001

Number and timing of ANC visits	Residence		
	Urban	Rural	Total
Number of ANC visits			
None	17.6	53.4	50.9
1	6.5	7.9	7.8
2-3	27.3	26.8	26.8
4+	48.4	11.8	14.3
Don't know/missing	0.3	0.2	0.2
Total	100.0	100.0	100.0
Number of months pregnant at time of first ANC visit			
No antenatal care	17.6	53.4	50.9
<4	41.0	14.6	16.4
4-5	24.3	18.2	18.7
6-7	14.4	10.7	11.0
8+	2.2	2.9	2.8
Don't know/missing	0.5	0.2	0.2
Total	100.0	100.0	100.0
Median months pregnant at first visit (for those with ANC)	4.0	5.1	5.0
Number of women	332	4,414	4,745

CARE COMPONENTS

Pregnancy complications are an important cause of maternal and child morbidity and mortality. Thus, providing adequate and proper information to expectant mothers about the danger signs associated with pregnancy and the appropriate action to be taken is an essential component of antenatal care.

Table 9.3 shows the components of antenatal care among women who received antenatal care for the most recent birth in the five years preceding the survey. About one in two mothers who received antenatal care reported that they were informed about the danger signs of pregnancy complications or had their weight measured, while one in seven had their height measured as a part of their ANC checkup. Among various services that a woman receives during her antenatal checkup, measurement of blood pressure is important. It is encouraging to note that three in five women reported that their blood pressure was measured. Urine tests and blood tests were each done for about three in ten women who received antenatal care. The relatively low coverage for these two tests may indicate a lack of testing facilities in most of the health institutions.

About one in four women with a live birth in the five years preceding the survey reported that they received iron/folic acid tablets.

Younger women and low parity women are more likely to receive information about pregnancy complications and other components of antenatal care services than older and high parity women. A similar pattern is observed by urban-rural residence, with urban women more likely than rural women to receive the various components of antenatal care. In terms of ecological region, a higher percentage of mothers from the mountain region received information on signs of complications than mothers from the other ecological regions. In general, a higher percentage of women residing in the hill ecological zone received the various components of antenatal care.

The different components of antenatal care received varies with women's level of education, with educated women much more likely to have received all components of antenatal care than uneducated women. For example, twice as many women with an SLC and above received information about pregnancy complications than women with no education.

Table 9.3 Components of antenatal care

Percentage of women with a live birth in the five years preceding the survey who received antenatal care for the most recent birth, by content of antenatal care, and percentage of women with a live birth in the five years preceding the survey who received iron/folic acid tablets for the most recent birth, by background characteristics, Nepal 2001

Background characteristic	Among women who received antenatal care								
	Informed of signs of pregnancy complications	Weight measured	Height measured	Blood pressure measured	Urine sample taken	Blood sample taken	Number of women	Received iron/folic acid tablets	Number of women
Age at birth									
<20	49.9	50.1	15.1	65.4	30.9	31.6	458	29.5	773
20-34	47.9	47.7	14.3	59.1	29.5	27.6	1,715	23.0	3,419
35-49	37.9	30.1	7.4	51.9	20.9	16.1	157	11.4	553
Birth order									
1	55.9	55.0	16.4	71.7	38.5	38.2	645	36.8	993
2-3	46.8	49.4	15.0	59.3	30.3	28.6	1,045	25.1	1,900
4-5	44.1	39.0	11.6	51.8	19.9	16.5	420	15.0	1,107
6+	34.2	27.4	6.6	43.3	13.9	12.9	221	9.3	746
Residence									
Urban	58.6	79.1	27.3	84.9	59.3	58.1	273	50.7	332
Rural	46.2	42.8	12.2	56.5	25.2	23.6	2,058	20.6	4,414
Ecological zone									
Mountain	55.7	38.9	4.5	47.0	18.1	13.9	111	14.1	361
Hill	51.4	52.7	14.3	67.1	33.4	30.3	870	22.1	1,979
Terai	44.6	44.0	14.5	56.2	27.3	27.0	1,350	24.5	2,405
Development region									
Eastern	39.3	51.5	13.8	57.2	23.3	23.1	599	24.0	1,102
Central	46.9	42.7	14.8	54.8	33.2	31.7	807	24.8	1,535
Western	54.0	56.1	15.5	71.7	38.4	35.8	517	28.5	914
Mid-western	47.4	26.9	9.1	56.7	17.7	15.5	243	11.3	693
Far-western	61.9	52.5	13.0	61.9	18.7	16.0	165	18.4	502
Subregion									
Eastern Mountain	40.7	38.3	8.6	48.1	17.3	14.8	31	16.6	74
Central Mountain	68.6	44.1	0.0	52.9	18.6	14.7	54	22.2	122
Western Mountain	46.7	28.9	8.9	33.3	17.8	11.1	26	7.0	166
Eastern Hill	31.8	36.9	8.3	43.9	15.3	14.0	173	19.7	347
Central Hill	59.3	67.8	25.2	72.6	47.8	47.0	251	28.1	484
Western Hill	50.2	57.9	12.8	75.3	40.7	34.3	307	30.9	521
Mid-western Hill	61.1	17.5	6.1	63.6	12.5	10.7	93	9.1	405
Far-western Hill	69.4	67.1	4.6	77.3	16.2	12.5	45	15.6	223
Eastern Terai	42.5	59.0	16.6	63.8	27.2	27.7	395	27.1	681
Central Terai	38.3	30.1	11.1	46.0	27.5	25.9	502	23.5	930
Western Terai	59.5	53.6	19.5	66.4	35.0	38.1	209	25.3	393
Mid-western Terai	37.7	32.7	10.9	52.0	21.2	19.1	145	17.6	222
Far-western Terai	63.0	51.2	17.9	62.3	19.8	18.1	99	27.1	179
Education									
No education	39.4	35.3	10.0	50.5	19.7	18.4	1,346	15.1	3,437
Primary	50.7	51.9	16.4	66.1	28.5	27.7	440	29.4	684
Some secondary	59.5	66.6	21.3	74.0	47.9	45.2	368	50.7	439
SLC and above	77.9	83.2	22.4	86.3	64.1	61.4	176	72.5	186
Total	47.6	47.0	14.0	59.9	29.2	27.6	2,330	22.7	4,745

SLC = School Leaving Certificate

TETANUS TOXOID COVERAGE

Tetanus toxoid injection, an important component of antenatal care, is given during pregnancy primarily for the prevention of neonatal tetanus. Neonatal tetanus is one of the major causes of infant deaths in Nepal. For full protection, it is recommended that a pregnant woman should receive at least two doses of tetanus toxoid during her first pregnancy, administered one month apart, and a booster shot during each subsequent pregnancy. Five doses of tetanus toxoid injections are considered to provide lifetime protection. However, if a pregnant woman does not have a card showing that she has received previous doses (as is often the case), she is likely to be given two doses, one month apart, for each pregnancy to ensure adequate protection.

Table 9.4 presents data on tetanus toxoid coverage during pregnancy for women who had a live birth in the five years preceding the survey by selected background characteristics. Forty-five percent of women received two or more doses of tetanus toxoid injections during their pregnancy, and 9 percent received only one dose. Nearly one in two women did not receive any tetanus toxoid injection during her pregnancy.

Mothers giving birth at a younger age and having lower birth order children are more likely to receive tetanus toxoid injections than older mothers and those with higher birth order children. For example, two-thirds of mothers below age 20 received one or more doses of tetanus toxoid injections, compared with one-third of mothers age 35-49. These patterns make sense since older, higher parity mothers most likely received tetanus toxoid injections during previous pregnancies. A larger difference is observed in coverage of tetanus toxoid shots among urban women than among rural women (81 percent versus 53 percent). A large difference in tetanus toxoid coverage is also observed by ecological zone. Mothers from the *terai* have the highest tetanus toxoid coverage (67 percent) compared with the hill and mountain zones (44 percent and 29 percent, respectively). In terms of development region, the Eastern, Central, and Western regions have higher tetanus toxoid coverage than the Mid-western and Far-western regions (about 60 percent versus 40 percent, respectively). Tetanus toxoid coverage is highest in the Eastern *terai* subregion and lowest in the Western mountain subregion.

Education of mothers is strongly associated with tetanus toxoid coverage. Pregnant mothers with an SLC and above are twice as likely as mothers with no education to receive at least one dose of tetanus toxoid injections (95 percent and 47 percent, respectively).

Table 9.4 Tetanus toxoid injections

Percent distribution of women who had a live birth in the five years preceding the survey by number of tetanus toxoid injections received during pregnancy for the most recent birth, according to background characteristics, Nepal 2001

Background characteristic	None	One injection	Two or more injections	Don't know/missing	Total	Number of women
Age at birth						
<20	34.2	10.0	55.7	0.1	100.0	773
20-34	44.1	9.4	46.3	0.2	100.0	3,419
35-49	67.9	7.6	24.5	0.0	100.0	553
Birth order						
1	31.5	10.0	58.5	0.0	100.0	993
2-3	39.1	9.8	50.9	0.2	100.0	1,900
4-5	53.7	8.8	37.3	0.2	100.0	1,107
6+	66.4	7.9	25.5	0.1	100.0	746
Residence						
Urban	18.3	13.9	67.3	0.5	100.0	332
Rural	47.3	9.0	43.7	0.1	100.0	4,414
Ecological zone						
Mountain	71.1	7.6	21.3	0.0	100.0	361
Hill	55.8	9.1	34.9	0.1	100.0	1,979
Terai	32.7	9.7	57.4	0.2	100.0	2,405
Development region						
Eastern	37.4	9.0	53.6	0.0	100.0	1,102
Central	38.7	10.9	50.1	0.4	100.0	1,535
Western	44.1	11.7	44.1	0.1	100.0	914
Mid-western	60.4	5.3	34.3	0.0	100.0	693
Far-western	63.7	6.4	29.9	0.1	100.0	502
Subregion						
Eastern Mountain	62.2	8.3	29.5	0.0	100.0	74
Central Mountain	61.7	10.0	28.3	0.0	100.0	122
Western Mountain	81.9	5.6	12.5	0.0	100.0	166
Eastern Hill	50.8	9.8	39.4	0.0	100.0	347
Central Hill	46.8	9.5	43.2	0.6	100.0	484
Western Hill	45.9	13.6	40.4	0.0	100.0	521
Mid-western Hill	70.4	4.6	25.0	0.0	100.0	405
Far-western Hill	79.4	5.1	15.5	0.0	100.0	223
Eastern Terai	27.9	8.7	63.5	0.0	100.0	681
Central Terai	31.5	11.7	56.5	0.3	100.0	930
Western Terai	41.7	9.0	49.1	0.3	100.0	393
Mid-western Terai	35.0	6.7	58.2	0.0	100.0	222
Far-western Terai	34.8	8.0	56.8	0.3	100.0	179
Education						
No education	53.0	7.8	39.0	0.2	100.0	3,437
Primary	34.6	12.4	52.8	0.2	100.0	684
Some secondary	18.2	14.1	67.7	0.0	100.0	439
SLC and above	4.6	14.2	81.1	0.0	100.0	186
Total	45.2	9.3	45.3	0.2	100.0	4,745

SLC = School Leaving Certificate

9.2 DELIVERY CARE

The objective of providing safe delivery services is to protect the life and health of the mother and her child by ensuring the delivery of a baby safely. An important component of efforts to reduce the health risk to mothers and children is to increase the proportion of babies delivered under the supervision of health professionals. Proper medical attention under hygienic conditions during delivery can reduce the risk of complications and infections that may cause death or serious illness either to the mother or the baby or both. The National Safe Motherhood Program encourages women to deliver at facilities under the care of skilled attendants when it is feasible and ensures that facilities are upgraded and providers are trained to manage complications. Respondents in the 2001 NDHS were asked to provide information on the place of birth of all children born in the five years preceding the survey.

PLACE OF DELIVERY

Traditionally, Nepalese children are delivered at home either without assistance or with the assistance of TBAs or relatives and friends. At the national level, only 9 percent of births are delivered in health facilities, compared with 89 percent at home (Table 9.5). This is a slight improvement since 1996, when 8 percent of births were delivered in health facilities. This suggests that despite an increase in the number of health facilities offering delivery services, use of health facilities during deliveries is still minimal among most Nepalese women.

Table 9.5 also shows that births to young women and low parity births are more likely to be delivered at health facilities than births to older women and high parity births. A child born in an urban area is six times more likely (45 percent) to be delivered at a health facility than a child from a rural area (7 percent). Children living in the mountain ecological zone are less likely to be delivered in a health facility than children living in the hill and *terai* zones.

Use of a health facility for delivery increases sharply with maternal education from 4 percent of births among women with no education to 55 percent among children of women with an SLC or higher level of education.

Institutional deliveries are about five times more common among births to mothers who had four or more antenatal checkups (40 percent) than among births to mothers who had one to three antenatal checkups (8 percent). Institutional deliveries are least prevalent (2 percent) among births to mothers who did not receive any antenatal checkups. Several factors are likely to contribute to this positive relationship between antenatal checkups and institutional deliveries. Women who have had contact with health facilities during pregnancy are more likely to subsequently deliver in an institution because of the advice and encouragement from health personnel. Women with pregnancy complications are more likely than other women to go for antenatal checkups and deliver in a health facility because they are more aware of the health risks associated with a complicated pregnancy. Women, especially the young, urban, and educated, with knowledge of the benefits of modern medical care will choose to use both antenatal and delivery services.

Table 9.5 Place of delivery

Percent distribution of live births in the five years preceding the survey by place of delivery, according to background characteristics, Nepal 2001

Background characteristic	Health facility			Home	Other	Missing	Total	Number of births
	Government sector	Non-gov. (NGO) sector	Private medical sector					
Mother's age at birth								
<20	9.2	1.5	1.4	85.9	1.8	0.2	100.0	1,290
20-34	6.9	0.9	1.1	89.1	1.9	0.1	100.0	5,043
35-49	3.1	0.2	0.3	93.0	3.5	0.0	100.0	645
Birth order								
1	14.5	2.2	2.4	78.6	2.1	0.2	100.0	1,665
2-3	6.1	0.8	1.1	90.2	1.6	0.1	100.0	2,790
4-5	3.3	0.3	0.2	93.8	2.4	0.0	100.0	1,534
6+	2.3	0.2	0.3	94.8	2.4	0.0	100.0	990
Residence								
Urban	34.9	5.7	3.9	53.8	1.4	0.2	100.0	449
Rural	5.1	0.6	0.9	91.3	2.0	0.1	100.0	6,529
Ecological zone								
Mountain	3.2	0.0	0.1	93.8	2.9	0.1	100.0	535
Hill	7.2	1.4	1.0	87.8	2.5	0.1	100.0	2,873
Terai	7.4	0.8	1.3	89.0	1.4	0.1	100.0	3,570
Development region								
Eastern	7.5	1.4	0.8	89.7	0.5	0.1	100.0	1,610
Central	9.0	1.3	1.4	86.2	2.0	0.1	100.0	2,310
Western	7.2	0.9	1.3	86.9	3.5	0.1	100.0	1,261
Mid-western	2.8	0.0	1.0	93.3	2.9	0.0	100.0	1,048
Far-western	5.2	0.5	0.5	92.3	1.2	0.3	100.0	749
Subregion								
Eastern Mountain	5.7	0.0	0.4	94.0	0.0	0.0	100.0	107
Central Mountain	3.9	0.0	0.0	88.1	7.8	0.3	100.0	177
Western Mountain	1.6	0.0	0.0	97.7	0.7	0.0	100.0	251
Eastern Hill	4.5	0.2	0.0	94.4	0.8	0.0	100.0	533
Central Hill	14.1	3.4	1.7	79.5	1.2	0.1	100.0	692
Western Hill	9.5	1.7	1.9	82.5	4.1	0.2	100.0	683
Mid-western Hill	1.7	0.0	0.8	93.1	4.5	0.0	100.0	634
Far-western Hill	2.6	1.1	0.0	95.3	1.0	0.0	100.0	330
Eastern Terai	9.3	2.2	1.4	86.7	0.4	0.1	100.0	969
Central Terai	7.2	0.4	1.5	89.2	1.7	0.0	100.0	1,441
Western Terai	4.5	0.0	0.5	92.1	2.8	0.0	100.0	578
Mid-western Terai	5.8	0.0	1.7	92.0	0.5	0.0	100.0	318
Far-western Terai	10.1	0.0	1.3	85.9	1.9	0.8	100.0	264
Mother's education								
No education	3.5	0.2	0.5	93.8	1.9	0.1	100.0	5,176
Primary	9.9	1.0	1.1	85.9	2.1	0.1	100.0	970
Some secondary	20.4	4.8	2.5	69.7	2.3	0.2	100.0	587
SLC and above	37.1	7.5	10.6	42.8	2.0	0.0	100.0	244
Antenatal care visits¹								
None	1.5	0.0	0.2	95.8	2.4	0.0	100.0	2,414
1-3	6.5	0.6	1.3	90.2	1.3	0.0	100.0	1,643
4+	29.3	6.3	4.4	57.7	2.3	0.0	100.0	680
Total	7.0	1.0	1.1	88.9	2.0	0.1	100.0	6,978

Note: Total includes 9 births with missing information on antenatal care visits which are not shown separately.

SLC = School Leaving Certificate

¹Includes only the most recent birth in the five years preceding the survey

ASSISTANCE DURING DELIVERY

Assistance by skilled health personnel during delivery is considered to be effective in the reduction of maternal and neonatal mortality. Births delivered at home are usually more likely to be delivered without assistance from a health professional, whereas births delivered at health facilities are more likely to be delivered by health personnel with at least minimal training in the provision of normal delivery services.

Table 9.6 and Figure 9.1 show the percent distribution of live births in the five years preceding the survey by the type of person providing assistance during delivery according to background characteristics. Only 13 percent of deliveries are assisted by health professionals, that is, doctors, nurses or ANMs, HAs or AHWs, MCHWs, and VHWs. Of these, 8 percent are doctors and 3 percent are nurses or ANMs. Contrary to expectations, the proportion of deliveries assisted by MCHWs is very low (less than 1 percent) in spite of the fact that in Nepal, MCHWs have been assigned to subhealth posts for the promotion of maternal and child health services. This finding suggests that MCHWs are either not properly deployed or they are not very effective in providing delivery services.

Although traditional birth attendants are considered to be less effective in reducing maternal deaths, TBAs continue to play a prominent role in assisting deliveries, especially in rural areas. The contribution of TBAs to providing delivery care remained almost the same over the last ten years at about 23 percent. More than half of births are assisted by relatives, friends, and other nonhealth personnel, while about one in ten births are delivered without any assistance at all.

Differences in delivery assistance by background characteristics are marked. This is especially obvious for assistance provided by doctors. Births to young mothers below age 20 and first order births are more likely to receive assistance from doctors during delivery. Urban births are seven times more likely than rural births to be delivered by doctors. Delivery assistance from doctors is about three times as high in the hills and *terai* (more than 8 percent) than in the mountains (3 percent). Similarly, a higher proportion of deliveries in the Central development region (10 percent) are assisted by doctors than in the other development regions.

Women's education is positively associated with deliveries by medical professionals. For example, only 4 percent of births to women with no education were assisted by a doctor, compared with 48 percent of births to women with at least an SLC. This could probably be attributed to the fact that women with higher levels of education mostly come from urban areas where the services of a doctor are more readily available.

Table 9.6 Assistance during delivery

Percent distribution of live births in the five years preceding the survey by person providing assistance during delivery, according to background characteristics, Nepal 2001

Background characteristic	Doctor	Nurse/auxiliary nurse midwife	Health assistant/auxiliary health worker	Maternal child health worker	Village health worker	Traditional birth attendant	Relative/friend/other	No one	Total	Number of births
Mother's age at birth										
<20	10.7	4.5	2.1	0.5	0.1	24.7	53.2	4.1	100.0	1,290
20-34	7.6	3.0	1.2	0.4	0.2	23.4	55.2	8.8	100.0	5,043
35-49	3.1	0.7	1.2	0.4	0.3	20.4	57.2	16.7	100.0	645
Birth order										
1	16.1	6.2	2.6	0.6	0.2	23.0	48.5	2.7	100.0	1,665
2-3	7.2	2.8	1.2	0.5	0.2	25.0	55.7	7.2	100.0	2,790
4-5	3.2	1.6	1.0	0.1	0.3	23.2	58.0	12.7	100.0	1,534
6+	2.6	0.8	0.5	0.4	0.1	19.8	59.5	16.4	100.0	990
Residence										
Urban	39.4	10.9	0.8	0.0	0.0	9.4	35.9	3.5	100.0	449
Rural	5.6	2.5	1.4	0.4	0.2	24.4	56.4	9.0	100.0	6,529
Ecological zone										
Mountain	3.0	1.0	0.8	0.7	0.2	10.1	71.4	12.8	100.0	535
Hill	8.3	2.6	1.2	0.7	0.2	7.0	67.1	12.9	100.0	2,873
Terai	8.1	3.7	1.6	0.2	0.2	38.6	42.9	4.6	100.0	3,570
Development region										
Eastern	7.9	5.4	1.9	0.1	0.3	25.6	49.5	9.2	100.0	1,610
Central	10.4	2.5	1.3	0.2	0.2	29.2	47.6	8.6	100.0	2,310
Western	7.7	3.9	1.0	1.4	0.1	17.8	58.5	9.6	100.0	1,261
Mid-western	3.7	0.4	1.7	0.3	0.2	19.4	68.0	6.1	100.0	1,048
Far-western	5.6	2.1	0.4	0.2	0.1	15.8	65.9	9.6	100.0	749
Subregion										
Eastern Mountain	6.0	1.4	2.5	0.4	0.4	6.0	58.5	24.8	100.0	107
Central Mountain	2.7	1.8	0.6	1.2	0.0	2.1	77.6	13.7	100.0	177
Western Mountain	1.8	0.2	0.2	0.5	0.2	17.5	72.6	6.9	100.0	251
Eastern Hill	4.8	1.9	1.2	0.0	0.6	9.9	64.9	16.7	100.0	533
Central Hill	16.7	4.0	1.3	0.2	0.0	6.6	54.4	16.7	100.0	692
Western Hill	10.3	5.0	1.8	2.5	0.2	8.9	59.0	12.3	100.0	683
Mid-western Hill	2.2	0.3	0.5	0.0	0.0	4.7	83.4	8.9	100.0	634
Far-western Hill	4.1	0.6	1.0	0.2	0.0	3.4	82.5	8.1	100.0	330
Eastern Terai	9.9	7.7	2.3	0.1	0.1	36.4	40.1	3.2	100.0	969
Central Terai	8.3	1.9	1.5	0.1	0.3	43.3	40.6	4.1	100.0	1,441
Western Terai	4.6	2.6	0.0	0.2	0.0	28.3	57.9	6.4	100.0	578
Mid-western Terai	7.5	1.0	4.4	0.8	0.8	47.1	37.4	1.0	100.0	318
Far-western Terai	9.1	5.0	0.0	0.2	0.2	33.1	39.4	12.3	100.0	264
Mother's education										
No education	3.7	1.5	1.0	0.2	0.2	25.6	58.2	9.5	100.0	5,176
Primary	9.7	4.4	2.5	0.8	0.2	19.4	53.9	8.9	100.0	970
Some secondary	23.9	9.2	2.3	1.3	0.2	16.3	42.9	4.0	100.0	587
SLC and above	47.8	16.3	2.6	1.1	0.0	9.9	20.8	1.6	100.0	244
Total	7.8	3.1	1.4	0.4	0.2	23.4	55.0	8.6	100.0	6,978

Note: If the respondent mentioned more than one person attending during delivery, only the most qualified person is considered in this tabulation. Total includes births for whom information on assistance at delivery is missing and not shown separately. SLC = School Leaving Certificate

USE OF HOME DELIVERY KIT

The clean home delivery kit was developed in the early 1990s by Maternal Child Health Products with funding from USAID. It is a social marketing product now supported by other donors as well as by revenue from sales. It is not widely marketed, however, and in some donor or NGO-supported areas it is available at no cost. Where it is sold, the average cost is about Rps. 25 or about US\$0.33 per unit. The kit contains a new razor blade, clean threads, hand soap, a plastic sheet to place under the woman, a plastic disc (used to replace the traditional coin placed under the cord when it is cut), and pictorial instructions. Since most babies are delivered at home with the assistance of elders or relatives and TBAs, use of the clean home delivery kit could play an important role in reducing neonatal tetanus and other infections.

Table 9.7 provides information on the use of the clean home delivery kits by type of residence and ecological zone. A clean delivery kit was used in only 9 percent of home deliveries. Although use of clean delivery kits in home deliveries has improved over the last five years (from 2 percent in 1996 to 9 percent in 2001), it has still not reached the bulk of Nepalese mothers. Home deliveries in urban areas are more likely to involve these delivery kits (14 percent) than home deliveries in rural areas (9 percent). Likewise, clean delivery kits are more likely to be used in the *terai* (12 percent) than in the hills or mountains (6 percent each). In terms of development regions, births in the Eastern and Western regions are more likely to involve clean delivery kits than births in the other regions.

DELIVERY CHARACTERISTICS

Less than 1 percent of births in Nepal are delivered by caesarean section (Table 9.8). This could in part be due to the high percentage of home deliveries coupled with a weak health care referral system. Births to older women, first order births, births in urban areas, births in the hill ecological zone, births in the Central development region, and births to women with at least an SLC are more likely to be delivered by caesarean section. There has been little change in the percentage of deliveries by caesarean section over the last five years.

Babies in Nepal are usually not weighed at birth since most deliveries take place outside an institutional setting. Thus, it is difficult to know whether the baby was underweight at birth. To overcome this, respondents were asked to provide an assessment of their child's size at birth. This type of assessment is subject to considerable error for individual births. However, at the aggregate level, it has been observed that there is a strong association between the actual weight at birth and a mother's perception of the size of her child at birth.

In the absence of birth weight, a mother's assessment of the size of the baby at birth can be a useful measure of the survival chances of a child. The 2001 NDHS data indicate that about one in five births (21 percent) was reported as being very small or smaller than average. Births in the mountain ecological zone and Far-western development region and births to mothers with low levels of education are more likely to be reported as being very small or smaller than average. Nearly 80 percent of the mothers report that their baby was of average size or larger at birth.

Table 9.7 Use of clean home delivery kits

Percentage of births delivered at home in the five years preceding the survey in which a clean home delivery kit was used, by residence and region, Nepal 2001

Residence and region	Clean home delivery kit used	Number of births
Residence		
Urban	13.8	242
Rural	9.2	5,960
Ecological zone		
Mountain	6.3	502
Hill	6.4	2,523
Terai	12.3	3,177
Development region		
Eastern	12.0	1,445
Central	8.5	1,992
Western	11.7	1,096
Mid-western	5.9	977
Far-western	8.0	692
Total	9.4	6,202

Table 9.8 Delivery characteristics

Percentage of live births in the five years preceding the survey delivered by caesarean section, and percent distribution by mother's estimate of baby's size at birth, according to background characteristics, Nepal 2001

Background characteristic	Delivery by C-section	Size of child at birth			Total	Number of births
		Very small	Smaller than average	Average or larger		
Mother's age at birth						
<20	0.7	7.1	16.9	75.8	100.0	1,290
20-34	0.8	5.6	14.2	80.1	100.0	5,043
35-49	1.0	7.3	16.8	75.9	100.0	645
Birth order						
1	1.6	6.8	17.5	75.5	100.0	1,665
2-3	0.8	5.1	12.7	82.1	100.0	2,790
4-5	0.4	6.5	13.9	79.6	100.0	1,534
6+	0.5	6.8	18.9	74.4	100.0	990
Residence						
Urban	4.8	7.4	13.4	79.0	100.0	449
Rural	0.6	5.9	15.1	78.9	100.0	6,529
Ecological zone						
Mountain	0.3	16.9	14.1	68.9	100.0	535
Hill	1.1	7.4	15.8	76.7	100.0	2,873
Terai	0.7	3.4	14.4	82.1	100.0	3,570
Development region						
Eastern	1.0	5.4	13.5	81.0	100.0	1,610
Central	1.2	4.7	12.1	83.1	100.0	2,310
Western	0.8	5.5	14.5	79.9	100.0	1,261
Mid-western	0.1	5.1	18.8	76.2	100.0	1,048
Far-western	0.3	13.8	22.3	63.5	100.0	749
Subregion						
Eastern Mountain	0.7	6.4	16.0	77.7	100.0	107
Central Mountain	0.6	20.0	6.6	73.1	100.0	177
Western Mountain	0.0	19.1	18.7	62.2	100.0	251
Eastern Hill	0.4	7.6	13.2	79.1	100.0	533
Central Hill	2.7	8.0	12.3	79.5	100.0	692
Western Hill	1.3	7.8	11.7	80.3	100.0	683
Mid-western Hill	0.0	5.5	19.8	74.7	100.0	634
Far-western Hill	0.3	8.4	27.9	63.7	100.0	330
Eastern Terai	1.4	4.1	13.4	82.4	100.0	969
Central Terai	0.6	1.3	12.7	86.1	100.0	1,441
Western Terai	0.3	2.7	17.8	79.4	100.0	578
Mid-western Terai	0.3	4.2	19.2	76.6	100.0	318
Far-western Terai	0.5	12.3	14.4	72.3	100.0	264
Mother's education						
No education	0.4	6.0	16.3	77.5	100.0	5,176
Primary	1.1	7.3	11.4	81.2	100.0	970
Some secondary	1.9	4.7	11.6	83.4	100.0	587
SLC and above	6.1	4.3	7.7	88.0	100.0	244
Total	0.8	6.0	15.0	78.9	100.0	6,978

Note: Total includes births for whom information on size at birth is not known or missing and not shown separately.

SLC = School Leaving Certificate

9.3 POSTNATAL CARE

The National Safe Motherhood program recommends that mothers should have a postnatal checkup within two days of delivery. This recommendation is based on the fact that a large number of maternal and neonatal deaths occur during the 48 hours after delivery. To assess the extent of postnatal care utilization, respondents who had a birth in the five years preceding the survey were asked whether they received a postnatal checkup after the delivery of their last birth. Table 9.9 shows the timing of postnatal checkups for the most recent birth that occurred outside a health facility. The timing of the first postnatal checkup was not asked of mothers who had an institutional birth because it is assumed that these mothers would normally receive postnatal care within the first two crucial days after delivery as part of their routine care.

Postnatal care is uncommon in Nepal. Seventy-nine percent of mothers who delivered outside a health facility do not receive any postnatal checkup. Less than one in five mothers receive postnatal care within the first two days after delivery.

Postnatal care utilization varies by place of residence. Rural women are slightly more likely to receive postnatal care within two days of delivery, compared with urban women (17 percent and 13 percent, respectively). Women from the *terai* ecological zone, Central development region, and Central *terai* are more likely to receive postnatal care within the first two days of delivery than women from other regions. A somewhat higher percentage of women having no education receive postnatal care within two days of delivery than women having at least an SLC level of education. This anomaly may be because a smaller percentage of deliveries in urban areas and to educated women occur at home, and it could be specific to women or families who have reservations about utilizing health facilities for deliveries.

9.4 REPRODUCTIVE HEALTH CARE AND WOMEN'S STATUS

Table 9.10 shows whether a woman's use of reproductive health services varies by her level of empowerment as measured by three indicators: her participation in decisionmaking, her attitudes toward a woman's right to refuse sex with her husband, and her attitudes toward wife beating. The more say a woman has in decisionmaking, the greater control she has over her reproductive needs. Similarly, empowerment over her reproductive needs is likely to vary positively with the number of reasons she believes a woman is justified in refusing sex with her husband. On the other hand, empowerment over her reproductive needs is likely to vary negatively relative to the number of reasons she believes wife beating is justified.

In the case of Nepal, there is little variation in the utilization of reproductive health services by women's decisionmaking autonomy. However, there is a positive relationship between utilization of reproductive health services and women's empowerment as measured by her attitude toward women's ability to refuse sex with their husband. For example, one in two women who believe that a woman can refuse sex with her husband for three or four reasons receives antenatal care services, compared with only one in three women who believe a wife should refuse sex with her husband for any reason at all. There appears to be a mixed association between women's empowerment as measured by the number of reasons women believe that wife beating is justified and their care-seeking behavior. For example, half as many women who believe that wife beating is not justified for any reason at all receive postnatal care within the first two days of delivery as women who believe that wife beating is justified for five reasons—a positive association. On the other hand, twice as many women in the former group receive delivery assistance from a health professional as women in the latter group—a negative association.

Table 9.9 Postnatal care by background characteristics

Percent distribution of women who had a noninstitutional live birth in the five years preceding the survey by timing of postnatal care for the most recent noninstitutional birth, according to background characteristics, Nepal 2001

Background characteristic	Timing of first postnatal checkup			Did not receive postnatal checkup ¹	Total	Number of women
	Within 2 days of delivery	3-6 days after delivery	7-41 days after delivery			
Age at birth						
<20	18.0	1.1	3.7	77.2	100.0	675
20-34	17.7	0.8	2.7	78.7	100.0	3,082
35-49	12.8	0.4	1.5	85.4	100.0	534
Birth order						
1	17.5	1.9	3.7	77.0	100.0	791
2-3	17.1	0.8	3.1	78.9	100.0	1,715
4-5	17.5	0.1	2.4	80.0	100.0	1,061
6+	16.3	0.8	1.0	81.9	100.0	724
Residence						
Urban	12.6	0.5	5.1	81.8	100.0	180
Rural	17.3	0.8	2.6	79.2	100.0	4,111
Ecological zone						
Mountain	1.8	0.4	0.8	97.1	100.0	350
Hill	2.0	0.4	2.1	95.5	100.0	1,781
Terai	32.1	1.2	3.5	63.1	100.0	2,160
Development region						
Eastern	13.2	1.5	4.0	81.2	100.0	986
Central	39.4	0.6	2.3	57.7	100.0	1,335
Western	8.5	0.8	2.1	88.6	100.0	838
Mid-western	0.5	0.6	2.7	96.1	100.0	663
Far-western	1.1	0.2	2.0	96.6	100.0	470
Subregion						
Eastern Mountain	4.9	0.5	0.5	94.0	100.0	69
Central Mountain	1.4	0.5	0.5	97.7	100.0	117
Western Mountain	0.7	0.4	1.1	97.9	100.0	163
Eastern Hill	2.3	0.3	2.7	94.7	100.0	331
Central Hill	2.6	0.7	3.6	93.1	100.0	378
Western Hill	3.8	0.8	1.9	93.4	100.0	465
Mid-western Hill	0.0	0.0	1.4	98.6	100.0	393
Far-western Hill	0.0	0.0	0.3	99.7	100.0	214
Eastern Terai	20.3	2.3	5.2	72.1	100.0	586
Central Terai	61.2	0.5	2.0	36.3	100.0	840
Western Terai	14.3	0.8	2.4	82.4	100.0	372
Mid-western Terai	1.6	2.0	6.1	90.3	100.0	205
Far-western Terai	2.5	0.3	4.6	92.5	100.0	156
Education						
No education	18.8	0.6	2.2	78.3	100.0	3,289
Primary	11.4	0.6	3.4	84.6	100.0	601
Some secondary	11.7	1.9	4.8	81.6	100.0	315
SLC and above	14.5	5.4	8.0	72.1	100.0	86
Total	17.1	0.8	2.7	79.3	100.0	4,291

Note: Total includes women for whom information on timing or postnatal care is not known or missing and not shown separately.

SLC = School Leaving Certificate

¹Includes women who received the first postnatal checkup after 41 days

Table 9.10 Reproductive health care by women's status

Percentage of women who had a live birth in the five years preceding the survey, who received antenatal care and postnatal care from a medical professional for the most recent birth, and percentage of births in the five years preceding the survey for which mothers received professional delivery care, by women's status indicators, Nepal 2001

Women's status indicator	Percentage of women who received antenatal care from a doctor/nurse/ANM/HA/AHW/MCHW/VHW	Percentage of women who received postnatal care within the first two days of delivery ¹	Number of women	Percentage of births for whom mothers received delivery care from a doctor/nurse/ANM/HA/AHW/MCHW/VHW	Number of births
Number of decisions in which woman has final say²					
0	52.8	26.0	758	13.7	1,061
1-2	46.3	24.6	2,276	11.8	3,460
3-4	51.5	27.0	935	14.7	1,347
5	47.7	23.2	777	13.2	1,110
Number of reasons to refuse sex with husband					
0	33.7	13.9	55	6.5	84
1-2	35.6	19.7	144	14.4	213
3-4	49.1	25.4	4,547	12.9	6,681
Number of reasons wife beating is justified					
0	48.3	24.4	3,357	13.1	4,932
1-2	48.3	20.8	1,095	12.2	1,601
3-4	53.1	48.6	240	14.6	358
5	50.1	46.4	53	6.0	87
Total	48.6	25.1	4,745	12.9	6,978
ANM = Auxiliary nurse midwife					
HA = Health assistant					
AHW = Auxiliary health worker					
MCHW = Maternal child health worker					
VHW = Village health worker					
¹ Includes mothers who delivered in a health facility					
² Either by herself or jointly with others					

9.5 VACCINATION OF CHILDREN

Universal immunization of children under one year of age against the six vaccine-preventable diseases (tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles) is one of the most cost-effective programs in reducing infant and child morbidity and mortality. The expanded program on immunization (EPI) is a priority program for the government of Nepal. Among the immediate objectives of the program are: to reduce measles cases by 90 percent and deaths due to measles by 95 percent from previous levels by the year 2000; and to eradicate polio by the year 2000 (Ministry of Health, 2001). Since 1988, the expanded program on immunization under the Ministry of Health has covered all 75 districts of Nepal. The program in Nepal follows the guidelines set by the World Health Organization. To be fully immunized, a child should receive the following vaccinations: one

dose of BCG, three doses each of DPT and polio, and one dose of measles vaccine. BCG, which is given at birth or at first clinical contact, protects against tuberculosis. DPT protects against diphtheria, pertussis, and tetanus. DPT and polio each require three vaccinations at approximately six, ten, and 14 weeks of age; however, since this regime is not always followed, emphasis is given on getting all three doses by the time the child reaches 12 months of age. Measles should be given at or soon after the child reaches nine months. It is recommended that children receive the complete schedule of vaccinations before 12 months of age. Children who receive protection against all six vaccine-preventable illnesses are considered fully vaccinated.

In addition to the routine doses of polio vaccines given during clinical visits, the EPI program in Nepal includes supplemental immunization activities, including national immunization days (NIDs) for polio eradication and outbreak response immunization for all cases in high-risk areas (Ministry of Health, 2001). The NIDs have been held regularly since 1996 and more recently a modification of the immunization strategy has resulted in intensive national immunization days, including sub-national immunization days (SNIDs) and mopping-up rounds.

The 2001 NDHS collected information on childhood immunization coverage, including immunizations received during national immunization day campaigns, for all living children born in the five years preceding the survey. This information is important for the monitoring and evaluation of the EPI. Information on vaccination coverage was collected in two ways: from vaccination cards shown to the interviewer and from mother's verbal reports. If the cards were available, the interviewer copied the vaccination dates directly onto the questionnaire. When a vaccination card for the child was not seen or if a vaccine had not been recorded as being given, the mother was asked to recall the vaccines given to her child. In Nepal, mothers often do not receive or keep vaccination cards, so most data depends on accurate recall of their children's vaccination. Information was also collected on whether a child ever had a vaccination card. Table 9.11 shows the percentage of children age 12-23 months who have received the various vaccinations by source of information, that is, from vaccination card or mother's report. This is the youngest cohort of children who have reached the age by which they should be fully immunized.

Table 9.11 Vaccinations by source of information

Percentage of children age 12-23 months who received specific vaccines at any time before the survey, by source of information (vaccination card or mother's report), and percentage vaccinated by 12 months of age, Nepal 2001

Source of information	BCG	DPT			Polio ¹				Measles	All ²	No vaccinations	Number of children
		1	2	3	0	1	2	3				
Vaccinated at any time before survey												
Vaccination card	16.1	15.8	15.2	14.2	0.3	16.0	15.9	15.5	12.9	12.5	0.0	212
Mother's report	68.3	68.1	63.5	58.0	1.7	83.0	82.6	76.0	57.7	53.1	0.9	1,101
Either source	84.5	84.0	78.7	72.1	2.0	99.0	98.5	91.5	70.6	65.6	0.9	1,313
Vaccinated by 12 months of age³												
	82.9	82.5	77.4	70.6	2.0	97.3	96.4	90.4	63.6	60.1	3.4	1,313

¹ Polio 0 is the polio vaccination given at birth.
² BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)
³ For children whose information was based on the mother's report, the proportion of vaccinations given during the first year of life was assumed to be the same as for children with a written record of vaccination.

Sixty percent of children are fully vaccinated by 12 months of age, 83 percent have received the BCG vaccination, and 64 percent have been vaccinated against measles. Coverage for the first dose of DPT is 83 percent, but this drops to 77 percent for the second dose and further to 71 percent for the third dose. Polio coverage is much higher at 97 percent for the first dose, 96 percent for the second dose, and 90 percent for the third dose. Although DPT and polio vaccinations are provided at the same time, polio coverage is much higher than DPT coverage primarily because of the success of the intensive national immunization day campaigns and other polio eradication activities. The Nepal Micronutrient Status Survey (NMSS), carried out in 1998, also showed a very high coverage for polio (96 percent) among children age 12-23 months (Ministry of Health, 1999).

Vaccination coverage has improved significantly over the last five years (Figure 9.2). The percentage of children age 12-23 months who are fully immunized by 12 months of age increased by 67 percent, from 36 percent in 1996 (Pradhan et al., 1997) to 60 percent in 2001. Coverage with all three doses of DPT increased from 51 to 71 percent of children, while complete polio coverage increased from 48 to 90 percent of children. BCG coverage increased from 73 to 83 percent, and measles vaccination increased from 45 to 64 percent.

Figure 9.2 Percentage of Children Age 12-23 Months Who Received Specific Vaccinations by 12 Months of Age, 1996 and 2001

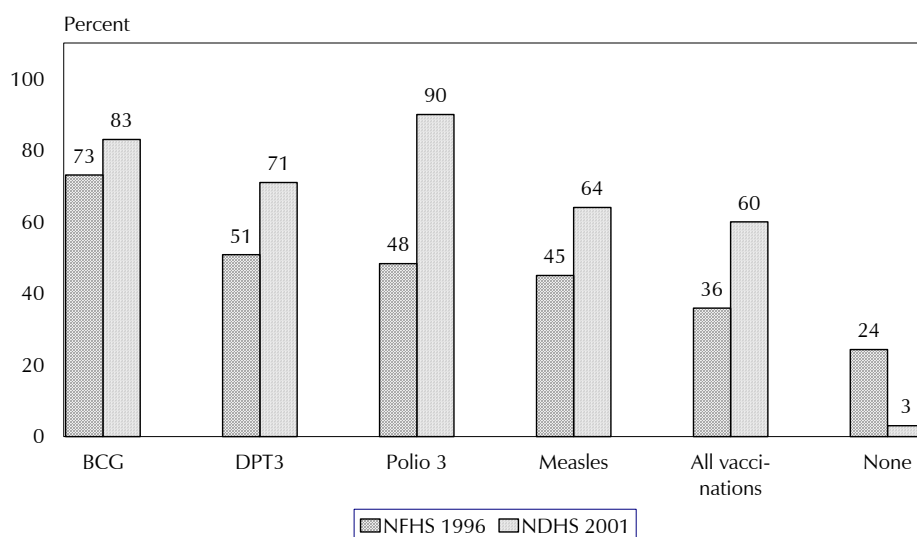


Table 9.12 presents vaccination coverage at any time before the survey (according to information from vaccination cards and mothers' reports) among children age 12-23 months by background characteristics. Male children are slightly more likely to be fully immunized than female children (68 percent versus 64 percent). Birth order has a negative relationship with vaccination coverage—as the birth order increases vaccination coverage decreases. More than 71 percent of first and second order births were fully immunized, compared with only 54 percent for sixth and higher order births.

Table 9.12 Vaccinations by background characteristics

Percentage of children age 12-23 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report), and percentage with a vaccination card, by background characteristics, Nepal 2001

Background characteristic	DPT			Polio ¹				Measles	All ²	No vaccinations	Percentage with a vaccination card seen	Number of children	
	BCG	1	2	3	0	1	2						3
Sex													
Male	86.1	85.8	81.8	74.2	2.9	99.3	99.0	92.1	72.9	67.5	0.7	17.3	631
Female	82.9	82.3	75.8	70.2	1.2	98.7	98.1	90.9	68.5	63.9	1.0	15.1	682
Birth order													
1	90.5	91.2	87.1	78.2	2.9	98.6	98.6	95.2	76.3	71.6	1.4	20.6	326
2-3	87.9	87.1	82.3	77.7	2.7	99.1	98.5	93.1	74.9	71.1	0.9	15.4	531
4-5	79.4	78.5	70.9	62.8	0.7	98.6	97.8	89.0	62.1	55.6	0.8	15.0	265
6+	71.7	70.4	65.1	59.2	0.4	100.0	99.4	84.1	60.7	54.0	0.0	12.2	190
Residence													
Urban	88.4	88.0	86.4	78.2	6.2	100.0	98.2	95.4	80.6	74.9	0.0	17.5	87
Rural	84.2	83.7	78.1	71.7	1.7	98.9	98.5	91.2	69.9	65.0	0.9	16.1	1,226
Ecological zone													
Mountain	78.0	78.5	71.5	67.0	0.6	99.4	98.4	85.0	72.3	63.5	0.6	8.8	95
Hill	83.3	82.4	80.3	76.8	2.8	98.2	98.0	89.7	73.2	70.4	1.5	12.9	564
Terai	86.4	86.1	78.3	68.8	1.5	99.6	99.0	94.0	68.1	61.8	0.4	20.0	654
Development region													
Eastern	92.5	92.1	88.6	81.0	3.6	100.0	99.5	96.5	78.6	73.8	0.0	21.5	303
Central	84.9	84.6	76.8	67.3	0.9	98.9	98.7	91.7	64.9	60.0	1.1	12.6	423
Western	84.8	84.5	77.9	73.1	3.2	97.3	96.9	93.2	68.0	64.8	2.7	22.4	230
Mid-western	81.7	80.5	78.6	74.0	1.2	99.2	98.7	86.4	76.1	69.9	0.0	9.9	216
Far-western	69.5	68.7	64.1	63.2	1.0	99.6	98.3	85.3	66.5	59.7	0.4	15.0	141
Subregion													
Eastern Mountain	(74.4)	(82.1)	(74.4)	(71.8)	(0.0)	(100.0)	(97.4)	(84.6)	(74.4)	(71.8)	(0.0)	(12.8)	15
Central Mountain	91.3	92.8	85.5	81.2	0.0	98.6	98.6	92.8	79.7	76.8	1.4	14.5	36
Western Mountain	68.0	65.3	58.7	53.3	1.3	100.0	98.7	78.7	65.3	49.3	0.0	2.7	43
Eastern Hill	93.1	92.2	91.2	86.3	3.9	100.0	100.0	98.0	76.5	75.5	0.0	15.7	112
Central Hill	82.6	80.1	80.1	77.0	1.9	98.1	98.1	86.8	70.0	68.5	1.9	16.4	132
Western Hill	90.3	91.4	87.1	83.9	6.1	95.7	95.7	94.6	77.4	76.3	4.3	16.8	122
Mid-western Hill	81.3	80.0	78.8	75.0	1.3	98.8	98.8	85.0	77.5	73.8	0.0	5.0	133
Far-western Hill	58.3	58.3	52.4	50.5	0.0	99.0	97.1	81.8	57.3	47.6	1.0	9.8	64
Eastern Terai	93.6	92.9	88.2	78.4	3.8	100.0	99.3	96.5	80.2	72.9	0.0	25.9	176
Central Terai	85.2	85.8	73.9	60.3	0.6	99.4	99.0	94.1	60.1	53.2	0.6	10.3	255
Western Terai	78.7	76.9	67.6	61.1	0.0	99.1	98.1	91.7	57.4	51.9	0.9	28.7	109
Mid-western Terai	83.1	82.7	80.6	76.8	1.3	100.0	99.2	90.3	73.4	66.7	0.0	22.4	66
Far-western Terai	88.8	87.8	85.7	85.7	1.7	100.0	99.0	94.8	82.5	81.8	0.0	27.6	49
Mother's education													
No education	79.7	78.8	72.5	64.3	1.1	98.6	98.1	89.0	63.2	57.0	1.2	14.3	931
Primary	94.4	94.7	90.8	87.8	3.2	100.0	99.4	96.5	84.6	83.2	0.0	19.6	191
Some secondary	96.7	97.9	96.2	93.6	4.5	100.0	99.2	98.5	92.9	89.6	0.0	22.1	132
SLC and above	100.0	100.0	97.8	96.4	6.6	100.0	100.0	100.0	93.1	90.9	0.0	20.8	58
Total	84.5	84.0	78.7	72.1	2.0	99.0	98.5	91.5	70.6	65.6	0.9	16.2	1,313

Note: Figures in parentheses are based on 25-49 unweighted cases.

SLC = School Leaving Certificate

¹Polio 0 is the polio vaccination given at birth.

²BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)

As expected, urban coverage (75 percent) is higher than rural coverage (65 percent); however, the gap has narrowed over the last five years. This indicates that there has been considerable improvement in immunization coverage in rural areas, while a relatively smaller change occurred in urban areas. The percentage of children age 12-23 months fully immunized is higher among children residing in the hill ecological zone than among children residing in the mountain and *terai* zones. In spite of the fact that transportation is better in the *terai* and it is easier to maintain a cold-chain, the coverage in that zone is lower. This could be attributed to a higher dropout in the third dose of DPT and a lower coverage for the measles vaccination. The Eastern development region has the highest immunization coverage (74 percent) compared with the other development regions. Immunization coverage is highest in the Far-western *terai* subregion (82 percent).

The percentage of children fully immunized increases with mother's educational level. For example, only 57 percent of children of mothers with no education are fully immunized, compared with 91 percent of children whose mothers have completed an SLC or above.

Vaccination cards were seen for 16 percent of children, with first order births and children from the *terai* region the most likely to have cards. Educated mothers are also more likely to show a vaccination card than mothers with little or no education.

9.6 PREVALENCE AND TREATMENT OF ARI AND FEVER

ACUTE RESPIRATORY INFECTION

Acute respiratory infection (ARI) is one of the leading causes of childhood morbidity and mortality in Nepal. The ARI program focuses on its early diagnosis and treatment with antibiotics, which can prevent a large proportion of deaths due to pneumonia. Therefore, emphasis is placed in the early recognition of the signs of ARI and its impending severity by primary health care workers and health volunteers. In the 2001 NDHS, the prevalence of ARI was estimated by asking mothers whether their children below five years of age had been sick with a cough accompanied by short, rapid breathing in the two weeks preceding the survey. These symptoms are compatible with ARI. It should be noted that morbidity data are subjective since the information is based on a mother's perception of her child's illness without any medical diagnosis. The prevalence of ARI is also subject to seasonality.

Table 9.13 shows that 23 percent of children below five years of age had symptoms of ARI at some time in the two weeks preceding the survey. The prevalence of ARI varies with the age of the child. Prevalence was highest among children 6-11 months of age. The prevalence of ARI decreases with increasing age. There are no significant differences in the prevalence of ARI by sex of the child and urban-rural residence. However, there are marked differences by region of residence. The prevalence of ARI is lowest in the hill zone (20 percent) compared with the *terai* and mountain zones. Prevalence is also lowest in the Mid-western region (15 percent) and highest in the Eastern region (30 percent) compared with the other development regions.

ARI prevalence varied little by mothers' education, with the exception of children of mothers with at least an SLC level of education, who are least likely to show symptoms of ARI. Prevalence is also slightly higher among children whose mothers smoke cigarettes or other tobacco (25 percent) than among children of mothers who do not smoke (22 percent).

Table 9.13 Prevalence and treatment of symptoms of ARI and fever

Percentage of children under five years who had a cough accompanied by short, rapid breathing (symptoms of ARI) in the two weeks preceding the survey, and percentage who had fever in the two weeks preceding the survey, and among children with symptoms of ARI and/or fever, percentage for whom treatment was sought from a health facility or provider, by background characteristics, Nepal 2001

Background characteristic	Children with symptoms of ARI	Children with fever	Number of children	Children with symptoms of ARI and/or fever, for whom treatment was sought from a health facility/provider ¹	Number of children
Age in months					
<6	28.1	27.9	651	21.6	259
6-11	36.3	47.8	631	27.9	357
12-23	27.7	40.9	1,313	25.8	626
24-35	21.5	32.4	1,245	19.4	481
36-47	17.7	26.1	1,329	21.8	419
48-59	15.0	22.8	1,301	25.5	354
Sex					
Male	23.7	32.1	3,194	25.9	1,238
Female	21.8	31.8	3,277	21.6	1,259
Residence					
Urban	23.8	26.7	431	33.3	158
Rural	22.7	32.3	6,040	23.1	2,338
Ecological zone					
Mountain	31.7	32.9	480	21.7	198
Hill	20.3	30.3	2,698	23.7	947
Terai	23.5	33.2	3,292	24.0	1,351
Development region					
Eastern	30.0	35.1	1,499	28.5	662
Central	25.4	35.7	2,126	20.0	918
Western	18.4	27.0	1,196	29.7	397
Mid-western	15.1	27.1	975	17.7	297
Far-western	17.4	29.0	674	22.7	223
Subregion					
Eastern Mountain	29.9	33.7	99	26.9	40
Central Mountain	47.6	40.5	163	19.7	94
Western Mountain	20.7	26.8	218	21.4	65
Eastern Hill	23.7	29.4	498	25.2	166
Central Hill	25.1	30.7	656	29.7	244
Western Hill	22.6	32.8	653	27.1	259
Mid-western Hill	12.4	27.9	593	12.3	177
Far-western Hill	15.0	30.4	298	18.4	101
Eastern Terai	33.5	38.4	901	29.8	456
Central Terai	22.8	37.6	1,306	15.9	579
Western Terai	13.3	20.1	543	34.5	138
Mid-western Terai	22.2	28.9	298	28.4	104
Far-western Terai	14.7	24.6	244	26.5	73
Mother's education					
No education	22.6	32.8	4,758	20.9	1,840
Primary	24.6	29.9	915	31.3	353
Some secondary	23.1	30.0	553	33.7	218
SLC and above	18.6	27.6	244	28.9	86
Mother's smoking status					
Smokes cigarettes/tobacco	25.4	na	1,671	na	670
Does not smoke cigarettes/tobacco	21.9	na	4,799	na	1,826
Total	22.8	32.0	6,471	23.7	2,496

na = Not applicable

ARI = Acute respiratory infection

SLC = School Leaving Certificate

¹Excludes pharmacy, shop, and traditional practitioner

FEVER

Fever is a manifestation of malaria, although it also accompanies various other illnesses. Malaria and fever contribute to high levels of malnutrition and high mortality. Although fever can occur throughout the year, malaria is more prevalent during the rainy season. For this reason, temporal factors must be taken into account when interpreting fever as an indicator of malaria prevalence. Presumptive treatment of fever with antimalarial tablets is advocated where malaria is endemic. Table 9.13 shows the percentage of children under five years of age who had fever during the two weeks preceding the survey.

Thirty-two percent of children under five years of age had fever in the two weeks preceding the survey. The prevalence of fever varies with the age of the child. One in two children age 6-11 months had fever; this decreases to about one in five children among those age 48-59 months. There is little variation in the prevalence of fever by sex, but children residing in rural areas have a higher prevalence of fever (32 percent) than urban children (27 percent). Differences in the prevalence of fever by ecological region are minor. Prevalence of fever is lowest among children of mothers with at least an SLC level of education.

TREATMENT OF ARI AND FEVER

Table 9.13 shows the percentage of children with symptoms of ARI and or fever for whom treatment was sought. As shown by the table, use of a health facility or provider for the treatment of ARI and/or fever is low in Nepal. Less than one in four children (24 percent) with symptoms of ARI and/or fever were taken to a health facility or provider for the treatment of ARI. Children age 24-35 months are least likely (19 percent) to be taken for treatment, while those age 6-11 months are most likely to be taken for treatment (28 percent). A higher proportion of male than female children are taken for treatment (26 percent versus 22 percent). Likewise a higher proportion of urban than rural children are taken to a health facility or provider (33 percent versus 23 percent). Children residing in the Eastern and Western development regions and especially the Western *terai* subregion are more likely than other children to be taken for treatment. Children of mothers with no education are least likely to be taken for treatment (21 percent), compared with mothers with some education.

9.7 DIARRHEA

STOOL DISPOSAL

Diarrhea is frequently caused by the use of contaminated water and unhygienic practices related to food preparation and excreta disposal. If human feces are left uncontained, diarrheal disease may spread by direct or indirect contact. So stool disposal practices also play a vital role in the prevalence of diarrhea.

Table 9.14 presents information on the disposal of the stools of children under five years of age by background characteristics and type of toilet facilities available in the household. Only 18 percent of children's stools are "contained," that is, the child always uses the toilet facilities or the child's stool is thrown into the toilet or buried in the yard. On the other hand, 65 percent of children's stools are either thrown outside the dwelling or yard, while 15 percent of children's stools are rinsed away, indicating a high potential in Nepal for the spread of diarrheal diseases from uncontained stools.

Table 9.14 Disposal of child's stools

Percent distribution of mothers whose youngest child under five years is living with her by way in which child's fecal matter is disposed of, according to background characteristics and type of toilet facilities in household, Nepal 2001

Background characteristic	Stools contained			Stools not contained					Total	Number of mothers
	Child always uses toilet/latrine	Thrown into toilet/latrine	Buried in yard	Thrown outside dwelling	Thrown outside yard	Rinsed away	Not disposed of	Other		
Residence										
Urban	4.0	34.9	8.0	16.1	25.1	8.9	0.5	2.4	100.0	325
Rural	0.6	7.5	7.2	14.1	52.3	15.0	0.9	2.3	100.0	4,286
Ecological zone										
Mountain	1.4	7.0	5.6	18.3	44.9	21.1	0.5	1.2	100.0	345
Hill	1.0	15.3	8.3	14.3	45.0	12.7	1.2	2.2	100.0	1,933
Terai	0.5	5.0	6.6	13.6	55.7	15.3	0.7	2.6	100.0	2,333
Development region										
Eastern	1.7	10.9	9.8	17.7	42.9	13.4	2.2	1.4	100.0	1,079
Central	1.1	9.2	5.1	6.2	58.7	17.6	0.2	1.9	100.0	1,483
Western	0.0	17.2	10.9	19.6	29.8	14.8	1.0	6.6	100.0	887
Mid-western	0.3	2.7	4.4	9.7	70.2	11.8	0.7	0.3	100.0	676
Far-western	0.4	2.3	5.5	27.6	51.6	11.8	0.1	0.7	100.0	486
Subregion										
Eastern Mountain	3.7	16.6	8.6	16.0	36.4	17.6	1.1	0.0	100.0	71
Central Mountain	0.4	7.6	7.2	14.3	30.0	36.8	0.4	3.1	100.0	118
Western Mountain	1.1	2.2	3.0	22.2	60.0	10.7	0.4	0.4	100.0	156
Eastern Hill	4.5	14.6	9.7	12.9	46.6	5.8	3.6	2.3	100.0	340
Central Hill	1.0	22.5	10.0	9.9	37.7	16.6	0.4	1.9	100.0	476
Western Hill	0.0	25.9	12.4	23.2	17.0	16.0	0.8	4.7	100.0	504
Mid-western Hill	0.0	1.3	3.4	4.2	79.4	10.5	1.3	0.0	100.0	397
Far-western Hill	0.0	1.2	2.3	23.6	61.0	11.1	0.0	0.9	100.0	216
Eastern Terai	0.0	8.5	9.9	20.3	41.8	16.7	1.6	1.2	100.0	667
Central Terai	1.2	2.2	2.3	3.2	73.7	15.6	0.0	1.6	100.0	889
Western Terai	0.0	5.8	8.9	14.9	46.7	13.3	1.3	9.2	100.0	383
Mid-western Terai	1.0	5.4	6.8	19.6	50.5	15.7	0.0	0.9	100.0	219
Far-western Terai	0.0	3.8	10.3	31.1	42.8	11.5	0.0	0.6	100.0	175
Education										
No education	0.2	4.4	5.2	15.2	57.2	14.8	0.9	2.0	100.0	3,330
Primary	1.9	15.8	10.7	13.4	38.1	15.2	1.2	3.7	100.0	673
Some secondary	2.2	25.5	15.3	11.5	29.5	13.4	0.3	2.5	100.0	423
SLC and above	4.3	41.3	13.7	6.1	20.1	12.4	0.0	2.3	100.0	184
Toilet facilities										
None	0.0	1.9	5.4	14.7	58.9	15.7	1.0	2.3	100.0	3,469
Traditional pit toilet	2.1	26.3	14.7	14.7	28.0	11.4	0.7	2.0	100.0	700
Ventilated improved pit latrine	4.4	31.7	16.7	6.8	25.4	10.3	0.0	4.6	100.0	79
Flush toilet	4.9	44.6	8.2	10.1	17.5	11.7	0.6	2.4	100.0	362
Total	0.8	9.5	7.2	14.2	50.4	14.6	0.9	2.3	100.0	4,611

Note: Total include one mother for whom information on toilet facilities was given as 'other' and women for whom information on disposal of child's stool is missing, who are not shown separately.

SLC = School Leaving Certificate

The way in which children's stools are disposed of varies markedly by urban-rural residence. Forty-seven percent of urban children's stools are contained, compared with only 15 percent in rural areas. Regional variations exist in the practice of stool disposal. Hygienic disposal of stools is more common in the hill ecological zone and in the Western development region than in the other regions. Not surprisingly, education exerts a positive influence on the hygienic disposal of children's stools, as does the availability of toilet facilities.

PREVALENCE OF DIARRHEA

Diarrhea has been singled out for investigation for two reasons. Dehydration caused by diarrhea is a major cause of morbidity and mortality among young children, and the condition can be easily treated by oral rehydration therapy (ORT). Exposure to agents that cause diarrheal disease is frequently related to the use of contaminated water and unhygienic practices of food preparation and excreta disposal. The most effective way to control dehydration is to administer oral rehydration therapy promptly.

The Ministry of Health in Nepal has given high priority to the control of diarrhea through preventive as well as curative strategies. To reduce the severity of symptoms from dehydration, health education programs promote the use of ORT. The availability of oral rehydration salt (ORS) packages all over the country has been increased along with an expanded social marketing system providing supplies to female community health volunteers. In the 2001 NDHS, information was collected on the prevalence of diarrhea among children under five years of age in the two weeks before the interview. The information on prevalence should be interpreted with caution since the incidence of diarrhea varies with the season.

Table 9.15 shows the percentage of children under five years of age with diarrhea in the two weeks preceding the survey by selected background characteristics. One in five children experienced diarrhea at some time in the two weeks preceding the survey.

Table 9.15 Prevalence of diarrhea

Percentage of children under five years with diarrhea in the two weeks preceding the survey, by background characteristics, Nepal 2001

Background characteristic	Diarrhea in the two weeks preceding the survey	Number of children
Age		
<6	18.7	651
6-11	34.5	631
12-23	29.6	1,313
24-35	20.2	1,245
36-47	15.3	1,329
48-59	10.6	1,301
Sex		
Male	21.3	3,194
Female	19.5	3,277
Residence		
Urban	16.6	431
Rural	20.7	6,040
Ecological zone		
Mountain	20.2	480
Hill	18.5	2,698
Terai	22.0	3,292
Development region		
Eastern	23.8	1,499
Central	23.2	2,126
Western	17.1	1,196
Mid-western	13.8	975
Far-western	19.2	674
Subregion		
Eastern Mountain	21.5	99
Central Mountain	25.2	163
Western Mountain	15.9	218
Eastern Hill	25.7	498
Central Hill	15.9	656
Western Hill	19.5	653
Mid-western Hill	13.1	593
Far-western Hill	21.2	298
Eastern Terai	23.1	901
Central Terai	26.6	1,306
Western Terai	14.3	543
Mid-western Terai	16.7	298
Far-western Terai	16.5	244
Mother's education		
No education	21.2	4,758
Primary	20.6	915
Some secondary	16.4	553
SLC and above	13.2	244
Source of drinking water		
Piped water	19.7	2,110
Dug well	22.0	2,681
Tubewell/borehole	23.5	259
Surface water	17.8	1,417
Total	20.4	6,471

Note: Total includes 4 children for whom information on source of drinking water is missing, and not shown separately.

SLC = School Leaving Certificate

The incidence of diarrhea varies with age. Prevalence is highest among children age 6-11 months (35 percent). There is little discernible difference in the prevalence of diarrhea by sex of the child, urban-rural residence, and ecological zone. Prevalence is higher in the Eastern and Central development regions.

Children of mothers with little or no education are also more likely to have diarrhea than children of mothers with at least some secondary education. Children living in households where the main source of drinking water is from a well (dug well, tube well, or borehole) are also more prone to diarrhea than children living in households with access to piped drinking water.

KNOWLEDGE OF ORS PACKETS

A major component of ORT is the early administration of a solution prepared from ORS packets to prevent dehydration. To assess the knowledge of ORS in Nepal, mothers were asked whether they know about ORS packets.

Table 9.16 shows the percentage of mothers who know about ORS packets for treatment of diarrhea among women who gave birth in the five years preceding the survey. As indicated by the table, knowledge of ORS packets is nearly universal (98 percent). No discernible differences in knowledge by background characteristics exist.

DIARRHEA TREATMENT

Table 9.17 provides information on whether medical care was sought for diarrhea in the two weeks preceding the survey. The percentage of children who received specific treatments for diarrhea is also shown by selected background characteristics. Particular attention is focused on treatment with oral rehydration therapy, including the use of ORS packets, and increased fluids. Oral rehydration therapy in Nepal includes recommended home fluids, but the use of oral rehydration salts is the main method being promoted. Recommended home fluids according to the Ministry of Health guidelines include breast milk and other liquids, but sugar-salt-water solution is no longer being actively promoted. The policy has also seen a shift in recent years, emphasizing the importance of giving increased fluid during diarrheal episodes, away from specifying the types of fluids to be given (NPC, 2000).

Table 9.16 Knowledge of ORS packets

Percentage of mothers with births in the five years preceding the survey who know about ORS packets for treatment of diarrhea, by background characteristics, Nepal 2001

Background characteristic	Percentage of mothers who know about ORS packets	Number of children
Age		
15-19	97.9	379
20-24	98.3	1,370
25-29	98.3	1,354
30-34	97.6	850
35-49	96.0	792
Residence		
Urban	98.3	332
Rural	97.7	4,414
Ecological zone		
Mountain	95.8	361
Hill	97.6	1,979
Terai	98.2	2,405
Development region		
Eastern	97.3	1,102
Central	98.3	1,535
Western	97.3	914
Mid-western	98.8	693
Far-western	96.5	502
Subregion		
Eastern Mountain	95.9	74
Central Mountain	99.1	122
Western Mountain	93.4	166
Eastern Hill	97.8	347
Central Hill	97.7	484
Western Hill	96.7	521
Mid-western Hill	99.6	405
Far-western Hill	95.2	223
Eastern Terai	97.3	681
Central Terai	98.5	930
Western Terai	98.0	393
Mid-western Terai	99.3	222
Far-western Terai	99.3	179
Education		
No education	97.0	3,437
Primary	99.4	684
Some secondary	99.8	439
SLC and above	100.0	186
Total	97.8	4,745

ORS = Oral rehydration salts
SLC = School Leaving Certificate

Table 9.17 Diarrhea treatment

Percentage of children under five years who had diarrhea in the two weeks preceding the survey taken for treatment to a health provider, percentage who received oral rehydration therapy (ORT), and percentage given other treatments, by background characteristics, Nepal 2001

Background characteristic	Percentage taken to a health provider ¹	Oral rehydration therapy (ORT)			Other treatments				No treatment	Number of children
		ORS packets	Increased fluids	ORS or increased fluids	Pill/syrup	Injection	Intra-venous solution	Home remedy/other		
Age in months										
<6	9.9	11.2	13.3	19.5	24.0	2.4	0.0	2.2	64.2	121
6-11	23.1	23.8	20.7	35.6	42.2	1.5	0.6	7.0	39.1	218
12-23	26.3	39.2	31.3	54.9	44.9	0.8	1.2	5.9	28.8	388
24-35	20.1	32.9	35.4	54.8	35.5	1.2	0.5	8.1	28.1	251
36-47	18.3	41.3	22.8	50.4	34.6	0.9	0.4	6.2	32.5	203
48-59	19.9	29.2	24.4	43.4	28.9	0.0	0.0	14.8	37.4	138
Sex										
Male	20.2	32.5	28.2	48.5	37.7	0.9	0.4	6.7	33.4	681
Female	22.2	31.8	24.9	44.4	37.3	1.3	0.8	7.5	36.9	639
Residence										
Urban	23.1	45.6	39.2	63.2	43.6	0.0	1.2	4.0	25.7	71
Rural	21.1	31.4	25.9	45.6	37.1	1.1	0.6	7.3	35.6	1,249
Ecological zone										
Mountain	28.2	29.1	28.4	48.1	19.2	0.6	0.0	6.9	43.9	97
Hill	23.7	31.2	37.7	52.1	28.1	1.0	0.3	7.8	36.3	500
Terai	18.5	33.2	18.7	42.5	46.4	1.2	0.9	6.7	33.1	723
Development region										
Eastern	19.1	38.7	32.3	51.5	33.2	1.7	0.6	8.2	33.6	357
Central	17.6	27.2	16.5	37.7	45.5	0.8	1.2	5.9	36.3	493
Western	30.0	33.8	33.5	52.1	35.6	0.0	0.0	7.6	34.8	205
Mid-western	16.7	27.5	37.3	53.2	26.1	1.2	0.0	10.3	34.1	135
Far-western	31.3	35.5	27.2	50.8	33.9	1.7	0.0	5.1	35.8	130
Subregion										
Eastern Mountain	32.1	33.9	50.0	58.9	25.0	0.0	0.0	12.5	30.4	21
Central Mountain	20.5	23.1	24.4	43.6	14.1	0.0	0.0	1.3	51.3	41
Western Mountain	35.0	33.3	20.0	46.7	21.7	1.7	0.0	10.0	43.3	35
Eastern Hill	22.4	42.2	44.8	60.3	16.4	0.0	0.0	12.1	33.6	128
Central Hill	26.4	29.6	34.4	50.0	34.8	2.4	1.2	4.0	35.2	104
Western Hill	29.8	33.2	39.4	55.1	35.6	0.0	0.0	6.2	34.6	127
Mid-western Hill	(8.6)	(17.2)	(37.5)	(46.1)	(21.6)	(2.2)	(0.0)	(10.8)	(40.9)	77
Far-western Hill	27.7	24.7	25.7	40.3	33.7	1.0	0.0	5.0	41.0	63
Eastern Terai	15.7	37.0	22.9	45.3	44.3	3.0	1.0	5.4	34.0	208
Central Terai	14.6	26.9	10.3	33.3	52.4	0.4	1.3	6.9	34.9	348
Western Terai	30.3	34.6	23.8	47.2	35.5	0.0	0.0	10.0	35.1	77
Mid-western Terai	27.4	46.9	38.5	67.0	34.1	0.0	0.0	11.2	19.6	50
Far-western Terai	33.2	48.7	36.2	67.7	42.2	2.6	0.0	0.0	25.4	40
Mother's education										
No education	18.7	29.1	21.6	42.5	35.9	1.2	0.5	7.3	37.3	1,009
Primary	27.4	39.0	37.7	55.0	40.6	0.0	1.5	4.8	31.5	188
Some secondary	26.7	43.0	47.0	62.7	40.7	0.0	0.0	8.6	26.8	91
SLC and above	(45.9)	(57.9)	(60.4)	(76.5)	(60.3)	(7.7)	(0.0)	(10.5)	(9.4)	32
Total	21.2	32.2	26.6	46.5	37.5	1.1	0.6	7.1	35.1	1,320

Note: Total includes children with missing information on diarrhea treatment who are not shown separately. Figures in parentheses are based on 25-49 unweighted cases.

ORS = Oral rehydration salts

SLC = School Leaving Certificate

¹ Excludes pharmacy, shop, and traditional practitioner

One in five children with diarrhea in the two weeks prior to the survey was taken to a health facility for treatment. Children age 12-23 months are most likely to be taken for treatment, and children less than six months of age are least likely. There is little difference in the percentage of children taken for treatment for diarrhea by child's sex and urban-rural residence. Children residing in the mountain ecological zone (28 percent) and children from the Western and Far-western development regions (about 30 percent) are more likely to be taken to a health facility for treatment than children residing in the other regions.

Children of mothers with an SLC are more than twice as likely to take their sick children to a health facility as mothers with no education.

Almost half of children with diarrhea received some sort of oral rehydration therapy, that is, either ORS or increased fluids, with 32 percent of children being treated with ORS and 27 percent receiving increased fluids. Thirty-eight percent of children were given a pill or syrup, while 7 percent receive home remedies or other treatments. However, a large proportion of children with diarrhea (35 percent) were not given any treatment.

Generally, therapeutic intervention increases with the increasing age of the child up to 24-35 months and then declines thereafter. Similarly the proportion of children not treated decreases sharply with increasing age of the child. For example, 64 percent of children under six months of age were not treated for diarrhea, compared with 28 percent of children age 24-35 months.

ORT varies markedly by place of residence, by rural-urban residence (from 46 percent in rural areas to 63 percent in urban areas), by ecological zone (from 43 percent in the *terai* to 52 percent in the hill), and by development region (from 38 percent in the Central region to 53 percent in the Mid-western region).

Children of educated mothers are also more likely to receive ORT than children of noneducated mothers.

FEEDING PRACTICE DURING DIARRHEA

It is recommended that children be given more liquids to drink during diarrhea and that food intake not be reduced.

Table 9.18 presents the percent distribution of children under five years who had diarrhea in the two weeks preceding the survey by feeding practices. One in three children who had diarrhea were given the same amount of liquids, and 27 percent were given more than the usual amount. However, one in four children were given less than their usual amount to drink and 16 percent were not given anything to drink at all. This finding is surprising given the high intensity of educational activities in this area during the last five years.

One in three children with diarrhea was given the same amount of food and 7 percent were given more than the usual amount to eat. However, 44 percent of children with diarrhea were given less than usual. Despite the substantial increase in educational activities about the importance of maintaining food intake during diarrhea, 6 percent of children with diarrhea were not given any food.

Table 9.18 Feeding practices during diarrhea	
Percent distribution of children under five years who had diarrhea in the two weeks preceding the survey by amount of liquids and food offered compared with normal practice, Nepal 2001	
Liquids/foods	Percent
Amount of liquids offered	
About the same	32.9
More than usual	26.6
Less than usual	23.9
Nothing to drink	16.4
Don't know	0.1
Total	100.0
Amount of food offered	
About the same	32.3
More than usual	6.6
Less than usual	43.8
Stopped food	6.0
Never gave food	11.2
Don't know	0.0
Total	100.0
Number of children	1,320

9.8 WOMEN'S STATUS AND USE OF HEALTH SERVICES

Status and self-respect of women can be a major determinant of a mother's ability to obtain adequate health care for her children. Table 9.19 shows the percentage of children age 12-23 months who have been fully vaccinated, the percentage of children with fever and/or symptoms of ARI, and the percentage of children with diarrhea in the two weeks preceding the survey who were taken to a health provider, according to the three measures of women's status.

The table shows that greater autonomy in decisionmaking is positively related to utilization of health facilities and the likelihood that children are fully immunized, though the relationships are not strong. For example, 71 percent of children of women who participate in five household decisions are fully immunized, compared with 65 percent of children of women who have no final say in any of the five household decisions. The data for Nepal show that children of women who believe that wife beating is not justified for any reason are slightly more likely to be fully vaccinated and taken to a health facility for treatment of ARI, fever, and diarrhea.

Table 9.19 Child health care by women's status						
Percentage of children age 12-23 months fully vaccinated, and percentage of children under five years who were ill with a fever, symptoms of ARI and/or diarrhea in the two weeks preceding the survey who were taken to a health provider for treatment, by women's status indicators, Nepal 2001						
Women's status indicator	Percentage of children age 12-23 months fully vaccinated ¹	Number of children	Percentage of children with fever and/or symptoms of ARI taken to a health provider ²	Number of children	Percentage of children with diarrhea taken to a health provider ²	Number of children
Number of decisions in which woman has final say³						
0	64.8	202	20.1	385	20.2	203
1-2	65.4	675	23.5	1,223	20.5	666
3-4	62.6	245	22.7	504	20.2	249
5	71.2	191	29.6	384	25.6	203
Number of reasons to refuse sex with husband						
0	*	17	(22.5)	30	*	12
1-2	(57.0)	40	15.0	73	(14.6)	38
3-4	65.6	1,256	24.0	2,393	21.5	1,270
Number of reasons wife beating is justified						
0	66.8	940	25.4	1,733	21.9	916
1-2	64.2	287	20.0	598	21.3	316
3-4	60.9	74	19.9	137	13.3	67
5	*	12	*	29	*	21
Total	65.6	1,313	23.7	2,496	21.2	1,320
Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.						
¹ Those who have received BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)						
² Excludes pharmacy, shop and traditional practitioner						
³ Either by herself or jointly with others						

9.9 WOMEN'S PERCEPTIONS OF PROBLEMS IN ACCESSING HEALTH CARE

Many factors can prevent a woman from getting medical advice or treatment for herself. In the 2001 NDHS, women age 15-49 were asked whether various issues pose “a big problem,” “a small problem,” or are “not a problem” in accessing health care for themselves when they are sick.

Table 9.20 shows that two in three women consider getting money for treatment to be a big problem, and 57 percent mention not wanting to go to a health facility alone to be a big problem. One in two women also considers the distance to a health facility, having to take transport, and lack of a female provider to be big problems. Knowing where to go was a big problem for 28 percent of women. In general, 87 percent of women mentioned that they considered accessing health care to be a big problem for any of the specified reasons. Education and urban-rural residence are the two background variables most likely to impact a woman's perception of being able to access health care for herself. Urban women are much less likely than rural women to cite any of the specified reasons as being a big problem in accessing health care for themselves. Similarly, nearly twice as many women with no education mention at least one of the specified problems as women with an SLC level of education or above.

9.10 USE OF SMOKING TOBACCO

Tobacco smoking during pregnancy increases the risk of having a small or low birth weight baby. Its use at other times also adversely affects women's health and may increase respiratory illnesses among children. Table 9.21 shows the percentage of women who smoke cigarettes or pipes or use tobacco and the distribution of women who smoke by the number of cigarettes smoked in the last 24 hours by background characteristics. Since more than one mode of tobacco consumption is possible, the percentage using tobacco may sum to more than 100 percent.

Nearly one in four women smoke cigarettes, while 4 percent smoke a pipe, and 6 percent use some other form of tobacco. Smoking is more prevalent among older women than among younger women, in rural areas than in urban areas, and in the mountain ecological zone and Midwestern development region than in the other regions. Education is negatively associated with smoking. Women who are neither pregnant nor breastfeeding are also more likely to smoke than other women.

One in five women who smoke reported that they consumed 10 or more cigarettes in the 24 hours preceding the survey, 16 percent smoked 6-9 cigarettes, 39 percent smoked 3-5 cigarettes, and 18 percent smoked 1-2 cigarettes. Five percent of women who usually smoke did not smoke in the 24 hours preceding the survey.

Table 9.20 Problems in accessing health care

Percentage of women who report they have big problems in accessing health care for themselves when they are sick, by type of problem and background characteristics, Nepal 2001

Background characteristic	Knowing where to go for treatment	Getting permission to go for treatment	Getting money for treatment	Distance to health facility	Having to take transport	Not wanting to go alone	Concern there may not be a female provider	Any of the specified problems	Number of women
Age									
15-19	30.2	27.7	62.3	54.5	54.0	66.1	52.0	87.6	941
20-29	27.0	17.7	63.8	48.3	48.6	54.2	47.2	84.8	3,324
30-39	26.6	14.9	68.1	50.7	51.7	56.9	50.3	86.9	2,595
40-49	30.4	13.3	70.5	52.2	52.9	58.6	50.5	88.3	1,867
Number of living children									
0	31.2	27.0	62.4	53.5	52.4	65.5	53.3	86.5	1,051
1-2	26.2	16.3	61.0	47.6	47.8	53.4	48.4	83.7	3,101
3-4	25.8	13.7	66.7	48.4	50.0	55.8	47.2	85.9	3,016
5+	33.4	17.9	78.9	58.6	58.7	61.9	52.8	93.1	1,557
Marital status									
Married	27.9	17.3	65.7	50.3	51.0	57.1	49.2	86.2	8,342
Divorced, separated, widowed	29.5	10.1	79.9	55.6	52.4	59.1	53.4	92.7	384
Residence									
Urban	18.3	9.6	43.6	22.2	20.0	38.6	39.3	67.8	841
Rural	29.0	17.8	68.8	53.5	54.4	59.2	50.4	88.5	7,885
Ecological zone									
Mountain	41.7	23.2	82.2	73.4	83.5	76.6	62.8	96.9	602
Hill	34.9	16.9	66.6	58.1	62.4	62.8	61.5	89.0	3,615
Terai	20.5	16.3	64.0	41.4	37.6	50.1	37.8	83.1	4,509
Development region									
Eastern	32.7	21.6	67.0	48.3	48.7	58.5	61.1	87.9	2,098
Central	26.1	22.7	67.1	46.3	46.1	54.5	36.2	83.6	2,804
Western	15.4	10.2	48.7	43.7	41.1	52.2	57.2	82.6	1,771
Mid-western	46.1	7.0	79.8	68.5	70.8	66.2	40.2	92.3	1,197
Far-western	23.1	15.3	79.9	58.9	65.9	61.1	60.3	92.3	855
Subregion									
Eastern Mountain	40.6	21.8	62.7	62.4	71.8	63.0	72.4	92.4	126
Central Mountain	43.3	27.3	83.3	62.8	78.5	77.0	59.5	96.5	209
Western Mountain	41.0	20.5	90.5	86.8	92.9	82.7	60.9	99.4	267
Eastern Hill	46.1	25.7	71.0	64.9	69.6	65.1	70.5	92.8	580
Central Hill	39.7	27.5	63.1	44.4	50.1	56.7	52.6	81.7	945
Western Hill	17.6	11.1	49.7	47.2	48.3	57.5	69.4	85.7	1,075
Mid-western Hill	56.0	6.4	85.3	85.3	88.2	75.8	51.4	97.5	648
Far-western Hill	18.3	10.6	85.5	66.8	78.2	67.4	64.8	96.4	368
Eastern Terai	26.4	19.8	65.7	40.1	37.9	55.3	56.1	85.4	1,393
Central Terai	16.1	19.3	67.3	45.2	39.8	50.3	23.9	83.1	1,651
Western Terai	11.9	8.8	47.2	38.2	29.9	43.9	38.2	78.0	696
Mid-western Terai	34.0	7.9	69.0	39.4	40.0	45.6	25.9	82.6	438
Far-western Terai	18.2	13.3	68.8	36.6	38.9	46.6	45.1	84.7	331
Education									
No education	31.7	19.3	75.8	56.8	57.1	62.8	51.8	92.0	6,279
Primary	23.7	13.4	53.3	42.4	44.3	50.2	50.9	81.3	1,294
Some secondary	14.2	10.8	35.5	26.7	27.8	37.5	38.0	67.9	814
SLC and above	7.9	2.7	14.6	21.5	21.0	27.5	24.7	48.6	339
Employment									
Not employed	24.0	19.9	51.4	36.4	32.3	52.6	37.7	75.4	1,390
Working for cash	22.8	12.4	60.2	37.3	34.7	46.4	47.8	79.9	1,061
Not working for cash	29.7	17.1	70.7	55.9	58.0	60.1	52.2	90.0	6,273
Total	27.9	17.0	66.3	50.5	51.0	57.2	49.4	86.5	8,726

Note: Total includes 2 women with missing information on employment who are not shown separately
SLC = School Leaving Certificate

Table 9.21 Use of smoking tobacco

Percentage of women who smoke cigarettes or use tobacco and percent distribution of cigarette smokers by number of cigarettes smoked in preceding 24 hours, according to background characteristics and maternity status, Nepal 2001

Background characteristic	Uses tobacco			Does not use tobacco	Number of women	Number of cigarettes					Total	Number of cigarette smokers
	Cigarettes	Pipe	Other tobacco			0	1-2	3-5	6-9	10+		
Age												
15-19	7.3	0.9	3.2	89.8	941	11.9	25.3	43.4	10.7	8.7	100.0	68
20-34	17.0	3.0	4.6	78.6	4,751	5.5	22.0	40.3	14.9	17.3	100.0	808
35-49	37.9	6.7	8.0	53.8	3,034	4.9	15.5	38.6	16.8	24.3	100.0	1,150
Residence												
Urban	13.6	0.6	3.4	83.0	841	4.0	15.1	43.4	16.3	21.2	100.0	114
Rural	24.3	4.4	5.9	69.9	7,885	5.5	18.6	39.2	15.8	21.0	100.0	1,912
Ecological zone												
Mountain	34.6	12.6	8.9	56.5	602	9.2	18.5	37.5	16.1	18.7	100.0	208
Hill	27.8	4.8	5.7	66.4	3,615	6.3	18.8	40.6	14.6	19.7	100.0	1,005
Terai	18.0	2.4	5.2	77.0	4,509	3.2	17.9	38.6	17.2	23.1	100.0	814
Development region												
Eastern	22.0	1.3	11.7	68.2	2,098	1.6	13.9	40.9	18.3	25.3	100.0	462
Central	23.9	1.7	3.0	73.7	2,804	3.0	13.9	40.5	19.6	22.9	100.0	670
Western	18.3	0.2	5.4	76.9	1,771	1.2	13.7	34.9	18.0	32.1	100.0	324
Mid-western	28.8	16.0	4.7	62.0	1,197	16.4	36.0	40.5	4.7	2.3	100.0	345
Far-western	26.3	10.0	1.2	71.2	855	9.0	20.9	38.0	13.2	18.9	100.0	225
Subregion												
Eastern Mountain	22.1	0.0	11.2	69.4	126	1.4	19.2	39.7	17.8	21.9	100.0	28
Central Mountain	44.3	1.5	16.7	53.4	209	4.0	17.1	40.6	16.6	21.7	100.0	93
Western Mountain	32.8	27.2	1.7	52.9	267	17.1	19.7	33.6	15.1	14.5	100.0	88
Eastern Hill	28.3	0.0	18.8	55.8	580	1.3	8.1	40.1	21.5	28.9	100.0	164
Central Hill	28.8	1.9	1.8	69.2	945	5.5	17.0	44.5	14.5	18.5	100.0	272
Western Hill	21.5	0.0	4.8	74.1	1,075	1.7	10.6	32.1	20.6	35.1	100.0	231
Mid-western Hill	38.4	17.5	4.6	54.1	648	13.0	34.5	44.5	6.0	2.0	100.0	249
Far-western Hill	24.1	11.3	0.0	74.7	368	11.3	22.0	40.2	10.4	16.1	100.0	89
Eastern Terai	19.4	2.0	8.8	73.3	1,393	1.8	16.8	41.5	16.4	23.4	100.0	270
Central Terai	18.5	1.6	2.0	78.9	1,651	0.5	10.2	37.0	25.1	27.2	100.0	305
Western Terai	13.4	0.4	6.4	81.3	696	0.0	21.5	41.9	11.8	24.7	100.0	93
Mid-western Terai	15.7	4.8	6.0	78.2	438	14.5	42.7	37.5	0.8	4.4	100.0	69
Far-western Terai	23.1	8.6	1.8	72.8	331	12.7	25.4	31.3	10.2	20.4	100.0	76
Education												
No education	29.4	5.5	6.3	64.2	6,279	5.6	18.1	39.4	15.7	21.2	100.0	1,849
Primary	12.2	0.7	5.9	82.8	1,294	2.0	23.0	38.3	17.8	18.8	100.0	158
Some secondary	2.3	0.0	2.5	95.2	814	*	*	*	*	*	100.0	19
SLC and above	0.2	0.0	1.0	98.8	339	*	*	*	*	*	100.0	1
Maternity status												
Pregnant	16.0	2.6	5.4	78.4	751	4.4	21.9	42.3	13.4	18.0	100.0	120
Breastfeeding (not pregnant)	20.5	4.5	5.0	74.8	3,544	6.4	22.9	39.8	13.9	17.1	100.0	726
Neither	26.6	4.0	6.3	67.1	4,431	4.8	15.3	39.0	17.2	23.7	100.0	1,180
Total	23.2	4.1	5.7	71.2	8,726	5.4	18.4	39.4	15.8	21.0	100.0	2,027

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

SLC = School Leaving Certificate