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 socio-economic 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 that was 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.

In Kerala, the information on child health and health-care practices was collected from mothers for children born since 1 January 1996. If a woman had more than two live births during that period, 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 for the usual resident (*de jure*) population of Kerala from NFHS-2 and the Sample Registration System (SRS). The table also presents crude death rates and age-specific death rates from NFHS-1 for the total population (both sexes combined). The SRS death rates are based on deaths to the usual resident population in 1997. The NFHS-1 and 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 1991–92 for NFHS-1 and 1997–98 for NFHS-2). 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 state. 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 (Office of the Registrar General, 1999a).

Table 6.1 shows an estimated average annual CDR for Kerala of 6.0 deaths per 1,000 population based on NFHS-2 data (covering roughly 1997–98), almost the same as the 1997 SRS rate of 6.2. This suggests that the completeness of reporting of deaths in NFHS-2 is about the same as in the SRS. NFHS-2 age-specific death rates are slightly higher than the SRS rates for ages below 15 and slightly lower than the SRS rates at other ages, particularly ages 60 and above.

Table 6.1 Age-specific death rates and crude death rates

Age-specific death rates and crude death rates (CDR) by sex from NFHS-1, NFHS-2, and the SRS, Kerala

	NFHS-1 (1991–92)	NFHS-2 (1997–98)			SRS (1997)		
Age	Total	Male	Female	Total	Male	Female	Total
< 5	3.8	6.1	1.5	3.8	3.0	3.5	3.2
5–14	0.5	1.2	1.5	1.3	0.5	0.5	0.5
15–49	1.5	1.5	0.9	1.2	2.4	1.3	1.8
50–59	9.4	7.6	5.8	6.7	13.2	4.2	8.5
60+	46.7	54.2	30.9	41.6	58.0	35.1	44.2
CDR	6.2	7.4	4.6	6.0	7.6	4.9	6.2

Note: Age-specific death rates and crude death rates by sex 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.
Source for SRS: Office of the Registrar General, 1999b

The NFHS-2 CDR estimate for Kerala of 6.0 is the lowest in the country and is much lower than the all-India estimate of 9.7. The NFHS-2 estimate is also slightly lower than the corresponding Kerala NFHS-1 estimate of 6.2 (covering roughly 1991–92). Between NFHS-1 and NFHS-2, death rates have declined for all ages except for ages 5–14, and have declined particularly sharply at ages 60 and above.

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). However, in Kerala, according to both NFHS-2 and the SRS, death rates are higher for males than for females or about equal for both sexes at most ages. It is notable, however, that for children age 0–5, the SRS data shows a marginally higher mortality rate for girls than for boys, but NFHS-2, even for this age group, finds the mortality rate for boys to be much higher than for girls.

6.2 Infant and Child Mortality

Infant and child mortality rates reflect a country's level of socio-economic 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 A, this section describes the results of various checks for nonsampling errors—in particular, underreporting of deaths in early childhood (which

[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:

$$ {}_nq_x = 1 - \prod_i (1 - q_i) $$

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 deaths. Changes in these ratios over time can be examined to test the 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 further in the past than children born recently, any decline in mortality will tend to be understated.

Results from Table B.5 (Appendix B) suggest that early neonatal deaths have not been underreported in the Kerala NFHS-2, since the ratios of deaths under seven days to all neonatal deaths are consistently high (between 70 and 95 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 of infant deaths that occurred during the neonatal period (Appendix Table B.6) are also consistently high (between 66 and 89 percent) for the different time periods preceding the survey.

Another problem inherent in most retrospective surveys is heaping of the age at death on certain digits, e.g., 2, 6, and 8 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 the Kerala NFHS-2, there appears to be some preference for reporting age at death at 1, 3, 4, and 7 days (Table B.5 in Appendix B). An examination of the distribution of deaths under age two years during the 15 years preceding the survey by month of death (Appendix Table B.6) does not indicate any heaping of deaths on specific months of age, however. This reflects the strong emphasis on this problem during the training of interviewers for the NFHS-2 fieldwork.[2] Further, an examination of the distribution of births and deaths since 1988 (Table B.4 in Appendix B) suggests that underreporting of deaths is not a problem in the Kerala NFHS-2.

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

[2]For example, 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'.

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 4.18 (Chapter 4) shows that only 4 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 6.2 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 Kerala declined from 39 deaths per 1,000 live births during 1984–88 (10–14 years before the survey) to 16 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 (16) with the infant mortality rate 0–4 years before NFHS-1 (24) suggests a somewhat slower decline of 1.2 infant deaths per 1,000 live births over the six and a half years between the two surveys.

All other measures of infant and child mortality presented in Table 6.2 have also declined during the past 15 years. Each of these rates has declined by 49–80 percent. Moreover, according

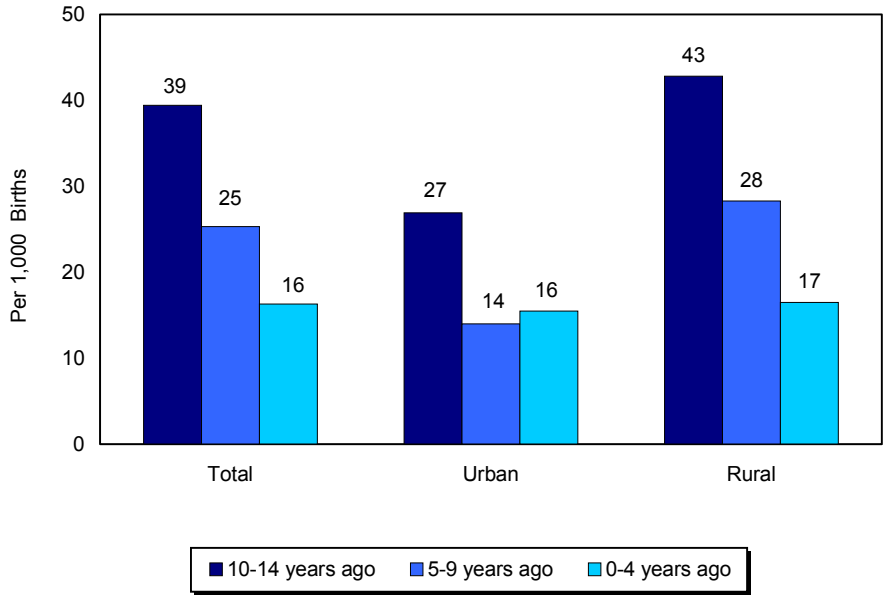
Table 6.2 Infant and child mortality

Neonatal, postneonatal, infant, child, and under-five mortality rates for five-year periods preceding the survey by residence, Kerala, 1999

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	(12.5)	(3.1)	(15.5)	(3.1)	(18.6)
5–9	(10.8)	(3.2)	(14.0)	(6.2)	(20.1)
10–14	(17.5)	(9.4)	(26.9)	(11.7)	(38.2)
RURAL					
0–4	14.2	2.4	16.5	2.4	18.9
5–9	18.4	9.9	28.3	8.3	36.4
10–14	29.4	13.4	42.8	8.2	50.6
TOTAL					
0–4	13.8	2.5	16.3	2.6	18.8
5–9	16.8	8.5	25.3	7.9	33.0
10–14	26.9	12.5	39.4	8.9	48.0

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.
( ) Based on 250–499 children surviving to the beginning of the age interval
[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, Kerala, 1999

to the NFHS-2 estimates, the infant mortality rate in Kerala (16) is not only the lowest in the country, but the all-India infant mortality rate (68) is more than four times as high as the rate for Kerala. Even so, there is scope for further reductions in infant and child mortality in Kerala, and child survival programmes in the state should be intensified to this end.

Urban and rural mortality rates for the five years preceding the survey are very similar. Also, all of the mortality rates declined sharply in rural areas over the 15-year period preceding the survey, and most also appear to have declined in urban areas. However, the small number of urban births makes it difficult to make more specific comparisons in mortality by residence.

Socioeconomic Differentials in Infant and Child Mortality

The probability of dying in early childhood is higher in some population groups than in others. Table 6.3 presents differentials in infant and child mortality rates for the 10-year period preceding the survey by selected background characteristics. In the 10 years preceding the survey, children in rural areas of Kerala experienced a 44 percent higher probability of dying before their fifth birthday than urban children, although this probability was similar in the most recent five year period shown in Table 6.2. This comparison suggests that the under-five mortality rate has been falling much faster in rural areas than in urban areas.

The different infant and child mortality rates are consistently lower among children of mothers who have completed at least high school than among mothers at other levels of education. For example the infant mortality rate and the under-five mortality rate are both about twice as high for children of mothers who are literate but have not completed middle school as for children of mothers who have completed at least high school. Notably, however, neonatal

Table 6.3 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, Kerala, 1999

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
Residence					
Urban	11.6	3.1	14.8	4.6	19.3
Rural	16.3	6.2	22.5	5.5	27.8
Mother's education					
Literate, < middle school complete	12.6	10.8	23.3	9.2	32.4
Middle school complete	(25.3)	(4.0)	(29.3)	(0.0)	(29.3)
High school complete and above	11.5	0.7	12.2	1.6	13.7
Religion					
Hindu	17.5	4.7	22.3	5.6	27.8
Muslim	11.1	7.7	18.9	7.0	25.7
Christian	(19.7)	(2.2)	(21.9)	(0.0)	(21.9)
Caste/tribe					
Other backward class	9.6	7.6	17.3	7.3	24.5
Other[2]	17.6	2.9	20.5	3.5	23.9
Standard of living index					
Low	(23.2)	(12.8)	(36.0)	(7.7)	(43.4)
Medium	11.9	4.0	15.9	6.8	22.6
High	17.2	4.1	21.3	0.6	21.9
Total	15.3	5.6	20.9	5.3	26.0

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 a small number of children whose mothers are illiterate, and children belonging to the scheduled castes and scheduled tribes. Each of these categories is based on fewer than 250 children survivng to the beginning of the age interval. Mortality rates for these categories are not shown separately.
( ) Based on 250–499 children surviving to the beginning of the age interval
[1]Computed as the difference between the infant and neonatal mortality rates
[2]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

mortality is quite similar for mothers with the least education (13 deaths per 1,000 live births) and mothers with the most education (12 deaths per 1,000 live births).

Mortality rates do not differ systematically by religion. For example, Muslims have lower neonatal and infant mortality rates than Hindus and Christians, but have higher postneonatal and child mortality rates. Given the large confidence intervals around mortality estimates (Table A.2), however, especially in a state with replacement level fertility, these differentials by religion are not likely to be statistically significant. In any case, mortality differentials by religion presumably reflect influences other than religion alone. This is confirmed by a study based on NFHS-1 data, which found 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).

The under-five mortality rate is similar for children from other backward classes and children who do not belong to the scheduled castes, scheduled tribes, and other backward classes. Other mortality rates do not vary consistently by caste/tribe and most rates also do not vary consistently with the standard of living. Despite this inconsistency and the small number of

cases for households with a low standard of living, however, the data suggest much higher infant and child mortality for children from households with a low standard of living.

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 6.4 and Figure 6.2 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, and length of the previous birth interval. Differentials by medical care received by the mother during pregnancy, delivery, and the early postpartum period, and the size of the child at the time of birth could not be examined due to the small numbers of cases.

Table 6.4 shows that the infant mortality rate and the under-five mortality rate are both higher for boys than for girls in Kerala. This is largely because of the much higher neonatal mortality rate for boys (20 deaths per 1,000 live births) than for girls (11 deaths per 1,000 live births) in Kerala. In keeping with low or no son preference in the state, the postneonatal mortality and child mortality rates are similar for boys and girls, however.

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 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

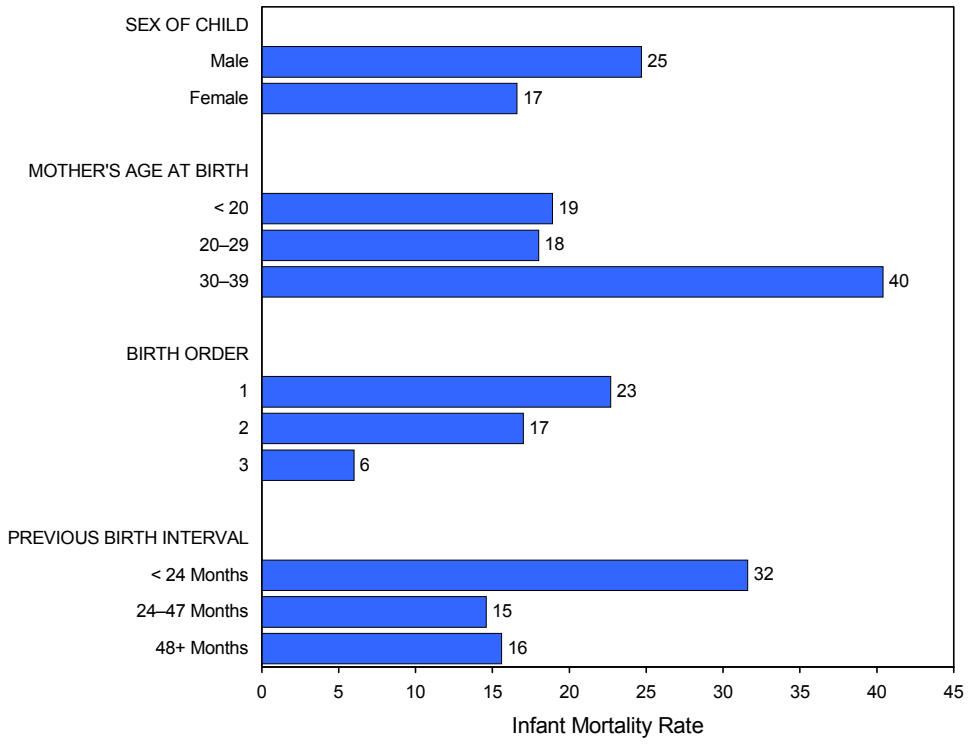
Table 6.4 Infant and child mortality by demographic characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey by selected demographic characteristics, Kerala, 1999

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality[1] (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
Sex of child					
Male	19.6	5.1	24.7	6.0	30.6
Female	10.6	6.0	16.6	4.5	21.1
Mother's age at birth					
< 20	(16.0)	(2.9)	(18.9)	(2.8)	(21.6)
20–29	12.5	5.4	18.0	6.4	24.3
30–39	(30.7)	(9.7)	(40.4)	(2.6)	(42.9)
Birth order					
1	17.2	5.5	22.7	3.8	26.4
2	16.1	0.9	17.0	1.0	18.0
3	(6.0)	(0.0)	(6.0)	(18.8)	(24.7)
Previous birth interval					
< 24 months	(22.1)	(9.5)	(31.6)	(6.7)	(38.1)
24–47 months	10.0	4.7	14.6	8.1	22.7
48+ months	(11.5)	(4.1)	(15.6)	(2.7)	(18.3)

Note: The 10-year period preceding the survey does not include the month in which the interview took place. See text for definition of rates. Total includes a small number of children of birth order 4 or more. This category is based on fewer than 250 children survivng to the beginning of the age interval. Mortality rates for this category are not shown separately. Rates are specified on a per-thousand basis.
( ) Based on 250–499 children surviving to the beginning of the age interval
[1]Computed as the difference between the infant and neonatal mortality rates

Figure 6.2
Infant Mortality Rates by Selected Demographic Characteristics



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

NFHS-2, Kerala, 1999

congenital problems. Kerala exhibits a U-shaped pattern of mortality by mother's age only in the case of neonatal mortality. However, the small number of births to mothers in the youngest and oldest age groups make the comparison inconclusive. Birth order also does not show the expected U-shaped pattern for most of the rates given in Table 6.4; nonetheless, mortality rates are consistently higher for first-born children.

The timing of successive births has a powerful effect on the survival chances of children. As expected, all mortality rates (with the exception of child mortality) are much higher for children born less than 24 months after a previous birth than for children born after longer birth intervals. For example, the infant mortality rate is twice as high for children with a previous birth interval of less than 24 months as for children with a previous interval of 24 months or more (32 deaths compared with 15–16 deaths per 1,000 live births). 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 socio-economic groups and are more likely than other families to live in rural areas where medical facilities and other survival-enhancing resources may be 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 socio-economic characteristics (Retherford et al., 1989).

6.3 Morbidity

There is only 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 sample 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 on morbidity for all household members, and no effort was made to clinically test for any of the disease conditions.

Table 6.5 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 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 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 Kerala, 5 percent of the population was reported to be suffering from asthma at the time of NFHS-2. The reported level of asthma (4,806 per 100,000 population) in Kerala is twice as high as the level reported for India as a whole (2,468 per 100,000 population). The prevalence of asthma in Kerala is considerably higher in rural areas (5,084 per 100,000 population) than in urban areas (3,901 per 100,000 population), and is about the same among females (4,921 per 100,000) and males (4,683 per 100,000). Age differences are marked, with the prevalence of asthma increasing from 3,936 per 100,000 for the population age 0–14 to 13,269 per 100,000 for the population 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 Kerala is 526 per 100,000 population, about the same as in India as a whole (544 per 100,000) and only slightly lower than its level at the time of NFHS-1 (590 per 100,000). The prevalence of tuberculosis is higher in rural areas (581 per 100,000) than in urban areas of Kerala (348 per 100,000), and is much higher for males (623 per 100,000) than for females (435 per 100,000). The sex differential in the prevalence of

Table 6.5 Morbidity

Number of persons per 100,000 usual household residents suffering from asthma, tuberculosis, jaundice, or malaria by age, sex, and residence, Kerala, 1999

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	2,011	284	284	291	0	836
15–59	3,353	179	143	143	72	2,213
60+	11,899	1,579	1,342	0	0	349
Sex						
Male	3,770	528	478	292	97	1,652
Female	4,025	178	133	44	0	1,747
Total	3,901	348	301	165	47	3,399
			RURAL			
Age						
< 15	4,460	669	424	1,127	70	3,069
15–59	3,957	443	317	430	62	6,862
60+	13,696	1,181	1,181	588	0	1,121
Sex						
Male	4,966	653	490	777	60	5,340
Female	5,195	514	382	512	56	5,711
Total	5,084	581	434	640	58	11,052
			TOTAL			
Age						
< 15	3,936	586	394	948	55	3,905
15–59	3,809	379	274	360	65	9,075
60+	13,269	1,276	1,219	448	0	1,470
Sex						
Male	4,683	623	487	662	69	6,993
Female	4,921	435	324	402	43	7,458
Total	4,806	526	403	528	56	14,451

[1]Includes medically treated tuberculosis

tuberculosis is much larger in urban areas than in rural areas. Probable reasons for the 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 Kerala smoke more than women. The prevalence of tuberculosis increases with age. It is substantially higher among persons age 60 and above (1,276 per 100,000) than among those age 15–59 (379 per 100,000). Notably, the prevalence of tuberculosis is higher in the youngest age group (0–14) (586 per 100,000) than in the age group 15–59.

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 lower (403 per 100,000) than the prevalence based on all reported cases (526 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 Kerala, 528 persons per 100,000 population were reported to have suffered from jaundice during the 12 months preceding the survey, considerably lower than the rate of 1,361 for India as a whole. People living in rural areas are much more likely to have suffered from jaundice (640 per 100,000) than those living in urban areas (165 per 100,000). Males are 65 percent more likely to have suffered from jaundice than females. Unlike the other conditions measured, the prevalence of jaundice is highest for the age group 0–14 (948 per 100,000), and is much lower for the other age groups.

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 Kerala, only 56 persons per 100,000 population were reported to have suffered from malaria during the three months preceding the survey, very much lower than the national rate of 3,697 per 100,000 population. 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.

The reported prevalence of malaria is higher for males than for females in both urban and rural areas. However, the overall urban-rural differential in the prevalence of malaria is small. The prevalence of malaria increases slightly with age, from 55 per 100,000 in the population age 0–14 to 65 per 100,000 in the population age 15–59 years. No cases of malaria were reported for the population 60 years and over.

6.4 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. In 1985–86, immunization against measles was added to the programme (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 Kerala whether they had a vaccination card for each child born since January 1996. 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 vaccination 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 6.6 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, the proportion of vaccinations given during the first year of life to children whose information is based on the mother's report is assumed to be the same as the proportion of vaccinations given during the first year of life to children with an exact date of vaccination on the card.

In NFHS-2, children who have 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'), 80 percent of children age 12–23 months are fully vaccinated, and only 2 percent have not received any vaccinations at all. By contrast, in India as a whole, 42 percent of all children age 12–23 months are fully vaccinated and 14 percent have not received any of the required vaccinations. Coverage for each vaccination, except Polio 0, is much higher than the percentage fully vaccinated. BCG, the first and second doses of DPT, and the first and second doses of the polio vaccine have each been received by 94–97 percent of children (see Figure 6.3).

Of all the required vaccinations, children are least likely to have received the measles vaccine. Fifteen percent of children age 12–23 months have not received this vaccination. In addition, not all children who begin the DPT and polio vaccination series go on to complete

[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 6.6 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, Kerala, 1999

	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	(95.1)	(90.2)	(100.0)	(97.5)	(95.0)	(100.0)	(97.5)	(95.0)	(92.9)	(88.1)	(0.0)	32
Mother's report	*	*	*	*	*	*	*	*	*	*	*	14
Either source	96.6	70.9	100.0	96.5	93.1	100.0	98.2	93.1	91.7	84.9	0.0	47
Vaccinated by 12 months of age[2]	96.6	70.9	100.0	96.5	93.1	100.0	98.2	93.1	77.2	73.2	0.0	47
RURAL												
Vaccinated at any time before the interview												
Vaccination card	99.1	75.5	100.0	99.1	94.7	100.0	99.1	94.7	92.9	92.0	0.0	122
Mother's report	91.3	30.2	86.9	85.5	74.1	89.8	86.9	75.3	66.8	56.5	7.2	75
Either source	96.1	58.2	95.0	93.9	86.8	96.1	94.5	87.3	82.9	78.4	2.8	197
Vaccinated by 12 months of age[2]	96.1	58.2	95.0	93.9	84.2	96.1	94.5	83.8	66.5	60.8	2.8	197
TOTAL												
Vaccinated at any time before the interview												
Vaccination card	98.3	78.6	100.0	98.8	94.7	100.0	98.8	94.7	92.9	91.1	0.0	154
Mother's report	92.7	29.8	89.0	86.9	76.5	91.4	89.0	77.4	70.3	59.9	6.1	90
Either source	96.2	60.6	96.0	94.4	88.0	96.9	95.2	88.4	84.6	79.7	2.2	244
Vaccinated by 12 months of age[2]	96.2	60.6	96.0	94.4	85.9	96.9	95.2	85.6	68.5	63.3	2.2	244

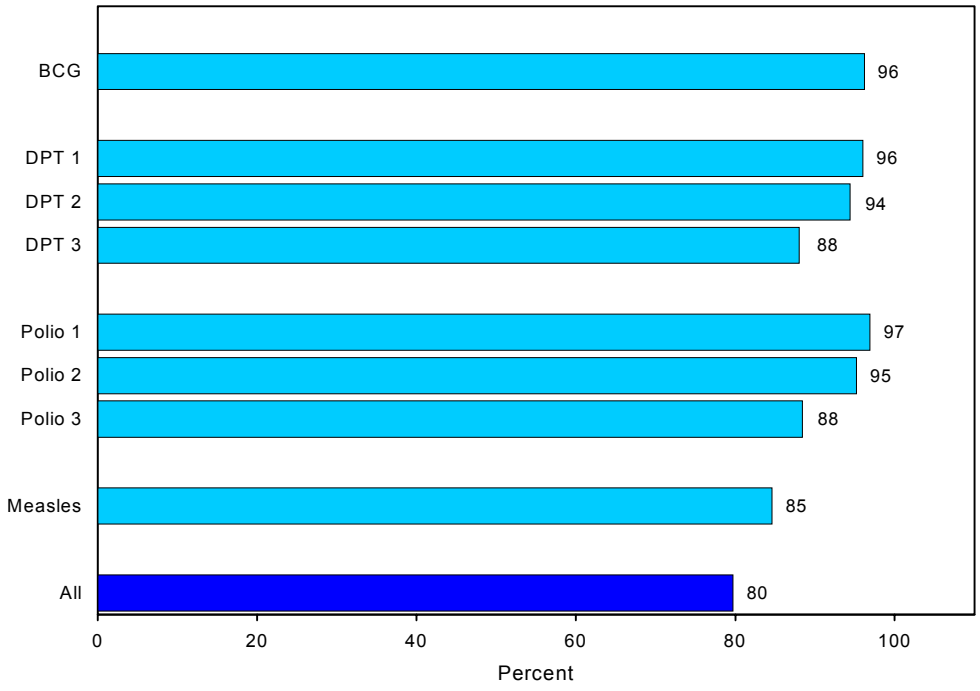
Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey.
( ) Based on 25–49 unweighted cases
*Percentage not shown; based on fewer than 25 unweighted cases
[1]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 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 vaccinations.

them. The difference between the percentages of children receiving the first and third doses of the vaccination is 8 percentage points for DPT and 9 percentage points for polio.

There has been considerable improvement in full vaccination coverage in Kerala since the time of NFHS-1, when the proportion of children fully vaccinated was 54 percent. The proportion of children who did not receive any vaccinations has declined substantially, from 11 percent in NFHS-1 to 2 percent in NFHS-2. The coverage of each vaccination has also improved considerably since NFHS-1. These data indicate that the progress that has been made in immunization coverage for children in Kerala is substantial and has probably contributed to the decline in infant and child mortality noted earlier. Nonetheless, one out of five children in Kerala are not fully vaccinated, suggesting that there is need for further expansion in coverage.

Government statistics suggest a higher level of vaccination coverage than NFHS-2 estimates for most vaccinations, although the two sets of estimates vary substantially only for the measles vaccine and the third dose of the polio vaccine. According to government statistics for

Figure 6.3
Percentage of Children Age 12–23 Months Who Have Received Specific Vaccinations



NFHS-2, Kerala, 1999

Kerala for 1997–98, 95 percent of children age 12–23 months are fully vaccinated and coverage is 100 percent for BCG, 98 percent for the third dose of DPT vaccine, 98 percent for the third dose of polio vaccine, and 95 percent for the measles vaccine (Ministry of Health and Family Welfare, 1999b).

According to the immunization schedule, all primary vaccinations, including measles, should be completed by the time a child is 12 months old. Table 6.6 shows that only 63 percent of all children (or 79 percent of fully vaccinated children) were fully vaccinated by age 12 months. The percentages of children who received the third dose of DPT and the third dose of polio by age 12 months are only slightly lower than the percentages that 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 (85 percent at any time before the survey, compared with 69 percent by age 12 months). Nineteen percent of children who were vaccinated against measles received the vaccination after their first birthday.

The analysis of vaccine-specific data indicates higher coverage for each type of vaccine in urban areas than in rural areas. Eighty-five percent of children age 12–23 months in urban areas had received all the recommended vaccinations by the time of the survey, compared with 78 percent in rural areas. The proportion fully vaccinated during the first year of life is also higher in urban areas (73 percent) than in rural areas (61 percent). Further, dropout rates for DPT and polio (the proportion of children receiving the first dose but not the third dose) are slightly lower in urban areas than in rural areas.

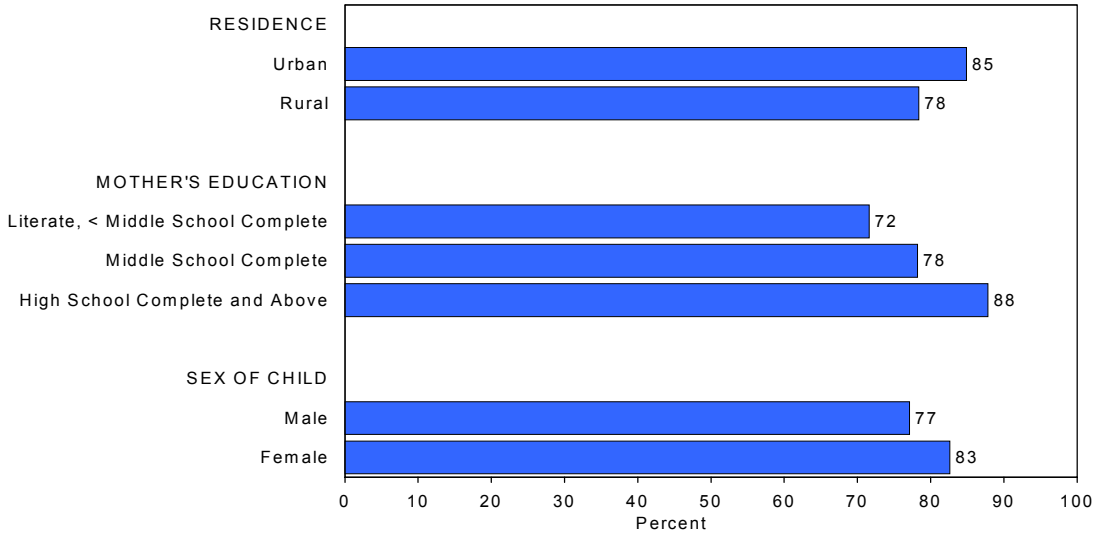
Table 6.7 Childhood vaccinations by background characteristics

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, Kerala, 1999

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	96.6	59.8	95.8	94.1	86.0	96.6	94.1	86.7	82.2	77.1	2.5	63.0	129
Female	95.8	61.5	96.2	94.8	90.3	97.2	96.5	90.3	87.3	82.6	1.9	63.5	114
Birth order													
1	100.0	71.3	98.7	97.8	96.5	98.7	98.7	93.9	94.1	89.3	0.0	68.6	86
2	96.2	59.6	96.7	95.9	90.8	98.9	97.0	91.8	83.3	79.6	1.1	62.7	99
3	(100.0)	(53.5)	(100.0)	(97.0)	(82.9)	(96.9)	(93.9)	(82.7)	(86.0)	(77.7)	(0.0)	(62.6)	37
Residence													
Urban	96.6	70.9	100.0	96.5	93.1	100.0	98.2	93.1	91.7	84.9	0.0	69.2	47
Rural	96.1	58.2	95.0	93.9	86.8	96.1	94.5	87.3	82.9	78.4	2.8	61.8	197
Mother's education													
Literate, < middle school complete	90.2	50.9	91.3	91.3	85.0	91.3	91.3	84.8	79.3	71.6	6.9	62.8	63
Middle school complete	98.0	60.8	96.1	92.2	83.0	96.0	90.2	82.9	82.2	78.2	2.0	66.3	56
High school complete and above	99.3	67.4	99.0	97.6	93.9	100.0	99.3	94.8	91.0	87.8	0.0	64.6	116
Religion													
Hindu	100.0	59.8	99.0	98.2	93.2	98.9	98.9	92.1	90.7	85.7	0.0	65.6	105
Muslim	91.4	57.7	91.1	88.9	80.4	93.3	90.0	81.4	72.5	67.6	5.6	55.4	98
Christian	(98.0)	(69.6)	(100.0)	(98.0)	(92.9)	(100.0)	(98.0)	(95.4)	(97.5)	(92.9)	(0.0)	(75.7)	41
Caste/tribe													
Other backward class	98.9	54.5	95.6	93.7	89.5	96.7	94.4	87.2	81.8	77.9	1.1	62.2	99
Other[2]	93.1	66.5	95.4	93.8	88.4	96.3	94.8	90.2	87.5	83.5	3.7	65.3	118
Standard of living index													
Low	(96.8)	(45.7)	(96.8)	(96.8)	(81.1)	(96.8)	(96.8)	(84.0)	(77.7)	(68.2)	(3.2)	(61.7)	34
Medium	94.9	59.5	93.9	92.4	87.4	95.4	93.2	88.1	81.3	78.4	3.0	62.0	144
High	98.8	71.0	100.0	97.5	93.0	100.0	98.8	91.3	95.4	88.4	0.0	66.8	66
Total	96.2	60.6	96.0	94.4	88.0	96.9	95.2	88.4	84.6	79.7	2.2	63.2	244

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 22 children of birth order 4 or more, 9 children whose mothers are illiterate, and 23 and 3 children belonging to the scheduled castes and scheduled tribes, respectively, who are not shown separately.
( ) Based on 25–49 unweighted cases
[1]BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0)
[2]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

Figure 6.4
Percentage of Children Age 12–23 Months Who Have Received All Vaccinations



NFHS-2, Kerala, 1999

Table 6.7 and Figure 6.4 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 showed vaccination cards for 63 percent of children age 12–23 months. Vaccination cards were shown for 69 percent of children in urban areas and 62 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 6.6).

Girls in Kerala are more likely (83 percent) than boys (77 percent) to be fully vaccinated, a change since NFHS-1 when boys were slightly more likely than girls to be fully vaccinated. The coverage of most individual vaccinations is similar for boys and girls, except for the third doses of DPT and polio vaccines and the measles vaccine. These vaccines are received more often by girls than boys. Vaccination coverage increases sharply with the mother's education, from 72 percent for children of mothers who are literate but have not completed middle school to 88 percent for children of mothers who have completed at least high school. Vaccination coverage also increases with the standard of living of the household. Sixty-eight percent of children from households with a low standard of living are fully vaccinated, compared with 88 percent of children from households with a high standard of living. Hindu and Christian children are much more likely than Muslim children to have received each of the recommended vaccinations, a pattern that is also evident at the national level. Children who do not belong to the scheduled castes, scheduled tribes, or other backward classes are more likely to have received all of the required vaccinations than children from other backward classes (84 percent compared with 78 percent); however, they are also more likely than children from other backward classes to have not received any vaccinations (4 percent, compared with 1 percent). Vaccination coverage decreases with birth order. These data suggest that, despite high levels of immunization

Table 6.8 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, Kerala, 1999

	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	69.2	67.8	61.8	50.5	63.2	53.5
Percentage vaccinated by 12 months of age[1]						
BCG	96.6	95.0	96.1	90.7	96.2	91.4
Polio 0	70.9	74.9	58.2	57.5	60.6	60.6
DPT						
1	100.0	92.1	95.0	89.0	96.0	89.4
2	96.5	89.3	93.9	86.1	94.4	86.5
3	93.1	89.3	84.2	82.0	85.9	83.5
Polio						
1	100.0	94.1	96.1	90.7	96.9	91.1
2	98.2	91.1	94.5	89.0	95.2	89.1
3	93.1	91.1	83.8	83.1	85.6	84.8
Measles	77.2	75.1	66.5	65.7	68.5	67.5
All vaccinations[2]	73.2	75.1	60.8	61.8	63.3	64.6
No vaccinations	0.0	5.9	2.8	5.8	2.2	6.0
Number of children	47	39	197	186	244	226

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)

coverage in Kerala, coverage for socioeconomically backward and Muslim children lags far behind the coverage for other children.

Table 6.8 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 proportion vaccinated during the first year of life is estimated separately for children in each age group. The row labelled 'No vaccinations' indicates the percentage of children that have not received any vaccination by 12 months of age.

The proportion of children whose vaccination status was determined from a vaccination card declines substantially with the age of children. This may reflect an upward trend in the use of vaccination cards, as well as an upward trend in 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 actually slightly lower (63 percent) for children age 12–23 months than for children age 24–35 months (65 percent), even as the coverage of each of the recommended vaccinations has

Table 6.9 Source of childhood vaccinations

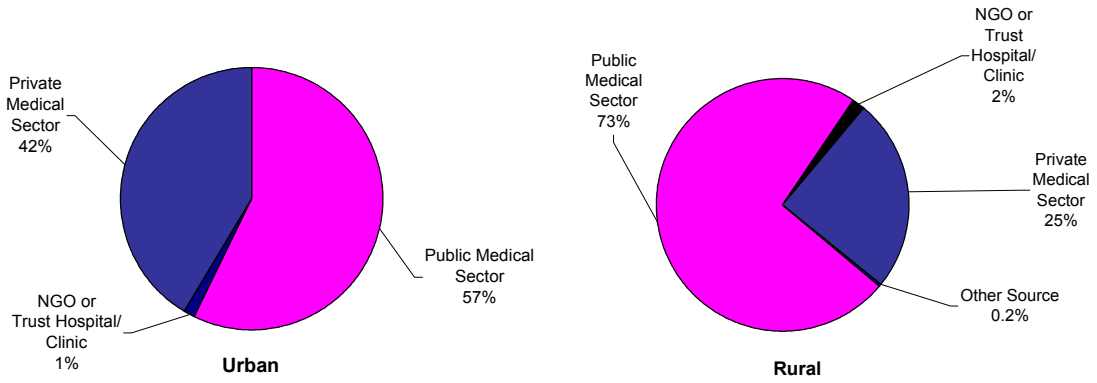
Percent distribution of children under age 3 who have received any vaccinations by source of most of the vaccinations, according to selected background characteristics, Kerala, 1999

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	62.5	2.6	35.0	0.0	100.0	214
12–23 months	73.3	0.4	25.8	0.5	100.0	238
24–35 months	74.0	1.7	24.3	0.0	100.0	217
Sex of child						
Male	70.9	1.3	27.8	0.0	100.0	344
Female	69.2	1.8	28.7	0.3	100.0	325
Birth order						
1	65.4	2.2	32.5	0.0	100.0	273
2	70.8	1.6	27.1	0.4	100.0	263
3	75.7	0.0	24.3	0.0	100.0	97
4+	(84.9)	(0.0)	(15.1)	(0.0)	100.0	37
Residence						
Urban	57.3	1.2	41.5	0.0	100.0	133
Rural	73.2	1.6	24.9	0.2	100.0	537
Mother's education						
Illiterate	(89.5)	(0.0)	(10.5)	(0.0)	100.0	28
Literate, < middle school complete	83.4	0.0	15.8	0.8	100.0	138
Middle school complete	74.6	1.4	24.0	0.0	100.0	133
High school complete and above	62.0	2.3	35.8	0.0	100.0	370
Religion						
Hindu	73.1	0.4	26.2	0.4	100.0	303
Muslim	73.7	2.3	24.0	0.0	100.0	262
Christian	52.3	2.9	44.9	0.0	100.0	104
Caste/tribe						
Scheduled caste	72.9	0.0	27.1	0.0	100.0	55
Other backward class	76.3	0.7	22.9	0.0	100.0	283
Other[1]	63.8	2.5	33.4	0.3	100.0	325
Standard of living index						
Low	86.8	0.0	13.2	0.0	100.0	95
Medium	78.7	1.4	19.6	0.3	100.0	374
High	46.2	2.6	51.3	0.0	100.0	201
Total	70.1	1.5	28.2	0.2	100.0	669

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 6 children belonging to the scheduled tribes, who are not shown separately.
NGO: Nongovernmental organization
( ) Based on 25–49 unweighted cases
[1]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

increased between the two time periods. Thus, the proportion of children who received one or more vaccinations (but not all) has increased over time, despite the slight decline in the proportion receiving all the recommended vaccinations. This is also clear from the fact that the proportion of children who did not receive any vaccination by age 12 months has declined sharply from 6 percent for children age 24–35 months to 2 percent for children age 12–23 months. This pattern of change is evident in both urban and rural areas.

Figure 6.5
Source of Childhood Vaccinations by Residence



Note: Rural percents add to more than 100.0 due to rounding

NFHS-2, Kerala, 1999

Table 6.9 and Figure 6.5 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 Kerala. Seventy percent of all children who have received vaccinations received most of them from a public medical sector source, 28 percent received them from a private medical sector source, and only 2 percent received them from a nongovernmental organization or trust source. The percentage of vaccinated children receiving vaccinations from the private medical sector is much higher in urban areas (42 percent), where private-sector services tend to be concentrated, than in rural areas (25 percent). Even in urban areas, however, 57 percent of children received their vaccinations from the public sector. The use of the private medical sector for child-immunization services decreases with both the age and the birth order of the child, increases with the education of the mother, and does not vary by the sex of the child. It is more common among children not belonging to the scheduled castes, scheduled tribes, and other backward classes and among Christian children than among most other children. The use of the private medical sector for immunization varies most by the household standard of living, however. Fifty-one percent of the children from households with a high standard of living have received most of their vaccinations from the private medical sector, compared with only 13 percent of children from households with a low standard of living.

6.5 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 6.10 shows the percentage of children age 12–35 months who received at least one dose of vitamin A and who received a dose

Table 6.10 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, Kerala, 1999

Background characteristic	Percentage who received vitamin A		Number of children
	At least one dose	At least one dose within past six months	
Age of child			
12–23 months	41.0	30.9	244
24–35 months	46.4	25.3	226
Sex of child			
Male	43.1	30.2	250
Female	44.1	25.9	220
Birth order			
1	51.8	34.4	182
2	42.5	28.8	184
3	38.3	20.3	67
4+	(17.8)	(9.1)	37
Residence			
Urban	35.0	25.8	86
Rural	45.5	28.8	383
Mother's education			
Literate, < middle school complete	43.8	28.1	115
Middle school complete	39.6	25.9	103
High school complete and above	45.6	29.6	226
Religion			
Hindu	50.6	36.8	196
Muslim	39.4	23.6	203
Christian	35.7	17.7	70
Caste/tribe			
Scheduled caste	(52.3)	(36.1)	39
Other backward class	42.1	29.9	206
Other[1]	42.3	24.4	221
Standard of living index			
Low	44.9	33.0	73
Medium	41.5	26.1	267
High	47.0	30.0	130
Total	43.6	28.2	469

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 25 children whose mothers are illiterate and 4 children belonging to the scheduled tribes, who are not shown separately.
( ) Based on 25–49 unweighted cases
[1]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

of vitamin A within the past six months by selected background characteristics. In the state as a whole, 44 percent of children age 12–35 months received at least one dose of vitamin A and 28 percent received a dose within the past six months. This indicates that the majority of children in Kerala have not received vitamin A supplementation and even more have not received vitamin A supplementation regularly.

Rural children are more likely than urban children to receive vitamin A supplementation. Also scheduled-caste children, children of birth order one, Hindu children, children from

households with a high standard of living, and children whose mothers have completed at least high school are more likely than most other children to receive vitamin A supplementation. There is no consistent relationship between receiving at least one dose of vitamin A supplementation and receiving at least one dose within the past six months by several of the background characteristics listed in Table 6.10. For some, however, such as birth order and religion, children who are more likely to have received at least one dose of vitamin A supplementation are also more likely to have received a dose in the past six months.

6.6 Child Morbidity and Treatment

This section discusses the prevalence and treatment of acute respiratory infection (ARI), fever, and diarrhoea. Mothers of children less than three years old 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 6.11 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 23 percent of children under age three years in Kerala suffered from acute respiratory infection (cough accompanied by short, rapid breathing) at some time during the two-week period before the interview. Table 6.11 shows that ARI was equally common in urban and rural areas. Boys were somewhat more likely than girls to have ARI. The prevalence of ARI is higher, at more than 25 percent, among scheduled-caste children, children age 6–11 months, children of mothers who have completed only middle school, children from households that do nothing to purify their drinking water, and children of birth order two.

Table 6.11 also shows the percentage of children suffering from ARI symptoms in the two weeks before the interview who were taken to a health facility or provider. Eighty-three percent of children suffering from ARI received advice or treatment from a health facility or health provider. Notably, more than three-fourths of children with ARI in every subgroup of the population were taken to a health facility or provider.

Fever

Fever is the most common of the three conditions shown in Table 6.11, with 42 percent of children suffering from fever during the two weeks preceding the survey. The prevalence of fever is lower among children age 1–5 months (37 percent) than among older children (40–46 percent). Fever is less prevalent in urban areas than in rural areas. Girls are slightly less likely than boys to have had fever in the two weeks preceding the survey. The prevalence of fever is higher, at more than 45 percent, among scheduled-caste children, children of mothers who have completed only middle school, and children age 12–23 months.

Table 6.11 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, Kerala, 1999

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	17.3	37.4	6.4	1.1	99	*	17
6–11 months	27.0	39.7	12.6	0.0	118	(87.2)	32
12–23 months	24.0	45.5	16.2	1.2	244	84.1	58
24–35 months	21.9	40.0	8.5	1.0	226	(80.6)	49
Sex of child							
Male	25.4	44.0	14.9	1.5	352	87.3	89
Female	20.1	38.9	8.1	0.3	335	76.8	67
Birth order							
1	21.2	40.2	13.2	1.1	274	84.4	58
2	25.7	44.0	12.4	0.4	266	84.7	68
3	22.2	41.2	6.3	1.1	99	*	22
4+	(17.8)	(36.4)	(8.9)	(2.3)	48	*	8
Residence							
Urban	23.0	36.3	12.7	0.6	130	(78.6)	30
Rural	22.8	42.7	11.3	1.0	556	83.8	127
Mother's education							
Illiterate	(24.6)	(24.9)	(18.2)	(3.7)	29	*	7
Literate, < middle school complete	24.3	39.8	11.4	0.0	148	(78.6)	36
Middle school complete	26.8	48.5	13.6	2.1	142	(90.2)	38
High school complete and above	20.6	40.8	10.4	0.6	368	80.9	76
Religion							
Hindu	23.1	42.6	10.3	0.7	303	88.4	70
Muslim	22.4	41.6	12.8	0.8	280	84.6	63
Christian	23.3	38.2	12.2	1.8	103	*	24
Caste/tribe							
Scheduled caste	31.8	55.7	16.4	2.0	54	*	17
Other backward class	23.4	36.4	12.5	0.7	294	84.0	69
Other[2]	20.3	43.7	10.3	0.9	331	76.3	67
Standard of living index							
Low	21.8	41.4	11.1	1.2	98	*	21
Medium	24.7	43.0	12.3	1.0	388	81.3	96
High	19.7	38.8	10.5	0.5	201	(79.8)	40
Source of drinking water							
Piped water	23.4	44.3	15.3	1.5	121	(79.0)	28
Well water	23.3	41.2	11.0	0.8	538	84.1	126
Purification of water[3]							
Alum	22.7	37.9	11.2	1.3	86	*	20
Water filter	(22.4)	(36.8)	(17.5)	(0.0)	43	*	10
Boiling	20.1	41.7	8.4	0.9	327	82.3	66
Nothing	26.6	42.5	13.3	0.8	263	83.8	70
Total	22.8	41.5	11.6	0.9	687	82.8	157

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 a small number of children whose mothers belong to scheduled tribes, children from households whose source of drinking water is ground water, surface water or some other source, and children from households that purify water by straining it or using electronic water purifier, 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]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class
[3]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.

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 less than three years old a series of questions about episodes of diarrhoea suffered by their children in the two weeks before the interview, including questions on feeding practices during diarrhoea, the treatment of diarrhoea, and their knowledge and use of ORS.

Table 6.11 shows that 12 percent of children under age three suffered from diarrhoea in the two-week period before the interview. There are seasonal variations in the prevalence of diarrhoea, however, so that the percentages shown in Table 6.11 cannot be assumed to reflect the situation throughout the year. Among children age 1–35 months, children age 12–23 months are most susceptible to diarrhoea (16 percent) and those age 1–5 months are least susceptible (6 percent). The prevalence of diarrhoea is relatively low in rural areas, among girls, among children of birth order three or higher, and among children living in households that boil their drinking water to purify it. The prevalence of diarrhoea is relatively high (16 percent or more) among children of illiterate mothers, children from households that use a water filter to purify their drinking water, and scheduled-caste children.

One percent of all children age 1–35 months (8 percent of children who suffered from diarrhoea in the two weeks preceding the survey) had diarrhoea with blood, a symptom of dysentery. Since the prevalence of diarrhoea with blood is very low, it is not meaningful to analyze the differentials with regard to various population characteristics.

Table 6.12 shows that 89 percent of mothers with births during the three years preceding the survey know about ORS packets, up sharply from 71 percent among women who gave birth during the three years before NFHS-1. Knowledge of ORS is much more widespread in Kerala than in the country as whole (62 percent). There is surprisingly little variation in mother's knowledge of ORS by background characteristics: over 80 percent of mothers in every subgroup of the population have knowledge of ORS. Nonetheless, it is notable that mothers who are not regularly exposed to the media are among the mothers least likely to know about ORS.

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 6.12 shows the responses of mothers to this question by selected background characteristics. In Kerala, 86 percent of mothers report that children should be given more to drink than usual during an episode of diarrhoea and only 3 percent of mothers incorrectly say that children should be given less. This suggests that knowledge about the proper management of diarrhoea is widespread in Kerala. The proportion reporting correctly that

Table 6.12 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, Kerala, 1999

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								
20–24	87.2	3.8	9.3	84.1	2.8	100.0	50.5	220
25–29	90.8	2.1	8.7	86.8	2.5	100.0	49.6	269
30–34	88.9	3.1	4.5	91.3	1.1	100.0	63.4	96
35–49	(88.3)	(7.0)	(15.0)	(76.1)	(1.9)	100.0	(60.2)	42
Residence								
Urban	91.1	4.3	4.4	88.1	3.2	100.0	51.9	125
Rural	88.4	2.9	9.9	84.9	2.3	100.0	52.5	524
Education								
Illiterate	(88.0)	(19.9)	(18.7)	(61.4)	(0.0)	100.0	(54.3)	27
Literate, < middle school complete	82.9	4.3	10.2	82.4	3.0	100.0	47.7	137
Middle school complete	86.4	5.1	13.5	77.2	4.2	100.0	46.1	130
High school complete and above	92.3	0.7	5.9	91.6	1.8	100.0	56.3	355
Religion								
Hindu	90.0	2.8	6.9	86.9	3.3	100.0	50.4	292
Muslim	86.5	4.8	11.8	81.3	2.0	100.0	50.4	254
Christian	92.0	0.0	7.1	91.8	1.1	100.0	62.8	102
Caste/tribe								
Scheduled caste	(87.2)	(3.2)	(12.1)	(82.5)	(2.3)	100.0	(52.3)	49
Other backward class	92.5	2.8	8.5	85.9	2.8	100.0	56.9	279
Other[2]	86.1	2.9	8.3	86.6	2.3	100.0	49.5	314
Exposure to media								
Exposed to any media	89.6	2.2	8.0	87.0	2.8	100.0	53.2	573
Watches television weekly	90.8	2.0	6.8	87.8	3.3	100.0	55.5	413
Listens to radio weekly	90.3	1.9	8.7	86.7	2.6	100.0	54.9	455
Visits cinema/theatre monthly	87.9	2.0	9.5	83.2	5.4	100.0	45.2	95
Reads newspaper/ magazine weekly	90.0	1.2	6.6	88.9	3.3	100.0	54.1	447
Not regularly exposed to any media	84.2	10.5	15.4	74.1	0.0	100.0	45.9	76
Total	88.9	3.2	8.9	85.5	2.5	100.0	52.3	648

Note: Total includes 22 women age 15–19 years and 7 women belonging to the scheduled tribes, who are not shown separately.
( ) Based on 25–49 unweighted cases
[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
[2]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

children with diarrhoea should be given more to drink is relatively low, at less than three-fourths, among illiterate women and women not regularly exposed to the media, however.

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

Table 6.13 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, percent distribution of children by source of ORS packets, Kerala, 1999

Source	Percent
Public medical sector	
Public medical sector	(40.4)
Government/municipal hospital	(19.2)
CHC/rural hospital/PHC	(19.1)
Sub-centre	(2.1)
Private medical sector	(49.0)
Private hospital/clinic	(29.1)
Private doctor	(5.8)
Private Paramedic	(2.1)
Vaidya/hakim/homeopath	(2.1)
Pharmacy/drugstore	(9.9)
Other Source	
Shop	(10.6)
Total percent	100.0
Number of children treated with ORS	38

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.
( ) Based on 25–49 unweighted cases
CHC: Community health centre; PHC: Primary Health Centre

warranting medical treatment include repeated watery stools, repeated vomiting, blood in the stools, fever, marked thirst, not eating or drinking well, getting sicker or very sick, and not getting better. Table 6.12 shows that only 52 percent of mothers were able to name two or more signs that indicate that a child with diarrhoea should be given medical treatment. Again, limited exposure to mass media and a low level of education are the characteristics most associated with mothers not being able to identify two or more signs for the medical treatment of diarrhoea.

Seventy-eight percent of children in Kerala age 1–35 months who suffered from diarrhoea during the two weeks preceding the survey were taken to a health facility or provider for medical advice or treatment (higher than the national level of 63 percent). Twelve percent did not receive any treatment at all. Almost half (48 percent) the children who suffered from diarrhoea during the two weeks preceding the survey were treated with a solution made from ORS packets. This proportion has tripled since NFHS-1 when it was only 16 percent. This indicates a remarkable improvement in the use of ORS packets in Kerala for the treatment of childhood diarrhoea. Seventy-three percent of children received increased fluids when sick with diarrhoea, and 49 percent received gruel. Only 10 percent of children with diarrhoea did not receive any of the various types of oral rehydration therapy (data not shown).

The use of antibiotics and other antidiarrhoeal drugs is not generally recommended for the treatment of childhood diarrhoea. Yet, 56 percent of the children who had diarrhoea in the two weeks before NFHS-2 were treated with pills or syrup, and 4 percent received an injection (data not shown). These figures indicate poor knowledge about the proper treatment of diarrhoea among health-care providers. The results suggest that, although Kerala has made huge strides in improving knowledge about the proper treatment of diarrhoea, there remains a need for

informational programmes for mothers and supplemental training for health-care providers that further encourage the use of ORS packets, emphasize the importance of oral rehydration therapy, and discourage the use of drugs to treat childhood diarrhoea.

Table 6.13 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 40 percent of children who were treated with ORS, the packets were obtained from public-sector medical sources, for 49 percent the packets were obtained from private-sector medical sources, and for 11 percent the packets were obtained from shops. These results suggest that both the private and the public medical sectors play important roles in supplying ORS packets for the treatment of diarrhoea. The number of children with diarrhoea in the two weeks preceding the survey who were treated with ORS is too few to permit a more detailed analysis.

6.7 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 contact with contaminated needles or blood, or from an HIV-infected mother to her child during pregnancy, during delivery, or through breastfeeding. HIV and AIDS prevalence in India have been on the rise for more than a decade and have reached alarming levels 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 6.14 shows the percentage of women who have heard about AIDS by background characteristics. Eighty-seven percent of women in Kerala have heard of AIDS, much higher than the average for India at 40 percent. NFHS-1 did not include AIDS-awareness questions for Kerala so it is not possible to assess the trend in AIDS awareness in the state between NFHS-1 and NFHS-2.

As one would expect, knowledge of AIDS is higher, at 90 percent, among younger women (age 15–34) than among older women, at 83 percent. Christians are much more likely to know about AIDS (97 percent) than either Muslims (79 percent) or Hindus (89 percent). The effect of media exposure on knowledge of AIDS is very powerful. Only 56 percent of women who are not regularly exposed to the radio, television, cinema, theatre, or print media say that they have heard about AIDS, whereas more than 90 percent of women regularly exposed to one or more forms of these media know about AIDS. Knowledge of AIDS is also higher among women from households with a high standard of living, women who have at least completed middle school, and urban women.

Table 6.14 Source of knowledge about AIDS

Percentage of ever-married women who have heard about AIDS and among women who have heard about AIDS, percentage who received information from specific sources by selected background characteristics, Kerala, 1999

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	Newspaper/ magazine	Poster/ hoarding	Health worker	Adult education programme	Friend/ relative	School teacher	Other source	
Age													
15–24	89.7	459	67.8	59.3	3.7	67.1	4.6	3.7	2.5	37.1	3.8	4.7	411
25–34	90.3	1,080	69.9	60.0	5.2	65.6	10.3	4.0	2.6	31.9	1.9	4.6	975
35–49	83.3	1,346	63.7	54.1	3.9	53.8	5.5	3.8	2.4	36.0	1.4	5.5	1,121
Residence													
Urban	92.8	667	63.7	73.3	7.5	64.4	9.3	3.8	2.3	25.6	1.9	4.7	619
Rural	85.2	2,217	67.8	52.0	3.3	59.3	6.5	3.9	2.6	37.5	2.0	5.1	1,888
Education													
Illiterate	55.0	362	54.7	26.3	0.0	3.9	0.0	3.0	1.9	58.0	0.5	5.2	199
Literate, < middle school complete	81.2	871	61.1	37.3	2.2	40.1	5.5	3.6	2.3	47.0	0.9	4.8	707
Middle school complete	93.9	493	66.7	55.6	3.7	64.9	6.7	3.7	0.7	31.8	0.8	3.9	463
High school complete and above	98.3	1,158	72.5	75.7	6.7	81.4	9.7	4.2	3.4	23.9	3.5	5.5	1,138
Religion													
Hindu	89.2	1,478	71.6	64.7	5.0	62.4	8.1	4.1	2.4	29.7	1.5	4.9	1,319
Muslim	78.6	941	59.5	39.2	1.3	53.5	4.1	3.8	2.5	48.6	2.4	3.6	739
Christian	96.6	462	64.9	64.9	7.5	66.7	9.7	3.3	2.8	25.9	2.8	7.8	447
Caste/tribe													
Scheduled caste	83.1	252	61.3	50.6	3.2	44.9	5.4	5.0	1.1	33.1	3.2	5.9	209
Scheduled tribe	(72.4)	32	*	*	*	*	*	*	*	*	*	*	23
Other backward class	87.1	1,244	66.6	55.0	4.4	61.3	6.2	4.3	3.0	41.4	1.5	4.9	1,083
Other	87.9	1,356	67.7	60.5	4.5	63.2	8.4	3.2	2.3	28.9	2.3	5.0	1,192
Standard of living index													
Low	72.3	448	63.6	32.5	2.9	36.2	6.4	4.8	1.9	47.8	1.5	8.3	324
Medium	85.7	1,590	68.4	49.6	3.2	55.0	6.2	4.1	2.6	36.8	1.9	4.6	1,362
High	97.1	846	65.5	79.7	6.7	79.4	9.2	3.0	2.5	25.7	2.3	4.4	821
Exposure to mass media													
Exposed to any media	90.9	2,552	69.1	60.9	4.7	63.6	7.6	3.7	2.6	31.9	1.9	4.9	2,321
Listens to radio weekly	91.6	2,046	75.1	60.4	4.6	63.6	7.0	4.0	2.9	31.8	1.8	4.6	1,874
Watches television weekly	93.7	1,799	68.2	76.4	5.8	66.2	8.4	3.5	2.1	28.2	2.2	5.0	1,686
Goes to cinema/theatre monthly	92.8	349	67.4	72.4	6.1	69.9	9.7	3.8	1.4	33.0	3.4	5.1	324
Reads newspaper/magazine weekly	95.3	1,852	70.8	67.5	5.6	74.0	8.8	3.6	2.7	28.0	2.2	5.2	1,765
Not regularly exposed to any media	56.2	332	38.3	11.5	0.0	23.1	2.0	5.5	1.2	67.6	3.4	5.9	186
Total	86.9	2,884	66.8	57.3	4.3	60.6	7.2	3.9	2.5	34.6	2.0	5.0	2,507

Note: Total includes a small number of women belonging to other religions, who are not shown separately.
( ) Based on 25–49 unweighted cases
*Percentage not shown; based on fewer than 25 unweighted cases

Source of Knowledge About AIDS

As part of its AIDS prevention programme, the Government of India has been using mass media extensively, especially electronic media, 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 6.14 shows the percentage of ever-married women who have heard about AIDS from specific sources. Radio is by far the most important source of information about AIDS among ever-married women in Kerala. Sixty-seven percent of women who know about AIDS received information from that source. For women, other important sources of information about AIDS are newspapers or magazines (61 percent) and television (57 percent). Friends and relatives are the source of information on AIDS for more than one-third (35 percent) of the women. Seven percent of women mention posters and hoardings as providing information. Only 4 percent report that they received information about AIDS from a health worker.

Radio is an important source of information about AIDS in all of the groups shown in Table 6.14. However, in some groups such as the more educated women, Christian women, and women from households with a high standard of living, newspapers/magazines and television are the most important sources. Among women not regularly exposed to the media, illiterate or less educated women, Muslim women, and women from households with a low standard of living, friends and relatives are as important or even more important than the radio as a source of knowledge about AIDS.

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 can be done were asked what a person can do to avoid AIDS. Table 6.15 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, 27 percent do not know any way to avoid infection, compared with 33 percent for India as a whole. The percentage is much higher among women who are not regularly exposed to the media (53 percent), illiterate and less educated women (42–55 percent), women from households with a low standard of living (39 percent), and Muslim women (37 percent).

Among women who have heard about AIDS, the most commonly mentioned ways of avoiding AIDS are having only one sex partner (58 percent), avoiding sex with commercial sex workers (26 percent), avoiding injections or using clean needles (25 percent), and avoiding blood transfusions (24 percent). Only 12 percent mention that the use of condoms can help avoid AIDS. The percentage reporting most of the specific ways of avoiding AIDS is lower for women not regularly exposed to mass media than for women in almost all other groups. The likelihood of mentioning most of the ways of avoiding AIDS goes up sharply with the level of education and with the household standard of living and tends to be lower among Muslims than among Hindus or Christians. The use of condoms as a way of avoiding AIDS is mentioned most often by women who have at least completed high school, women from households with a high standard of living, and women who are regularly exposed to the cinema or theatre.

Table 6.15 Knowledge about avoidance of AIDS

Among ever-married women who have heard about AIDS, percentage who believe AIDS can be avoided in specific ways by selected background characteristics, Kerala, 1999

Background characteristic	Percentage who believe AIDS can be avoided by:										
	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	Knows no way to avoid AIDS	Number of women
Age											
15–24	0.7	13.6	58.6	26.9	1.3	21.2	23.2	0.2	5.7	28.6	411
25–34	0.9	15.2	63.7	28.2	2.1	28.3	28.0	0.7	5.3	20.1	975
35–49	0.5	8.6	52.4	24.1	2.3	20.9	22.0	0.5	3.6	31.5	1,121
Residence											
Urban	0.5	14.1	60.1	28.0	2.7	29.3	29.8	0.9	3.7	23.4	619
Rural	0.8	11.3	57.1	25.6	1.8	22.0	22.8	0.4	4.9	27.6	1,888
Education											
Illiterate	0.6	0.9	36.4	9.8	0.0	3.8	4.7	0.0	1.5	54.6	199
Literate, < middle school complete	0.5	6.4	45.9	20.8	0.4	10.3	12.5	0.2	2.3	41.8	707
Middle school complete	0.4	8.6	57.4	26.0	1.7	17.4	23.0	0.9	6.3	24.5	463
High school complete and above	1.0	18.8	69.1	32.4	3.5	38.3	36.1	0.7	5.9	13.1	1,138
Religion											
Hindu	0.9	13.2	60.4	28.1	2.2	27.3	26.6	0.7	4.4	23.2	1,319
Muslim	0.2	9.4	50.0	24.5	0.4	14.7	15.6	0.3	4.1	37.1	739
Christian	1.0	12.6	62.9	23.4	4.4	28.3	33.2	0.6	6.0	19.4	447
Caste/tribe											
Scheduled caste	0.4	9.4	55.1	19.4	1.1	15.1	19.1	1.1	4.5	32.4	209
Other backward class	0.6	12.7	58.0	30.2	2.2	23.2	20.7	0.7	4.6	25.8	1,083
Other[1]	0.8	11.8	58.3	23.8	2.2	26.2	29.1	0.2	4.5	26.0	1,192
Standard of living index											
Low	0.7	7.4	49.5	19.5	0.7	12.2	13.3	0.9	4.1	39.1	324
Medium	0.7	10.8	54.7	24.8	1.4	20.7	22.1	0.4	3.9	29.3	1,362
High	0.7	15.8	66.3	31.0	3.6	33.5	32.9	0.6	6.0	17.1	821
Exposure to mass media											
Exposed to any media	0.8	12.7	59.5	26.9	2.2	25.0	25.8	0.6	4.7	24.5	2,321
Listens to radio weekly	0.8	13.0	59.8	27.6	2.2	25.3	25.8	0.6	4.3	24.2	1,874
Watches television weekly	0.8	14.0	61.9	27.3	2.4	28.7	28.1	0.7	5.3	22.1	1,686
Goes to cinema/theatre monthly	0.6	20.4	65.6	32.8	3.2	30.0	28.0	1.5	5.7	19.3	324
Reads newspaper/magazine weekly	0.9	14.9	63.4	28.9	2.5	29.5	30.0	0.7	5.4	19.9	1,765
Not regularly exposed to any media	0.0	3.2	36.5	16.7	0.0	8.3	8.4	0.0	3.5	53.0	186
Total	0.7	12.0	57.8	26.2	2.0	23.8	24.5	0.5	4.6	26.6	2,507

Note: Total includes 2 women belonging to other religions and 23 women belonging to the scheduled tribes, who are not shown separately.
[1]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class

These results suggest that although knowledge of AIDS is fairly widespread, it remains limited among low educated women and women not regularly exposed to any media. Further, knowledge of ways to avoid AIDS is not as widespread. Thus 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. They also need to devise innovative ways of reaching those harder to reach groups that are not as easily reached by means of mass media.