CHAPTER 6

MORTALITY, MORBIDITY, AND IMMUNIZATION

This chapter presents mortality rates, particularly for infants and young children, and data on the prevalence of certain diseases (morbidity). It also presents information on the prevention and treatment of diseases, especially those that are life-threatening to young children. The chapter ends with data on women's knowledge of AIDS. This type of information is relevant both to an assessment of the demographic situation and to the design of appropriate health policies and programmes. Mortality estimates are also useful for projecting the future size of the population. Detailed information on mortality and morbidity (by demographic and socioeconomic characteristics) can be used to identify population groups that are at high risk and in need of health services. This chapter primarily presents information on child health, while other chapters of this report, particularly Chapter 8, present information on maternal and reproductive health.

The Government of India has repeatedly taken steps to strengthen maternal and child health services in India, starting during the First and Second Five-Year Plans (1951–56 and 1956–61) under the Ministry of Health, and continuing with the Minimum Needs Programme initiated during the Fifth Five-Year Plan (1974–79). More recently, efforts to improve maternal and child health have been enhanced by activities of the Family Welfare Programme and by the introduction of the Child Survival and Safe Motherhood Programme (Ministry of Health and Family Welfare, 1992). The Ministry of Health and Family Welfare has also sponsored special projects under the Maternal and Child Health Programme, including the Oral Rehydration Therapy (ORT) programme, the establishment of Regional Institutes of Maternal and Child Health in states where infant mortality rates are high, the Universal Immunization Programme, and the Maternal and Child Health Supplemental Programme within the Postpartum Programme (Ministry of Health and Family Welfare, 1992). These programmes are now integrated into the Reproductive and Child Health Programme launched in 1996.

Maternal and child health services in rural areas of India are delivered mainly by government-run Primary Health Centres and sub-centres. In urban areas, such services are available mainly through government or municipal hospitals, urban health posts, hospitals and nursing homes operated by nongovernmental organizations (NGOs), and private nursing homes and maternity homes.

The second National Family Health Survey (NFHS-2) includes questions on mortality and morbidity on both the Household Questionnaire and the Woman's Questionnaire. The Household Questionnaire has questions on individuals in the household suffering from asthma, tuberculosis, jaundice, and malaria, plus questions on deaths occurring to usual residents of the household during the two years preceding the survey. The Woman's Questionnaire collects information on the survival status of all births and the age at death of children who died. The Woman's Questionnaire also contains questions on child immunization coverage and sources; vitamin A supplementation for children; prevalence of acute respiratory infections, fever, and diarrhoea among children and the treatment of these illnesses; and mothers' knowledge of oral rehydration therapy.

The information on child health and health-care practices was collected from mothers for children born since 1 January 1995 (in states where the fieldwork started in 1998) or 1 January 1996 (in states where the fieldwork started in 1999). If a woman had more than two live births during the three years preceding the survey, the information was collected for only the two most recent births. The information on child health presented in this chapter pertains to children born during the three years preceding the survey.

6.1 Crude Death Rates and Age-Specific Death Rates

Table 6.1 shows crude death rates (CDR) and age-specific death rates by sex and by residence for the usual resident (*de jure*) population of India from NFHS-2 and the Sample Registration System (SRS). The SRS death rates are based on deaths to the usual resident population in 1997. The NFHS-2 death rates are based on the average annual number of deaths occurring to usual residents of the household during the two-year period preceding the survey (approximately 1997–98). The denominators for the NFHS-2 death rates are obtained by projecting the number of usual residents at the time of the survey backwards to the midpoint of the time period on the basis of the intercensal population growth rate in the country. The intercensal growth rate is assumed to be the same for all age and sex groups. Similarly, the rural intercensal growth rate is applied to all rural age and sex groups and the urban intercensal growth rate is applied to all urban age and sex groups.

Questions on the number of deaths occurring to usual residents in each household during a particular time period have been included in demographic surveys in many countries and have often resulted in a substantial underreporting of deaths. The Sample Registration System (SRS), maintained by the Office of the Registrar General of India, provides a useful comparison. The most recent report on mortality estimates by age for India is for 1997 (Office of the Registrar General, 1999a).

Table 6.1 shows an estimated average annual CDR for India of 9.7 deaths per 1,000 population based on NFHS-2 data (covering roughly 1997–98) compared with 8.9 from the 1997 SRS. Thus, contrary to expectations, the CDR estimated from NFHS-2 is slightly higher than the corresponding SRS estimate. NFHS-2 estimates of the CDR are also higher than the SRS estimates in both urban and rural areas. This suggests that reporting of deaths in NFHS-2 may be better than that in the SRS. The urban CDR estimated by NFHS-2 is 25 percent lower than the rural CDR. NFHS-2 age-specific death rates are higher than the SRS rates for most of the age groups. The most notable exception is the age group 0–4, where the NFHS-2 estimate is considerably lower than the SRS estimate.

In most countries, male death rates are higher than female death rates at nearly all ages. South Asia generally has been an exception in this respect, with higher death rates for females over much of the age span (Tabutin and Willems, 1995; Preston, 1989; Ghosh, 1987). According to both NFHS-2 and the SRS, the male CDR in India is higher than the female CDR, but the age-specific death rates are slightly higher for females than for males through age 30, after which males generally have higher rates.

Table 6.1 Age-specific death rates and crude death rates

Age-specific death rates and crude death rates (CDR) from NFHS-2 and the SRS by sex and residence, India

	NFHS-2 (1997–98)			SRS (1997)		
Age	Male	Female	Total	Male	Female	Total
			URBAN			
0–4	13.1	11.3	12.2	12.5	13.8	13.1
5–9	0.9	1.4	1.2	1.0	1.2	1.1
10–14	1.2	0.9	1.1	0.9	0.7	0.8
15–19	1.7	1.9	1.8	1.0	1.5	1.2
20–24	1.4	1.5	1.4	1.8	2.0	1.9
25–29	3.0	2.3	2.6	2.1	2.1	2.1
30–34	4.0	2.1	3.1	2.9	1.9	2.4
35–39	2.9	2.7	2.8	3.5	2.0	2.8
40–44	5.5	2.3	4.0	4.4	3.6	4.0
45–49	8.8	4.4	6.7	7.5	5.5	6.6
50–54	13.1	9.3	11.4	12.5	7.3	10.1
55–59	16.1	8.7	12.3	18.2	11.2	14.8
60–64	24.5	20.9	22.8	28.2	18.2	23.2
65–69	34.1	30.2	32.1	46.2	30.8	38.2
70+	103.2	103.4	103.3	88.4	73.7	80.7
CDR	8.3	7.3	7.8	7.0	6.0	6.5
			RURAL			
0–4	19.5	20.6	20.0	24.2	27.2	25.6
5–9	2.1	2.4	2.2	2.0	2.7	2.3
10–14	1.0	1.5	1.2	1.2	1.3	1.3
15–19	1.8	2.7	2.2	1.4	2.4	1.9
20–24	3.2	4.7	4.0	2.3	3.1	2.7
25–29	2.9	3.5	3.2	2.8	2.9	2.9
30–34	4.3	2.8	3.5	3.5	3.2	3.3
35–39	4.2	3.8	4.0	4.0	3.2	3.6
40–44	6.3	4.0	5.2	6.6	4.2	5.4
45–49	9.0	7.1	8.1	9.6	5.8	7.8
50–54	15.1	11.8	13.6	14.7	11.0	12.9
55–59	16.3	11.9	13.9	20.1	14.9	17.5
60–64	29.8	27.3	28.6	33.4	23.1	28.1
65–69	40.9	27.8	34.6	46.4	35.3	40.7
70+	99.5	111.3	104.5	90.0	78.6	84.2
CDR	10.7	10.0	10.4	9.8	9.4	9.6
			TOTAL			
0–4	18.1	18.5	18.3	21.8	24.5	23.1
5–9	1.8	2.2	2.0	1.8	2.4	2.1
10–14	1.0	1.4	1.2	1.1	1.2	1.2
15–19	1.8	2.5	2.1	1.4	2.1	1.7
20–24	2.7	3.8	3.2	2.2	2.8	2.5
25–29	2.9	3.2	3.1	2.6	2.7	2.7
30–34	4.2	2.6	3.4	3.4	2.8	3.1
35–39	3.8	3.5	3.7	3.9	2.9	3.4
40–44	6.1	3.5	4.9	6.0	4.0	5.0
45–49	8.9	6.3	7.7	9.0	5.8	7.5
50–54	14.6	11.1	13.0	14.2	10.2	12.2
55–59	16.3	11.1	13.5	19.7	14.1	16.9
60–64	28.5	25.9	27.2	32.3	22.1	27.1
65–69	39.2	28.4	34.0	46.3	34.4	40.2
70+	100.3	109.1	104.2	89.7	77.6	83.5
CDR	10.1	9.3	9.7	9.2	8.6	8.9

Note: Age-specific death rates and crude death rates (CDR) from NFHS-2 are based on the annual number of deaths reported for the *de jure* population during the two years preceding the survey. The SRS rates are also *de jure*, based on deaths during 1997. Rates are specified on a per-thousand basis.
Source for SRS: Office of the Registrar General, 1999b

Table 6.2 Crude death rates by state

Crude death rates (CDR) from NFHS-1, NFHS-2, and the SRS by residence and state, India

State	NFHS-1 (1991–92)			NFHS-2 (1997–98)			SRS (1997)		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
India	7.6	10.4	9.7	7.8	10.4	9.7	6.5	9.6	8.9
North									
Delhi	8.0	4.1	7.8	7.9	6.8	7.8	5.4	5.4	5.4
Haryana	8.1	9.3	9.0	7.4	8.4	8.1	6.9	8.3	8.0
Himachal Pradesh	6.5	8.6	8.4	7.4	8.3	8.3	5.9	8.3	8.1
Jammu & Kashmir	U	U	U	9.1	8.0	8.3	U	U	U
Punjab	7.2	7.0	7.1	7.1	9.0	8.4	6.1	7.8	7.4
Rajasthan	7.2	7.9	7.8	8.8	10.6	10.2	9.4	9.3	8.9
Central									
Madhya Pradesh	9.1	10.7	10.3	8.7	10.7	10.2	7.7	11.7	11.0
Uttar Pradesh	7.7	13.0	11.9	7.9	10.8	10.2	8.2	10.7	10.3
East									
Bihar	9.0	12.0	11.5	8.3	11.6	11.2	6.8	10.4	10.0
Orissa	7.4	11.6	11.0	9.2	13.4	12.9	7.5	11.3	10.9
West Bengal	8.6	10.2	9.7	7.3	8.7	8.3	7.2	7.9	7.7
Northeast									
Arunachal Pradesh	0.8	9.1	8.2	12.1	12.5	12.4	2.0	6.1	5.8
Assam	7.0	11.9	11.3	6.1	9.7	9.4	5.9	10.3	9.9
Manipur	5.3	6.1	5.8	9.8	8.7	9.0	6.2	5.8	5.9
Meghalaya	6.6	6.1	6.2	7.6	10.4	9.9	4.4	9.7	8.8
Mizoram	4.2	2.7	3.4	6.0	8.7	7.3	3.7	5.7	4.8
Nagaland	1.7	2.0	1.9	4.3	7.6	6.9	2.7	U	U
Sikkim	U	U	U	3.3	6.8	6.3	3.5	6.6	6.5
West									
Goa	5.9	7.1	6.5	8.7	11.1	10.1	7.2	8.0	7.7
Gujarat	7.2	10.2	9.1	7.6	8.3	8.0	6.2	8.3	7.6
Maharashtra	7.3	8.1	7.7	7.8	9.9	9.0	5.4	8.6	7.3
South									
Andhra Pradesh	7.4	9.2	8.7	7.7	11.7	10.7	5.9	9.1	8.3
Karnataka	6.2	8.1	7.5	6.9	8.4	7.9	5.4	8.5	7.6
Kerala	6.1	6.3	6.2	5.7	6.1	6.0	6.1	6.3	6.2
Tamil Nadu	7.3	11.0	9.7	8.1	12.2	10.8	6.7	8.7	8.0

Note: Crude death rates (CDR) from NFHS-1 and NFHS-2 are based on the annual number of deaths reported for the *de jure* population during the two years preceding the survey. The SRS rates are also *de jure*, based on deaths during 1997. Rates are specified on a per-thousand basis.
U: Not available
Source for SRS: Office of the Registrar General, 1999a

Table 6.2 provides comparisons among NFHS-1, NFHS-2, and SRS estimates of the CDR by state. For India as a whole, the CDR has remained at 9.7 per 1,000 since NFHS-1. The CDR from NFHS-2 ranges from 6.0 per 1,000 in Kerala to 12.9 per 1,000 in Orissa. Estimates for urban Nagaland and Sikkim seem low, perhaps mainly due to the small size of the samples. The CDR is higher in rural areas than in urban areas for all states except Delhi, Jammu and Kashmir, and Manipur. A comparison of NFHS-1 and NFHS-2 estimates by state shows that the CDR has declined in only 9 of the 23 states where data are available from both surveys. The CDR appears to have increased most markedly in the smaller northeastern states between the two surveys. It should be pointed out that the sampling errors are relatively large in these states due to the small size of the samples in both surveys.

Table 6.2 also shows the CDRs for the year 1997 from the SRS for 23 states for which the SRS has published statewise estimates. The SRS estimates are lower than the NFHS-2 estimates in 18 of the 23 states. This may reflect greater underestimation of deaths in the SRS than in NFHS-2.

6.2 Infant and Child Mortality

Infant and child mortality rates reflect a country's level of socioeconomic development and quality of life and are used for monitoring and evaluating population and health programmes and policies. NFHS-2 asked all ever-married women age 15–49 to provide a complete history of their births including, for each live birth, the sex, month and year of birth, survival status, and age at the time of the survey or age at death. Age at death was recorded in days for children dying in the first month of life, in months for other children dying before their second birthday, and in years for children dying at later ages. This information was used to calculate the following direct estimates of infant and child mortality[1]:

Neonatal mortality:	The probability of dying in the first month of life
Postneonatal mortality:	The probability of dying after the first month of life but before the first birthday
Infant mortality ($_1q_0$):	The probability of dying before the first birthday
Child mortality ($_4q_1$):	The probability of dying between the first and fifth birthdays
Under-five mortality ($_5q_0$):	The probability of dying before the fifth birthday

Assessment of Data Quality

The reliability of mortality estimates calculated from retrospective birth histories depends upon the completeness with which deaths of children are reported and the extent to which birth dates and ages at death are accurately reported and recorded. Estimated rates of infant and child mortality are subject to both sampling and nonsampling errors. While sampling errors for various mortality estimates are provided in Appendix C, this section describes the results of various checks for nonsampling errors—in particular, underreporting of deaths in early childhood (which would result in an underestimate of mortality) and misreporting of the date of birth or age at death (which could distort the age pattern of under-five mortality). Both problems are likely to be more pronounced for children born further in the past than for children born recently. Underreporting of infant deaths is usually most serious for deaths that occur very early in infancy. If deaths in the early neonatal period are selectively underreported, there will be an abnormally low ratio of deaths under seven days to all neonatal deaths and an abnormally low ratio of neonatal to infant mortality. Changes in these ratios over time can be examined to test the

[1]A detailed description of the method for calculating the probabilities presented here is given in Rutstein (1984). The mortality estimates are not rates, but are true probabilities, calculated according to the conventional life-table approach. Deaths and exposure in any calendar period are first tabulated for the age intervals 0, 1–2, 3–5, 6–11, 12–23, 24–35, 36–47, and 48–59 months. Then age-interval-specific probabilities of survival are calculated. Finally, probabilities of mortality for larger age segments are produced by multiplying the relevant age-interval survival probabilities together and subtracting the product from one:

$$_nq_x = 1 - \prod_{i=x}^{i=x+n} (1 - q_i)$$

hypothesis that underreporting of early infant deaths is more common for births that occurred further in the past than for births that occurred more recently. Failure to report deaths will result in mortality figures that are too low and if underreporting is more severe for children born longer ago than children born recently, any decline in mortality will tend to be understated.

Results from Table D.5 (Appendix D) suggest that early neonatal deaths have not been seriously underreported in India as a whole in NFHS-2, since the ratios of deaths under seven days to all neonatal deaths are consistently high (between 70 and 74 percent) for the different time periods preceding the survey (a ratio of less than 25 percent is often used as a guideline to indicate underreporting of early neonatal deaths). The ratios decline slightly over time, from 74 in the five years preceding the survey to 70 in the period 10–14 years preceding the survey, indicating that some early infant deaths may not have been reported by older women. The ratios of infant deaths that occurred during the neonatal period (Appendix Table D.6) are also consistently high (between 64 and 67 percent) for the different time periods preceding the survey, and again they increase slightly over time.

Another problem inherent in most retrospective surveys is heaping of age at death on certain digits, e.g., 6, 12, and 18 months. If the net result of age misreporting is the transference of deaths between age segments for which the rates are calculated, misreporting of the age at death will bias estimates of the age pattern of mortality. For instance, an overestimate of child mortality relative to infant mortality may result if children dying during the first year of life are reported as having died at age one year or older. Thus, heaping at 12 months can bias the mortality estimates because a certain fraction of these deaths, which are reported to have occurred after infancy (i.e., at ages 12–23 months), may have actually occurred during infancy (i.e., at ages 0–11 months). In such cases, heaping would bias infant mortality ($_1q_0$) downward and child mortality ($_4q_1$) upward.

In NFHS-2, there appears to be some preference for reporting age at death at 3, 5, 8, 10, 12, 15, 20, and 25 days (Table D.5 in Appendix D). An examination of the distribution of deaths under age two years during the 15 years preceding the survey by month of death (Appendix Table D.6) indicates some heaping of deaths at 6, 12, and 18 months of age. Heaping at 12 months and reporting of the age at death as 'one year' are substantial despite the strong emphasis on this problem during the training of interviewers for the NFHS-2 fieldwork[2]. Nevertheless, even if one-third of the deaths reported at age 12 months or age one year actually occurred at less than 12 months of age, the infant mortality rate for the five years before the survey would be underestimated by only 2 percent.

An examination of the distribution of births and deaths since 1988 (Table D.4 in Appendix D) suggests that there may be some underreporting of deaths in the most recent five-year period. The proportion of deaths to births decreases from 11 percent in 1988 to 6 percent in 1998. Some of this decrease undoubtedly reflects a real reduction in mortality during that period and some reflects the fact that younger children have had less exposure to the risk of mortality. However, the sharp disjuncture in the proportion of deaths between 1994 and 1995 may be due partly to underreporting of deaths relative to births during the most recent period.

[2]Interviewers were trained to probe for the exact number of months lived by the child if the age at death was reported as 'one year'.

It is seldom possible to establish mortality levels with confidence for a period of more than 15 years before a survey. Even within the recent 15-year period considered here, apparent trends in mortality rates should be interpreted with caution for several reasons. First, there may be differences in the completeness of death reporting related to the length of time before the survey. Second, the accuracy of reports of age at death and of date of birth may deteriorate with time. Third, sampling variability of mortality rates tends to be high, especially for groups with relatively few births. Fourth, mortality rates are truncated as they go back in time because women currently age 50 or above who were bearing children during earlier periods were not included in the survey. This truncation affects mortality trends, in particular. For example, for the period 10–14 years before the survey, the rates do not include any births for women age 40–49 since these women were over age 50 at the time of the survey and were not eligible to be interviewed. Since these excluded births to older women were likely to be at a somewhat greater risk of dying than births to younger women, the mortality rates for the period may be slightly underestimated. Estimates for more recent periods are less affected by truncation bias since fewer older women are excluded. The extent of this bias depends on the proportion of births omitted. Table 4.26 (Chapter 4) shows that less than 5 percent of the children born in the three years before the survey were born to women age 35 and above. Given the small proportion of births excluded, selection bias for infant and child mortality statistics as far back as 15 years before the survey should be negligible.

Levels, Trends, and Differentials in Infant and Child Mortality

Table 6.3 and Figure 6.1 present various measures of infant and child mortality by residence for the three five-year periods preceding the survey. Infant mortality in India declined from 86 deaths per 1,000 live births during 1984–88 (10–14 years before the survey) to 68 deaths per 1,000 live births during 1994–98 (0–4 years before the survey), an average rate of decline of nearly 2 infant deaths per 1,000 live births per year. A comparison of the infant mortality rate for the period 0–4 years before NFHS-2 (68 deaths per 1,000 live births) with the infant mortality rate 0–4 years before NFHS-1 (79 deaths per 1,000 live births) suggests a similar rate of decline of 11 deaths per 1,000 live births over the six and one-half years between the two surveys. The NFHS-2 infant mortality rate for the period 5–9 years before the survey (78) is slightly lower than the NFHS-1 infant mortality rate for the period 0–4 years before the survey, so the results from the two surveys are quite compatible for these years.

All other measures of infant and child mortality presented in Table 6.3 have also declined during the past 15 years. Despite the overall decline in infant and child mortality, however, 1 in every 15 children born during the five years before NFHS-2 died within the first year of life, and 1 in every 11 children died before reaching age five. Clearly, child survival programmes in India need to be intensified to achieve further reductions in infant and child mortality.

Rural mortality rates are considerably higher than urban mortality rates. Child mortality is almost twice as high in rural areas as in urban areas, neonatal mortality is 47 percent higher in rural areas, postneonatal mortality is 73 percent higher in rural areas, and infant mortality is 56 percent higher in rural areas. Under-five mortality is 64 percent higher in rural areas than in urban areas.

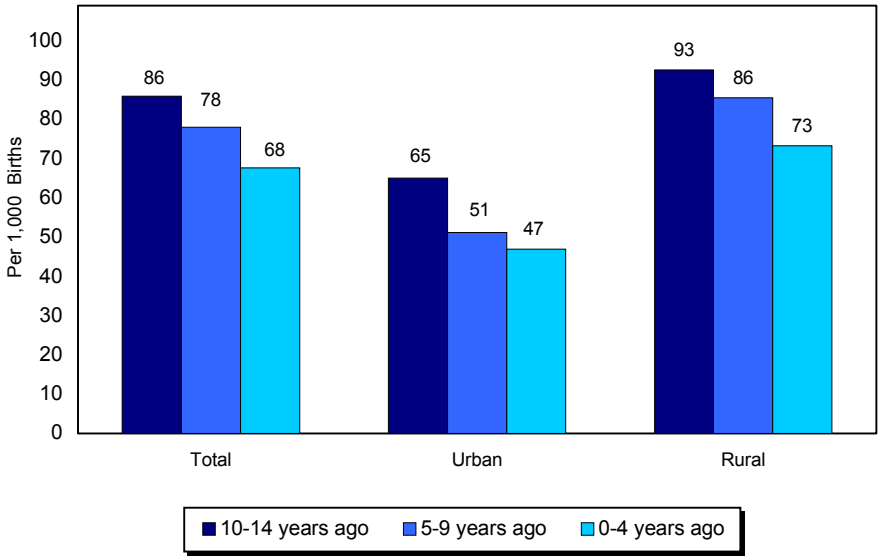
Table 6.3 Infant and child mortality

Neonatal, postneonatal, infant, child, and under-five mortality rates for five-year periods preceding the survey by residence, India, 1998–99

Years preceding the survey	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
URBAN					
0–4	31.7	15.4	47.0	16.9	63.1
5–9	35.1	16.1	51.2	17.2	67.5
10–14	42.1	22.9	65.1	23.1	86.7
RURAL					
0–4	46.7	26.6	73.3	32.8	103.7
5–9	56.3	29.2	85.5	36.4	118.8
10–14	58.4	34.2	92.6	45.0	133.4
TOTAL					
0–4	43.4	24.2	67.6	29.3	94.9
5–9	51.7	26.4	78.0	31.9	107.4
10–14	54.5	31.4	85.9	39.3	121.9

Note: The first five-year period preceding the survey does not include the month in which the interview took place. Rates are specified on a per-thousand basis. See text for definition of rates.
[1]Computed as the difference between the infant and neonatal mortality rates

Figure 6.1
Infant Mortality Rates for Five-Year Periods by Residence



Note: Rates are for five-year periods preceding the survey

NFHS-2, India, 1998–99

All infant and child mortality rates declined steadily in both urban and rural areas of India during the 15 years preceding NFHS-2. Infant mortality in rural areas declined from 93 deaths per 1,000 live births during 1984–88 to 73 deaths per 1,000 live births during 1994–98. Neonatal mortality declined by 20 percent and postneonatal mortality declined by 22 percent in rural areas over the same period. In urban areas, infant mortality declined from 65 deaths per 1,000 live births during 1984–88 to 47 deaths per 1,000 live births during 1994–98. Neonatal and postneonatal mortality in urban areas declined by 25 percent and 33 percent, respectively. A comparison with corresponding figures from NFHS-1 shows a decline in every rural and urban estimate of infant and child mortality for the five-year period before each survey.

The estimated NFHS-2 infant mortality rate of 68 deaths per 1,000 live births during 1994–98 is somewhat lower than the SRS value of 73 deaths per 1,000 live births averaged for the period 1994–98. This difference between NFHS-2 and the average SRS infant mortality rates is significant statistically (the lower and upper confidence limits for the NFHS-2 estimate are 64.7 and 70.4, respectively (Appendix Table C.2)). The NFHS-2 estimate of the infant mortality rate for rural areas is also lower than the average SRS estimate over the same period (73 deaths per 1,000 live births from NFHS-2 compared with 78 deaths per 1,000 live births from the SRS). The NFHS-2 estimate for urban areas is the same as the average SRS estimate for urban areas (47 deaths per 1,000 live births).

Socioeconomic Differentials in Infant and Child Mortality

The probability of dying in early childhood is higher in some population groups than in others. Table 6.4 and Figure 6.2 present differentials in infant and child mortality rates for the 10-year period preceding the survey by selected background characteristics. Children in rural areas of India experience a 70 percent higher probability of dying before their fifth birthday than urban children, slightly more than the 64 percent differential in the most recent five-year period shown in Table 6.3.

The overall infant mortality rate declines sharply with increasing education of mothers, as expected, ranging from a high of 87 deaths per 1,000 live births for illiterate mothers to a low of 33 deaths per 1,000 live births for mothers who have at least completed high school. Other mortality indicators shown in the table vary similarly with mother's education. As one would expect, mother's education has a stronger negative effect on postneonatal and child mortality than on neonatal mortality (which is strongly affected by biological factors).

All the infant and child mortality rates are much higher for Hindus than for Muslims. The infant mortality rate is 31 percent higher and the child mortality rate is 28 percent higher for Hindu children than for Muslim children. These findings are consistent with those of NFHS-1, which also recorded much higher rates of infant and child mortality for Hindus than Muslims in India. Mortality differentials by religion presumably reflect influences other than religion alone. For example, a larger proportion of Muslims than Hindus in India live in urban areas, where mortality rates are generally low. This is confirmed by a study based on NFHS-1 data, which noted that the difference in infant and child mortality rates between Hindu and Muslim children is reduced considerably when other demographic and socioeconomic variables are controlled statistically (Pandey et al., 1998).

Table 6.4 Infant and child mortality by background characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected background characteristics and residence, India, 1998–99

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
		URBAN			
Mother's education					
Illiterate	44.1	23.8	67.8	28.8	94.7
Literate, < middle complete	30.8	11.8	42.6	14.7	56.7
Middle school complete	29.5	13.3	42.8	9.2	51.6
High school complete and above	22.2	8.2	30.4	3.7	34.0
Religion					
Hindu	36.6	16.7	53.3	17.2	69.6
Muslim	25.9	14.0	39.8	18.8	57.9
Christian	29.6	8.0	37.5	10.9	48.0
Sikh	21.8	18.8	40.6	13.1	53.1
Jain	(44.5)	(4.7)	(49.2)	(0.0)	(49.2)
Buddhist/Neo-Buddhist	(17.5)	(9.2)	(26.7)	(6.1)	(32.6)
Other	(2.0)	(8.7)	(10.7)	(5.9)	(16.6)
No religion	*	*	*	*	*
Caste/tribe					
Scheduled caste	40.1	20.2	60.4	25.2	84.0
Scheduled tribe	35.6	22.1	57.6	23.4	79.6
Other backward class	35.3	15.8	51.2	16.3	66.6
Other	29.8	13.7	43.5	14.1	57.0
Standard of living index					
Low	48.8	27.3	76.1	39.1	112.2
Medium	34.6	16.9	51.5	17.6	68.2
High	24.1	8.9	33.0	6.6	39.4
Total	33.5	15.8	49.2	17.0	65.4
		RURAL			
Mother's education					
Illiterate	57.0	32.4	89.4	41.5	127.2
Literate, < middle complete	44.0	20.3	64.3	20.0	82.9
Middle school complete	36.1	15.0	51.1	11.4	61.9
High school complete and above	26.9	8.8	35.7	5.6	41.1
Religion					
Hindu	53.8	29.1	82.8	36.3	116.2
Muslim	43.6	23.8	67.5	28.6	94.1
Christian	30.0	24.0	53.9	23.3	76.0
Sikh	42.5	14.3	56.8	12.0	68.2
Jain	*	*	*	*	*
Buddhist/Neo-Buddhist	58.7	18.2	76.9	20.9	96.2
Other	63.6	27.4	91.0	23.4	112.2
No religion	(48.5)	(36.0)	(84.5)	(83.0)	(160.5)
Caste/tribe					
Scheduled caste	56.2	31.9	88.1	43.0	127.3
Scheduled tribe	55.1	31.8	86.9	48.8	131.4
Other backward class	54.7	27.6	82.2	32.7	112.2
Other	45.1	24.2	69.3	25.6	93.1
Standard of living index					
Low	56.5	33.7	90.2	45.8	131.8
Medium	50.7	25.3	76.0	28.8	102.6
High	37.4	14.7	52.1	11.7	63.2
Total	51.7	28.0	79.7	34.6	111.5

Table 6.4 Infant and child mortality by background characteristics (contd.)

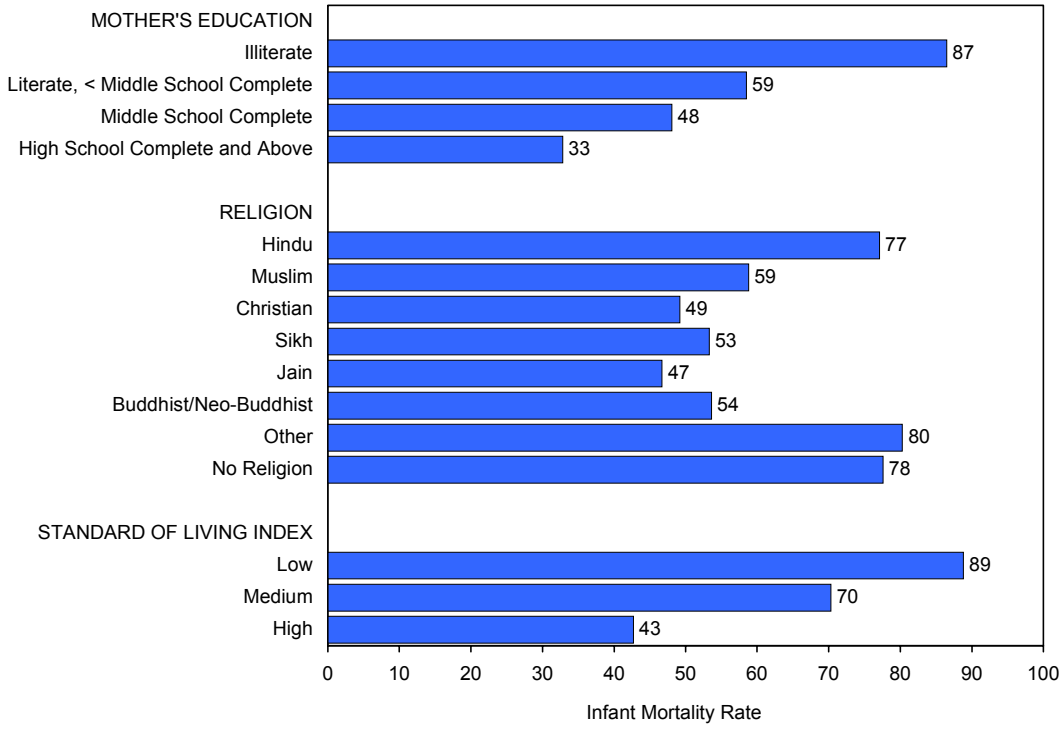
Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected background characteristics and residence, India, 1998–99

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
		TOTAL			
Mother's education					
Illiterate	55.3	31.2	86.5	39.7	122.8
Literate, < middle complete	40.5	18.0	58.5	18.4	75.8
Middle school complete	33.7	14.4	48.1	10.5	58.1
High school complete and above	24.3	8.5	32.8	4.4	37.1
Religion					
Hindu	50.4	26.7	77.1	32.4	107.0
Muslim	38.0	20.8	58.8	25.4	82.7
Christian	29.8	19.4	49.2	19.7	68.0
Sikh	38.0	15.3	53.3	12.3	64.9
Jain	(36.3)	(10.5)	(46.7)	(11.3)	(57.5)
Buddhist/Neo-Buddhist	39.5	14.0	53.6	14.1	66.9
Other	55.5	24.7	80.3	20.9	99.4
No religion	(45.4)	(32.1)	(77.6)	(77.2)	(148.8)
Caste/tribe					
Scheduled caste	53.2	29.8	83.0	39.5	119.3
Scheduled tribe	53.3	30.9	84.2	46.3	126.6
Other backward class	50.8	25.2	76.0	29.3	103.1
Other	40.7	21.1	61.8	22.2	82.6
Standard of living index					
Low	55.8	33.1	88.8	45.2	130.0
Medium	47.0	23.4	70.3	26.1	94.6
High	30.9	11.8	42.7	9.1	51.5
Total	47.7	25.3	73.0	30.6	101.4

Note: The 10-year period preceding the survey does not include the month in which the interview took place. Rates are specified on a per-thousand basis. See text for definition of rates. Total includes children with missing information on mother's education, religion, caste/tribe, and the standard of living index, whose mortality rates are not shown separately.
( ) Based on 250–499 children surviving to the beginning of the age interval
*Rates not shown; based on fewer than 250 children surviving to the beginning of the age interval
[1]Computed as the difference between the infant and neonatal mortality rates

Children of women belonging to scheduled castes and scheduled tribes have higher rates of infant and child mortality than children of women belonging to other backward classes or 'other' women. Children of 'other' women have by far the lowest rates of infant and child mortality. As expected, all indicators of infant and child mortality decline substantially with increases in the household standard of living. For example, for children in households with a high standard of living the infant mortality rate is 43 deaths per 1,000 live births and the under-five mortality rate is 52 deaths per 1,000 live births; the corresponding rates for children in households with a low standard of living are more than twice as high at 89 and 130, respectively. The postneonatal mortality rate is almost three times as high in households with a low standard of living as in households with a high standard of living, the child mortality rate is almost five times as high, and the neonatal mortality rate is almost twice as high. Similar differentials in infant and child mortality by mothers' education, religion, caste/tribe, and living standard are observed in both urban and rural areas.

Figure 6.2
Infant Mortality Rates by Selected Background Characteristics



Demographic Differentials in Infant and Child Mortality

This section examines differentials in early childhood mortality by demographic characteristics of the child and the mother. Table 6.5 and Figure 6.3 present various indicators of infant and child mortality for the 10 years preceding the survey by sex of the child, mother's age at childbirth, birth order, length of the previous birth interval, medical care received by the mother during pregnancy, delivery, and the early postpartum period, and size of the child at the time of birth.

Table 6.5 shows that the female mortality rate below age five years is slightly higher than the male mortality rate (105 deaths per 1,000 live births for females compared with 98 deaths per 1,000 live births for males). This pattern is evident in rural areas, but not in urban areas. Excess female mortality occurs mainly after the first year of life. The infant mortality rate during the 10-year period before the survey is slightly higher for boys (75 deaths per 1,000 live births) than for girls (71 deaths per 1,000 live births), but the child mortality rate ($_4q_1$) is considerably higher for girls (37 deaths per 1,000) than for boys (25 deaths per 1,000). This reversal of sex differentials in mortality with increasing age has been observed in other studies in South Asia and is thought to reflect the relative medical and nutritional neglect of the girl-child (Das Gupta, 1987; Basu, 1989).

Table 6.5 Infant and child mortality by demographic characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected demographic characteristics and residence, India, 1998–99

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
		URBAN			
Sex of child					
Male	37.8	16.0	53.8	14.6	67.6
Female	28.8	15.5	44.3	19.7	63.1
Mother's age at birth					
< 20	48.4	19.3	67.7	21.3	87.5
20–29	28.1	14.4	42.4	14.2	56.0
30–39	36.6	17.1	53.7	23.5	75.9
40–49	*	*	*	*	*
Birth order					
1	34.3	13.7	48.1	9.1	56.8
2	32.3	12.6	44.8	14.3	58.5
3	26.8	15.7	42.5	19.5	61.1
4	36.6	19.4	56.0	25.7	80.3
5	29.9	21.1	50.9	21.0	70.8
6+	47.9	27.4	75.4	37.5	110.0
Previous birth interval					
< 24 months	49.4	23.1	72.6	27.8	98.3
24–47 months	26.9	15.4	42.2	19.6	61.0
48+ months	17.9	7.9	25.9	8.8	34.4
Medical care[2]					
No care	46.2	20.0	66.2	U	U
One or two types of care	35.8	19.3	55.1	U	U
All three types of care	21.8	8.2	30.1	U	U
Birth size[3]					
Large	31.0	9.3	40.3	U	U
Average	21.5	13.9	35.4	U	U
Small	43.5	23.1	66.6	U	U
Very small	(106.5)	(17.5)	(124.0)	U	U

Table 6.5 Infant and child mortality by demographic characteristics (contd.)

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected demographic characteristics and residence, India, 1998–99

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
		RURAL			
Sex of child					
Male	54.3	26.4	80.7	27.9	106.4
Female	49.0	29.7	78.6	41.7	117.0
Mother's age at birth					
< 20	66.1	31.8	97.9	33.1	127.7
20–29	44.7	25.3	70.0	33.5	101.2
30–39	52.0	30.9	83.0	41.4	121.0
40–49	60.8	47.5	108.4	53.3	155.9
Birth order					
1	58.8	25.4	84.2	22.4	104.7
2	47.5	25.0	72.6	29.5	100.0
3	41.6	25.2	66.8	38.0	102.2
4	46.5	30.4	76.9	39.5	113.3
5	52.4	28.8	81.2	46.6	124.1
6+	65.0	40.6	105.6	52.3	152.4
Previous birth interval					
< 24 months	77.4	41.6	119.0	55.1	167.5
24–47 months	37.5	24.3	61.9	34.4	94.2
48+ months	26.0	16.5	42.5	15.2	57.0
Medical care[2]					
No care	54.2	36.8	90.9	U	U
One or two types of care	35.8	19.0	54.7	U	U
All three types of care	22.4	14.5	36.9	U	U
Birth size[3]					
Large	33.4	21.1	54.6	U	U
Average	32.4	21.6	54.0	U	U
Small	48.5	29.7	78.2	U	U
Very small	111.2	42.6	153.8	U	U

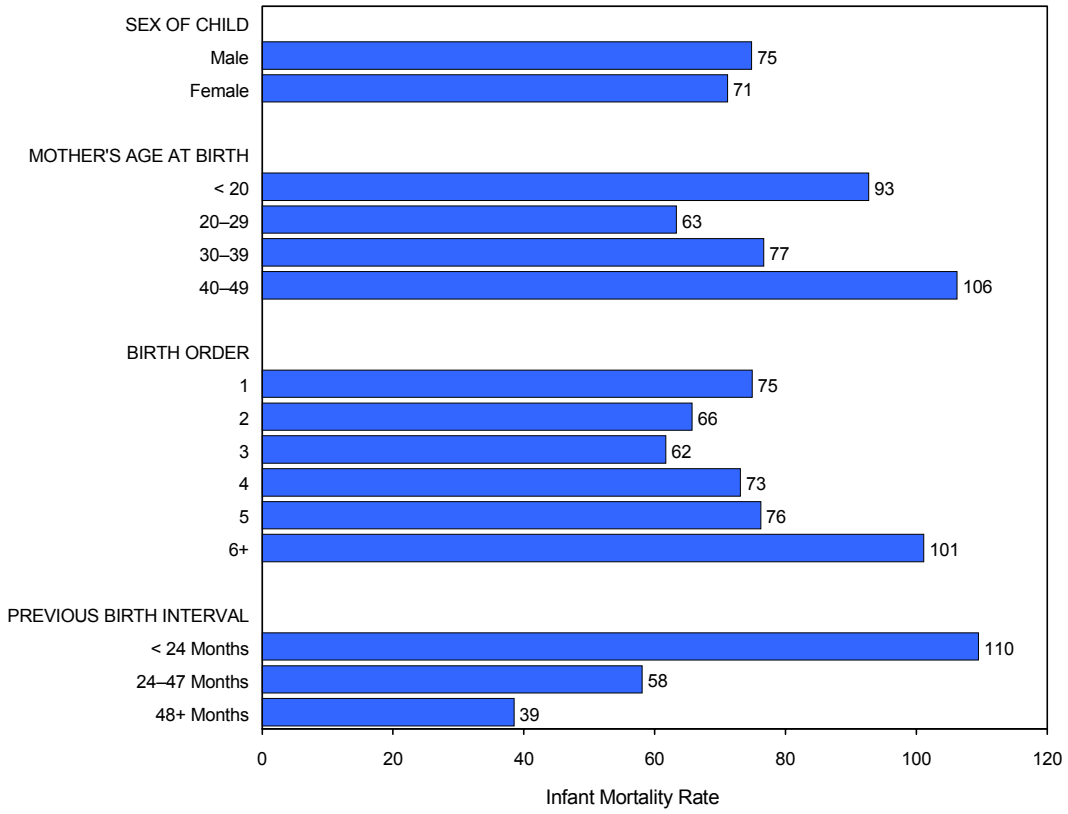
Table 6.5 Infant and child mortality by demographic characteristics (contd.)

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected demographic characteristics and residence, India, 1998–99

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
		TOTAL			
Sex of child					
Male	50.7	24.2	74.8	24.9	97.9
Female	44.6	26.6	71.1	36.7	105.2
Mother's age at birth					
< 20	63.1	29.7	92.7	31.0	120.8
20–29	40.7	22.6	63.3	28.7	90.2
30–39	48.7	27.9	76.7	37.4	111.2
40–49	61.9	44.3	106.2	57.2	157.4
Birth order					
1	52.4	22.4	74.9	18.9	92.3
2	43.8	22.0	65.7	25.7	89.8
3	38.5	23.2	61.7	33.9	93.5
4	44.7	28.4	73.1	36.8	107.3
5	48.7	27.5	76.2	42.0	115.0
6+	62.5	38.6	101.1	49.8	145.9
Previous birth interval					
< 24 months	71.7	37.8	109.5	49.2	153.3
24–47 months	35.5	22.6	58.1	31.4	87.7
48+ months	24.1	14.4	38.5	13.6	51.5
Medical care[2]					
No care	53.6	35.5	89.1	U	U
One or two types of care	35.8	19.0	54.8	U	U
All three types of care	22.2	11.8	34.0	U	U
Birth size[3]					
Large	32.8	18.1	50.9	U	U
Average	30.0	19.9	49.9	U	U
Small	47.5	28.3	75.9	U	U
Very small	110.1	37.0	147.2	U	U

Note: The period preceding the survey does not include the month in which the interview took place. Rates are specified on a per-thousand basis. See text for definition of rates.
U: Not available
( ) Based on 250–499 children surviving to the beginning of the age interval
*Rates not shown; based on fewer than 250 children surviving to the beginning of the age interval
[1]Computed as the difference between the infant and neonatal mortality rates
[2]Medical care includes (i) antenatal care received from a health worker, (ii) delivery assistance given by a doctor, nurse, trained midwife, or other health professional, and (iii) postnatal care received in a health facility or at home within two months of delivery; rates are for the three-year period preceding the survey.
[3]Birth size as reported by the mother; rates are for the three-year period preceding the survey.

Figure 6.3
Infant Mortality Rates by Selected Demographic Characteristics



Note: Based on births in the 10 years preceding the survey (1989–98)

NFHS-2, India, 1998–99

The lower female than male infant mortality rate in India results from considerably higher neonatal mortality among boys (51 deaths per 1,000) than among girls (45 deaths per 1,000) coupled with slightly higher female than male mortality rates during the postneonatal period.

For both social and biological reasons, infant mortality rates and child mortality rates often exhibit a U-shaped pattern with respect to the mother's age at childbirth, with children of the youngest and oldest mothers experiencing higher mortality rates than children whose mothers are in their prime reproductive ages. Children born to young mothers are more likely to be of low birth weight, which is probably an important factor contributing to their higher neonatal mortality rate. Similarly, children born to mothers above age 30 are at a relatively high risk of experiencing congenital problems. The expected U-shaped pattern of mortality by mother's age is observed for all indicators of infant and child mortality in India.

Birth order also tends to have a U-shaped relationship to infant deaths, with first births and high-order births having elevated mortality rates. In Table 6.5 and Figure 6.3, birth order shows the expected U-shaped pattern for neonatal and infant mortality rates. This association is likely to reflect not only the effect of birth order but also the effect of the age of the mother at childbirth. Postneonatal mortality and child mortality rates tend to increase with birth order. The

under-five mortality rate declines slightly from the first birth order to the second birth order and then increases steadily with birth order. The increase in the child mortality rate with birth order may reflect a more intense competition faced by higher birth-order children for the caregiver's time, for medical resources, and for nutritious food when children are weaned. It is also likely that higher birth-order children are disproportionately from lower socioeconomic groups, in which mortality tends to be higher.

The timing of successive births has a powerful effect on the survival chances of children in India. Infant and child mortality rates decrease sharply as the length of the previous birth interval increases, and all measures are especially high for children born less than 24 months after a previous birth. The infant mortality rate is almost three times as high for children with a previous birth interval of less than 24 months as for children with a previous interval of 48 months or more (110 deaths compared with 39 deaths per 1,000 live births). The previous birth interval has a similar effect on all other indicators of infant and child mortality shown in Table 6.5. Although the length of the previous birth interval is likely to affect mortality risks directly, a substantial portion of the association between birth intervals and mortality risks may reflect the effect of factors that are correlated with birth intervals. For example, shorter birth intervals are likely to occur in large families, and large families tend to come from lower socioeconomic groups and are more likely than other families to live in rural areas where medical facilities and other survival-enhancing resources are less readily available. Nevertheless, multivariate analyses of birth-interval effects and child survival commonly find an association between short birth intervals (less than 24 months) and increased mortality even after controlling for other demographic and socioeconomic characteristics (Retherford et al., 1989).

Antenatal, delivery, and postnatal care are usually associated with lower infant mortality. Table 6.5 shows that children of women who receive all three types of care have considerably lower risk of neonatal and postneonatal mortality than those with only one or two types of care. Mortality rates are highest for children of mothers who receive none of the three types of pregnancy-related care.

Another important determinant of the survival chances of children is the baby's weight at the time of birth. Many studies have found that low birth weight babies (under 2,500 grams) have a substantially increased risk of mortality. Because most babies in India are not weighed at the time of birth, in addition to birth weight, mothers were asked whether babies born during the three years preceding the survey were "large, average, small, or very small" at birth. The last panel in Table 6.5 shows neonatal, postneonatal, and infant mortality rates by birth size. Children who are perceived by their mothers to be smaller than average at birth experience much higher mortality risks than children perceived to be of average size or larger. Mortality among children perceived to be very small is markedly higher.

Table 6.5 also shows demographic differentials in infant and child mortality separately for urban and rural areas. In both urban and rural areas, the pattern of demographic differentials is similar to that for the country as a whole.

Table 6.6 and Figure 6.4 present variations in infant and child mortality rates by state. Infant mortality rates vary dramatically from one state to another, ranging from 16 in Kerala to more than 86 in Meghalaya, Uttar Pradesh, and Madhya Pradesh. Other states with infant mortality rates above the national average are Orissa (81), Rajasthan (80), Bihar (73), and Assam

Table 6.6 Infant and child mortality by state

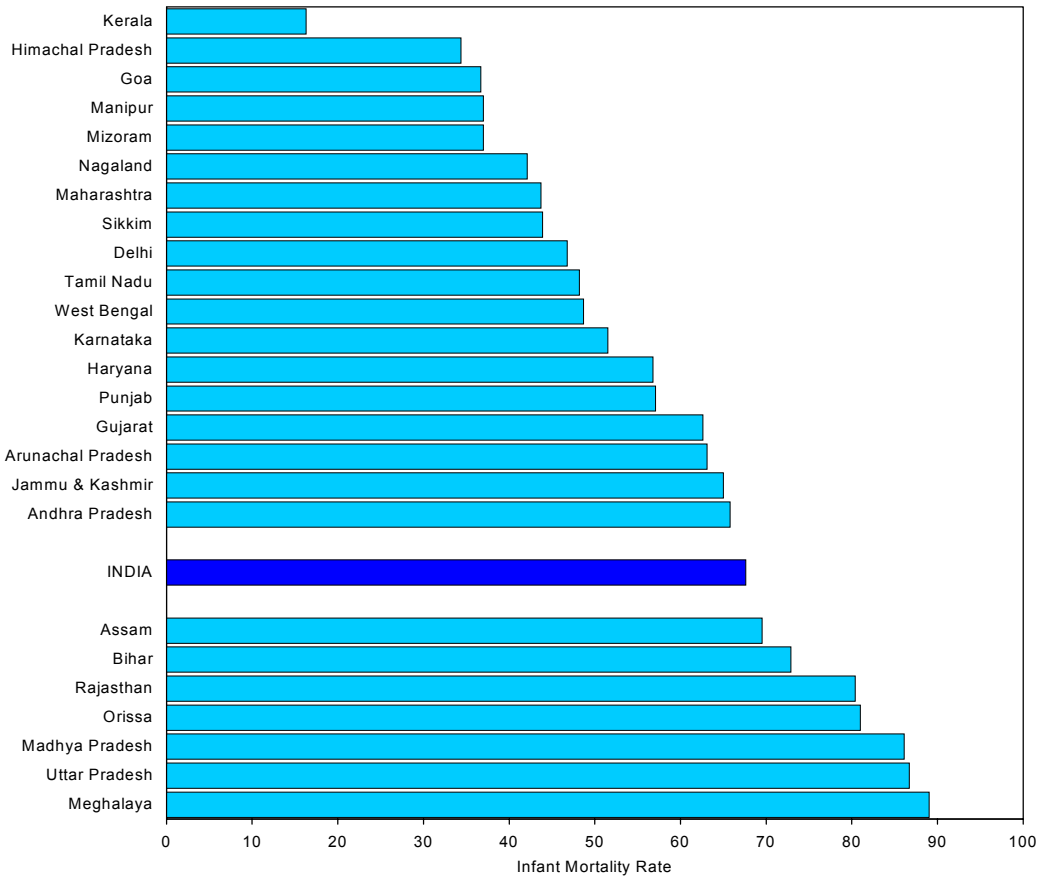
Neonatal, postneonatal, infant, child, and under-five mortality rates for the five-year period preceding the survey by state, India, 1998–99

State	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
India	43.4	24.2	67.6	29.3	94.9
North					
Delhi	29.5	17.4	46.8	9.0	55.4
Haryana	34.9	21.9	56.8	21.2	76.8
Himachal Pradesh	22.1	12.3	34.4	8.3	42.4
Jammu & Kashmir	40.3	24.7	65.0	16.1	80.1
Punjab	34.3	22.8	57.1	15.9	72.1
Rajasthan	49.5	30.9	80.4	37.6	114.9
Central					
Madhya Pradesh	54.9	31.2	86.1	56.4	137.6
Uttar Pradesh	53.6	33.1	86.7	39.2	122.5
East					
Bihar	46.5	26.4	72.9	34.7	105.1
Orissa	48.6	32.3	81.0	25.5	104.4
West Bengal	31.9	16.8	48.7	19.9	67.6
Northeast					
Arunachal Pradesh	41.8	21.3	63.1	37.4	98.1
Assam	44.6	24.9	69.5	21.4	89.5
Manipur	18.6	18.4	37.0	19.9	56.1
Meghalaya	50.7	38.3	89.0	36.2	122.0
Mizoram	18.8	18.2	37.0	18.4	54.7
Nagaland	20.1	22.0	42.1	22.7	63.8
Sikkim	26.3	17.6	43.9	28.4	71.0
West					
Goa	31.2	5.5	36.7	10.5	46.8
Gujarat	39.6	23.0	62.6	24.0	85.1
Maharashtra	32.0	11.7	43.7	15.0	58.1
South					
Andhra Pradesh	43.8	22.1	65.8	21.0	85.5
Karnataka	37.1	14.4	51.5	19.3	69.8
Kerala	13.8	2.5	16.3	2.6	18.8
Tamil Nadu	34.8	13.3	48.2	15.9	63.3

[1]Computed as the difference between the infant and neonatal mortality rates

(70). The child mortality rate ($_4q_1$) also varies considerably in India, ranging from 3 in Kerala to 56 in Madhya Pradesh. Other states with child mortality above the national average are Uttar Pradesh, Rajasthan, Arunachal Pradesh, Meghalaya, and Bihar.

Figure 6.4
Infant Mortality Rate by State



Note: Based on births in the five years preceding the survey (1994–98)

NFHS-2, India, 1998–99

6.3 Maternal Mortality

Worldwide, about 500,000 women die every year from pregnancy and childbirth related causes and most of these deaths occur in developing countries (World Health Organization, 1999). Although reliable national estimates of maternal mortality are not available for most countries, South Asia is thought to have among the highest maternal mortality rates in the world. Most demographic surveys do not have samples that are large enough to produce reliable direct estimates of maternal mortality. The NFHS samples, however, are large enough to estimate maternal mortality at the national level for the two-year period preceding each survey. The NFHS estimates are based on a series of questions in the Household Questionnaire about deaths occurring to usual residents of the household since January of the second calendar year preceding the start of the survey in each state. In the case of deaths to women age 15–49 (13–49 in NFHS-1), a series of follow-up questions was asked about whether the women was pregnant when she died, whether the death occurred during childbirth, whether she died within two months after the end of a pregnancy or childbirth, and whether the death was due to a complication of the pregnancy or childbirth.

On the basis of this information, it is possible to calculate the maternal mortality ratio (MMR), which is defined here as the number of maternal deaths to women age 15–49 per 100,000 live births. This measure is based on the annual number of female deaths to usual residents of the sample households that occurred during childbirth or within two months after the end of a pregnancy or childbirth. The average maternal mortality ratio at the national level for the two-year period preceding NFHS-2 is 540 deaths per 100,000 live births. The corresponding value for the two-year period preceding NFHS-1 was 424 deaths per 100,000 live births (revised using a two-year general fertility rate as in the calculation of the NFHS-2 maternal mortality ratio), suggesting a considerable increase in the maternal mortality ratio in the country. However, it should be noted that despite the large size of the NFHS-1 and NFHS-2 samples, sampling errors for the maternal mortality estimates are quite large. The 95 percent confidence interval for the maternal mortality ratio ranges from 428 to 653 per 100,000 live births for NFHS-2 and from 324 to 524 per 100,000 live births for NFHS-1. There is considerable overlap in the confidence intervals from the two surveys, indicating that the difference between the NFHS-1 and NFHS-2 estimates of MMR is not significant statistically.

In both NFHS-1 and NFHS-2, the rural MMR is much higher than urban MMR (434 compared with 385 in NFHS-1 and 619 compared with 267 in NFHS-2). The confidence intervals are even wider for the urban and rural estimates. Because of large sampling errors, there is no easy way to assess the completeness and accuracy of these estimates, and reliable maternal mortality ratios cannot be calculated for individual states or population subgroups.

Other estimates of the maternal mortality ratio for India range from 407 for 1998 from the Sample Registration System (Office of the Registrar General, 2000) to 570 for 1990 from the World Health Organization (WHO, 1999). The two NFHS estimates—424 from NFHS-1 for 1991–92 and 540 from NFHS-2 for 1997–98—are of the same order of magnitude as these other estimates. All of these estimates imply that more than 100,000 women in India die every year from causes related to pregnancy and childbirth. This finding reinforces the urgency of ensuring that all pregnant women receive adequate antenatal care during pregnancy and that deliveries take place under hygienic conditions with the assistance of trained medical practitioners.

6.4 Morbidity

There is limited experience in collecting morbidity data from population-based demographic sample surveys. NFHS-1 collected data on five major morbidity conditions—partial and complete blindness, tuberculosis, leprosy, physical impairment of the limbs, and malaria—among all persons in the sampled households. The results were found to be generally plausible and useful. For these reasons, it was decided to include similar morbidity questions in NFHS-2. In NFHS-2, questions on blindness, leprosy, and physical impairment of the limbs were replaced by questions on asthma and jaundice. The questions on tuberculosis and malaria were retained, and a question on medical treatment of tuberculosis was added to get a better measure of the prevalence of tuberculosis. The household head or other knowledgeable adult in the household reported morbidity for all household members, and no effort was made to do clinical tests for any of the disease conditions.

Table 6.7 shows the prevalence of asthma, tuberculosis, jaundice, and malaria in the household population by age, sex, and place of residence. There are several reasons why the results of NFHS-2 may understate the prevalence of these conditions. Respondents may

Table 6.7 Morbidity

Number of persons per 100,000 usual household residents suffering from asthma, tuberculosis, jaundice, or malaria by age, sex, and residence, India, 1998–99

Age and sex	Number of persons per 100,000 suffering from: Asthma	Tuberculosis[1]	Medically treated tuberculosis	Jaundice during the past 12 months	Malaria during the past 3 months	Number of usual residents
URBAN						
Age						
< 15	829	144	106	1,555	2,112	40,908
15–59	1,795	426	338	1,132	2,207	79,941
60+	8,304	1,141	913	583	1,913	9,488
Sex						
Male	1,955	446	350	1,354	2,133	67,586
Female	1,978	330	262	1,085	2,180	62,750
Total	1,966	390	307	1,225	2,156	130,336
RURAL						
Age						
< 15	986	155	106	1,503	3,990	134,529
15–59	2,517	776	630	1,423	4,343	196,498
60+	11,036	1,448	1,141	903	4,858	29,737
Sex						
Male	2,784	690	558	1,675	4,320	184,367
Female	2,508	507	391	1,134	4,184	176,397
Total	2,649	600	476	1,410	4,254	360,764
TOTAL						
Age						
< 15	950	153	106	1,515	3,552	175,437
15–59	2,309	675	545	1,339	3,725	276,439
60+	10,375	1,374	1,086	826	4,146	39,224
Sex						
Male	2,561	624	502	1,589	3,734	251,953
Female	2,369	460	357	1,121	3,658	239,147
Total	2,468	544	432	1,361	3,697	491,100

[1]Includes medically treated tuberculosis

underreport diseases carrying a stigma, such as tuberculosis, due to intentional concealment. Underestimation may also occur because the household respondents are unaware that they or other members of the household have the condition. It is also possible that the respondents know that a household member suffers from a given condition but fail to report it because they do not recognize the term used by the enumerator to describe the condition. On the other hand, a factor contributing to a possible overestimation of prevalence without clinical verification is that some other disease can be mistaken by the respondent as one of the listed diseases; for example, chronic bronchitis may be reported as asthma or tuberculosis, or common flu may be reported as malaria.

Asthma

Asthma is a chronic respiratory disease characterized by sudden attacks of laboured breathing, chest constriction, and coughing. There has been a rapid increase in asthma cases in recent years in many parts of the world. In India, 2,468 persons per 100,000 population were reported to be suffering from asthma at the time of the survey. The prevalence of asthma is considerably higher in rural areas (2,649 per 100,000 population) than in urban areas (1,966 per 100,000 population), and is slightly higher among males (2,561 per 100,000) than among females (2,369 per 100,000). Age differences are marked, with the prevalence of asthma increasing from 950 per 100,000 at age 0–14 to 10,375 per 100,000 at age 60 and over.

Tuberculosis

Tuberculosis, which is also resurgent worldwide, is an infectious disease that affects the lungs and other body tissues. Tuberculosis of the lungs, the most commonly known form, is characterized by coughing up mucus and sputum, fever, weight loss, and chest pain. According to NFHS-2, the overall prevalence of tuberculosis in India is 544 per 100,000 population. This is 16 percent higher than the prevalence recorded in NFHS-1 (467 per 100,000), indicating that tuberculosis may be on the rise in India. The prevalence of tuberculosis is much higher in rural areas (600 per 100,000) than in urban areas (390 per 100,000). The prevalence rate is much higher for males (624 per 100,000) than for females (460 per 100,000). The sex differential in the prevalence of tuberculosis is about the same in urban and rural areas. Probable reasons for the much higher prevalence of tuberculosis among males than females are that men are more likely than women to come in contact with people who suffer from active tuberculosis and that men in India smoke more than women. The prevalence of tuberculosis increases rapidly with age. It is substantially higher among persons age 60 and above (1,374 per 100,000) than among those age 15–59 (675 per 100,000) or age 0–14 (153 per 100,000).

Medically treated tuberculosis is expected to give a more reliable measure of the prevalence of active tuberculosis than the measure based on all reported cases considered in the preceding paragraph. As expected, the prevalence of medically treated tuberculosis is considerably lower (432 per 100,000) than the prevalence based on all reported cases (544 per 100,000). Differentials in the prevalence of medically treated tuberculosis by residence, age, and sex are similar to differentials in the prevalence of all reported cases.

Jaundice

Jaundice is characterized by yellowish discolouration of the eyes and skin, fever, liver enlargement, and abdominal pain. NFHS-2 asked household respondents if any member of the household had suffered from jaundice at any time during the 12 months preceding the survey. In India as a whole, 1,361 persons per 100,000 population were reported to have suffered from jaundice during the 12 months preceding the survey. People living in rural areas were somewhat more likely to have suffered from jaundice (1,410 per 100,000) than those living in urban areas (1,225 per 100,000). Males were 42 percent more likely to have suffered from jaundice than females. Jaundice is the only condition measured that decreases with age. The prevalence of jaundice was highest for the age group 0–14 (1,515 per 100,000), followed by the age groups 15–59 (1,339 per 100,000) and 60 years and above (826 per 100,000). The age and sex differentials in the prevalence of jaundice are similar in urban and rural areas.

Malaria

Malaria is characterized by recurrent high fever with shivering. NFHS-2 asked household respondents whether any member of their household suffered from malaria any time during the three months preceding the survey. In India, 3,697 persons per 100,000 population were reported to have suffered from malaria during the three months preceding the survey. Since the prevalence of malaria is known to vary considerably by season, the NFHS-2 estimates should not be interpreted as representative of the level throughout the year. It would also be misleading to compare this estimate with the lower NFHS-1 estimate because the months of the year comprising the reference period for the malaria estimates from the two surveys are different.

Rural residents are almost twice as likely to suffer from malaria (4,254 per 100,000) as are urban residents (2,156 per 100,000). The reported prevalence of malaria is slightly higher for males than for females. The prevalence of malaria during the past three months increases with age, from 3,552 per 100,000 in the population under age 15 to 4,146 per 100,000 in the population age 60 years and above. The steady increase with age occurs in rural areas but not in urban areas.

Comparisons by State

Table 6.8 shows comparisons of prevalence rates for morbidity by state. The prevalence of asthma varies considerably by state, from a low of 1,204 per 100,000 in Delhi to a high of 5,995 per 100,000 in Meghalaya. Other states with relatively low levels of asthma prevalence are Punjab and Himachal Pradesh, and other states with relatively high prevalence rates are Nagaland, Kerala, Sikkim, and Andhra Pradesh.

State variations in the prevalence rate of tuberculosis are also large. Tuberculosis prevalence ranges from 207 per 100,000 in Punjab to 1,654 per 100,000 in Nagaland. All states in the Northeast Region except Assam have prevalence rates above 1,000 per 100,000. Tuberculosis prevalence rates are also noticeably high in Bihar and Orissa. Variations in the prevalence of medically treated tuberculosis are generally in line with the variations in all reported cases of tuberculosis.

State differentials are also substantial for jaundice. Jaundice is most common in Nagaland, but it is also a substantial problem in most other northeastern states and in West Bengal and Goa. The prevalence of malaria varies widely across the states, at least partly because of seasonal variations in the timing of the survey fieldwork. Malaria was most often reported in Meghalaya, Nagaland, Arunachal Pradesh, and Madhya Pradesh, where 10–17 percent of the population were reported to have malaria during the three months preceding the survey. On the other hand, there were very few reports of malaria in Kerala, Himachal Pradesh, and Tamil Nadu. Four states (Arunachal Pradesh, Meghalaya, Nagaland, and Andhra Pradesh) have a higher prevalence of all these diseases than the national average, and six states (Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Karnataka, and Tamil Nadu) consistently have a lower prevalence than the national average.

Table 6.8 Morbidity by state

Number of persons per 100,000 usual household residents suffering from asthma, tuberculosis, jaundice, or malaria by state and residence, India, 1998–99

State	Number of persons per 100,000 suffering from: Asthma	Tuberculosis[1]	Medically treated tuberculosis	Jaundice during the past 12 months	Malaria during the past 3 months
			URBAN		
India	1,966	390	307	1,225	2,156
North					
Delhi	1,216	548	483	946	592
Haryana	1,545	305	284	885	1,217
Himachal Pradesh	841	200	177	575	177
Jammu & Kashmir	1,158	320	320	977	199
Punjab	1,112	200	164	1,057	949
Rajasthan	2,573	329	290	808	3,007
Central					
Madhya Pradesh	1,737	405	326	1,318	5,240
Uttar Pradesh	1,667	490	347	1,037	1,441
East					
Bihar	1,430	629	558	1,551	1,833
Orissa	3,000	819	652	1,152	4,571
West Bengal	2,410	357	170	1,892	918
Northeast					
Arunachal Pradesh	1,451	1,055	792	1,451	11,346
Assam	1,931	583	345	2,716	1,910
Manipur	1,900	1,086	1,086	1,324	847
Meghalaya	2,798	580	506	1,306	5,533
Mizoram	2,112	1,096	907	1,837	4,438
Nagaland	4,343	1,723	1,546	6,972	14,447
Sikkim	3,197	1,151	128	2,046	1,535
West					
Goa	2,003	445	329	1,989	1,267
Gujarat	1,304	279	242	1,141	3,378
Maharashtra	2,172	342	282	1,618	3,551
South					
Andhra Pradesh	3,525	299	199	1,456	2,613
Karnataka	1,442	216	190	372	280
Kerala	3,901	348	301	165	47
Tamil Nadu	1,318	431	366	1,185	346

Table 6.8 Morbidity by state (contd.)

Number of persons per 100,000 usual household residents suffering from asthma, tuberculosis, jaundice, or malaria by state and residence, India, 1998–99

State	Number of persons per 100,000 suffering from: Asthma	Tuberculosis[1]	Medically treated tuberculosis	Jaundice during the past 12 months	Malaria during the past 3 months
			RURAL		
India	2,649	600	476	1,410	4,254
North					
Delhi	1,068	92	92	639	725
Haryana	2,074	379	327	1,037	2,447
Himachal Pradesh	1,389	265	240	437	394
Jammu & Kashmir	1,870	455	455	933	706
Punjab	1,391	210	210	942	1,140
Rajasthan	3,237	420	358	1,070	4,458
Central					
Madhya Pradesh	2,457	669	587	2,134	11,646
Uttar Pradesh	2,061	566	444	943	4,103
East					
Bihar	2,103	1,035	868	1,510	4,034
Orissa	3,288	835	714	1,265	7,770
West Bengal	2,654	537	330	2,544	1,669
Northeast					
Arunachal Pradesh	3,371	1,302	1,164	1,703	12,814
Assam	3,394	721	358	2,773	3,066
Manipur	2,108	1,118	988	1,924	2,551
Meghalaya	6,793	1,679	683	2,996	19,433
Mizoram	2,190	1,027	708	4,630	10,623
Nagaland	6,076	1,637	961	4,940	16,597
Sikkim	4,938	980	742	2,432	1,044
West					
Goa	1,971	480	304	2,417	688
Gujarat	2,451	550	438	1,087	5,199
Maharashtra	2,788	236	191	1,471	4,509
South					
Andhra Pradesh	4,560	695	532	1,611	5,633
Karnataka	1,888	297	237	374	770
Kerala	5,084	581	434	640	58
Tamil Nadu	1,667	505	455	1,118	399

Table 6.8 Morbidity by state (contd.)

Number of persons per 100,000 usual household residents suffering from asthma, tuberculosis, jaundice, or malaria by state and residence, India, 1998–99

State	Number of persons per 100,000 suffering from:				
	Asthma	Tuberculosis[1]	Medically treated tuberculosis	Jaundice during the past 12 months	Malaria during the past 3 months
			TOTAL		
India	2,468	544	432	1,361	3,697
North					
Delhi	1,204	511	451	921	603
Haryana	1,922	358	314	993	2,093
Himachal Pradesh	1,339	259	234	450	374
Jammu & Kashmir	1,725	428	428	942	602
Punjab	1,308	207	197	976	1,082
Rajasthan	3,073	397	342	1,005	4,099
Central					
Madhya Pradesh	2,273	602	520	1,927	10,015
Uttar Pradesh	1,979	551	424	963	3,552
East					
Bihar	2,028	989	833	1,515	3,788
Orissa	3,255	833	707	1,253	7,414
West Bengal	2,593	492	290	2,381	1,482
Northeast					
Arunachal Pradesh	3,117	1,270	1,115	1,669	12,619
Assam	3,278	710	357	2,768	2,974
Manipur	2,040	1,107	1,020	1,728	1,995
Meghalaya	5,995	1,459	648	2,658	16,656
Mizoram	2,149	1,063	813	3,155	7,359
Nagaland	5,729	1,654	1,078	5,348	16,166
Sikkim	4,711	1,002	662	2,382	1,108
West					
Goa	1,984	466	314	2,245	920
Gujarat	1,979	438	357	1,109	4,449
Maharashtra	2,524	282	230	1,534	4,098
South					
Andhra Pradesh	4,292	592	446	1,571	4,851
Karnataka	1,733	269	221	373	600
Kerala	4,806	526	403	528	56
Tamil Nadu	1,546	479	424	1,142	380

[1]Includes medically treated tuberculosis

6.5 Child Immunization

The vaccination of children against six serious but preventable diseases (tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles) has been a cornerstone of the child health care system in India. As part of the National Health Policy, the National Immunization Programme is being implemented on a priority basis. The Expanded Programme on Immunization (EPI) was initiated by the Government of India in 1978 with the objective of reducing morbidity, mortality, and disabilities from these six diseases by making free vaccination services easily available to all eligible children. Immunization against poliomyelitis was introduced in 1979–80, and tetanus toxoid for school children was added in 1980–81. Immunization against tuberculosis (BCG) was

brought under the EPI in 1981–82. The latest addition to the Programme was vaccination against measles in 1985–86 (Ministry of Health and Family Welfare, 1991).

The Universal Immunization Programme (UIP) was introduced in 1985–86 with the following objectives: to cover at least 85 percent of all infants against the six vaccine-preventable diseases by 1990 and to achieve self-sufficiency in vaccine production and the manufacture of cold-chain equipment (Ministry of Health and Family Welfare, 1991). This scheme has been introduced in every district of the country and the target now is to achieve 100 percent immunization coverage. Pulse Polio Immunization Campaigns began in December 1995 as part of a major national effort to eliminate polio.

The standard immunization schedule developed for the child immunization programme specifies the age at which each vaccine is to be administered, the number of doses to be given, and the route of vaccination (intramuscular, oral, or subcutaneous). Routine vaccinations received by infants and children are usually recorded on a vaccination card that is issued for the child.

NFHS-2 asked mothers in India whether they had a vaccination card for each child born since January 1995 (or since January 1996 in states in which the survey began in 1999). If a card was available, the interviewer was required to copy carefully the dates when the child received vaccinations against each disease. For vaccinations not recorded on the card, the mother's report that the vaccination was or was not given was accepted. If the mother could not show a vaccination card, she was asked whether the child had received any vaccinations. If any vaccinations had been received, the mother was asked whether the child had received a vaccination against tuberculosis (BCG); diphtheria, whooping cough (pertussis), and tetanus (DPT); poliomyelitis (polio); and measles. For DPT and polio, information was obtained on the number of doses of the vaccine given to the child. Mothers were not asked the dates of vaccinations. To distinguish Polio 0 (polio vaccine given at the time of birth) from Polio 1 (polio vaccine given about six weeks after birth), mothers were also asked whether the first polio vaccine was given just after birth or later[3].

Table 6.9 gives the percentages of urban and rural children age 12–23 months who received specific vaccinations at any time before the interview and before 12 months of age, according to whether a vaccination card was shown to the interviewer or the mother was the source of all vaccination information. The 12–23 month age group was chosen for analysis because both international and Government of India guidelines specify that children should be fully immunized by the time they complete their first year of life. Because the date of vaccination was not asked of the mother if she could not show a vaccination card, for children whose information is based on the mother's report, the proportion of vaccinations given during the first year of life is assumed to be the same as the proportion of vaccinations given during the first year of life among children with an exact date of vaccination on the card.

[3]Because mothers sometimes report that the first dose was given just after birth even if it was given several weeks later, an adjustment was made to the estimates of the number of polio vaccinations given, based on reports of the number of DPT vaccinations. This adjustment is based on the fact that when children receive a DPT vaccination, they are almost always given a polio vaccination at the same time. Thus, if the number of polio vaccinations was reported to be less than the number of DPT vaccinations and the first polio vaccination was reported to be given just after birth, then Polio 0 is assumed to really be Polio 1, Polio 1 is assumed to be Polio 2, etc. For comparative purposes, this same adjustment was made to the NFHS-1 vaccination estimates.

Table 6.9 Childhood vaccinations by source of information

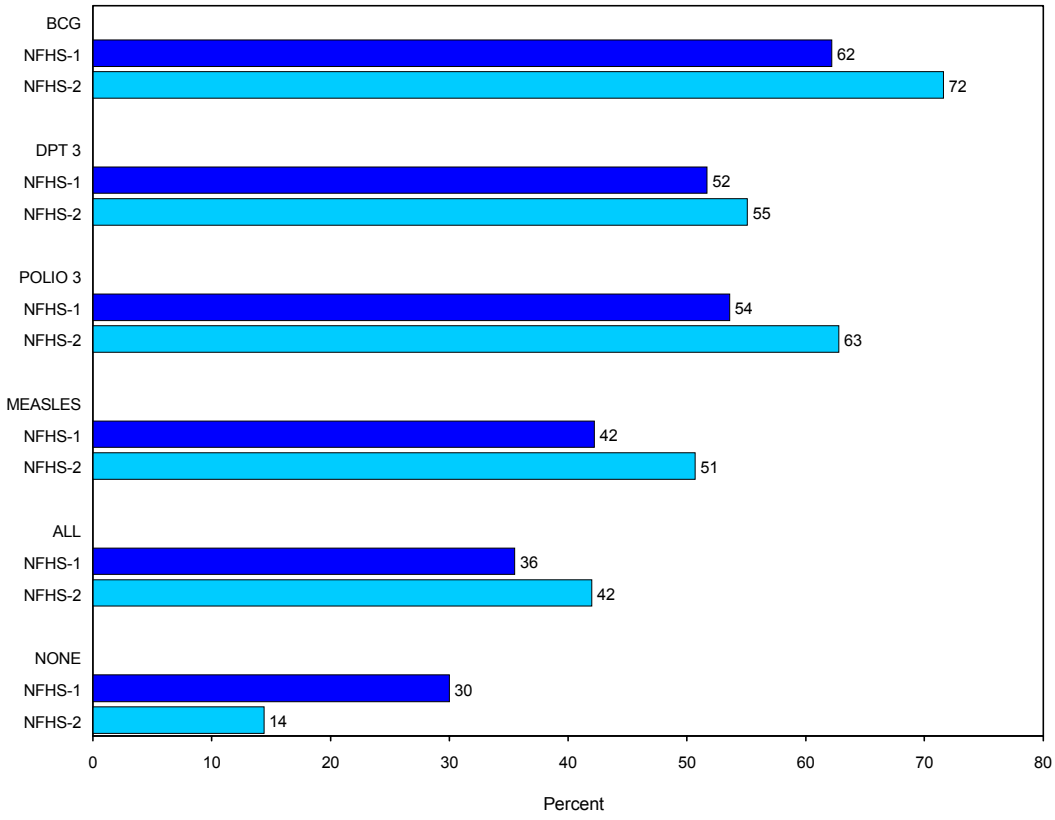
Percentage of children age 12–23 months who received specific vaccinations at any time before the interview and before 12 months of age by source of information on vaccination history and residence, India, 1998–99

	Percentage vaccinated											
			DPT			Polio						Number of
Source of information	BCG	Polio 0	1	2	3	1	2	3	Measles	All[1]	None	children
URBAN												
Vaccinated at any time before the interview												
Vaccination card	96.6	33.0	98.9	96.4	91.1	98.5	96.0	90.8	81.0	77.5	0.1	1,048
Mother's report	78.4	14.9	75.3	69.5	58.3	86.9	83.7	67.5	59.2	46.0	11.7	1,233
Either source	86.8	23.3	86.1	81.9	73.4	92.2	89.4	78.2	69.2	60.5	6.4	2,282
Vaccinated by 12 months of age[2]	85.1	23.3	83.6	79.1	70.6	89.4	86.1	74.9	59.7	51.9	8.6	2,282
RURAL												
Vaccinated at any time before the interview												
Vaccination card	94.5	19.8	98.4	91.4	83.0	97.9	91.1	83.0	69.7	65.4	0.1	2,344
Mother's report	55.3	5.9	53.7	46.6	35.5	73.8	68.0	47.7	34.8	24.3	23.9	5,450
Either source	67.1	10.1	67.1	60.1	49.8	81.1	75.0	58.3	45.3	36.6	16.7	7,795
Vaccinated by 12 months of age[2]	64.3	10.1	64.4	57.0	46.6	77.5	71.1	54.4	36.2	29.3	20.2	7,795
TOTAL												
Vaccinated at any time before the interview												
Vaccination card	95.2	23.9	98.6	92.9	85.5	98.1	92.6	85.4	73.2	69.1	0.1	3,393
Mother's report	59.6	7.6	57.6	50.8	39.7	76.2	70.9	51.3	39.3	28.3	21.6	6,684
Either source	71.6	13.1	71.4	65.0	55.1	83.6	78.2	62.8	50.7	42.0	14.4	10,076
Vaccinated by 12 months of age[2]	69.1	13.1	68.8	62.1	52.1	80.3	74.6	59.2	41.7	34.5	17.5	10,076

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey.
[1]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0)
[2]For children whose information was based on the mother's report, the proportion of vaccinations given by 12 months of age is assumed to be the same as for children with a written record of vaccination.

In NFHS-2, children who received BCG, measles, and three doses each of DPT and polio (excluding Polio 0) are considered to be fully vaccinated. Based on information obtained from a card or reported by the mother ('either source'), 42 percent of children age 12–23 months are fully vaccinated and 14 percent have not received any vaccinations. Coverage for BCG, DPT, and polio (except Polio 0) vaccinations is much higher than the percentage fully vaccinated. BCG, the first dose of DPT, and the first and second doses of polio vaccine have each been received by at least 71 percent of children. Fifty-five percent of children have received three doses of DPT and 63 percent have received three doses of polio vaccine. Although DPT and polio vaccinations are given at the same time as part of the routine immunization programme, the coverage rates are higher for polio than for DPT (especially for the first two doses), undoubtedly because of the Pulse Polio campaigns. Not all children who begin with the DPT and polio vaccination series go on to complete them. The difference between the percentages of children receiving the first and third doses is 16 percentage points for DPT and 21 percentage points for polio. Fifty-one percent of children age 12–23 months have been vaccinated against measles.

Figure 6.5
Percentage of Children Age 12–23 Months Who Have Received Specific Vaccinations, NFHS-1 and NFHS-2



The relatively low percentage vaccinated against measles is partly responsible for the fact that the percentage fully vaccinated is not higher than it is.

There has been considerable improvement in vaccination coverage in India since the time of NFHS-1 when the proportion of children fully vaccinated was 36 percent and the proportion who had received no vaccinations was 30 percent (Figure 6.5). The coverage of each specific vaccination has also improved considerably since NFHS-1. Nonetheless, these data indicate that achievement of the goal of universal immunization coverage for children in India is far from complete.

Government of India statistics suggest a much higher level of vaccination coverage than NFHS-2 estimates. According to government statistics for 1997–98, 61 percent of children age 12–23 months are fully vaccinated and coverage is 79 percent for BCG, 73 percent for the third dose of DPT, 73 percent for the third dose of polio vaccine, and 66 percent for measles (Ministry of Health and Family Welfare, 1999).

According to the immunization schedule, all primary vaccinations, including measles, should be completed by the time a child is 12 months old. Table 6.9 shows that only 35 percent

of all children (or 82 percent of fully vaccinated children) were fully vaccinated by age 12 months. The percentages of children who received BCG, each dose of DPT, and each dose of polio by age 12 months are only slightly lower than the percentages who received these vaccines at any time before the survey. For measles vaccination, however, which is supposed to be given when the child is nine months old, the gap is wider (51 percent at any time before the survey compared with 42 percent by age 12 months). Eighteen percent of children who were vaccinated against measles received the vaccination after their first birthday.

The analysis of vaccine-specific data indicates much higher coverage for each type of vaccine in urban areas than in rural areas. Sixty-one percent of children age 12–23 months in urban areas had received all of the recommended vaccinations by the time of the survey, compared with 37 percent in rural areas. The proportion fully vaccinated during the first year of life is also much higher in urban areas (52 percent) than in rural areas (29 percent). Dropout rates for both DPT and polio are lower in urban areas than in rural areas.

Table 6.10 and Figure 6.6 present vaccination coverage rates (according to the vaccination card or the mother) for children age 12–23 months by selected background characteristics. The table also shows the percentage of children with vaccination cards that were shown to the interviewer. Mothers could show vaccination cards for 34 percent of children age 12–23 months, up slightly from 31 percent in NFHS-1. Vaccination cards were shown for 46 percent of children in urban areas and 30 percent in rural areas. As expected, vaccination coverage is much higher for children for whom a vaccination card was shown than for other children (see Table 6.9).

Boys (43 percent) are slightly more likely than girls (41 percent) to be fully vaccinated. Boys are also somewhat more likely than girls to have received each of the individual vaccinations. Mothers showed vaccination cards for 34 percent of boys and 33 percent of girls. In NFHS-1, vaccination coverage was also slightly higher for boys than for girls and a vaccination card was shown for a higher proportion of boys than girls. It is noteworthy that the male-female difference in the percentage fully immunized and in the percentage showing a vaccination card is small and diminishing over time, indicating that discrimination against female children in India with regard to immunizations is not a major problem.

The relationship between vaccination coverage and birth order is consistently negative for almost all vaccinations. A large majority of first-order births occur to younger women who are more likely than older women to utilize maternal and child health care services. As with the use of maternal health care services, there is a strong positive relationship between mother's education and children's vaccination coverage. Only 28 percent of children of illiterate mothers are fully vaccinated compared with 73 percent of children of mothers who have at least completed high school. Muslim children (33 percent) are less likely to be fully vaccinated than are Hindu (42 percent), Christian (61 percent), Sikh (70 percent), Buddhist/Neo-Buddhist (73 percent), or 'other' (60 percent) children. By caste/tribe, scheduled-tribe children (26 percent) are less likely to be fully vaccinated than are scheduled-caste (40 percent), other backward class (43 percent), or 'other' (47 percent) children. Household standard of living has a strong positive relationship with vaccination coverage, as expected. Only 30 percent of children from households with a low standard of living are fully vaccinated compared with 65 percent of children from households with a high standard of living. Differentials in immunization coverage for individual vaccines are similar to those just reported for full immunization.

Table 6.10 Childhood vaccinations by background characteristics

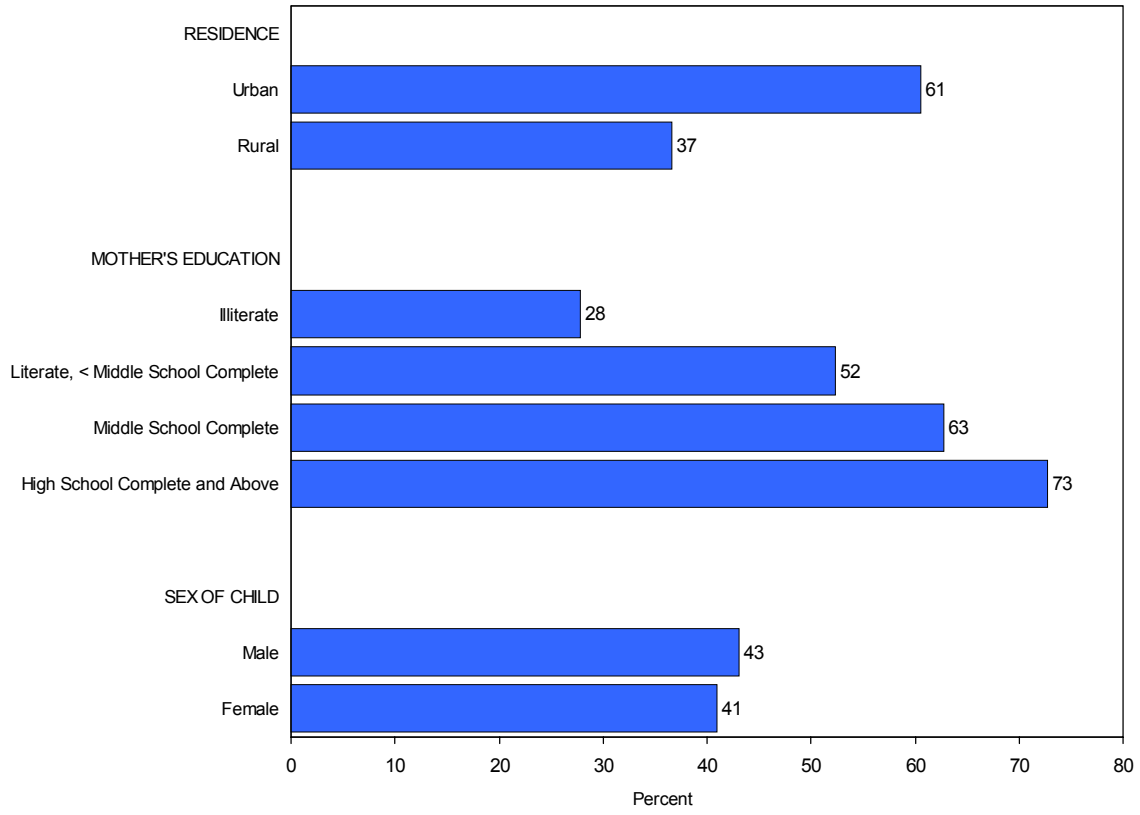
Percentage of children age 12–23 months who received specific vaccinations at any time before the interview (according to the vaccination card or the mother) and percentage with a vaccination card that was shown to the interviewer by selected background characteristics, India, 1998–99

Background characteristic	Percentage vaccinated											Percentage showing vaccination card	Number of children
			DPT			Polio							
	BCG	Polio 0	1	2	3	1	2	3	Measles	All[1]	None		
Sex of child													
Male	72.8	13.2	73.2	66.6	56.3	84.5	79.3	63.4	51.6	43.1	13.5	34.4	5,163
Female	70.3	13.0	69.5	63.3	54.0	82.7	77.1	62.2	49.8	40.9	15.3	32.9	4,913
Birth order													
1	79.8	19.2	80.1	74.9	66.9	88.6	84.5	72.7	61.8	54.0	9.8	42.3	2,957
2	79.0	15.8	78.7	72.9	63.0	89.2	84.4	69.8	56.7	48.9	9.1	38.5	2,663
3	72.0	9.7	70.0	63.0	51.4	82.2	75.9	59.3	49.4	38.8	15.0	29.9	1,805
4+	54.6	5.9	55.3	47.4	36.8	73.3	66.6	47.2	33.1	24.1	24.4	21.7	2,651
Residence													
Urban	86.8	23.3	86.1	81.9	73.4	92.2	89.4	78.2	69.2	60.5	6.4	45.9	2,282
Rural	67.1	10.1	67.1	60.1	49.8	81.1	75.0	58.3	45.3	36.6	16.7	30.1	7,795
Mother's education													
Illiterate	59.1	7.1	58.7	51.0	40.2	76.3	69.4	50.9	35.8	27.8	21.2	24.2	5,867
Literate, < middle school complete	82.8	15.2	82.6	76.8	66.7	90.4	85.9	72.8	61.8	52.3	8.0	41.4	1,782
Middle school complete	90.5	23.0	91.1	85.8	77.6	94.0	90.9	79.5	71.8	62.7	4.6	49.0	921
High school complete and above	95.2	27.9	95.6	92.7	86.0	97.4	95.5	87.1	82.8	72.7	1.4	52.2	1,505
Religion													
Hindu	72.5	13.1	72.1	65.6	55.7	84.7	79.3	63.5	51.5	42.4	13.3	33.7	7,941
Muslim	62.3	9.9	63.2	56.0	45.7	76.3	70.0	54.0	40.4	32.7	21.0	30.6	1,605
Christian	84.0	32.1	84.5	81.4	72.8	88.5	86.8	76.5	66.2	61.1	11.0	42.3	264
Sikh	86.4	14.0	86.8	84.5	77.6	87.9	86.9	80.5	75.7	69.5	11.1	45.9	138
Buddhist/Neo-Buddhist	94.6	15.6	94.1	94.0	88.7	94.4	94.3	90.1	77.3	73.0	1.1	39.9	58
Other	88.1	11.4	89.4	88.9	75.2	90.1	89.8	67.2	69.8	59.7	9.1	41.6	31
Caste/tribe													
Scheduled caste	69.6	11.7	68.4	62.9	52.7	82.6	77.8	61.3	47.6	40.2	15.1	31.3	2,031
Scheduled tribe	60.0	4.5	57.0	48.6	37.5	73.9	66.9	49.0	34.3	26.4	24.2	24.5	935
Other backward class	71.6	18.7	72.4	66.0	56.7	86.6	81.3	65.6	50.7	43.0	11.6	33.4	3,217
Other	76.1	11.6	76.4	69.9	60.4	84.6	79.4	65.6	57.1	46.8	13.3	38.1	3,770
Standard of living index													
Low	59.3	9.0	59.2	52.2	42.7	76.4	69.8	51.9	37.6	30.4	20.8	26.2	3,637
Medium	74.1	12.9	74.0	67.4	56.9	85.3	80.0	64.8	51.6	43.2	13.1	35.2	4,680
High	91.2	22.6	91.0	86.3	78.0	94.6	91.8	81.2	77.2	64.7	4.0	45.8	1,649
Total	71.6	13.1	71.4	65.0	55.1	83.6	78.2	62.8	50.7	42.0	14.4	33.7	10,076

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 21 children belonging to the Jain religion, 7 children with no religion, and 1, 10, 124, and 109 children with missing information on mother's education, religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.

[1]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0)

Figure 6.6
Percentage of Children Age 12–23 Months Who Have Received All Vaccinations



NFHS-2, India, 1998–99

Table 6.11 and Figure 6.7 show vaccination coverage rates for each type of vaccination and the percentage of mothers showing a vaccination card for children age 12–23 months in each state. There are considerable interstate differentials in the coverage rates for different vaccinations and for children receiving all vaccinations. The percentage of children who are fully vaccinated ranges from 11 percent in Bihar to 89 percent in Tamil Nadu. Among major states, Bihar (11 percent), Assam (17 percent), Rajasthan (17 percent), Uttar Pradesh (21 percent), and Madhya Pradesh (22 percent) stand out as having a much lower percentage of children fully vaccinated than the national average of 42 percent. As these states account for more than 40 percent of the total population of the country, their low coverage for vaccination pulls down the coverage rate for the country as a whole. All northern states except Rajasthan, and all southern and western states, have fared relatively well with regard to full coverage of vaccinations. Most of the northeastern states have a relatively poor record on vaccination coverage. A similar picture emerges with respect to individual vaccinations. Tamil Nadu, Goa, Maharashtra, Himachal Pradesh, and Kerala are approaching universal coverage for BCG and three doses of DPT and polio. In most states, there is a considerable drop from the second to the third dose for both DPT and polio, and in almost every state fewer children have received measles vaccine than any of the other vaccinations. Dropouts for DPT and polio and relatively low levels of coverage for measles are major factors in the failure to achieve full immunization coverage.

Table 6.11 Childhood vaccinations by state

Percentage of children age 12–23 months who received specific vaccinations at any time before the interview (according to the vaccination card or the mother) and percentage with a vaccination card that was shown to the interviewer by state, India, 1998–99

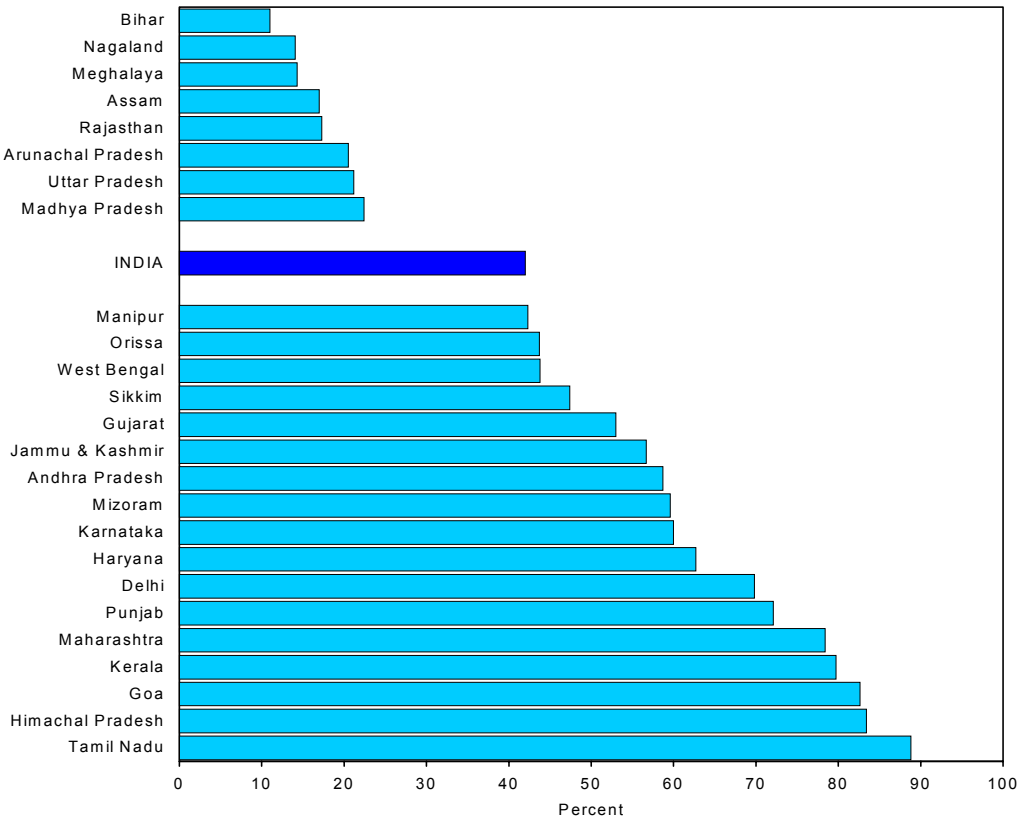
State	Percentage vaccinated											Percentage showing vaccination card
			DPT			Polio						
	BCG	Polio 0	1	2	3	1	2	3	Measles	All[1]	None	
India	71.6	13.1	71.4	65.0	55.1	83.6	78.2	62.8	50.7	42.0	14.4	33.7
North												
Delhi	92.0	36.9	90.8	88.3	79.9	93.8	91.7	81.0	77.5	69.8	5.1	43.7
Haryana	86.8	6.1	89.5	84.5	71.1	90.1	87.4	74.3	72.2	62.7	9.9	24.4
Himachal Pradesh	94.6	4.2	96.7	96.1	88.8	97.2	97.2	89.8	89.1	83.4	2.8	54.6
Jammu & Kashmir	85.6	4.8	85.7	83.6	72.3	88.3	85.4	74.3	68.9	56.7	10.4	51.1
Punjab	88.7	11.2	88.4	87.3	82.0	90.5	88.5	83.6	76.5	72.1	8.7	43.0
Rajasthan	53.9	3.2	47.8	40.2	26.1	75.5	67.3	44.6	27.1	17.3	22.5	14.7
Central												
Madhya Pradesh	64.9	10.1	62.8	52.3	37.0	85.4	79.0	56.7	35.5	22.4	13.9	25.1
Uttar Pradesh	57.5	4.7	57.3	46.5	33.9	66.5	60.3	42.3	34.6	21.2	29.5	20.4
East												
Bihar	37.7	3.6	39.7	33.4	24.2	81.3	71.7	41.0	16.6	11.0	16.8	17.4
Orissa	84.7	14.6	80.1	74.8	61.9	88.7	84.8	68.4	54.0	43.7	9.4	46.2
West Bengal	76.5	2.1	77.9	70.1	58.3	83.9	76.5	61.7	52.4	43.8	13.6	58.0
Northeast												
Arunachal Pradesh	54.2	4.5	57.4	52.7	41.8	67.6	62.5	43.3	33.6	20.5	28.7	24.6
Assam	53.5	3.1	57.4	48.5	37.5	61.8	53.6	37.9	24.6	17.0	33.2	32.5
Manipur	71.0	32.1	76.4	71.0	59.1	81.3	76.9	62.5	45.8	42.3	17.2	43.4
Meghalaya	46.1	11.5	44.8	36.8	25.4	51.8	43.8	27.6	17.7	14.3	42.3	20.6
Mizoram	88.2	4.6	86.9	83.9	69.5	88.3	83.5	71.9	71.0	59.6	10.5	41.1
Nagaland	46.1	5.5	48.1	40.9	29.6	66.6	60.3	41.8	19.6	14.1	32.7	18.4
Sikkim	76.5	8.2	75.7	71.7	62.5	79.8	75.7	63.5	58.9	47.4	17.6	47.0
West												
Goa	99.2	31.6	97.6	95.2	93.4	99.2	98.4	95.8	84.3	82.6	0.0	69.7
Gujarat	84.7	5.3	83.1	75.4	64.1	90.2	82.5	68.6	63.6	53.0	6.6	31.8
Maharashtra	93.7	8.3	94.9	91.7	89.4	97.2	94.7	90.8	84.3	78.4	2.0	48.9
South												
Andhra Pradesh	90.2	5.3	89.8	86.9	79.5	93.8	90.9	81.6	64.7	58.7	4.5	41.3
Karnataka	84.8	26.4	87.0	84.8	75.2	91.9	89.0	78.3	67.3	60.0	7.7	41.2
Kerala	96.2	60.6	96.0	94.4	88.0	96.9	95.2	88.4	84.6	79.7	2.2	63.2
Tamil Nadu	98.6	85.5	98.6	97.5	96.7	99.7	99.5	98.0	90.2	88.8	0.3	45.8

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey.
[1]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0)

The percentage of children with a vaccination card that was shown to the interviewer varies considerably by state, from 15 percent in Rajasthan to 70 percent in Goa. These differentials reflect both differences in the proportion who have a vaccination card for their young children in each state and, among those who have cards, differences in the ability or willingness to find the card and show it to the interviewer.

Table 6.12 shows the percentage of children age 12–35 months with a vaccination card that was shown to the interviewer and the percentage who received various vaccinations during the first year of life by current age of the child and place of residence. The table shows a considerable improvement in vaccination coverage over a short period of time. The proportion vaccinated during the first year of life is estimated separately for children in each age group. The

Figure 6.7
Percentage of Children Age 12–23 Months Who Have Received All Vaccinations by State



NHS-2, India, 1998–99

row labelled 'No vaccinations' indicates the percentage of children who have not received any vaccination by 12 months of age.

The proportion of children whose vaccination status was determined from a vaccination card declines with the age of children. This may reflect an upward trend in the use of vaccination cards as well as an upward trend in overall vaccination coverage. On the other hand, vaccination cards may have been lost or discarded, especially for older children who have received all their vaccinations. The proportion of children fully vaccinated by age 12 months is about the same for children age 12–23 months (35 percent) as for children age 24–35 months (34 percent). A similar pattern is observed in both urban and rural areas. However, a decline in coverage with increasing children's age is observed for BCG, DPT, and the first two doses of polio, indicating that there has been some progress for individual vaccines. However, because the percentage vaccinated by 12 months of age declines only marginally for measles, the extent of progress for individual vaccines is not fully seen in the very small decline in the percentage receiving all vaccinations.

Table 6.12 Childhood vaccinations received by 12 months of age

Percentage of children age 12–23 months and 24–35 months with a vaccination card that was shown to the interviewer and percentage who received specific vaccinations by 12 months of age, according to residence and child's current age, India, 1998–99

	Urban		Rural		Total	
Vaccination status	12–23 months	24–35 months	12–23 months	24–35 months	12–23 months	24–35 months
Vaccination card shown to interviewer	45.9	32.7	30.1	21.4	33.7	24.0
Percentage vaccinated by 12 months of age[1]						
BCG	85.1	82.4	64.3	59.9	69.1	65.2
Polio 0	23.3	21.5	10.1	9.0	13.1	11.9
DPT						
1	83.6	81.3	64.4	58.7	68.8	64.1
2	79.1	77.6	57.0	53.2	62.1	59.0
3	70.6	69.2	46.6	43.5	52.1	49.6
Polio						
1	89.4	87.3	77.5	71.8	80.3	75.7
2	86.1	84.6	71.1	68.7	74.6	72.6
3	74.9	75.2	54.4	54.5	59.2	59.6
Measles	59.7	59.2	36.2	35.7	41.7	41.3
All vaccinations[2]	51.9	51.4	29.3	28.6	34.5	33.9
No vaccinations	8.6	12.1	20.2	25.6	17.5	22.2
Number of children	2,282	2,277	7,795	7,536	10,076	9,813

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey.
[1]Information was obtained either from the vaccination card or from the mother if there was no written record. For children whose information was based on the mother's report, the proportion of vaccinations given by 12 months of age is assumed to be the same as for children with a written record of vaccinations.
[2]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0)

Table 6.13 and Figure 6.8 give the percent distribution of children under age three years who have received any vaccinations by the source of most of the vaccinations, according to selected background characteristics. The public sector is the primary provider of childhood vaccinations in India. Eighty-two percent of all children who have received any vaccinations received most of them from a public-sector medical source and only 13 percent received them from a private-sector medical source. The percentage of children receiving vaccinations from the private sector is considerably lower in rural areas (9 percent) than in urban areas (24 percent), where private-sector services tend to be concentrated. Even in urban areas, however, 72 percent of children received their vaccinations from the public sector. Children of more educated mothers and those belonging to households with a high standard of living are more likely than other children to receive vaccinations from the private sector. Christian and Jain children are much more likely to receive vaccinations from the private sector than children belonging to other religions. Children from scheduled tribes and scheduled castes are much less likely than other children to receive vaccinations from the private sector.

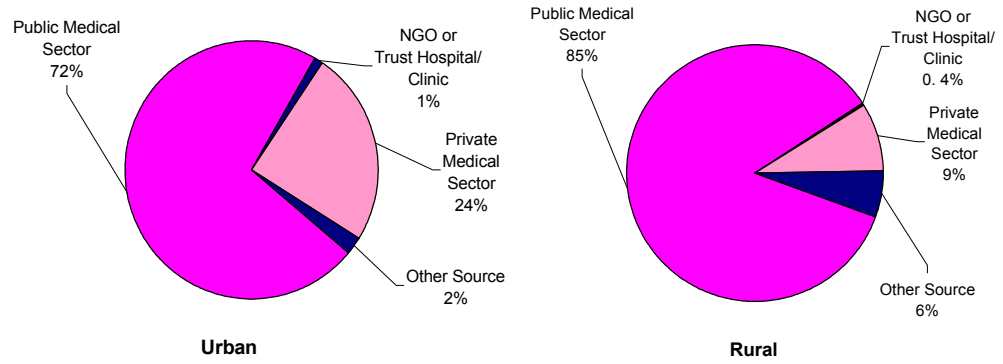
Table 6.13 Source of childhood vaccinations

Percent distribution of children under age 3 who have received any vaccinations by source of most of the vaccinations, according to selected background characteristics, India, 1998–99

Background characteristic	Source				Total percent	Number of children
	Public medical sector	NGO or trust hospital/ clinic	Private medical sector	Other		
Age of child						
< 12 months	79.9	0.8	14.1	5.2	100.0	7,432
12–23 months	82.7	0.5	12.1	4.7	100.0	8,622
24–35 months	83.0	0.6	11.4	5.0	100.0	8,384
Sex of child						
Male	81.7	0.6	12.9	4. 8	100.0	12,824
Female	82.3	0.6	12.0	5.1	100.0	11,614
Birth order						
1	77.8	0.7	17.3	4.1	100.0	7,589
2	81.4	0.7	13.5	4.4	100.0	6,683
3	83.0	0.5	10.0	6.5	100.0	4,331
4+	87.2	0.5	6.8	5.5	100.0	5,835
Residence						
Urban	72.3	1.2	24.3	2.3	100.0	6,176
Rural	85.2	0.4	8.5	5.9	100.0	18,262
Mother's education						
Illiterate	87.1	0.5	6.5	5.9	100.0	12,886
Literate, < middle school complete	83.3	0.6	10.5	5.5	100.0	4,783
Middle school complete	81.2	0.8	13.6	4.4	100.0	2,548
High school complete and above	65.2	0.8	32.3	1.7	100.0	4,219
Religion						
Hindu	82.2	0.5	11.9	5.4	100.0	19,546
Muslim	82.6	0.6	13.7	3.0	100.0	3,545
Christian	72.8	3.5	22.3	1.4	100.0	625
Sikh	84.7	0.1	14.3	0.9	100.0	369
Jain	71.6	0.0	23.5	4.9	100.0	69
Buddhist/Neo-Buddhist	70.8	0.0	13.0	16.2	100.0	184
Other	85.9	0.9	11.6	1.6	100.0	62
No religion	93.8	0.0	6.2	0.0	100.0	13
Caste/tribe						
Scheduled caste	87.2	0.6	7.9	4.2	100.0	4,746
Scheduled tribe	86.3	0.8	5.5	7.3	100.0	2,053
Other backward class	83.0	0.4	13.1	3.5	100.0	8,110
Other	77.3	0.7	15.9	6.1	100.0	9,315
Standard of living index						
Low	87.6	0.7	5.3	6.5	100.0	8,060
Medium	84.0	0.5	10.7	4.8	100.0	11,547
High	67.4	0.7	29.5	2.4	100.0	4,551
Total	82.0	0.6	12.5	5.0	100.0	24,438

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 2, 26, 214, and 281 children with missing information on mother's education, religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.
NGO: Nongovernmental organization

Figure 6.8
Source of Childhood Vaccinations by Residence



Note: Percents do not add to 100 due to rounding

NFHS-2, India, 1998–99

6.6 Vitamin A Supplementation

Vitamin A deficiency is one of the most common nutritional deficiency disorders in the world, affecting more than 250 million children worldwide (Bloem et al., 1997). The National Programme on Prevention of Blindness targets children under age five years and administers oral doses of vitamin A every six months starting at age nine months. NFHS-2 asked mothers of children born during the three years before the survey whether their children ever received a dose of vitamin A. Those who said that their child had received at least one dose of vitamin A were asked how long ago the last dose of vitamin A was given. Table 6.14 shows the percentage of children age 12–35 months who received at least one dose of vitamin A and who received a dose of vitamin A within the past six months by selected background characteristics. In the country as a whole, only 3 out of 10 children age 12–35 months received at least one dose of vitamin A, and only 17 percent received a dose within the past six months. This indicates that a large majority of children in India have not received vitamin A supplementation at all and even fewer children receive vitamin A supplementation regularly.

Children living in urban areas, children of more educated mothers, and children living in high standard of living households are considerably more likely than other children to receive vitamin A supplementation (Table 6.14). Children of birth order 4 or above are much less likely than children of birth orders 1, 2, or 3 to have received any vitamin A supplementation. Muslim, Hindu, and Christian children are less likely to receive vitamin A than other children. Similarly, children from schedule castes, schedule tribes, and other backward classes are less likely to receive vitamin A than other children. As is the case with immunizations, boys have a slight edge in vitamin A coverage. In general, children from groups that are less likely to have received at least one dose of vitamin A supplementation are also less likely to have received a dose in the past six months.

Table 6.14 Vitamin A supplementation for children

Percentage of children age 12–35 months who received at least one dose of vitamin A and who received at least one dose of vitamin A within the six months preceding the survey by selected background characteristics, India, 1998–99

Background characteristic	Percentage who received vitamin A		Number of children
	At least one dose	At least one dose within the past six months	
Age of child			
12–23 months	28.4	20.4	10,076
24–35 months	31.0	13.8	9,813
Sex of child			
Male	30.8	18.1	10,251
Female	28.4	16.1	9,638
Birth order			
1	35.7	20.2	5,680
2	33.4	19.4	5,215
3	29.8	17.0	3,556
4+	19.6	11.8	5,439
Residence			
Urban	38.7	21.2	4,559
Rural	27.0	15.9	15,331
Mother's education			
Illiterate	20.4	12.6	11,541
Literate, < middle school complete	39.1	21.2	3,625
Middle school complete	41.9	22.4	1,829
High school complete and above	47.0	27.0	2,892
Religion			
Hindu	29.7	17.1	15,621
Muslim	24.1	14.5	3,226
Christian	33.0	20.0	484
Sikh	55.3	31.7	301
Jain	(57.1)	(34.0)	45
Buddhist/Neo-Buddhist	67.5	28.2	119
Other	57.3	23.3	58
No religion	43.5	20.0	17
Caste/tribe			
Scheduled caste	27.1	15.6	3,956
Scheduled tribe	26.0	15.1	1,819
Other backward class	26.8	15.4	6,347
Other	34.8	20.1	7,545
Standard of living index			
Low	21.7	12.7	7,138
Medium	30.9	17.9	9,251
High	43.3	24.2	3,271
Total	29.7	17.1	19,889

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 2, 19, 222, and 229 children with missing information on mother's education, religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.
( ) Based on 25–49 unweighted cases

Table 6.15 Vitamin A supplementation for children by state

Percentage of children age 12–35 months who received at least one dose of vitamin A and who received at least one dose of vitamin A within the six months preceding the survey by state, India, 1998–99

State	Percentage who received vitamin A	
	At least one dose	At least one dose within the past six months
India	29.7	17.1
North		
Delhi	32.7	17.4
Haryana	45.2	21.4
Himachal Pradesh	71.1	35.1
Jammu & Kashmir	36.0	22.8
Punjab	56.5	30.2
Rajasthan	17.6	12.5
Central		
Madhya Pradesh	24.4	14.7
Uttar Pradesh	13.9	9.5
East		
Bihar	10.2	6.8
Orissa	42.0	26.4
West Bengal	43.4	23.5
Northeast		
Arunachal Pradesh	20.9	9.6
Assam	15.4	8.9
Manipur	38.4	18.8
Meghalaya	24.7	10.7
Mizoram	70.6	41.8
Nagaland	6.8	4.4
Sikkim	45.8	22.0
West		
Goa	78.0	52.3
Gujarat	51.9	26.3
Maharashtra	64.7	36.6
South		
Andhra Pradesh	24.8	14.0
Karnataka	48.4	22.8
Kerala	43.6	28.2
Tamil Nadu	16.2	10.0

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey.

State variations in the percentage of children who received at least one dose of vitamin A and the percentage who received at least one dose within the six months preceding the survey are shown in Table 6.15. The percentage of children age 12–35 who received at least one dose of vitamin A supplementation ranges from 7 percent in Nagaland to 78 percent in Goa. In addition to Nagaland, Bihar (10 percent), Uttar Pradesh (14 percent), Assam (15 percent), Tamil Nadu (16 percent), and Rajasthan (18 percent) stand out as having very low proportions of children receiving at least one dose of vitamin A. In addition to Goa, Himachal Pradesh (71 percent) and Maharashtra (65 percent) stand out as having relatively successful vitamin A supplementation programmes. State variations in the percentage of children receiving at least one dose of vitamin A supplementation within the past six months follow closely the variations in the percentage of children receiving at least one dose at any time in the past.

6.7 Child Morbidity and Treatment

This section discusses the prevalence and treatment of acute respiratory infection (ARI), fever, and diarrhoea. Mothers of children born during the three years preceding the survey were asked if their children suffered from cough, fever, or diarrhoea during the two weeks preceding the survey, and if so, the type of treatment given. Accuracy of all these measures is affected by the reliability of the mother's recall of when the disease episode occurred. The two-week recall period is thought to be most suitable for ensuring that there will be an adequate number of cases to analyze and that recall errors will not be too serious. Table 6.16 shows the percentage of children with cough accompanied by fast breathing (symptoms of acute respiratory infection), fever, and diarrhoea during the two weeks preceding the survey and the percentage with acute respiratory infection who were taken to a health facility or provider, by selected background characteristics.

Acute Respiratory Infection

Acute respiratory infection, primarily pneumonia, is a major cause of illness among infants and children and the leading cause of childhood mortality throughout the world (Murray and Lopez, 1996). Early diagnosis and treatment with antibiotics can prevent a large proportion of ARI/pneumonia deaths. NFHS-2 found that 19 percent of children under age three in India suffered from acute respiratory infection (cough accompanied by short, rapid breathing) at some time during the two-week period before the survey (Table 6.16). A comparison with NFHS-1 ARI data is not meaningful since the two surveys took place at different times of the year and rates of ARI are affected by the time of the year when the measurements are taken.

Table 6.16 shows that there is little variation in the prevalence of ARI by most of the background characteristics included in the table. ARI is somewhat more common among boys than girls and among children living in rural areas than urban areas. Children of mothers who have at least completed high school have a lower occurrence of ARI than other children. The prevalence of ARI is higher among scheduled-tribe children than among other children, and children living in lower standard of living households also have a higher prevalence of ARI. Children living in households that use piped drinking water and in households that use a water filter for the purification of water have a lower prevalence of ARI than do other children. The small variation in the prevalence of ARI by most socioeconomic characteristics indicates that respiratory infections affect children from all strata in India irrespective of their socioeconomic background.

Table 6.16 also shows the percentage of children suffering from ARI symptoms in the two weeks before the survey who were taken to a health facility or provider. Sixty-four percent of children received some advice or treatment from a health facility or health provider when ill with ARI. This percentage, as expected, is relatively low for children whose mothers are illiterate or who live in households with a low standard of living. The percentage is relatively high for children whose mothers do not belong to a scheduled caste or scheduled tribe. Notably, boys, urban children, and children of birth order one are also more likely than other children to have been taken to a health facility or provider for advice or treatment.

Table 6.16 Prevalence of acute respiratory infection, fever, and diarrhoea

Percentage of children under age 3 who were ill with a cough accompanied by fast breathing (symptoms of acute respiratory infection—ARI), fever, or diarrhoea during the two weeks preceding the survey and percentage with ARI who were taken to a health facility or provider by selected background characteristics, India, 1998–99

Background characteristic	Percentage of children suffering in past two weeks from:				Number of children	Percentage with ARI taken to a health facility or provider	Number of children with ARI
	Cough accompanied by fast breathing (ARI)	Fever	Diarrhoea				
			Any diarrhoea[1]	Diarrhoea with blood			
Age of child							
1–5 months	17.4	20.9	16.9	0.9	5,074	55.7	884
6–11 months	23.7	33.6	25.1	2.8	4,901	66.9	1,161
12–23 months	20.0	33.4	21.3	2.9	10,076	65.1	2,019
24–35 months	17.5	27.8	15.1	3.0	9,813	64.8	1,716
Sex of child							
Male	20.7	30.3	19.4	2.5	15,515	66.5	3,214
Female	17.9	28.5	18.9	2.6	14,349	60.8	2,564
Birth order							
1	19.7	30.0	18.5	2.0	8,630	70.1	1,700
2	18.3	27.7	17.8	2.4	7,785	65.0	1,424
3	19.3	29.5	20.1	2.3	5,316	62.8	1,023
4+	20.1	30.6	20.5	3.6	8,134	57.4	1,631
Residence							
Urban	16.2	28.8	19.6	1.6	6,768	75.1	1,096
Rural	20.3	29.7	19.0	2.9	23,096	61.4	4,682
Mother's education							
Illiterate	20.6	29.5	20.1	3.3	17,273	58.3	3,550
Literate, < middle school complete	20.3	31.5	19.8	2.0	5,457	69.5	1,105
Middle school complete	18.8	28.9	18.6	2.0	2,753	76.3	517
High school complete and above	13.8	27.2	15.0	0.9	4,377	77.0	604
Religion							
Hindu	19.1	28.3	19.0	2.5	23,568	62.9	4,502
Muslim	20.8	34.5	20.7	2.9	4,773	66.8	994
Christian	20.3	32.8	16.5	2.9	705	57.1	143
Sikh	13.8	25.8	10.1	1.3	425	90.5	59
Jain	12.0	28.3	23.8	2.7	72	*	9
Buddhist/Neo-Buddhist	18.8	41.9	23.2	0.7	189	93.0	35
Other	31.6	34.1	27.5	1.2	81	69.5	26
No religion	19.1	21.7	11.1	1.0	22	(69.5)	4
Caste/tribe							
Scheduled caste	19.6	29.4	19.8	2.9	5,894	60.3	1,153
Scheduled tribe	22.4	31.4	21.1	3.7	2,810	50.4	631
Other backward class	19.1	28.1	18.3	2.6	9,573	67.9	1,826
Other	18.7	30.4	19.1	2.1	11,257	67.2	2,108
Standard of living index							
Low	21.0	29.8	19.9	3.2	10,710	55.1	2,245
Medium	19.4	30.1	19.7	2.6	13,906	67.4	2,694
High	15.7	26.7	16.1	1.3	4,889	76.9	768

Contd…

Table 6.16 Prevalence of acute respiratory infection, fever, and diarrhoea (contd.)

Percentage of children under age 3 who were ill with a cough accompanied by fast breathing (symptoms of acute respiratory infection—ARI), fever, or diarrhoea during the two weeks preceding the survey and percentage with ARI who were taken to a health facility or provider by selected background characteristics, India, 1998–99

Background characteristic	Percentage of children suffering in past two weeks from:				Number of children	Percentage with ARI taken to a health facility or provider	Number of children with ARI
	Cough accompanied by fast breathing (ARI)	Fever	Diarrhoea				
			Any diarrhoea[1]	Diarrhoea with blood			
Source of drinking water							
Piped water	15.1	28.4	19.3	1.8	9,697	75.7	1,461
Hand pump	21.7	29.6	19.2	3.2	13,343	60.1	2,902
Well water	21.1	30.9	18.5	2.5	5,834	61.1	1,230
Surface water	19.3	30.0	22.1	3.8	783	47.3	151
Other	17.6	34.6	16.8	1.4	200	(66.3)	35
Purification of water[2]							
Straining by cloth	18.6	29.0	22.0	2.3	5,151	71.2	957
Alum	20.3	29.0	18.8	1.6	323	76.1	65
Water filter	12.2	25.4	15.2	0.9	1,159	78.9	142
Boiling	16.9	31.2	16.5	1.8	2,054	75.7	348
Electronic purifier	20.8	24.2	18.0	0.1	69	*	14
Other	23.3	30.3	25.2	3.3	216	80.0	50
Nothing	19.9	29.6	19.0	2.8	21,673	61.1	4,321
Total	19.3	29.5	19.2	2.6	29,864	64.0	5,778

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey. Total includes children with missing information on mother's education, religion, caste/tribe, the standard of living index, and source of drinking water, who are not shown separately.
( ) Based on 25–49 unweighted cases
*Percentage not shown; based on fewer than 25 unweighted cases
[1]Includes diarrhoea with blood
[2]Number of children and number of children with ARI add to more than the respective totals because multiple methods of purification of water could be recorded.

There is considerable variation in the prevalence of ARI by state (Table 6.17). The percentage of children under age three who suffered from ARI during the two weeks preceding the survey ranges from 8 percent in Karnataka to 30 percent in Sikkim. Interstate variations in the prevalence of ARI, fever, or diarrhoea should be interpreted with caution, however, because these conditions vary throughout the year and the fieldwork was conducted at different times of the year in different states.

Fever

In Table 6.16, fever is the most common of the three conditions examined, with 30 percent of children suffering from fever during the two weeks before the survey. The prevalence of fever is lower among children under age six months (21 percent) than among older children (28–34 percent). In general, the prevalence of fever does not vary widely or in a predictable way with most of the remaining demographic and socioeconomic characteristics. As with acute respiratory infection, fever tends to strike young children irrespective of their demographic and socioeconomic background. The prevalence of fever varies from 21 percent in Gujarat to 42 percent in Kerala (Table 6.17).

Table 6.17 Prevalence of acute respiratory infection, fever, and diarrhoea by state

Percentage of children under age 3 who were ill with a cough accompanied by fast breathing (symptoms of acute respiratory infection—ARI), fever, or diarrhoea during the two weeks preceding the survey and percentage with ARI who were taken to a health facility or provider by state, India, 1998–99

State	Percentage of children suffering in past two weeks from:				Percentage with ARI taken to a health facility or provider
	Cough accompanied by fast breathing (ARI)	Fever	Diarrhoea		
			Any diarrhoea[1]	Diarrhoea with blood	
India	19.3	29.5	19.2	2.6	64.0
North					
Delhi	16.9	35.7	30.1	1.6	83.3
Haryana	11.8	23.7	13.9	1.8	87.9
Himachal Pradesh	10.8	29.9	31.3	4.5	95.6
Jammu & Kashmir	22.2	39.4	32.8	4.1	76.2
Punjab	14.4	24.9	9.8	0.6	93.8
Rajasthan	22.0	25.8	19.8	3.4	60.6
Central					
Madhya Pradesh	29.2	31.0	23.4	4.3	57.9
Uttar Pradesh	21.1	27.8	23.3	3.8	61.3
East					
Bihar	21.7	31.0	17.7	2.9	58.2
Orissa	22.5	36.0	28.1	4.5	57.1
West Bengal	24.8	29.9	8.3	1.0	52.4
Northeast					
Arunachal Pradesh	25.4	38.5	23.4	3.0	49.2
Assam	17.8	28.4	8.2	2.2	41.7
Manipur	26.9	36.8	16.6	4.1	45.0
Meghalaya	28.8	41.2	21.8	6.1	48.7
Mizoram	11.2	35.9	23.0	3.5	51.0
Nagaland	18.4	34.0	21.7	2.6	28.0
Sikkim	30.0	31.3	31.0	2.5	41.3
West					
Goa	17.1	34.4	18.7	0.6	98.2
Gujarat	11.0	20.7	19.7	1.3	71.2
Maharashtra	13.5	37.4	25.4	1.7	84.6
South					
Andhra Pradesh	19.3	28.6	15.0	1.5	69.4
Karnataka	7.9	25.9	13.9	0.7	77.4
Kerala	22.8	41.5	11.6	0.9	82.8
Tamil Nadu	10.3	22.3	14.4	1.7	82.9

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey.
[1]Includes diarrhoea with blood

Diarrhoea

Diarrhoea is the second most important killer of children under age five worldwide, following acute respiratory infection. Deaths from acute diarrhoea are most often caused by dehydration due to loss of water and electrolytes. Nearly all dehydration-related deaths can be prevented by prompt administration of rehydration solutions. Because deaths from diarrhoea are a significant proportion of all child deaths, the Government of India has launched the Oral Rehydration Therapy Programme as one of its priority activities for child survival. One major goal of this programme is to increase awareness among mothers and communities about the causes and treatment of diarrhoea. Oral rehydration salt (ORS) packets are made widely available and mothers are taught how to use them. NFHS-2 asked mothers of children born during the three years preceding the survey a series of questions about episodes of diarrhoea suffered by their children in the two weeks before the survey, including questions on feeding practices during diarrhoea, the treatment of diarrhoea, and their knowledge and use of ORS.

Table 6.16 shows that 19 percent of children under age three suffered from diarrhoea in the two-week period before the survey. There are seasonal variations in the prevalence of diarrhoea, however, so that the percentages shown in Table 6.16 cannot be assumed to reflect the situation throughout the year.

Among children age 1–35 months, those age 6–11 months are most susceptible to diarrhoea (as is the case with ARI and fever). Differentials by sex of child, birth order, place of residence, and caste/tribe are small. Sikh children are considerably less likely to suffer from diarrhoea than children belonging to other religions. As expected, children of mothers with high school or more education and children in high standard of living households are somewhat less likely to suffer from diarrhoea than other children. Also consistent with expectations, diarrhoea is somewhat less common among children living in households that boil water or use a water filter for purification of drinking water than among other children. Children living in households that use surface water for drinking are more vulnerable to diarrhoea than children living in households that use other sources for drinking water.

Three percent of all children age 1–35 months (14 percent of children who suffered from diarrhoea in the two weeks before the survey) suffered from diarrhoea with blood, a symptom of dysentery. Children under age six months had the lowest prevalence of diarrhoea with blood (less than 1 percent). Children of birth order four or higher, children living in rural areas, children whose mothers are illiterate, scheduled-tribe children, children living in low standard of living households, children living in households using surface water for drinking, and children living in households using 'other' means of water purification or using unpurified water for drinking all had an elevated risk of having diarrhoea with blood.

Prevalence of diarrhoea also varies considerably by state (Table 6.17). Prevalence of any diarrhoea among children age 1–35 months during the two weeks preceding the survey ranges from 8 percent in Assam and West Bengal to 33 percent in Jammu and Kashmir. Prevalence of diarrhoea with blood was highest in Meghalaya (6 percent).

Table 6.18 shows that 62 percent of mothers with births during the three years preceding the survey know about ORS packets, up from 43 percent among women who gave birth during the three years before NFHS-1. Knowledge of ORS packets is somewhat lower among mothers age 15–19 and among mothers age 35 years or older than among mothers in the middle age groups. As expected, knowledge is considerably higher among urban mothers (76 percent) than rural mothers (59 percent), and among more educated mothers, especially literate mothers as compared with illiterate mothers. Knowledge of ORS is higher among Sikh, Jain, and Christian mothers than among mothers belonging to other religions. Mothers belonging to scheduled tribes are less likely to know about ORS packets than mothers belonging to other caste/tribe groups. Among all the groups shown in the table, knowledge of ORS packets is lowest among mothers who are not regularly exposed to any mass media (48 percent).

In order to assess mothers' knowledge of children's need for extra fluids during episodes of diarrhoea, all mothers of children born in the three years preceding the survey were asked: 'When a child has diarrhoea, should he/she be given less to drink than usual, about the same amount, or more than usual?' Table 6.18 shows the response of mothers to this question by selected background characteristics. In India as a whole, only 29 percent of mothers report that children should be given more to drink than usual during an episode of diarrhoea and, contrary to the standard recommendation, 34 percent report that children should be given less to drink. This suggests that mothers in India need much more education in the proper management of diarrhoea. The proportion reporting correctly that children with diarrhoea should be given more to drink is particularly low among rural mothers, illiterate mothers, mothers belonging to a scheduled tribe, and mothers not regularly exposed to any mass media. The proportion reporting correctly that children with diarrhoea should be given more to drink is much higher among Sikh and Christian mothers than among mothers belonging to other religions. Mothers age 15–19 and 35 years or older are less likely to answer correctly than mothers age 20–34.

To assess whether mothers are aware of one or more signs associated with diarrhoea which suggest the need for medical treatment, mothers were also asked: 'When a child is sick with diarrhoea, what signs of illness would tell you that he or she should be taken to a health facility or health worker?' All answers given by the respondent were recorded. The signs warranting medical treatment include repeated watery stools, repeated vomiting, blood in the stools, fever, marked thirst, not eating or not drinking well, getting sicker or very sick, and not getting better. Table 6.18 shows that only 37 percent of mothers were able to name two or more signs of diarrhoea that indicate that a child with diarrhoea should be given medical treatment. The percentage who know two or more signs for medical treatment of diarrhoea does not vary much by socioeconomic characteristics. Contrary to expectations, there is no difference in the percentage by place of residence. Literate mothers and mothers exposed to mass media are slightly more likely to know the danger signs. Notably, however, knowledge of two or more signs of diarrhoea that suggest the need for medical treatment is universally low across all demographic and socioeconomic groups. This suggests a need for further educating mothers with regard to children's diarrhoea so that they are better able to recognize the danger signs of diarrhoea for which a health provider should be consulted.

Table 6.18 Knowledge of diarrhoea care

Among mothers with births during the three years preceding the survey, percentage who know about oral rehydration salt (ORS) packets, percent distribution by quantity to be given to drink during diarrhoea, and percentage who know two or more signs of diarrhoea that indicate the need for medical treatment by selected background characteristics, India, 1998–99

Background characteristic	Percentage who know about ORS packets	Reported quantity to be given to drink					Percentage who know two or more signs for medical treatment of diarrhoea[1]	Number of mothers
		Less	Same	More	Don't know/ missing	Total percent		
Age								
15–19	55.7	39.5	29.8	21.0	9.7	100.0	33.9	3,691
20–24	64.6	34.5	29.7	28.9	6.9	100.0	37.0	10,691
25–29	64.8	32.8	28.4	32.7	6.1	100.0	38.8	8,432
30–34	62.0	32.0	27.1	33.1	7.8	100.0	37.5	3,741
35–49	53.1	32.8	30.1	26.5	10.6	100.0	35.0	1,900
Residence								
Urban	75.8	30.9	28.4	36.8	3.9	100.0	37.1	6,291
Rural	58.6	35.2	29.2	27.3	8.4	100.0	37.1	22,163
Education								
Illiterate	51.2	37.9	30.1	22.2	9.7	100.0	34.9	16,757
Literate, < middle school complete	72.3	34.2	29.0	32.0	4.8	100.0	38.3	5,028
Middle school complete	77.2	30.5	28.9	36.0	4.6	100.0	42.1	2,539
High school complete and above	86.5	21.5	24.5	51.1	2.9	100.0	41.4	4,125
Religion								
Hindu	61.5	34.3	29.7	28.6	7.4	100.0	36.8	22,566
Muslim	63.4	36.1	26.0	29.7	8.2	100.0	36.4	4,454
Christian	74.1	26.3	30.3	39.8	3.7	100.0	46.8	674
Sikh	81.9	19.2	24.7	50.0	6.1	100.0	37.1	388
Jain	75.7	31.0	32.0	33.1	3.9	100.0	39.8	68
Buddhist/Neo-Buddhist	66.7	36.3	26.1	32.1	5.5	100.0	46.0	173
Other	57.6	49.9	19.9	24.4	5.8	100.0	39.3	80
No religion	54.6	16.7	50.3	25.3	7.7	100.0	44.8	22
Caste/tribe								
Scheduled caste	59.3	36.9	28.9	26.5	7.6	100.0	37.5	5,658
Scheduled tribe	51.3	35.1	34.9	22.0	7.9	100.0	35.1	2,709
Other backward class	62.4	33.3	29.9	29.2	7.6	100.0	38.9	9,169
Other	66.9	33.1	26.9	33.1	6.9	100.0	35.8	10,586
Exposure to media								
Exposed to any media	74.6	31.9	28.6	35.0	4.6	100.0	39.0	15,255
Watches television weekly	77.7	30.5	28.8	36.5	4.1	100.0	38.3	11,205
Listens to radio weekly	75.8	30.7	28.0	36.5	4.9	100.0	41.8	9,254
Visits cinema/theatre monthly	79.7	31.7	30.6	33.9	3.8	100.0	37.7	2,804
Reads newspaper/magazine weekly	83.2	24.0	27.0	45.8	3.3	100.0	42.3	5,234
Not regularly exposed to any media	48.3	36.9	29.5	22.9	10.7	100.0	34.8	13,199
Total	62.4	34.2	29.0	29.4	7.4	100.0	37.1	28,454

Note: Total includes 5, 30, and 332 mothers with missing information on education, religion, and caste/tribe, respectively, who are not shown separately.

[1]Percentage who know two or more signs of illness that indicate that a child should be taken to a health facility or health worker

Table 6.19 Knowledge of diarrhoea care by state

Among mothers with births during the three years preceding the survey, percentage who know about oral rehydration salt (ORS) packets, percent distribution by quantity to be given to drink during diarrhoea, and percentage who know two or more signs of diarrhoea that indicate the need for medical treatment by state, India, 1998–99

State	Percentage who know about ORS packets	Reported quantity to be given to drink					Percentage who know two or more signs for medical treatment of diarrhoea[1]
		Less	Same	More	Don't know/ missing	Total percent	
India	62.4	34.2	29.0	29.4	7.4	100.0	37.1
North							
Delhi	73.9	15.0	15.8	64.9	4.4	100.0	33.2
Haryana	71.7	20.2	24.9	49.7	5.2	100.0	31.9
Himachal Pradesh	92.7	18.8	29.5	49.1	2.5	100.0	26.8
Jammu & Kashmir	72.9	30.1	24.4	41.1	4.4	100.0	40.7
Punjab	81.8	19.6	28.9	47.2	4.4	100.0	38.6
Rajasthan	44.8	43.2	29.7	21.0	6.1	100.0	17.9
Central							
Madhya Pradesh	55.5	29.5	36.9	28.1	5.5	100.0	30.9
Uttar Pradesh	59.1	35.2	28.8	25.3	10.7	100.0	36.4
East							
Bihar	37.5	32.1	24.7	27.6	15.5	100.0	49.6
Orissa	72.9	10.3	24.5	62.1	3.2	100.0	44.4
West Bengal	76.0	57.6	16.9	21.2	4.2	100.0	34.4
Northeast							
Arunachal Pradesh	77.1	24.4	37.8	28.4	9.5	100.0	28.6
Assam	42.9	21.7	17.9	40.4	20.0	100.0	43.9
Manipur	91.6	10.8	36.3	39.5	13.3	100.0	47.3
Meghalaya	51.9	31.2	33.2	23.4	12.2	100.0	57.3
Mizoram	96.0	3.1	22.0	66.3	8.6	100.0	36.3
Nagaland	58.6	18.0	64.6	13.8	3.7	100.0	63.0
Sikkim	63.8	17.5	13.9	66.6	1.9	100.0	36.8
West							
Goa	85.8	36.0	24.3	32.4	7.3	100.0	43.1
Gujarat	61.5	38.0	33.4	27.7	0.9	100.0	29.3
Maharashtra	65.1	42.4	35.4	17.6	4.6	100.0	41.2
South							
Andhra Pradesh	73.0	36.8	35.3	22.5	5.5	100.0	29.6
Karnataka	78.9	23.8	31.7	39.5	4.9	100.0	28.6
Kerala	88.9	3.2	8.9	85.5	2.5	100.0	52.3
Tamil Nadu	83.1	42.3	37.8	16.6	3.3	100.0	50.7

[1]Percentage who know two or more signs of illness that indicate that a child should be taken to a health facility or health worker

Table 6.19 shows differentials in the knowledge of diarrhoea care by state. Knowledge of ORS packets is almost universal in Mizoram (96 percent), Himachal Pradesh (93 percent), and Manipur (92 percent) and it also exceeds 80 percent in Kerala, Goa, Tamil Nadu, and Punjab. Knowledge of ORS packets is lowest in Bihar, Assam, and Rajasthan, where most mothers do not know about ORS packets. Women in Meghalaya, Madhya Pradesh, and Uttar Pradesh also have relatively low levels of knowledge of ORS packets.

The proportion reporting correctly that children with diarrhoea should be given more to drink also varies considerably across states, from only 14 percent in Nagaland to 86 percent in Kerala. Tamil Nadu and Maharashtra are the only other states where less than 20 percent of

mothers know that children with diarrhoea should be given more to drink than before the diarrhoea. Knowledge of two or more signs of diarrhoea requiring medical treatment is lowest in Rajasthan (18 percent) and highest in Nagaland (63 percent), followed by Meghalaya, Kerala, and Tamil Nadu.

Table 6.20 shows the percentage of children under age three with diarrhoea during the two weeks preceding the survey who were taken to a health facility or provider, the percentage who received various types of oral rehydration therapy (ORT), and the percentage who received other types of treatment, by selected background characteristics. Among children who suffered from diarrhoea during the two weeks preceding NFHS-2, 63 percent were taken to a health facility or provider (almost the same percentage that were taken for medical advice or treatment for ARI). Twenty-seven percent of children with diarrhoea did not receive any treatment at all. The percentage taken to a health facility or provider for diarrhoea is slightly higher for boys than for girls and much higher for urban children than for rural children and for children of more educated mothers. The percentage is particularly low for scheduled-tribe children and for children living in households with a low standard of living.

Twenty-seven percent of the children age 1–35 months who suffered from diarrhoea during the two weeks preceding the survey were treated with a solution made from ORS packets. This is up from 18 percent in NFHS-1, indicating some improvement in the use of ORS packets for the treatment of childhood diarrhoea in India. As expected, use of ORS packets is relatively high among urban children, children of more educated mothers, and children living in high standard of living households. Use of ORS packets is lower among Hindu and Muslim children than among children belonging to other religions. Scheduled-tribe children were less likely than any other group to be taken to a health facility or provider, but they were more likely than any other caste/tribe group to receive ORS during their diarrhoea.

More than half (52 percent) of children did not receive any of the various types of oral rehydration therapy when sick with diarrhoea. Only 22 percent received increased fluids when sick with diarrhoea and only 15 percent received gruel. The youngest children (age 1–11 months), children living in rural areas, children whose mothers are illiterate, and children belonging to households with a low standard of living are less likely than other children to receive any of the various types of oral rehydration therapy.

The use of antibiotics and other antidiarrhoeal drugs is not generally recommended for the treatment of childhood diarrhoea. Yet 53 percent of the children who had diarrhoea in the two weeks before NFHS-2 were treated with pills or syrup, and 15 percent received an injection. These figures indicate poor knowledge about the proper treatment of diarrhoea not only among mothers but also among health-care providers. The results underscore the need for informational programmes for mothers and supplemental training for health-care providers that emphasizes the importance of ORT, increased fluid intake, and continued feeding and discourages the use of drugs to treat childhood diarrhoea. The use of unnecessary antidiarrhoeal drugs is widespread across most socioeconomic groups, and is particularly common for children of more educated mothers and for children belonging to higher standard of living households.

Table 6.20 Treatment of diarrhoea

Among children under age 3 who had diarrhoea in the past two weeks, the percentage taken to a health facility or provider, the percentage who received various types of oral rehydration therapy (ORT), and the percentage who received other treatments by selected background characteristics, India, 1998–99

		Oral rehydration					Other treatment						
Background characteristic	Taken to a health facility or provider	Oral rehydration salt (ORS) packets	Gruel	Homemade sugar-salt-water solution	Increased fluids	ORT not given	Pill or syrup	Injec-tion	Intrave-nous (IV/drip/ bottle)	Home remedy/ herbal medicine	Other	No treat-ment	Number of children with diarrhoea
Age of child													
1–11 months	60.7	21.2	8.9	3.0	17.9	62.2	47.8	13.1	3.2	4.8	0.3	33.8	2,087
12–23 months	66.6	31.6	18.3	3.2	23.5	46.7	56.4	16.7	3.9	2.9	0.5	23.3	2,149
24–35 months	62.6	27.7	18.4	3.6	26.3	46.7	54.0	14.4	3.8	3.5	0.9	24.2	1,485
Sex of child													
Male	64.8	26.8	15.6	3.4	22.3	52.4	53.7	14.4	3.7	3.4	0.5	26.8	3,015
Female	61.9	26.8	14.1	3.1	22.1	52.2	51.5	15.3	3.5	4.1	0.7	28.0	2,706
Residence													
Urban	75.2	32.7	20.2	5.2	25.5	42.9	59.6	12.7	5.5	3.7	0.9	18.4	1,324
Rural	59.9	25.0	13.3	2.6	21.2	55.2	50.6	15.4	3.0	3.8	0.4	30.1	4,397
Mother's education													
Illiterate	58.5	22.8	12.1	2.6	18.9	57.9	50.8	15.0	3.4	3.1	0.6	31.4	3,473
Literate, < middle school complete	65.2	28.8	15.9	3.8	22.6	48.8	50.4	14.8	3.5	4.7	0.6	26.0	1,078
Middle school complete	74.2	34.7	20.5	2.8	26.0	44.7	59.3	14.2	3.1	5.5	0.4	18.0	513
High school complete and above	78.2	38.6	23.7	6.2	35.7	34.6	61.1	14.1	5.3	4.1	0.2	15.6	658
Religion													
Hindu	62.0	26.3	14.5	3.0	21.7	53.5	51.5	14.9	3.1	3.7	0.6	28.7	4,476
Muslim	67.7	26.8	15.7	4.2	21.8	50.3	59.0	13.5	4.4	3.8	0.4	21.9	989
Christian	62.3	34.9	23.2	3.2	34.1	40.2	36.4	22.4	9.2	7.9	1.5	24.8	117
Sikh	89.7	43.4	21.6	3.9	45.7	29.3	70.0	19.5	0.0	2.3	0.0	14.7	43
Buddhist/Neo-Buddhist	84.1	30.5	16.1	4.9	18.2	43.5	54.7	20.9	14.8	0.1	0.0	21.5	44
Other	55.6	36.6	2.2	2.8	29.4	46.5	44.9	0.3	18.9	0.8	0.0	49.6	22
Caste/tribe													
Scheduled caste	64.6	25.3	15.8	1.9	23.4	52.5	52.0	17.4	4.1	2.5	0.4	27.6	1,168
Scheduled tribe	52.2	31.9	13.2	3.5	18.6	50.6	44.1	9.6	2.8	4.7	0.3	36.3	592
Other backward class	63.8	25.2	14.2	2.8	21.9	55.0	52.5	16.4	3.8	4.3	0.6	28.2	1,750
Other	66.1	27.6	15.7	4.2	22.6	50.4	55.7	13.5	3.6	3.6	0.7	23.8	2,145
Standard of living index													
Low	55.5	24.2	12.9	2.6	19.1	56.0	45.1	14.7	2.9	3.1	0.6	33.2	2,126
Medium	65.1	27.3	14.7	3.4	22.2	52.6	56.0	15.2	4.0	4.2	0.5	25.6	2,745
High	77.2	32.6	20.7	4.5	30.7	41.4	61.1	13.5	4.4	4.3	0.8	17.9	786
Total	63.4	26.8	14.9	3.2	22.2	52.3	52.7	14.8	3.6	3.8	0.5	27.4	5,721

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey. Total includes 17 Jain children, 2 children having no religion, and 11, 66, and 64 children with missing information on religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.

Table 6.21 shows state differentials in the percentage of children under age three with diarrhoea during the two weeks preceding the survey who were taken to a health facility or provider, the percentage who received various types of oral rehydration therapy, and the percentage who received other types of treatment. The percentage of children taken to a health facility or provider when sick with diarrhoea is considerably higher in the northern states (with the exception of Rajasthan) than in other states. Kerala and Maharashtra also have a relatively high percentage of children receiving medical attention when sick with diarrhoea. The northeastern and eastern states, on the other hand, have the lowest percentage of children taken to a health facility or provider for diarrhoea treatment.

Use of oral rehydration therapy for children with diarrhoea is quite limited in Rajasthan and Uttar Pradesh where almost two-thirds of the children who had diarrhoea during the two weeks preceding the survey were not given ORT. In Kerala, on the other hand, 9 out of 10 children received ORT. Use of antidiarrhoeal drugs or injections is most widespread in the contiguous states of Haryana, Punjab, and Himachal Pradesh. Jammu and Kashmir and Maharashtra also have a relatively high percentage of children receiving pills, syrup, or injections when they are sick with diarrhoea.

Table 6.22 shows the percent distribution of children who were treated with ORS for diarrhoea in the two weeks before NFHS-2 by the source of the ORS packets. For 38 percent of children who were treated with ORS, the packets were obtained from public-sector medical sources, for 40 percent the packets were obtained from private-sector medical sources, for less than 1 percent the packets were obtained from an NGO or trust, and for the remaining 21 percent the packets were obtained from other sources. Among the public-sector sources, government or municipal hospitals are mentioned most often, followed by community health centres (CHC), rural hospitals, or Primary Health Centres (PHC), sub-centres, and government dispensaries. Among the private-sector medical sources, ORS packets were usually obtained from a private doctor or a private hospital or clinic. The pharmacy or drugstore category accounts for 9 percent of all cases. If this category is added to the shop category, the proportion purchasing ORS packets from shops, pharmacies, or drugstores becomes 26 percent.

State differentials in feeding practices during diarrhoea compared with feeding practices before diarrhoea are shown in Table 6.23. In India as a whole, only 22 percent of children who were sick with diarrhoea were given more to drink and only 10 percent were given more to eat. On the other hand, 30 percent of the children were given less to drink and 44 percent of the children were given less food to eat or no food at all. This is contrary to the recommendations for proper management of diarrhoea and suggests the need for public education programmes on proper feeding practices during diarrhoea. Kerala stands out among the states as having the highest percentage of children given more to drink during a diarrhoea episode than before (73 percent). In every other state, no more than 44 percent of women give children more to drink when they are sick with diarrhoea. Assam, Rajasthan, Maharashtra, and Tamil Nadu have very small proportions (below 15 percent) of children receiving more to drink when sick with diarrhoea. With regard to the amount given to eat during diarrhoea, Haryana, Punjab, Himachal Pradesh, and Mizoram stand out as having relatively high proportions of children given more or the same amount to eat. Kerala, Goa, Manipur, West Bengal, and Orissa are at the other end of the spectrum. In these states, more than 55 percent of the children were given less food or no food to eat when sick with diarrhoea.

Table 6.21 Treatment of diarrhoea by state

Among children under age 3 who had diarrhoea in the past two weeks, the percentage taken to a health facility or provider, the percentage who received various types of oral rehydration therapy (ORT), and the percentage who received other treatments by state, India, 1998–99

State	Taken to a health facility or provider	Oral rehydration					Other treatment					No treatment
		Oral rehydration salt (ORS) packets	Gruel	Homemade sugar-salt-water solution	Increased fluids	ORT not given	Pill or syrup	Injection	Intravenous (IV/drip/bottle)	Home remedy/ herbal medicine	Other	
India	63.4	26.8	14.9	3.2	22.2	52.3	52.7	14.8	3.6	3.8	0.5	27.4
North												
Delhi	80.1	39.1	27.2	12.1	38.1	32.4	52.7	10.7	0.8	10.2	0.0	18.3
Haryana	92.6	25.7	14.0	3.0	41.1	41.9	82.2	30.9	3.7	4.5	0.0	6.6
Himachal Pradesh	91.6	45.6	26.2	0.6	35.0	32.4	80.9	18.9	4.4	1.2	0.0	5.4
Jammu & Kashmir	81.2	47.5	13.6	6.5	32.0	33.3	68.4	13.6	2.6	5.1	0.3	10.2
Punjab	91.7	42.3	20.5	7.4	42.0	34.6	77.7	29.4	2.3	1.1	0.0	11.1
Rajasthan	58.2	20.3	9.2	1.5	13.9	65.9	49.3	7.5	2.5	4.2	2.2	36.3
Central												
Madhya Pradesh	59.4	29.8	14.2	1.6	21.0	54.3	54.4	16.3	3.1	2.7	0.0	30.3
Uttar Pradesh	62.1	15.8	10.5	2.0	18.8	63.8	58.8	14.6	2.7	2.5	0.2	30.2
East												
Bihar	50.3	15.4	16.5	2.1	25.0	59.0	42.4	23.4	6.0	4.2	0.0	38.8
Orissa	46.9	35.1	14.4	9.1	41.9	32.8	23.9	4.8	0.3	6.5	0.2	34.5
West Bengal	54.2	40.5	35.0	4.3	15.6	27.4	30.6	5.3	3.9	0.0	1.3	26.7
Northeast												
Arunachal Pradesh	52.8	40.2	14.8	9.1	34.1	35.2	26.4	1.0	3.2	2.3	0.0	36.8
Assam	48.2	37.1	19.7	2.7	11.1	46.2	22.1	12.6	7.3	3.5	0.0	38.8
Manipur	44.8	50.7	33.5	4.7	22.1	30.2	59.0	5.7	8.6	1.9	0.9	15.2
Meghalaya	44.1	22.4	29.5	4.0	23.2	48.1	44.0	4.4	0.0	7.7	0.0	33.2
Mizoram	33.7	44.7	23.6	0.0	43.6	31.5	54.5	0.8	0.0	2.7	0.0	25.7
Nagaland	23.3	29.7	35.0	9.8	19.2	38.4	11.5	4.7	0.0	12.2	0.0	37.1
Sikkim	31.8	27.0	22.8	3.6	39.4	34.9	23.4	0.7	5.0	5.7	0.0	39.3
West												
Goa	65.4	55.6	37.2	3.5	15.5	24.1	38.6	3.2	0.0	4.9	5.1	14.1
Gujarat	63.1	28.9	4.9	3.7	17.4	57.8	58.2	3.3	1.6	4.2	2.0	29.8
Maharashtra	77.2	33.2	11.9	4.4	14.4	48.5	64.3	14.3	9.1	1.9	0.4	17.0
South												
Andhra Pradesh	69.0	39.6	20.3	3.9	21.5	44.8	53.0	17.0	1.2	5.1	0.6	20.6
Karnataka	67.9	34.3	22.2	3.6	29.7	41.7	45.7	21.3	1.2	3.7	0.6	19.8
Kerala	77.8	47.9	49.2	4.7	72.8	10.0	56.4	3.7	2.3	9.7	0.0	12.1
Tamil Nadu	67.3	27.9	14.7	1.2	14.9	54.6	41.3	27.7	2.5	9.2	2.0	21.6

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey.

Table 6.22 Source of ORS packets

Among children under age 3 who were treated with a solution made from oral rehydration salt (ORS) packets for diarrhoea in the two weeks preceding the survey, the percent distribution of children by source of ORS packets, India, 1998–99

Source	Percent
Public medical sector	37.6
Government/municipal hospital	13.5
Government dispensary	2.5
UHC/UHP/UFWC	0.7
CHC/rural hospital/PHC	12.7
Sub-centre	4.3
Government mobile clinic	0.2
Government paramedic	1.0
Other public medical sector	2.5
NGO or trust	0.8
Hospital/clinic	0.6
NGO worker	0.3
Private medical sector	40.2
Private hospital/clinic	13.0
Private doctor	14.7
Private mobile clinic	0.1
Private paramedic	1.9
Vaidya/hakim/homeopath	0.6
Pharmacy/drugstore	9.2
Dai (TBA)	0.0
Other private medical sector	0.8
Other source	21.4
Shop	17.2
Husband	2.0
Other relative/friend	0.2
Other	1.9
Total percent	100.0
Number of children treated with ORS	1,528

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey. Table excludes children with missing information on source of ORS packets.
UHC: Urban health centre; UHP: Urban health post; UFWC: Urban family welfare centre; CHC: Community health centre; PHC: Primary Health Centre; NGO: Nongovernmental organization; TBA: Traditional birth attendant

Table 6.23 Feeding practices during diarrhoea by state

Percent distribution of children under age 3 who had diarrhoea in the past two weeks by amount given to drink and eat during diarrhoea by state, India, 1998–99

State	Amount given to drink during diarrhoea compared with amount given before diarrhoea						Amount given to eat during diarrhoea compared with amount given before diarrhoea						
	Less	Same	More	Don't know	Missing	Total percent	Less	Same	More	Stopped completely	Don't know	Missing	Total percent
India	29.8	46.0	22.2	1.9	0.1	100.0	37.4	42.8	10.1	6.5	2.9	0.3	100.0
North													
Delhi	16.6	44.1	38.1	1.3	0.0	100.0	41.3	35.2	18.0	1.3	3.8	0.4	100.0
Haryana	17.0	41.2	41.1	0.7	0.0	100.0	20.6	39.1	36.0	3.7	0.7	0.0	100.0
Himachal Pradesh	16.5	47.6	35.0	0.9	0.0	100.0	27.3	48.8	21.9	1.0	0.9	0.0	100.0
Jammu & Kashmir	22.5	45.1	32.0	0.3	0.0	100.0	37.6	44.3	7.3	8.3	2.5	0.0	100.0
Punjab	19.2	38.7	42.0	0.0	0.0	100.0	25.5	37.9	35.3	1.3	0.0	0.0	100.0
Rajasthan	27.9	57.5	13.9	0.7	0.0	100.0	32.6	52.7	5.8	6.4	2.6	0.0	100.0
Central													
Madhya Pradesh	27.0	49.0	21.0	2.8	0.2	100.0	34.1	45.3	8.4	7.3	4.9	0.0	100.0
Uttar Pradesh	34.2	42.9	18.8	3.9	0.2	100.0	36.1	40.3	9.7	8.4	4.5	0.9	100.0
East													
Bihar	28.9	43.6	25.0	2.6	0.0	100.0	34.9	41.2	10.2	8.6	5.2	0.0	100.0
Orissa	19.3	38.0	41.9	0.6	0.3	100.0	48.2	37.9	5.7	7.3	0.9	0.0	100.0
West Bengal	46.8	37.6	15.6	0.0	0.0	100.0	52.6	27.9	15.5	4.0	0.0	0.0	100.0
Northeast													
Arunachal Pradesh	23.3	32.7	34.1	8.5	1.3	100.0	36.2	35.6	15.1	4.8	8.2	0.0	100.0
Assam	32.8	53.3	11.1	2.8	0.0	100.0	36.5	39.5	12.7	8.6	2.7	0.0	100.0
Manipur	28.6	47.5	22.1	1.9	0.0	100.0	42.2	36.9	3.9	16.0	0.9	0.0	100.0
Meghalaya	28.1	47.2	23.2	1.5	0.0	100.0	48.3	39.4	3.9	4.6	3.8	0.0	100.0
Mizoram	13.1	42.1	43.6	1.1	0.0	100.0	20.6	40.4	29.8	3.8	5.3	0.0	100.0
Nagaland	21.2	58.6	19.2	1.0	0.0	100.0	26.3	61.5	7.4	3.7	1.0	0.0	100.0
Sikkim	21.6	38.2	39.4	0.8	0.0	100.0	46.3	32.5	16.8	3.6	0.7	0.0	100.0
West													
Goa	40.3	44.2	15.5	0.0	0.0	100.0	54.3	35.8	3.4	5.1	1.5	0.0	100.0
Gujarat	26.4	55.4	17.4	0.8	0.0	100.0	35.2	54.1	5.8	3.3	1.3	0.4	100.0
Maharashtra	36.2	48.0	14.4	1.4	0.0	100.0	40.0	43.0	9.5	5.2	2.2	0.0	100.0
South													
Andhra Pradesh	33.0	45.5	21.5	0.0	0.0	100.0	37.4	43.6	14.0	5.0	0.0	0.0	100.0
Karnataka	21.6	47.6	29.7	1.2	0.0	100.0	27.3	50.4	14.0	6.6	1.8	0.0	100.0
Kerala	8.6	18.6	72.8	0.0	0.0	100.0	57.7	31.6	6.4	4.2	0.0	0.0	100.0
Tamil Nadu	30.8	54.3	14.9	0.0	0.0	100.0	47.4	43.4	4.2	5.0	0.0	0.0	100.0

Note: Table includes only surviving children age 1–35 months from among the two most recent births in the three years preceding the survey.

6.8 HIV/AIDS

Acquired Immune Deficiency Syndrome (AIDS) is an illness caused by the HIV virus, which weakens the immune system and leads to death through secondary infections such as tuberculosis or pneumonia. The virus is generally transmitted through sexual contact, through the placenta of HIV-infected women to their unborn children, or through contact with contaminated needles (injections) or blood. HIV and AIDS prevalence in India have been on the rise for more than a decade and have reached alarming proportions in recent years. The Government of India established a National AIDS Control Organization (NACO) under the Ministry of Health and Family Welfare in 1989 to deal with the epidemic. Since then there have been various efforts to prevent HIV transmission, such as public health education through the media and the activities of many nongovernmental organizations (NGOs).

NFHS-2 included a set of questions on knowledge of AIDS and AIDS prevention. Ever-married women age 15–49 were first asked if they had ever heard of an illness called AIDS. Respondents who had heard of AIDS were asked further questions about their sources of information on AIDS, whether they believe that AIDS is preventable, and if so, what precautions, if any, a person can take to avoid infection.

Knowledge of AIDS

Table 6.24 shows the percentage of women who have heard about AIDS by background characteristics. Sixty percent of women in India have never heard of AIDS. Knowledge of AIDS varies little by women's age, but it is somewhat higher among women age 25–34. Urban residence, education, and the standard of living all have a very strong positive association with AIDS knowledge. Seventy percent of urban women in India have heard about AIDS compared with only 30 percent of rural women. Knowledge of AIDS increases from only 18 percent among illiterate women to 92 percent among women who have at least completed high school. Similarly, knowledge of AIDS increases from 20 percent among women in households with a low standard of living to 74 percent among women in households with a high standard of living.

Jain (83 percent), Christian (78 percent), Buddhist/Neo-Buddhist (69 percent), and Sikh (54 percent) women are much more likely to know about AIDS than Hindus, Muslims, or women belonging to other religions (28–39 percent). Only 17 percent of scheduled-tribe women have heard about AIDS compared with 32 percent of scheduled-caste women, 42 percent of women belonging to other backward classes, and 48 percent of 'other' women. Exposure to mass media increases women's knowledge about AIDS substantially. Eighty-five percent of women who read a newspaper or magazine at least once a week know about AIDS compared with only 10 percent of women who are not regularly exposed to any mass media (newspapers, magazines, radio, television, cinema, or theatre).

Table 6.24 Source of knowledge about AIDS

The percentage of ever-married women who have heard about AIDS and among women who have heard about AIDS, the percentage who received information from specific sources by selected background characteristics, India, 1998–99

Background characteristic	Percentage who have heard about AIDS	Number of women	Among those who have heard about AIDS, percentage who received information from:										Number of women who have heard about AIDS
			Radio	Television	Cinema	News-paper/ magazine	Poster/ hoarding	Health worker	Adult education programme	Friend/ relative	School/ teacher	Other source	
Age													
15–24	37.2	24,571	42.4	80.0	8.2	23.5	12.6	3.3	0.4	29.5	1.4	5.4	9,131
25–34	42.7	32,839	42.7	79.6	8.8	28.6	13.2	4.0	0.5	30.7	0.9	6.3	14,007
35–49	40.3	31,789	39.7	77.1	7.2	27.2	11.6	3.4	0.5	32.1	0.9	7.3	12,808
Residence													
Urban	70.3	23,370	36.4	91.1	10.6	34.0	16.0	2.8	0.5	23.2	1.0	4.8	16,424
Rural	29.7	65,829	45.9	68.5	6.0	20.8	9.5	4.3	0.5	37.3	1.0	7.8	19,522
Education													
Illiterate	18.4	51,871	33.6	61.7	3.7	1.2	2.3	3.0	0.2	44.0	0.5	9.1	9,564
Literate, < middle school complete	53.8	17,270	39.9	76.3	5.8	15.7	10.3	3.0	0.3	33.6	0.4	5.4	9,296
Middle school complete	74.0	7,328	44.3	83.7	8.1	30.2	15.7	3.7	0.2	26.3	0.7	4.3	5,421
High school complete and above	91.7	12,719	48.1	92.7	13.5	55.1	21.0	4.5	0.9	20.1	2.1	6.0	11,661
Religion													
Hindu	39.2	72,903	42.3	79.8	8.7	26.0	12.4	3.5	0.4	30.7	1.0	6.6	28,591
Muslim	35.4	11,190	37.2	75.0	4.9	23.5	8.4	2.9	0.7	30.0	1.1	3.1	3,963
Christian	77.6	2,263	51.1	64.6	9.3	42.1	15.6	5.1	1.2	40.8	1.6	11.4	1,756
Sikh	54.2	1,427	28.5	94.6	4.1	35.3	20.4	3.0	0.5	21.0	0.7	3.1	773
Jain	83.1	331	31.3	89.2	6.9	50.6	22.8	2.3	0.2	15.0	0.6	7.7	275
Buddhist/Neo-Buddhist	68.6	676	23.8	80.7	3.2	20.0	21.2	7.7	0.0	32.6	1.0	9.9	464
Other	28.4	285	41.7	51.6	7.2	24.9	9.6	10.4	0.4	42.7	0.3	15.3	81
No religion	37.0	44	50.6	71.1	2.4	43.9	24.2	2.4	2.4	46.2	0.0	4.9	16
Caste/tribe													
Scheduled caste	32.4	16,301	39.4	72.5	6.2	15.5	9.6	4.2	0.4	36.6	1.0	8.1	5,288
Scheduled tribe	17.2	7,750	41.0	57.0	3.7	21.4	14.1	7.5	0.4	42.1	2.1	11.2	1,335
Other backward class	41.9	29,383	46.5	76.6	9.5	25.0	12.2	3.6	0.5	37.4	1.0	6.6	12,314
Other	48.4	34,904	38.7	84.2	8.0	32.2	13.5	3.1	0.5	23.4	1.0	5.4	16,878

Contd…

Table 6.24 Source of knowledge about AIDS (contd.)

The percentage of ever-married women who have heard about AIDS and among women who have heard about AIDS, the percentage who received information from specific sources by selected background characteristics, India, 1998–99

Background characteristic	Percentage who have heard about AIDS	Number of women	Among those who have heard about AIDS, percentage who received information from:										Number of women who have heard about AIDS
			Radio	Television	Cinema	News-paper/ magazine	Poster/ hoarding	Health worker	Adult education programme	Friend/ relative	School/ teacher	Other source	
Standard of living index													
Low	19.6	29,033	40.4	51.5	5.1	8.3	6.1	3.8	0.4	50.1	0.9	10.2	5,682
Medium	40.1	41,289	42.5	76.1	6.7	19.9	10.4	3.9	0.4	32.7	0.8	6.4	16,559
High	74.3	17,845	40.9	93.9	11.2	43.4	17.7	3.2	0.6	20.6	1.4	4.9	13,267
Exposure to mass media													
Exposed to any media	60.7	53,224	43.3	83.5	8.7	29.2	13.2	3.5	0.5	27.9	1.1	5.8	32,316
Listens to radio weekly	61.6	32,547	59.2	81.1	9.9	32.0	13.0	3.7	0.6	28.4	1.2	6.0	20,040
Watches television weekly	68.1	40,788	40.2	90.9	9.2	30.4	13.9	3.4	0.5	25.5	1.1	5.4	27,776
Goes to cinema/theatre monthly	71.9	9,457	48.8	84.6	19.6	33.1	14.3	3.8	0.7	32.4	1.4	6.3	6,795
Reads newspaper/ magazine weekly	85.1	18,567	47.9	89.4	12.2	51.1	19.6	4.1	0.8	22.4	1.6	5.7	15,809
Not regularly exposed to any media	10.1	35,975	26.2	37.3	2.4	5.3	5.8	4.4	0.2	57.6	0.9	12.0	3,630
Total	40.3	89,199	41.5	78.8	8.1	26.8	12.5	3.6	0.5	30.9	1.0	6.4	35,946

Note: Total includes women with missing information on education, religion, caste/tribe, and the standard of living index, who are not shown separately.

State variations in the percentage of ever-married women who have heard about AIDS are shown in Table 6.25 and Figure 6.9. Knowledge of AIDS ranges from a low of only 12 percent in Bihar to 93 percent in Manipur and Mizoram. Bihar, Uttar Pradesh, Rajasthan, and Madhya Pradesh all have very low levels of AIDS awareness (below 23 percent). On the other hand, Tamil Nadu, Kerala, Delhi, Goa, and Nagaland (in addition to Manipur and Mizoram) have relatively high levels of AIDS awareness (above 72 percent). In NFHS-1, AIDS-awareness questions were asked in only 13 states so it is not possible to assess trends in AIDS awareness between NFHS-1 and NFHS-2 for India as a whole. However, in all of the 12 states with comparable information currently available, awareness of AIDS increased substantially between the two surveys. Particularly dramatic increases in AIDS knowledge have taken place in Tamil Nadu (from 23 to 87 percent), Delhi (from 36 percent to 79 percent), Maharashtra (from 19 to 61 percent), and Goa (from 42 percent to 76 percent).

Source of Knowledge about AIDS

As part of the AIDS prevention programme, the Government of India has been using mass media, especially electronic media, extensively to create awareness among the general public about AIDS and its prevention. NFHS-2 asked women who had heard of AIDS about their sources of AIDS information. Table 6.24 shows the percentage of ever-married women who have heard about AIDS from specific sources. Television is the most important source of information about AIDS among ever-married women in India. Seventy-nine percent of women report television as a source of their information about AIDS. Other important sources are the radio (42 percent), friends or relatives (31 percent), and newspapers or magazines (27 percent). Only 4 percent report that they received information about AIDS from a health worker.

Television is the most important source of information about AIDS in both urban and rural areas, followed by the radio. Rural women are more likely than urban women to have learned about AIDS from the radio, a health worker, or a friend or relative. On the other hand, urban women are more likely to have learned about AIDS from television, cinema, newspapers or magazines, or posters or hoardings. More educated women are less likely than less educated women to have learned about AIDS from a friend or relative, but they are more likely to have learned about AIDS from each of the other sources. Scheduled-tribe women are less likely than other women to have learned about AIDS from television or cinema, but are more likely than other women to have learned about it from a health worker or a friend or relative.

Women in households with a high standard of living are more likely than other women to have learned about AIDS from television, cinema, newspapers or magazines, or posters or hoardings; they are less likely to have learned about AIDS from a friend or relative. Finally, women who are not regularly exposed to mass media are much less likely to have learned about AIDS from any media sources, but they are more likely to have learned about AIDS from a friend or relative, as might be expected.

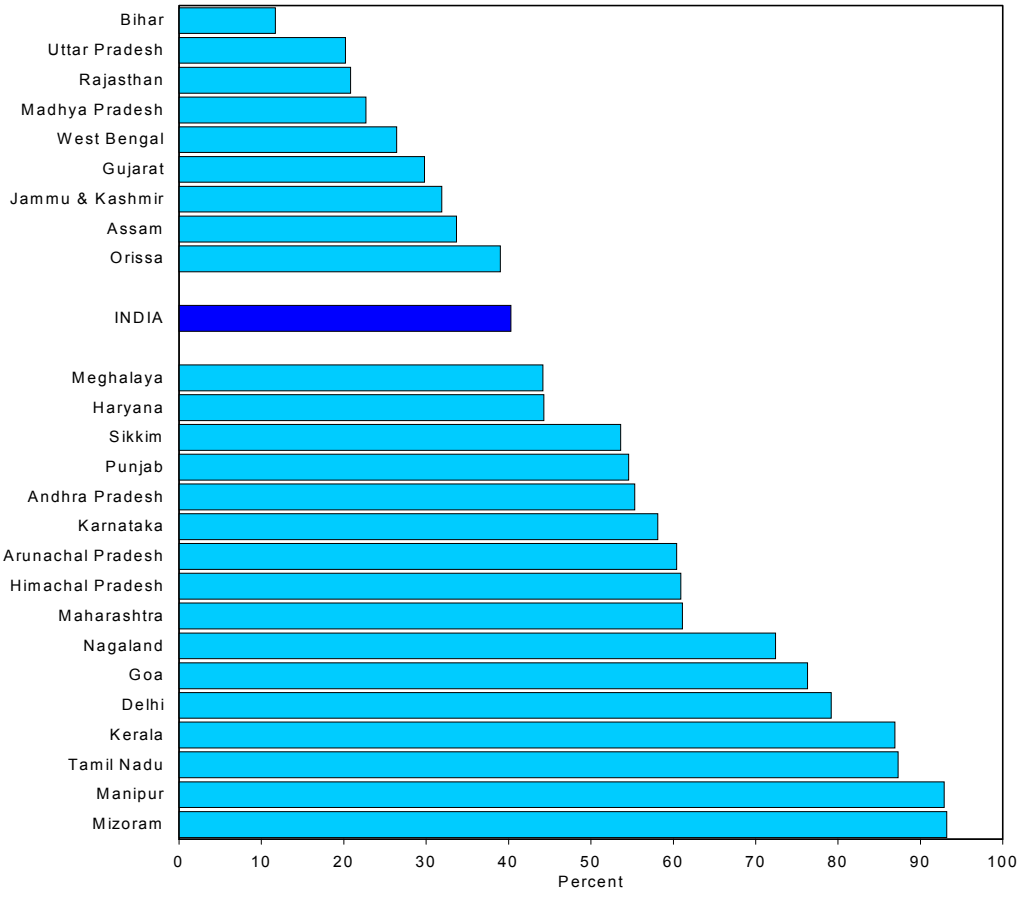
Among ever-married women who have heard about AIDS, television is the primary source of information in most states, followed by the radio (Table 6.25). Newspapers and magazines are also important sources of information about AIDS in most states. The percentage who received AIDS information from a health worker is much higher in Mizoram, Sikkim, Himachal Pradesh, and Goa than in other states, but even in those states only 10–13 percent of women mention health workers as a source of information. Friends and relatives are a relatively

Table 6.25 Source of knowledge about AIDS by state

The percentage of ever-married women who have heard about AIDS and among women who have heard about AIDS, the percentage who received information from specific sources by state, India, 1998–99

State	Percentage who have heard about AIDS	Among those who have heard about AIDS, percentage who received information from:									
		Radio	Television	Cinema	Newspaper/ magazine	Poster/ hoarding	Health worker	Adult education programme	Friend/ relative	School/ teacher	Other source
India	40.3	41.5	78.8	8.1	26.8	12.5	3.6	0.5	30.9	1.0	6.4
North											
Delhi	79.2	36.1	96.9	13.2	38.8	21.6	2.4	0.4	14.2	0.6	3.1
Haryana	44.3	32.2	90.5	3.6	26.3	17.8	3.2	0.6	24.4	2.4	2.6
Himachal Pradesh	60.9	33.3	89.8	2.7	28.0	31.9	10.4	0.5	21.7	0.8	3.7
Jammu & Kashmir	31.9	45.9	86.4	2.2	16.4	4.0	2.2	0.4	17.9	0.9	1.0
Punjab	54.6	25.2	94.6	3.9	34.2	23.0	3.1	0.7	24.2	0.6	2.8
Rajasthan	20.8	28.1	87.4	4.5	26.7	12.6	3.3	0.2	13.0	1.3	4.0
Central											
Madhya Pradesh	22.7	27.8	93.8	5.3	29.9	7.0	3.4	0.3	10.7	0.8	2.0
Uttar Pradesh	20.2	39.4	90.4	7.4	22.4	6.3	1.2	0.0	11.1	0.3	1.9
East											
Bihar	11.7	55.4	82.9	13.8	22.1	2.9	1.2	0.4	16.4	1.1	3.2
Orissa	39.0	61.8	74.4	5.1	16.7	7.0	2.2	0.4	40.2	0.8	2.9
West Bengal	26.4	31.3	84.8	5.2	25.8	6.0	1.8	0.0	16.3	0.3	4.2
Northeast											
Arunachal Pradesh	60.4	30.8	62.7	5.0	9.3	8.1	1.7	0.5	65.3	1.4	4.5
Assam	33.7	63.2	63.6	15.5	27.9	17.0	3.1	0.2	38.5	0.9	5.1
Manipur	92.9	73.2	34.5	4.1	23.1	12.5	6.1	0.1	57.4	0.8	17.9
Meghalaya	44.2	54.9	60.6	4.5	42.9	21.0	6.0	1.4	57.4	1.1	4.8
Mizoram	93.2	67.4	30.4	1.7	60.1	44.4	12.9	1.6	59.3	2.8	16.0
Nagaland	72.4	39.8	40.0	1.2	25.8	27.1	3.1	1.0	72.3	1.0	23.4
Sikkim	53.6	57.1	70.7	4.6	21.2	24.3	10.7	0.5	40.3	0.9	4.5
West											
Goa	76.3	26.5	82.5	2.4	34.7	18.5	10.2	1.8	32.9	2.5	13.0
Gujarat	29.8	15.2	85.9	5.2	46.4	37.6	3.8	0.3	11.9	1.5	5.4
Maharashtra	61.1	22.2	76.8	2.7	23.0	16.6	6.5	0.2	32.8	1.5	13.6
South											
Andhra Pradesh	55.3	33.7	74.3	14.7	15.9	6.8	2.9	0.3	40.6	0.9	7.7
Karnataka	58.1	68.3	80.6	12.0	26.9	10.9	4.4	0.4	33.4	0.9	3.4
Kerala	86.9	66.8	57.3	4.3	60.6	7.2	3.9	2.5	34.6	2.0	5.0
Tamil Nadu	87.3	52.4	75.1	11.8	19.2	14.3	3.4	0.4	50.9	0.9	8.9

Figure 6.9
Percentage Who Have Heard About AIDS by State



important source of AIDS information in the northeastern and southern states, as well as in Orissa, Goa, and Maharashtra.

Knowledge of Ways to Avoid AIDS

Respondents who have heard of AIDS were asked if a person can do anything to avoid becoming infected. Those who reported that something could be done were asked what a person could do to avoid AIDS. Table 6.26 shows the percentage of ever-married women who know of no way to avoid AIDS and the percentages who report that AIDS can be avoided in specific ways, by selected background characteristics.

Among women who have heard about AIDS, 33 percent do not know any way to avoid infection. As expected, this percentage is higher among rural women than among urban women and among women not regularly exposed to mass media than among other women. The percentage who do not know any way to avoid becoming infected with AIDS decreases sharply with increasing levels of education and household standard of living, as expected. This percentage is also considerably higher among Muslim women (40 percent) than among women

Table 6.26 Knowledge about avoidance of AIDS

Among ever-married women who have heard about AIDS, the percentage who believe AIDS can be avoided in specific ways by selected background characteristics, India, 1998–99

Background characteristic	Percentage who believe AIDS can be avoided by:									Knows no way to avoid AIDS	Number of women
	Abstaining from sex	Using condoms	Having only one sex partner	Avoiding sex with commercial sex workers	Avoiding sex with homo-sexuals	Avoiding blood transfusions	Avoiding injections/ using clean needles	Avoiding IV drug use	Other ways		
Age											
15–24	6.3	20.3	37.8	23.8	2.9	17.3	28.6	1.3	5.7	34.7	9,131
25–34	7.3	22.1	42.2	27.1	3.1	20.0	31.1	1.7	6.3	30.0	14,007
35–49	6.2	16.9	39.5	24.5	3.3	18.8	29.1	1.5	6.4	34.4	12,808
Residence											
Urban	7.7	26.2	42.0	28.7	3.9	22.5	34.4	1.8	6.3	28.4	16,424
Rural	5.8	14.4	38.6	22.5	2.4	15.9	25.8	1.3	6.1	36.5	19,522
Education											
Illiterate	3.5	5.6	31.4	18.7	1.8	8.1	15.9	0.7	4.2	48.9	9,564
Literate, < middle school complete	5.0	12.8	35.3	24.0	1.9	14.2	25.2	0.9	6.1	38.6	9,296
Middle school complete	6.7	20.8	43.5	26.4	2.5	19.4	31.8	1.6	6.0	28.7	5,421
High school complete and above	10.6	36.6	49.5	31.4	5.5	31.3	43.8	2.7	8.0	16.9	11,661
Religion											
Hindu	6.6	19.9	40.4	25.5	3.1	18.9	30.0	1.5	6.3	32.1	28,591
Muslim	4.9	15.9	36.8	23.3	2.4	14.7	23.1	0.9	4.9	40.4	3,963
Christian	5.2	16.5	45.7	31.4	4.4	29.1	39.2	2.8	7.7	27.4	1,756
Sikh	22.0	34.5	40.3	11.1	2.6	23.6	29.4	3.3	4.7	30.8	773
Jain	9.5	30.7	42.3	22.6	5.1	18.7	32.7	0.3	6.6	26.0	275
Buddhist/Neo-Buddhist	3.2	23.2	34.8	34.4	3.4	12.8	31.4	1.4	8.2	33.3	464
Other	3.0	22.9	26.2	18.0	3.3	23.4	23.6	4.5	7.9	41.8	81
No religion	7.9	23.5	44.5	25.6	0.5	23.2	24.1	7.2	0.0	42.1	16
Caste/tribe											
Scheduled caste	5.0	14.1	39.7	23.3	2.3	15.1	24.1	1.0	5.6	37.0	5,288
Scheduled tribe	6.3	16.3	25.7	21.0	3.7	15.4	26.4	2.8	8.0	44.6	1,335
Other backward class	4.5	15.3	47.2	29.0	3.1	20.8	30.2	1.4	5.6	28.2	12,314
Other	8.8	25.1	36.5	23.7	3.4	19.1	31.5	1.7	6.7	33.6	16,878

Contd…

Table 6.26 Knowledge about avoidance of AIDS (contd.)

Among ever-married women who have heard about AIDS, the percentage who believe AIDS can be avoided in specific ways by selected background characteristics, India, 1998–99

Background characteristic	Percentage who believe AIDS can be avoided by:									Knows no way to avoid AIDS	Number of women
	Abstaining from sex	Using condoms	Having only one sex partner	Avoiding sex with commercial sex workers	Avoiding sex with homo-sexuals	Avoiding blood transfusions	Avoiding injections/ using clean needles	Avoiding IV drug use	Other ways		
Standard of living index											
Low	2.9	5.5	36.5	21.5	1.3	9.4	17.8	0.5	4.6	43.5	5,682
Medium	5.0	15.0	38.3	24.9	2.7	16.3	27.3	1.2	5.8	36.1	16,559
High	10.3	31.8	44.0	27.3	4.4	26.3	38.0	2.4	7.4	24.2	13,267
Exposure to mass media											
Exposed to any media	6.9	21.4	41.2	26.5	3.3	20.2	31.6	1.6	6.4	30.6	32,316
Listens to radio weekly	7.4	22.1	42.8	27.5	4.0	22.6	34.0	1.7	6.8	28.3	20,040
Watches television weekly	7.3	23.3	41.8	26.9	3.4	21.3	32.8	1.7	6.5	29.4	27,776
Goes to cinema/theatre monthly	6.9	25.5	44.8	29.1	4.4	24.7	37.1	1.9	7.1	25.4	6,795
Reads newspaper/magazine weekly	9.0	31.4	47.3	31.1	4.7	27.9	40.7	2.2	7.6	20.6	15,809
Not regularly exposed to any media	4.1	5.5	30.1	15.3	1.3	7.1	13.3	0.7	4.3	52.0	3,630
Total	6.7	19.8	40.1	25.3	3.1	18.9	29.7	1.5	6.2	32.8	35,946

Note: Total includes 3, 26, 131, and 438 women with missing information on education, religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.

from almost all other religious groups. Scheduled-tribe women are less likely to know any way to avoid AIDS than other women.

Among women who report that something can be done to prevent AIDS, the most commonly mentioned ways of avoiding AIDS are having only one sex partner (40 percent) and avoiding injections or using clean needles (30 percent). Avoiding sex with commercial sex workers, using condoms, and avoiding blood transfusions are also mentioned as ways to avoid AIDS by substantial proportions of women (25, 20, and 19 percent, respectively). Only 7 percent mention abstaining from sex, 3 percent mention avoiding sex with homosexuals, and 2 percent mention avoiding intravenous drug use. The percentage reporting each means of avoiding AIDS is lower among rural than among urban women and among women not regularly exposed to mass media than among other women. The level of education and the household standard of living are strongly and positively associated with women mentioning each of these ways of avoiding AIDS.

Table 6.27 shows state variations in specific ways to avoid AIDS. Even among women who have heard about AIDS, about one-half of women or more do not know of any way to avoid getting AIDS in Sikkim, Arunachal Pradesh, Jammu and Kashmir, Assam, West Bengal, and Bihar. On the other hand, in Mizoram, Tamil Nadu, and Orissa a large majority of women (84 percent or more) know of at least one way to avoid AIDS. The percentage mentioning the use of condoms as a way to avoid AIDS ranges 3 percent in Nagaland to 52 percent in Delhi. Other states where condoms are rarely mentioned as a way to avoid infection include Karnataka (9 percent), Tamil Nadu (11 percent), and Kerala (12 percent). 'Having only one sex partner' is mentioned more often than 'avoiding injections or using clean needles' in 16 out of 25 states. 'Abstaining from sex' is mentioned much less frequently as a way to avoid AIDS in the southern and western states than in other states.

The lack of knowledge of AIDS, its modes of transmission, and ways to avoid infection among women in India is a major challenge to efforts to avoid the spread of AIDS. Most ever-married women in their childbearing years have never heard of AIDS, and many of those who have heard of AIDS do not know even one way to avoid infection. It is clear that AIDS prevention organizations need to strengthen the educational components of their programmes, in addition to trying to reduce high-risk behaviour, since even basic information about AIDS is seriously deficient, at least among women in India.

Table 6.27 Knowledge about avoidance of AIDS by state

Among ever-married women who have heard about AIDS, the percentage who believe AIDS can be avoided in specific ways by state, India, 1998–99

State	Percentage who believe AIDS can be avoided by:									Knows no way to avoid AIDS
	Abstaining from sex	Using condoms	Having only one sex partner	Avoiding sex with commercial sex workers	Avoiding sex with homosexuals	Avoiding blood transfusions	Avoiding injections/ using clean needles	Avoiding IV drug use	Other ways	
India	6.7	19.8	40.1	25.3	3.1	18.9	29.7	1.5	6.2	32.8
North										
Delhi	17.4	52.0	54.4	21.0	7.0	30.2	42.2	1.3	4.1	23.7
Haryana	23.0	36.5	43.4	8.4	1.0	20.7	31.6	2.0	4.0	28.5
Himachal Pradesh	21.9	39.8	44.9	11.4	0.9	15.3	30.1	0.9	2.4	26.7
Jammu & Kashmir	6.7	15.9	26.7	8.4	2.8	12.6	20.4	2.4	6.5	51.8
Punjab	25.2	34.8	40.3	10.6	1.8	23.2	29.9	4.0	5.4	32.1
Rajasthan	10.7	33.7	36.0	4.1	1.5	9.7	19.0	1.4	5.3	40.5
Central										
Madhya Pradesh	10.1	26.4	21.6	7.3	2.0	11.4	23.2	1.2	3.0	44.9
Uttar Pradesh	10.0	24.8	27.9	11.2	2.8	14.8	22.5	1.5	4.6	45.0
East										
Bihar	18.8	23.7	25.7	11.8	3.2	9.8	16.8	4.5	12.1	49.6
Orissa	16.9	14.5	39.5	34.5	2.8	27.1	61.8	4.9	25.2	15.7
West Bengal	6.7	21.1	18.9	15.2	2.1	10.7	20.4	1.0	5.4	50.5
Northeast										
Arunachal Pradesh	1.9	20.7	21.1	9.1	5.3	21.2	16.8	2.9	4.9	52.5
Assam	15.2	26.5	23.2	13.8	3.7	18.7	18.6	2.7	3.3	51.7
Manipur	7.2	15.4	26.5	39.8	2.7	36.9	51.5	10.2	5.9	29.0
Meghalaya	11.8	18.9	33.6	10.5	2.3	22.6	25.6	8.1	5.1	47.8
Mizoram	20.7	39.8	42.8	34.9	8.8	25.3	63.7	9.8	9.0	6.2
Nagaland	10.6	3.2	12.9	42.7	3.3	40.5	55.2	20.7	25.5	25.3
Sikkim	2.3	23.6	22.5	4.3	1.4	11.7	18.2	0.5	7.3	62.6
West										
Goa	2.9	15.0	33.7	36.6	1.1	28.7	40.7	2.0	9.5	25.1
Gujarat	1.8	27.2	33.0	34.6	2.6	18.7	25.6	0.8	6.0	35.4
Maharashtra	2.2	20.1	37.6	33.3	1.8	10.9	27.3	0.8	6.9	33.3
South										
Andhra Pradesh	3.9	16.1	32.2	26.0	2.1	20.8	38.2	1.5	6.0	36.8
Karnataka	3.0	8.6	25.3	37.6	13.8	30.2	38.7	1.1	7.5	36.0
Kerala	0.7	12.0	57.8	26.2	2.0	23.8	24.5	0.5	4.6	26.6
Tamil Nadu	1.2	11.0	74.7	37.6	1.5	22.5	28.6	0.7	3.5	11.5