# 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) and child immunization. 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, which 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.

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 Tamil Nadu 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 1990–91 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 of 10.7 deaths per 1,000 population for Tamil Nadu based on NFHS-2 data (covering roughly 1997–98), which is higher than the corresponding NFHS-1 estimate of 9.8 (covering roughly 1990–91). From NFHS-1 to NFHS-2, death rates have increased in all age groups.

The NFHS-2 CDR estimate of 10.7 is also higher by 2.7 points than the 1997 SRS rate of 8.0 deaths. The NFHS-2 age-specific death rate for the elderly population (age 60 and above) is higher than the SRS rate by 9 points (or 19 percent). The NFHS-2 age-specific death rates for males are higher than the SRS rates for all ages from 5 and above, while for females the NFHS–2 death rates are much higher than the SRS rates only for those age 60 and above. The NFHS-2 CDR of 10.7 is higher than the all-India NFHS-2 rate of 9.7. The higher CDR for Tamil Nadu than for India as a whole is primarily due to higher mortality rates at older ages (50 and above), combined with a somewhat older population structure in Tamil Nadu.

In most countries, male death rates are higher than female death rates at nearly all ages. South Asia generally has been an exception to this pattern, with higher death rates for females over much of the age span (Tabutin and Willems, 1995; Preston, 1989; Ghosh, 1987). However, for Tamil Nadu, the NFHS-2 crude death rate is higher by about three points for males than females and age-specific death rates are also higher for males than females at all ages above five years. The SRS estimates exhibit the same pattern by sex as the NFHS-2 rates, but with more modest gender differences.

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, Tamil Nadu

| | NFHS-1 (1990–91) | NFHS-2 (1997–98) | | | SRS (1997) | | |
|---|---|---|---|---|---|---|---|
| Age | Total | Male | Female | Total | Male | Female | Total |
| < 5 | 17.7 | 11.7 | 13.9 | 12.7 | 12.2 | 14.6 | 13.4 |
| 5–14 | 1.5 | 1.9 | 1.8 | 1.9 | 0.8 | 0.7 | 0.8 |
| 15–49 | 3.7 | 5.3 | 3.9 | 4.6 | 3.8 | 2.5 | 3.2 |
| 50–59 | 11.1 | 22.4 | 6.6 | 13.7 | 17.6 | 10.5 | 14.1 |
| 60+ | 56.1 | 63.6 | 52.5 | 58.0 | 53.5 | 44.0 | 48.7 |
| CDR | 9.7 | 12.2 | 9.3 | 10.7 | 8.8 | 7.2 | 8.0 |

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

## 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

[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:

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

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 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 in Appendix B suggest that early neonatal deaths have not been seriously underreported in the Tamil Nadu NFHS-2, since the ratios of deaths under seven days to all neonatal deaths are high (ranging from 68 to 82 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 in the high range (56 to76 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., 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 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 Tamil Nadu NFHS-2, there appears to be a slight preference for reporting age at death at 3, 8, 10, 15, and 20 days (Table B.5 in Appendix B). The distribution of deaths under age two years during the 15 years preceding the survey by month of death (Appendix Table B.6) also indicates heaping of deaths at 3, 6, 10, 12, and 18 months of age. However, the amount of heaping on 12 months is not pronounced, possibly because of the strong emphasis on this problem during the training of interviewers for the NFHS-2 fieldwork.[2] Even if one-third of the deaths reported at age 12 months actually occurred at less than 12 months of age, the number of infant deaths in the 15 years before the survey would increase by less than 1 percent.

An examination of the distribution of births and deaths since 1988 (Table B.4 in Appendix B) indicates that there was probably some omission of children born in 1996 who have died and/or displacement of such dead children from 1996 to 1995or earlier years. This is illustrated by the fact that the number of children who have died falls from 29 in 1995 to 13 in 1996 and then increases to 22 in 1997 and 1998.

[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 4.18 (Chapter 4) shows that only 2 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 Tamil Nadu has declined from 66 deaths per 1,000 live births during 1984–88 (10–14 years before the survey) to 48 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. This is a substantial decline over an average of 10 years, but the decline was greater between the earliest two five-year periods. A comparison of the infant mortality rate for the period 0–4 years before NFHS-2 (48) with the infant mortality rate 0–4 years before NFHS-1 (68) suggests a higher rate of decline of almost 3 infant deaths per 1,000 live births over the seven 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, except neonatal mortality in urban areas, which shows an increase, and infant mortality in urban areas, which has remained constant. For the state as a whole during the past 15 years, postneonatal mortality declined by 55 percent, infant mortality declined by 27 percent, child mortality declined by 45 percent, and under-five mortality declined by 32 percent. However, neonatal mortality has remained almost stagnant, increasing in urban areas and declining in rural areas. Despite the overall decline in the infant and child mortality rates, however, 1 in every 21 children born during the five years before NFHS-2 died within the first year of life, and 1 in every 16 children died before reaching age five. The infant mortality rate in Tamil Nadu (48) is much lower than the rate of 68 for India as a whole, but in the context of the state having almost reached replacement-level fertility, having a very high level of deliveries in medical institutions, and having close to universal coverage of child immunization, the infant mortality rate is relatively high.

For the most recent five-year period, all mortality rates indicate higher levels of mortality in the rural than in urban areas. Infant mortality is 28 percent higher in rural areas than in urban

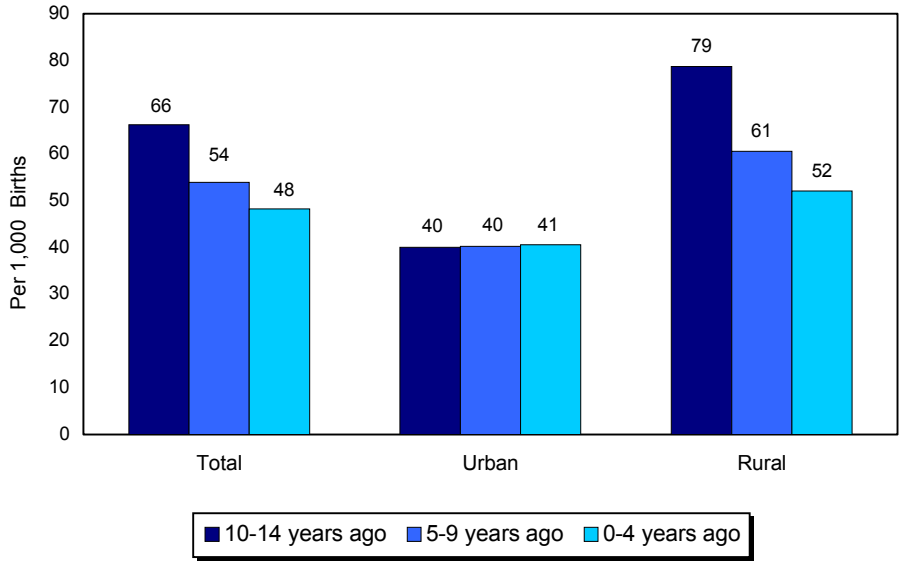
Table 6.2 Infant and child mortality

Neonatal, postneonatal, infant, child, and under-five mortality rates for five-year periods preceding the survey by residence, Tamil Nadu, 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 | 28.5 | 12.2 | 40.6 | 9.4 | 49.7 |
| 5–9 | 25.5 | 14.7 | 40.2 | 7.9 | 47.8 |
| 10–14 | 20.7 | 19.3 | 40.0 | 25.0 | 64.0 |
| **RURAL** | | | | | |
| 0–4 | 38.1 | 14.0 | 52.1 | 19.3 | 70.4 |
| 5–9 | 42.8 | 17.8 | 60.6 | 14.9 | 74.7 |
| 10–14 | 44.6 | 34.1 | 78.7 | 30.8 | 107.1 |
| **TOTAL** | | | | | |
| 0–4 | 34.8 | 13.3 | 48.2 | 15.9 | 63.3 |
| 5–9 | 37.1 | 16.8 | 53.9 | 12.5 | 65.7 |
| 10–14 | 36.8 | 29.3 | 66.2 | 29.0 | 93.2 |

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, Tamil Nadu, 1999

areas, and child mortality is twice as high. Neonatal mortality is 34 percent higher in rural areas than in urban areas, but postneonatal mortality rates indicate only a very small rural-urban difference. During the three five-year periods shown in Table 6.2, mortality rates have declined sharply in rural Tamil Nadu, while in urban areas, postneonatal, child, and under-five mortality rates have declined, but neonatal mortality has increased by 38 percent and infant mortality has

stagnated at the same level. A comparison with corresponding figures from NFHS-1 shows a decline in all rural estimates and almost all urban estimates of infant and child mortality rates.

The estimated NFHS-2 infant mortality rate of 48 deaths per 1,000 live births during 1994–98 is somewhat lower than the SRS value of 54 deaths per 1,000 live births averaged for the period 1994–98. The NFHS-2 estimate of the infant mortality rate for rural areas is 52, which is also lower than the average SRS estimate of 60 over the same period. But the NFHS-2 estimate for urban areas (41 deaths per 1,000 live births) is identical to the average SRS estimate for urban areas.

## 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. Children in rural areas of Tamil Nadu experience a 49 percent higher probability of dying before their fifth birthday than urban children, only slightly more than the 42 percent differential in the most recent five-year period shown in Table 6.2. The mortality rates for Chennai are nearly the same as in all urban areas.

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, Tamil Nadu, 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 | 27.0 | 13.4 | 40.4 | 8.6 | 48.7 |
| Rural | 40.5 | 15.9 | 56.3 | 17.1 | 72.5 |
| Chennai | 27.2 | 13.0 | 40.2 | 8.9 | 48.8 |
| **Mother's education** | | | | | |
| Illiterate | 44.9 | 19.2 | 64.1 | 19.1 | 82.0 |
| Literate, < middle school complete | 41.7 | 11.0 | 52.6 | 8.4 | 60.6 |
| Middle school complete | 19.7 | 14.0 | 33.7 | 15.1 | 48.3 |
| High school complete and above | 15.6 | 9.5 | 25.1 | 6.0 | 30.9 |
| **Religion** | | | | | |
| Hindu | 35.7 | 14.4 | 50.1 | 14.7 | 64.2 |
| Muslim | (32.2) | (18.9) | (51.1) | (5.2) | (56.0) |
| **Caste/tribe** | | | | | |
| Scheduled caste | 29.2 | 12.6 | 41.8 | 22.5 | 63.3 |
| Other backward class | 37.1 | 15.5 | 52.7 | 10.9 | 63.0 |
| **Standard of living index** | | | | | |
| Low | 42.5 | 19.5 | 62.0 | 18.0 | 78.8 |
| Medium | 34.4 | 13.0 | 47.4 | 13.6 | 60.4 |
| High | 23.3 | 7.1 | 30.3 | 3.7 | 33.9 |
| Total | 35.9 | 15.0 | 51.0 | 14.3 | 64.5 |

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 belonging to Christian and 'other' religions, scheduled tribes, 'other' caste/tribes, and children with missing information on the standard of living index, who 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

The overall infant mortality rate declines sharply with increasing education of mothers, from a high of 64 deaths per 1,000 live births for illiterate mothers to a low of 25 deaths per 1,000 live births for mothers who have at least completed high school. All other mortality indicators except child mortality vary similarly with the education of the mother.

Differences in infant and child mortality rates by religion are difficult to assess, given the small numbers of Muslim women interviewed. The under-five mortality rate is about the same for children of women belonging to scheduled castes and women belonging to other backward classes, although the infant mortality rate is lower for the former and the child mortality rate is lower for the latter group. 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 under-five mortality rate is 34 deaths per 1,000 live births; the corresponding rate for children in households with a low standard of living (79) is more than twice as high. The child mortality rate is almost five times higher in households with a low standard of living than in households with a high 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, length of the previous birth interval, 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.

Table 6.4 shows that the mortality rate below age five years is somewhat higher for girls than for boys. Excess female mortality occurs in every age group, though for all except the child mortality rate, the differences are very small and even for child mortality, the difference is only modest. The sex differential in child mortality in Tamil Nadu is much smaller than the very high levels of excess female child mortality observed in states such as Uttar Pradesh and Punjab. The mortality pattern found in most parts of the world shows higher mortality for boys than for girls during the neonatal period (which largely reflects mortality due to congenital conditions) and the postneonatal period and reaches nearly equal levels of mortality during childhood ages. However, in many of the northern states of India, the lower female mortality during the neonatal period turns into large excess female mortality from the postneonatal period. 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).

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 congenital problems. Tamil Nadu also exhibits the expected U-shaped pattern of mortality by mother's age, with higher infant mortality among children of mothers age under 20 (60 deaths per 1,000 live births) and age 30–39 (55 deaths per 1,000) than among children of mothers age

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, Tamil Nadu, 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 | 35.3 | 14.9 | 50.2 | 12.7 | 62.3 |
| Female | 36.6 | 15.2 | 51.8 | 15.8 | 66.8 |
| **Mother's age at birth** | | | | | |
| < 20 | 43.2 | 16.3 | 59.5 | 15.8 | 74.4 |
| 20–29 | 33.8 | 13.6 | 47.4 | 13.7 | 60.4 |
| 30–39 | (35.5) | (19.8) | (55.2) | (14.2) | (68.6) |
| **Birth order** | | | | | |
| 1 | 32.3 | 10.7 | 43.0 | 11.0 | 53.5 |
| 2 | 41.8 | 17.6 | 59.4 | 14.2 | 72.8 |
| 3 | 28.7 | 9.8 | 38.5 | 21.7 | 59.3 |
| 4+ | 42.2 | 28.8 | 71.0 | 13.9 | 83.9 |
| **Previous birth interval** | | | | | |
| < 24 months | 53.8 | 31.8 | 85.6 | 17.7 | 101.8 |
| 24–47 months | 35.4 | 12.5 | 47.9 | 17.1 | 64.2 |
| 48+ months | 18.8 | 9.5 | 28.4 | (11.8) | 39.8 |
| **Medical care**[2] | | | | | |
| One or two types of care | (24.0) | (3.8) | (27.9) | U | U |
| All three types of care | 30.7 | 14.7 | 45.4 | U | U |
| **Size at birth**[3] | | | | | |
| Average | 27.6 | 2.7 | 30.3 | U | U |
| Small | (21.5) | (23.4) | (44.9) | U | U |

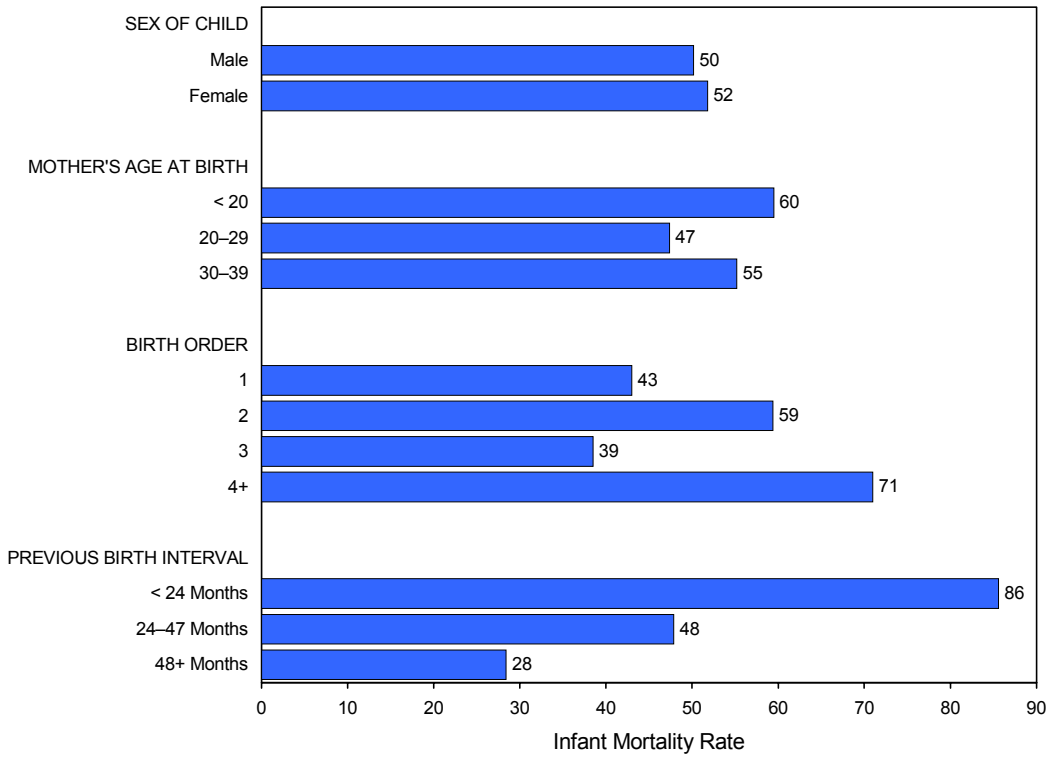
Note: The period preceding the survey does not include the month in which the interview took place. Rates are specified on a per-thousand basis. See text for definition of rates. Total includes a small number of children whose mothers were age 40–49 at the time of birth, children whose mothers had no medical care, and children whose size was large and very small at the time of birth, who are not shown separately.
U: Not available
( ) 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]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 mother; rates are for the three-year period preceding the survey.

20–29 (47 deaths per 1,000). Similar patterns are observed for all rates, though the U-shaped relationship is not strong in the case of child mortality.

Birth order also tends to have a U-shaped relationship to infant deaths, with first births and high-order births having elevated mortality rates. However, the mortality rates by birth order for Tamil Nadu in Table 6.4 show no U-shaped relationship, but rather a zigzag shape for most age-groups. The child mortality rate (age 1–4 years) increases steadily with birth order, but drops for births of order four and above.

The timing of successive births has a powerful effect on the survival chances of children in Tamil Nadu. All the mortality rates decrease sharply as the length of the previous birth interval increases, and the mortality rates are very high for children born less than 24 months after a previous birth. The infant mortality rate is 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

**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, Tamil Nadu, 1999

more (86 deaths compared with 29 deaths per 1,000 live births). The previous birth interval has less of an effect on child mortality than on mortality at other ages. 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).

Another important factor affecting 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 6.4 shows neonatal, postneonatal, and infant mortality rates by birth size. Children who are perceived by their mothers to be smaller than average at birth have experienced higher postneonatal mortality than children perceived to be of average size.

## 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 this reason, 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 6.5 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 Tamil Nadu, 1.5 percent of the population was reported to be suffering from asthma at the time of NFHS-2. The reported level of asthma (1,546 per 100,000 population) in Tamil Nadu is lower than the level reported for India as a whole (2,468 per 100,000 population). The prevalence of asthma in Tamil Nadu is considerably higher in rural areas (1,667 per 100,000 population) than in urban areas (1,318 per 100,000 population), and is higher among males (1,622 per 100,000) than among females (1,471 per 100,000). There are large differences by age, with the prevalence of asthma increasing from 365 per 100,000 at age 0–14 to 4,470 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 Tamil Nadu is 479 per 100,000 population, lower than the national estimate of 544 and far lower than the level reported in NFHS-1 (703 per 100,000 population). The prevalence of tuberculosis is higher in rural areas (505 per 100,000) than in urban areas of Tamil Nadu (431 per 100,000). The tuberculosis prevalence rate is more

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, Tamil Nadu, 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 | 472 | 236 | 155 | 2,338 | 337 | 2,147 |
| 15–59 | 1,261 | 375 | 345 | 781 | 325 | 4,885 |
| 60+ | 4,435 | 1,459 | 1,197 | 447 | 523 | 672 |
| **Sex** | | | | | | |
| Male | 1,394 | 610 | 519 | 1,306 | 376 | 3,860 |
| Female | 1,241 | 250 | 212 | 1,064 | 316 | 3,845 |
| Total | 1,318 | 431 | 366 | 1,185 | 346 | 7,705 |
| | | | **RURAL** | | | |
| **Age** | | | | | | |
| < 15 | 311 | 309 | 281 | 1,946 | 170 | 4,268 |
| 15–59 | 1,861 | 519 | 464 | 860 | 480 | 8,810 |
| 60+ | 4,486 | 996 | 913 | 248 | 582 | 1,449 |
| **Sex** | | | | | | |
| Male | 1,745 | 687 | 637 | 1,358 | 387 | 7,177 |
| Female | 1,591 | 327 | 278 | 884 | 410 | 7,350 |
| Total | 1,667 | 505 | 455 | 1,118 | 399 | 14,527 |
| | | | **TOTAL** | | | |
| **Age** | | | | | | |
| < 15 | 365 | 285 | 239 | 2,077 | 226 | 6,415 |
| 15–59 | 1,647 | 467 | 421 | 832 | 424 | 13,696 |
| 60+ | 4,470 | 1,143 | 1,003 | 311 | 563 | 2,121 |
| **Sex** | | | | | | |
| Male | 1,622 | 660 | 595 | 1,340 | 383 | 11,037 |
| Female | 1,471 | 301 | 255 | 946 | 378 | 11,195 |
| Total | 1,546 | 479 | 424 | 1,142 | 380 | 22,232 |

[1]Includes medically treated tuberculosis

than twice as high for males (660 per 100,000) as for females (301 per 100,000). 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 smoking is more widely prevalent among men than women. The prevalence of tuberculosis increases rapidly with age. It is substantially higher among persons age 60 and above (1,143 per 100,000) than among those age 15–59 (467 per 100,000) or age 0–14 (285 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. The prevalence of medically treated tuberculosis is somewhat lower (424 per 100,000) than the prevalence based on all reported cases (479 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 a disease 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 Tamil Nadu, 1,142 persons per 100,000 population were reported to have suffered from jaundice during the 12 months preceding the survey, somewhat lower than the rate of 1,361 for India as a whole. People living in urban areas are slightly more likely to have suffered from jaundice (1,185 per 100,000) than those living in rural areas (1,118 per 100,000). Males are 42 percent more likely to have suffered from jaundice than females. Jaundice is the only condition measured that does not increase but decreases sharply with age. The prevalence of jaundice is highest for the age group below 15 years (2,077 per 100,000), followed by those age 15–59 years (832 per 100,000) and those age 60 and above (311 per 100,000).

### 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 Tamil Nadu, 380 persons per 100,000 population were reported to have suffered from malaria during the three months preceding the survey, which is only one-tenth as high as 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. Comparison of malaria prevalence rates from the NFHS-1 and NFHS-2 are hampered by the fact that the former survey was conducted from mid-April to late July, while the later survey was conducted mostly during March-May, making the reference periods overlapping, but not identical. According to the two surveys, the rate of malaria has fallen by one-third between 1992 (576 per 100,000) and 1999 (380 per 100,000).

The prevalence of malaria is somewhat higher in rural areas (399 per 100,000 population than in urban areas (346 per 100,000). The reported prevalence of malaria is almost the same for males than for females. The prevalence of malaria increases with age, from 226 per 100,000 in the population age 0–14 to 563 per 100,000 in the population age 60 years and over. The steady increase with age occurs in rural areas but not in urban areas.

## 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 Tamil Nadu 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'), 89 percent of children age 12–23 months in Tamil Nadu are fully vaccinated, the highest coverage among all the states and more than twice the all-India coverage of 42 percent. Less than 1 percent of children have not received any vaccinations at all. The coverage for each vaccination except measles (and Polio 0) is close to

[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, Tamil Nadu, 1999

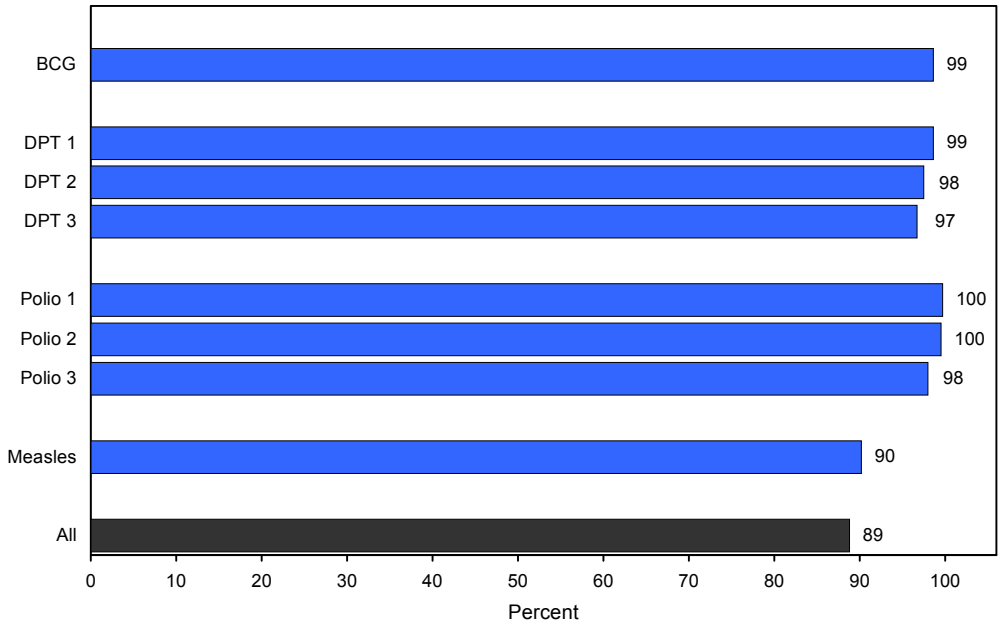
| | Percentage vaccinated | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DPT | | | Polio | | | | | | Number of |
| Source of information | BCG | Polio 0 | 1 | 2 | 3 | 1 | 2 | 3 | Measles | All[1] | None | children |
| **URBAN** | | | | | | | | | | | | |
| **Vaccinated at any time before the interview** | | | | | | | | | | | | |
| Vaccination card | 100.0 | 97.3 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 96.0 | 96.0 | 0.0 | 84 |
| Mother's report | 100.0 | 90.6 | 100.0 | 100.0 | 99.5 | 100.0 | 100.0 | 99.5 | 97.9 | 97.9 | 0.0 | 68 |
| Either source | 100.0 | 94.3 | 100.0 | 100.0 | 99.8 | 100.0 | 100.0 | 99.8 | 96.8 | 96.8 | 0.0 | 151 |
| Vaccinated by 12 months of age[2] | 100.0 | 94.3 | 98.6 | 98.6 | 98.3 | 98.6 | 98.5 | 98.3 | 85.4 | 83.6 | 0.0 | 151 |
| **RURAL** | | | | | | | | | | | | |
| **Vaccinated at any time before the interview** | | | | | | | | | | | | |
| Vaccination card | 100.0 | 99.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 89.8 | 89.8 | 0.0 | 117 |
| Mother's report | 96.5 | 68.3 | 96.5 | 93.7 | 91.5 | 99.3 | 98.6 | 95.1 | 84.5 | 81.0 | 0.7 | 170 |
| Either source | 97.9 | 80.8 | 97.9 | 96.2 | 95.0 | 99.6 | 99.2 | 97.1 | 86.7 | 84.6 | 0.4 | 286 |
| Vaccinated by 12 months of age[2] | 96.7 | 80.8 | 97.9 | 96.2 | 95.0 | 99.6 | 97.9 | 97.1 | 81.1 | 78.0 | 1.5 | 286 |
| **TOTAL** | | | | | | | | | | | | |
| **Vaccinated at any time before the interview** | | | | | | | | | | | | |
| Vaccination card | 100.0 | 98.3 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 92.4 | 92.4 | 0.0 | 201 |
| Mother's report | 97.5 | 74.7 | 97.5 | 95.5 | 93.8 | 99.5 | 99.0 | 96.4 | 88.3 | 85.8 | 0.5 | 237 |
| Either source | 98.6 | 85.5 | 98.6 | 97.5 | 96.7 | 99.7 | 99.5 | 98.0 | 90.2 | 88.8 | 0.3 | 438 |
| Vaccinated by 12 months of age[2] | 97.9 | 85.5 | 98.0 | 96.9 | 96.0 | 99.1 | 98.1 | 97.3 | 82.1 | 79.4 | 0.9 | 438 |

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 vaccinations.

universal (97–99 percent—see Figure 6.3). Both DPT and polio vaccinations are given at the same time as part of the routine immunization programme, and the coverage rates are nearly the same for both. Almost all children who begin with the DPT and polio vaccination series go on to complete them, with only about 2 percent dropping out between the first to third dose. Ninety percent of children have been vaccinated against measles. This lower coverage of measles vaccination is the main reason why vaccination coverage is less than universal.

There has been a 36 percent increase in full vaccination coverage in Tamil Nadu since the time of NFHS-1 when the proportion of children fully vaccinated was 65 percent. The proportion of children who did not receive any vaccinations at all declined from 3 percent in NFHS-1 to less than 1 percent in NFHS-2. The substantial increase in full vaccination coverage between NFHS-1 and NFHS-2 mainly comes from the increased coverage for the third doses of DPT and polio and for measles vaccinations.

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




NFHS-2, Tamil Nadu, 1999

Government statistics suggest vaccination coverage levels very similar to the NFHS-2 estimates. According to government statistics for Tamil Nadu for 1997–98, 91 percent of children age 12–23 months are fully vaccinated, and coverage is 99 percent for BCG, 97 percent for the third dose of DPT vaccine, 96 percent for the third dose of polio vaccine, and 95 percent for measles vaccine (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 6.6 shows that close to 80 percent of all children were fully vaccinated by age 12 months. The percentages of children who received BCG, the third dose of DPT, and the third 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. Eight percent of children were vaccinated against measles after their first birthday. Differences in coverage rates for various vaccinations between rural and urban areas are minimal except for Polio 0 and measles. The proportion fully vaccinated at any time before the survey is higher by 12 percentage points in urban areas (97 percent) than in rural areas (85 percent).

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 46 percent of children age 12–23 months. Vaccination cards were shown for 57 percent of children in Chennai, 55 percent of children in all

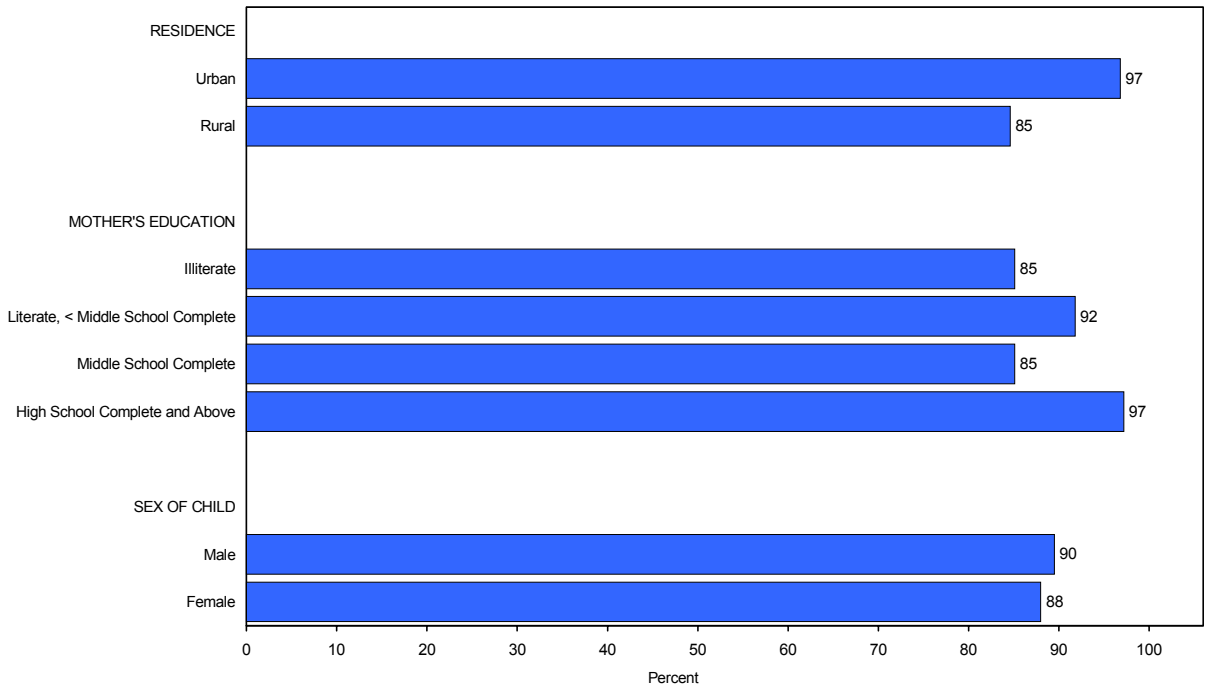
Table 6.7 Childhood vaccinations by background characteristics

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, Tamil Nadu, 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 | 99.0 | 86.5 | 99.0 | 97.4 | 96.2 | 100.0 | 99.5 | 98.3 | 91.6 | 89.5 | 0.0 | 45.9 | 230 |
| Female | 98.3 | 84.4 | 98.3 | 97.7 | 97.1 | 99.4 | 99.4 | 97.7 | 88.6 | 88.0 | 0.6 | 45.7 | 208 |
| **Birth order** | | | | | | | | | | | | | |
| 1 | 99.3 | 87.6 | 99.3 | 98.7 | 98.1 | 100.0 | 100.0 | 98.7 | 93.0 | 91.7 | 0.0 | 42.1 | 186 |
| 2 | 99.2 | 86.0 | 100.0 | 98.5 | 96.7 | 100.0 | 100.0 | 99.8 | 90.0 | 88.5 | 0.0 | 45.7 | 156 |
| 3 | 97.9 | 82.2 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 91.6 | 91.6 | 2.1 | 60.3 | 57 |
| 4+ | (93.8) | (78.4) | (90.7) | (87.6) | (87.6) | (100.0) | (96.9) | (87.6) | (75.2) | (72.2) | (0.0) | (42.9) | 39 |
| **Residence** | | | | | | | | | | | | | |
| Urban | 100.0 | 94.3 | 100.0 | 100.0 | 99.8 | 100.0 | 100.0 | 99.8 | 96.8 | 96.8 | 0.0 | 55.4 | 151 |
| Rural | 97.9 | 80.8 | 97.9 | 96.2 | 95.0 | 99.6 | 99.2 | 97.1 | 86.7 | 84.6 | 0.4 | 40.8 | 286 |
| Chennai | 100.0 | 93.0 | 100.0 | 100.0 | 98.8 | 100.0 | 100.0 | 98.8 | 98.8 | 98.8 | 0.0 | 57.0 | 27 |
| **Mother's education** | | | | | | | | | | | | | |
| Illiterate | 97.4 | 77.0 | 96.7 | 95.5 | 94.2 | 99.4 | 98.7 | 95.5 | 87.1 | 85.1 | 0.6 | 39.0 | 184 |
| Literate, < middle school complete | 100.0 | 91.7 | 100.0 | 100.0 | 98.3 | 100.0 | 100.0 | 99.7 | 91.8 | 91.8 | 0.0 | 46.6 | 90 |
| Middle school complete | 98.5 | 88.9 | 100.0 | 98.5 | 98.5 | 100.0 | 100.0 | 100.0 | 88.1 | 85.1 | 0.0 | 58.2 | 79 |
| High school complete and above | 100.0 | 94.1 | 100.0 | 98.6 | 98.6 | 100.0 | 100.0 | 100.0 | 97.2 | 97.2 | 0.0 | 48.3 | 85 |
| **Religion** | | | | | | | | | | | | | |
| Hindu | 98.4 | 84.5 | 98.4 | 97.5 | 96.5 | 99.7 | 99.4 | 98.1 | 89.7 | 88.1 | 0.3 | 46.1 | 383 |
| Muslim | (100.0) | (90.8) | (100.0) | (95.9) | (95.9) | (100.0) | (100.0) | (95.9) | (95.9) | (95.9) | (0.0) | (44.6) | 29 |
| Christian | (100.0) | (94.2) | (100.0) | (100.0) | (100.0) | (100.0) | (100.0) | (100.0) | (90.6) | (90.6) | (0.0) | (44.6) | 25 |
| **Caste/tribe** | | | | | | | | | | | | | |
| Scheduled caste | 99.0 | 77.9 | 99.0 | 99.0 | 97.0 | 100.0 | 100.0 | 99.0 | 85.2 | 84.2 | 0.0 | 36.5 | 121 |
| Other backward class | 98.8 | 88.8 | 98.8 | 97.3 | 96.8 | 99.6 | 99.2 | 98.0 | 92.2 | 90.6 | 0.4 | 49.2 | 306 |
| **Standard of living index** | | | | | | | | | | | | | |
| Low | 96.6 | 79.4 | 97.9 | 97.9 | 95.7 | 99.3 | 99.3 | 97.8 | 87.5 | 86.1 | 0.7 | 43.1 | 174 |
| Medium | 100.0 | 87.6 | 99.4 | 97.0 | 97.0 | 100.0 | 99.4 | 98.2 | 90.5 | 88.7 | 0.0 | 43.3 | 200 |
| High | 100.0 | 97.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 98.1 | 98.1 | 0.0 | 61.7 | 58 |
| Total | 98.6 | 85.5 | 98.6 | 97.5 | 96.7 | 99.7 | 99.5 | 98.0 | 90.2 | 88.8 | 0.3 | 45.8 | 438 |

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 6 and 4 children belonging to scheduled tribes and 'other' caste/tribes, respectively, and 1 and 5 children with missing information on religion and the standard of living index, 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)

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




NFHS-2, Tamil Nadu, 1999

urban areas, and 41 percent in rural areas. As expected, full vaccination coverage is higher for children for whom a vaccination card was shown than for other children (see Table 6.6).

In Tamil Nadu, differentials in full vaccination coverage and coverage for each individual vaccine between boys and girls are very small. Boys (90 percent) are only slightly more likely than girls (88 percent) to be fully immunized. Mothers showed vaccination cards for 46 percent of both boys and girls, indicating no sex difference at all. NFHS-1 also found that the sex differential in vaccination coverage between boys and girls was small for most individual vaccinations except measles, for which the coverage was somewhat higher for boys than for girls. Full vaccination coverage and that of each individual vaccination does not vary much by birth order of children.

Eight-five percent of children of illiterate mothers are fully vaccinated, compared with 97 percent of children whose mothers have at least completed high school. Differences by education are very small for BCG, three doses of DPT and three doses of polio but are somewhat higher for Polio 0 and measles. The coverage for Muslim and Christian children is slightly higher than for Hindu children, though the small number of non-Hindu children makes comparisons by religion unreliable. Differences by caste/tribe are also very small for all vaccines except Polio 0 and measles; children from scheduled castes have somewhat lower coverage than children from other backward classes (84 and 91 percent, respectively). The standard of living of the household has a strong positive relationship with vaccination coverage. Eighty-six percent of children from households with a low standard of living are fully vaccinated, compared with 98 percent of children from households with a high standard of living. In conclusion, the overall coverage for

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, Tamil Nadu, 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 | 55.4 | 36.3 | 40.8 | 28.7 | 45.8 | 31.5 |
| **Percentage vaccinated by 12 months of age**[1] | | | | | | |
| BCG | 100.0 | 97.8 | 96.7 | 98.7 | 97.9 | 98.3 |
| Polio 0 | 94.3 | 87.6 | 80.8 | 76.1 | 85.5 | 80.4 |
| DPT | | | | | | |
| 1 | 98.6 | 98.2 | 97.9 | 98.7 | 98.0 | 98.4 |
| 2 | 98.6 | 98.2 | 96.2 | 96.1 | 96.9 | 97.1 |
| 3 | 98.3 | 96.2 | 95.0 | 96.1 | 96.0 | 96.0 |
| Polio | | | | | | |
| 1 | 98.6 | 98.4 | 99.6 | 99.6 | 99.1 | 99.0 |
| 2 | 98.5 | 98.4 | 97.9 | 99.6 | 98.1 | 99.0 |
| 3 | 98.3 | 97.5 | 97.1 | 99.1 | 97.3 | 98.4 |
| Measles | 85.4 | 87.8 | 81.1 | 88.6 | 82.1 | 88.2 |
| All vaccinations[2] | 83.6 | 85.2 | 78.0 | 85.4 | 79.4 | 85.3 |
| No vaccinations | 0.0 | 1.6 | 1.5 | 0.0 | 0.9 | 0.7 |
| Number of children | 151 | 165 | 286 | 274 | 438 | 439 |

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)

each vaccination except Polio 0 and measles is close to universal in Tamil Nadu and differentials in coverage of immunization by background characteristics are very small. The close to universal immunization coverage is evidence of the success of the immunization programme in Tamil Nadu.

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 who have not received any vaccination by 12 months of age.

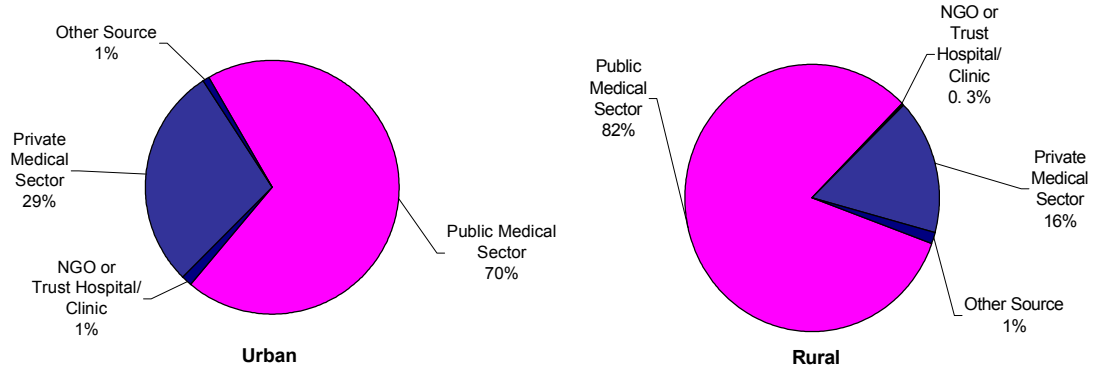
The proportion of children whose vaccination status was determined from a vaccination card declines substantially with the age of children. This may reflect an upward trend in the use of vaccination cards. On the other hand, vaccination cards may have been lost or discarded, especially for older children who have received all their vaccinations.

The proportion of children fully vaccinated by age 12 months declines from 85 percent for children age 24–35 months to 79 percent for children age 12–23 months. This pattern is due primarily to a decline in measles vaccination. The percentage receiving a polio vaccination at birth is higher for children age 12–23 months (86 percent) than for children age 24–35 months (80 percent).

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 Tamil Nadu. Seventy-eight percent of all children who have received vaccinations received most of them from a public sector source, and 21 percent received them from a private sector medical source. The percentage of vaccinated children receiving vaccinations from the private medical sector is higher in urban areas (29 percent) and in Chennai (22 percent) where private-sector services tend to be concentrated, than in rural areas (16 percent). Even in urban areas, however, 70 percent of children received their vaccinations from the public sector. The public medical sector is used for vaccinations by a large majority in each category of background characteristic except for children living in households with a high standard of living (62 percent of whom received most of their vaccinations from the private medical sector).

Children of more educated mothers are more likely than other children to receive vaccinations from the private medical sector. However, even among children whose mothers completed high school, a majority (53 percent) received most vaccinations from the public medical sector. Muslim and Christian children are more likely than Hindu children to receive vaccinations from the private medical sector, perhaps because Muslims and Christians are disproportionately concentrated in urban areas. Children from other backward classes are more likely than children from scheduled castes to receive vaccinations from the private medical sector.

**Figure 6.5**
**Source of Childhood Vaccinations by Residence**




Note: Percents do not add to 100.0 due to rounding

NFHS-2, Tamil Nadu, 1999

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, Tamil Nadu, 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 | 73.5 | 0.9 | 24.7 | 1.0 | 100.0 | 403 |
| 12–23 months | 80.3 | 0.5 | 17.9 | 1.3 | 100.0 | 437 |
| 24–35 months | 78.6 | 0.5 | 19.6 | 1.3 | 100.0 | 439 |
| **Sex of child** | | | | | | |
| Male | 77.2 | 0.7 | 21.1 | 1.0 | 100.0 | 664 |
| Female | 77.9 | 0.6 | 20.1 | 1.4 | 100.0 | 614 |
| **Birth order** | | | | | | |
| 1 | 71.0 | 0.8 | 26.5 | 1.7 | 100.0 | 556 |
| 2 | 78.8 | 0.5 | 20.3 | 0.4 | 100.0 | 431 |
| 3 | 88.9 | 0.0 | 10.1 | 1.0 | 100.0 | 178 |
| 4+ | 87.2 | 1.1 | 9.6 | 2.1 | 100.0 | 113 |
| **Residence** | | | | | | |
| Urban | 69.5 | 1.3 | 28.5 | 0.7 | 100.0 | 445 |
| Rural | 81.8 | 0.3 | 16.4 | 1.4 | 100.0 | 833 |
| Chennai | 75.1 | 0.0 | 22.0 | 2.9 | 100.0 | 75 |
| **Mother's education** | | | | | | |
| Illiterate | 89.6 | 0.5 | 8.2 | 1.7 | 100.0 | 471 |
| Literate, < middle school complete | 79.8 | 0.4 | 18.6 | 1.2 | 100.0 | 315 |
| Middle school complete | 76.7 | 0.9 | 21.9 | 0.4 | 100.0 | 237 |
| High school complete and above | 53.2 | 0.9 | 44.9 | 0.9 | 100.0 | 255 |
| **Religion** | | | | | | |
| Hindu | 78.7 | 0.5 | 19.7 | 1.0 | 100.0 | 1,109 |
| Muslim | 75.9 | 0.0 | 22.5 | 1.6 | 100.0 | 93 |
| Christian | 60.6 | 3.2 | 32.8 | 3.3 | 100.0 | 72 |
| **Caste/tribe** | | | | | | |
| Scheduled caste | 87.9 | 1.4 | 7.9 | 2.8 | 100.0 | 316 |
| Other backward class | 74.7 | 0.4 | 24.2 | 0.7 | 100.0 | 937 |
| **Standard of living index** | | | | | | |
| Low | 89.2 | 1.2 | 7.3 | 2.3 | 100.0 | 489 |
| Medium | 79.5 | 0.4 | 19.6 | 0.6 | 100.0 | 595 |
| High | 38.0 | 0.0 | 61.8 | 0.2 | 100.0 | 176 |
| Total | 77.6 | 0.6 | 20.6 | 1.2 | 100.0 | 1,278 |

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 2 children whose mothers belong to other religion, 9 and 16 children belonging to scheduled tribes and 'other' caste/tribes, respectively, and 2 and 18 children with missing information on religion and the standard of living index, respectively, who are not shown separately.
NGO: Nongovernmental organization

### 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 of vitamin A within the past six months by selected background characteristics. In the state as a whole, only 16 percent of children age 12–35 months received at least one dose of vitamin A, and only 10 percent received a dose within the past six months. This indicates that a large majority of children in Tamil Nadu have not received vitamin A supplementation at all and even fewer children receive vitamin A supplementation regularly, perhaps because of a low level of awareness about the health benefits of vitamin A supplements.

Children living in rural areas, children whose mothers are illiterate, Hindu children, children who are from a scheduled caste, and children living in households with a low standard of living are somewhat less likely than other children to receive vitamin A supplementation. The proportion of children who received at least one dose of vitamin A supplementation is the same (16 percent) for boys and girls, but girls are more likely than boys to have received a dose in the six months before the survey.

## 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. Table 6.11 shows that 10 percent of children under age three in Tamil Nadu suffered from acute respiratory infection (cough accompanied by short, rapid breathing) at some time during the two-week period before the survey. ARI was somewhat more common among boys than girls. ARI was also slightly more prevalent among children 6–23 months of age, fourth and higher-order births, children whose mothers are illiterate, Muslim and Christian children, and children from scheduled castes. The percentage of children of illiterate mothers and in households with a low standard of living who suffered from ARI is about three times higher

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, Tamil Nadu, 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 | 15.3 | 11.7 | 438 |
| 24–35 months | 17.1 | 8.2 | 439 |
| **Sex of child** | | | |
| Male | 16.3 | 8.8 | 451 |
| Female | 16.1 | 11.2 | 425 |
| **Birth order** | | | |
| 1 | 14.7 | 10.8 | 383 |
| 2 | 21.1 | 11.8 | 284 |
| 3 | 13.2 | 7.1 | 127 |
| 4+ | 11.4 | 4.3 | 83 |
| **Residence** | | | |
| Urban | 19.3 | 12.9 | 316 |
| Rural | 14.5 | 8.3 | 560 |
| Chennai | 22.7 | 14.1 | 51 |
| **Mother's education** | | | |
| Illiterate | 10.8 | 5.6 | 348 |
| Literate, < middle school complete | 20.2 | 11.9 | 213 |
| Middle school complete | 17.1 | 11.3 | 152 |
| High school complete and above | 21.7 | 15.6 | 164 |
| **Religion** | | | |
| Hindu | 15.1 | 9.4 | 755 |
| Muslim | 21.3 | 10.3 | 70 |
| Christian | (24.7) | (16.2) | 49 |
| **Caste/tribe** | | | |
| Scheduled caste | 11.6 | 7.4 | 227 |
| Other backward class | 17.8 | 10.7 | 629 |
| **Standard of living index** | | | |
| Low | 13.1 | 6.3 | 345 |
| Medium | 17.0 | 10.7 | 397 |
| High | 22.8 | 17.6 | 123 |
| Total | 16.2 | 10.0 | 876 |

Note: Table includes only surviving children from among the two most recent births in the three years preceding the survey. Total includes 2 children whose mothers belong to other religions, 8 scheduled-tribe children, 12 children belonging to 'other' caste/tribes, and 1 and 12 children with missing information on religion and the standard of living index, respectively, who are not shown separately.
( ) Based on 25–49 unweighted cases

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, Tamil Nadu, 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 | 5.7 | 18.5 | 8.6 | 0.7 | 178 | * | 10 |
| 6–11 months | 11.4 | 27.1 | 24.3 | 3.6 | 234 | (86.6) | 27 |
| 12–23 months | 11.7 | 22.7 | 14.8 | 1.7 | 438 | (77.9) | 51 |
| 24–35 months | 10.1 | 21.0 | 11.0 | 1.2 | 439 | (87.5) | 44 |
| **Sex of child** | | | | | | | |
| Male | 12.0 | 22.2 | 14.7 | 1.3 | 671 | 82.7 | 81 |
| Female | 8.4 | 22.5 | 14.0 | 2.2 | 617 | 83.1 | 52 |
| **Birth order** | | | | | | | |
| 1 | 9.7 | 23.2 | 11.8 | 1.0 | 559 | 87.5 | 54 |
| 2 | 10.1 | 21.5 | 16.2 | 3.0 | 430 | (84.8) | 44 |
| 3 | 10.5 | 23.5 | 16.6 | 0.0 | 181 | * | 19 |
| 4+ | 13.0 | 19.5 | 16.6 | 3.3 | 118 | * | 15 |
| **Residence** | | | | | | | |
| Urban | 10.7 | 23.1 | 15.0 | 2.0 | 445 | 82.6 | 48 |
| Rural | 10.0 | 21.9 | 14.0 | 1.6 | 843 | 83.0 | 85 |
| Chennai | 9.7 | 21.9 | 16.0 | 1.7 | 74 | * | 7 |
| **Mother's education** | | | | | | | |
| Illiterate | 13.6 | 21.1 | 15.8 | 2.0 | 482 | 77.5 | 65 |
| Literate, < middle school complete | 9.9 | 24.0 | 14.5 | 1.6 | 316 | (85.0) | 31 |
| Middle school complete | 10.2 | 23.2 | 12.9 | 2.1 | 238 | (92.5) | 24 |
| High school complete and above | 4.5 | 21.7 | 12.6 | 1.0 | 252 | * | 11 |
| **Religion** | | | | | | | |
| Hindu | 9.9 | 22.2 | 14.1 | 1.7 | 1,118 | 82.7 | 111 |
| Muslim | 11.1 | 22.5 | 17.6 | 1.5 | 96 | * | 11 |
| Christian | 13.3 | 25.4 | 13.8 | 2.0 | 71 | * | 9 |
| **Caste/tribe** | | | | | | | |
| Scheduled caste | 11.8 | 22.7 | 12.2 | 0.7 | 325 | (75.5) | 38 |
| Other backward class | 9.9 | 22.0 | 15.3 | 2.1 | 940 | 85.7 | 93 |

Contd…

than children of mothers with at least a high school education and children in households with a high standard of living.

Table 6.11 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. Eighty-three percent of children received advice or treatment from a health facility or health provider when ill with ARI. There is no difference in this proportion by urban-rural residence or by sex of the child. Because of the low prevalence of ARI, the number of ill children in the sample is small, making it difficult to assess differences in treatment by the other background characteristics.

Table 6.11 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, Tamil Nadu, 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 | | | |
| **Standard of living index** | | | | | | | |
| Low | 12.6 | 23.6 | 16.9 | 2.0 | 502 | 83.7 | 64 |
| Medium | 10.0 | 21.2 | 13.5 | 1.8 | 592 | 81.1 | 59 |
| High | 3.6 | 22.7 | 10.4 | 0.6 | 176 | * | 6 |
| **Source of drinking water** | | | | | | | |
| Piped water | 9.5 | 22.3 | 14.9 | 1.8 | 897 | 81.5 | 85 |
| Hand pump | 13.5 | 19.1 | 10.8 | 0.8 | 193 | (78.0) | 26 |
| Well water | 10.2 | 25.1 | 16.4 | 2.4 | 151 | * | 15 |
| Surface water | (9.2) | (24.2) | (15.0) | (3.1) | 39 | * | 4 |
| **Purification of water[2]** | | | | | | | |
| Straining by cloth | 9.3 | 18.6 | 20.3 | 0.0 | 130 | * | 12 |
| Water filter | 4.5 | 21.7 | 18.0 | 1.1 | 56 | * | 3 |
| Boiling | 7.2 | 23.0 | 15.9 | 1.4 | 222 | * | 16 |
| Nothing | 11.2 | 22.8 | 13.4 | 2.1 | 931 | 80.7 | 104 |
| Total | 10.3 | 22.3 | 14.4 | 1.7 | 1,288 | 82.9 | 132 |

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 other religions, scheduled tribes, 'other' caste/tribes, children in households having an 'other' source of drinking water or using alum or electronic water purifiers or 'other' methods to purify water, and children with missing information on religion and the standard of living index, 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.

## Fever

Fever is the most common of the three conditions examined in Table 6.11, with 22 percent of children suffering from fever during the two weeks preceding the survey. The prevalence of fever is higher among children age 6–11 months (27 percent) than among children of other ages (19–23 percent). However, the differentials in the prevalence of fever by background characteristics are generally quite small.

## 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 survey, including questions on feeding practices during diarrhoea, the treatment of diarrhoea, and their knowledge and use of ORS.

Table 6.11 shows that 14 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 6.11 cannot be assumed to reflect the situation throughout the year.

Among children age 1–35 months, those age 1–5 months are least susceptible to diarrhoea as these children are more likely to be exclusively breastfed than other children. The prevalence of diarrhoea jumps to 24 percent among children age 6–11 months, the age at which children start to crawl and are more exposed to pathogens in their environment. The prevalence of diarrhoea is relatively low among first birth order children, among Hindu and Christian children, and among children living in households with a high standard of living. It also declines gradually as the education of the mother increases. Differentials by sex and residence are negligible. The prevalence of diarrhoea is relatively low among children living in households that obtain their drinking water from hand pumps, but it is also low among children living in households that do nothing to purify their drinking water.

Two percent of all children age 1–35 months (12 percent of children who suffered from diarrhoea in the two weeks preceding the survey) had diarrhoea with blood, a symptom of dysentery. The prevalence of diarrhoea with blood is highest for children age 6–11 months. A higher proportion of girls than boys who had diarrhoea had diarrhoea with blood. The prevalence of diarrhoea with blood is relatively low for children whose mothers have at least a high school education and children from households with a high standard of living. Children of other backward classes, children living in households using well water for drinking, and children living in households that do nothing to treat their drinking water have a slightly elevated risk of having diarrhoea with blood.

Table 6.12 shows that 83 percent of mothers with births during the three years preceding the survey know about ORS packets, up sharply from 61 percent among women who gave birth during the three years before NFHS-1, and much higher than the national average of 62 percent. Knowledge of ORS packets is somewhat lower among mothers age 20–24 and among mothers age 35–49 than among mothers in the other age groups. Knowledge is considerably higher among more educated mothers and mothers in Chennai, but only slightly higher among urban mothers than rural mothers. Knowledge of ORS is lower among Christian mothers (76 percent) than Hindu (83 percent) or Muslim (88 percent) mothers. Knowledge of ORS packets is somewhat lower among mothers who are not regularly exposed to any mass media than among mothers who are exposed to some media.

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. Despite the high proportion of mothers in Tamil Nadu who know about ORS, only 17 percent of mothers report that children should be given more to drink

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, Tamil Nadu, 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** | | | | | | | | |
| 15–19 | 83.3 | 33.5 | 44.8 | 11.9 | 9.8 | 100.0 | 46.1 | 115 |
| 20–24 | 79.9 | 43.2 | 39.6 | 14.5 | 2.7 | 100.0 | 50.6 | 504 |
| 25–29 | 87.3 | 44.4 | 35.6 | 17.7 | 2.3 | 100.0 | 53.1 | 401 |
| 30–34 | 86.5 | 39.1 | 30.3 | 28.8 | 1.8 | 100.0 | 46.9 | 132 |
| 35–49 | (71.4) | (45.8) | (41.3) | (5.6) | (7.3) | 100.0 | (53.0) | 41 |
| **Residence** | | | | | | | | |
| Urban | 84.9 | 41.0 | 34.8 | 22.2 | 2.1 | 100.0 | 52.4 | 408 |
| Rural | 82.2 | 43.0 | 39.4 | 13.7 | 4.0 | 100.0 | 49.8 | 785 |
| Chennai | 90.4 | 37.8 | 32.7 | 25.4 | 4.1 | 100.0 | 47.7 | 68 |
| **Education** | | | | | | | | |
| Illiterate | 77.5 | 47.1 | 41.1 | 8.7 | 3.2 | 100.0 | 51.4 | 464 |
| Literate, < middle school complete | 87.1 | 40.2 | 41.8 | 13.7 | 4.3 | 100.0 | 46.2 | 279 |
| Middle school complete | 83.4 | 42.1 | 36.5 | 18.1 | 3.4 | 100.0 | 56.0 | 204 |
| High school complete and above | 89.1 | 35.9 | 28.0 | 33.6 | 2.4 | 100.0 | 50.1 | 246 |
| **Religion** | | | | | | | | |
| Hindu | 83.2 | 41.2 | 39.3 | 16.1 | 3.3 | 100.0 | 50.8 | 1,033 |
| Muslim | 87.7 | 43.8 | 35.0 | 16.9 | 4.4 | 100.0 | 47.8 | 85 |
| Christian | 76.2 | 57.6 | 17.2 | 23.5 | 1.7 | 100.0 | 51.5 | 70 |
| **Caste/tribe** | | | | | | | | |
| Scheduled caste | 81.1 | 41.6 | 43.6 | 12.4 | 2.4 | 100.0 | 52.3 | 295 |
| Other backward class | 83.6 | 43.0 | 36.1 | 17.3 | 3.7 | 100.0 | 50.1 | 872 |
| Other[2] | (96.3) | (14.1) | (21.6) | (62.5) | (1.8) | 100.0 | (72.0) | 17 |
| **Exposure to media** | | | | | | | | |
| Exposed to any media | 84.9 | 41.0 | 37.2 | 18.5 | 3.3 | 100.0 | 50.8 | 977 |
| Watches television weekly | 86.8 | 40.1 | 35.7 | 21.0 | 3.2 | 100.0 | 49.6 | 749 |
| Listens to radio weekly | 87.4 | 39.8 | 37.2 | 20.0 | 3.0 | 100.0 | 52.7 | 639 |
| Visits cinema/theatre monthly | 88.1 | 36.4 | 44.5 | 17.3 | 1.7 | 100.0 | 55.5 | 289 |
| Reads newspaper/magazine weekly | 89.8 | 36.1 | 34.9 | 26.3 | 2.7 | 100.0 | 53.4 | 308 |
| Not regularly exposed to any media | 75.4 | 48.3 | 40.3 | 7.9 | 3.5 | 100.0 | 50.4 | 216 |
| Total | 83.1 | 42.3 | 37.8 | 16.6 | 3.3 | 100.0 | 50.7 | 1,193 |

Note: Total includes 2 women belonging to other religions, 9 scheduled-tribe women, and 2 women with missing information on religion, 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

than usual during an episode of diarrhoea and, contrary to the standard recommendation, 42 percent report that children should be given less to drink. This is surprising for a state that has been successful in providing maternal and child health services and suggests that mothers in Tamil Nadu 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 teenage mothers, rural mothers, illiterate mothers, mothers belonging to a scheduled caste, and mothers not regularly exposed to any mass media.

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 drinking well, getting sicker or very sick, and not getting better. Table 6.12 shows that 51 percent of mothers were able to name two or more signs that indicate that a child with diarrhoea should be given medical treatment. The knowledge of two or more signs of diarrhoea that suggest the need for medical treatment is inadequate across all demographic and socioeconomic groups (although knowledge is better than in almost all other states). This lack of knowledge suggests a need for further educating mothers about children's diarrhoea in Tamil Nadu so that they are better able to recognize the signs of diarrhoea for which a health provider should be consulted.

Table 6.13 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. Sixty-seven percent of children in Tamil Nadu who suffered from diarrhoea during the two weeks preceding the survey were taken to a health facility or provider for medical advice or treatment, slightly higher than the national level of 63 percent. Twenty-two percent of children with diarrhoea did not receive any treatment at all. Boys with diarrhoea were somewhat more likely than girls to be taken to a health facility or provider. The likelihood of seeking treatment is higher for children in urban areas, particularly in Chennai, than in rural areas.

Twenty-eight 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 19 percent in NFHS-1, indicating an improvement in the use of ORS packets in Tamil Nadu for the treatment of childhood diarrhoea. The level of ORS use in Tamil Nadu is close to the NFHS-2 national level of 27 percent. Only 15 percent of children in Tamil Nadu received increased fluids or received gruel when sick with diarrhoea. Slightly more than half of children with diarrhoea (55 percent) did not receive any of the various types of oral rehydration therapy (ORT). The youngest children (age 1–11 months), female children, children living in rural areas, and children from households with a low standard of living are less likely than other children to receive oral rehydration therapy.

The use of antibiotics and other antidiarrhoeal drugs is not generally recommended for the treatment of childhood diarrhoea. However, 41 percent of the children who had diarrhoea in the two weeks before NFHS-2 were treated with pills or syrup, and 28 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

Table 6.13 Treatment of diarrhoea

Among children under age 3 who had diarrhoea in the past two weeks, percentage taken to a health facility or provider, percentage who received various types of oral rehydration therapy (ORT), and percentage who received other treatments by selected background characteristics, Tamil Nadu, 1999

| | | 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 | Injection | Intrave-nous (IV/drip/ bottle) | Home remedy/ Herbal medicine | Other | No treat-ment | Number of children with diarrhoea |
| **Age of child** | | | | | | | | | | | | | |
| 1–11 months | 69.6 | 29.0 | 7.7 | 0.0 | 10.3 | 63.5 | 45.9 | 29.2 | 4.9 | 10.5 | 0.4 | 18.7 | 72 |
| 12–23 months | 71.1 | 19.2 | 21.4 | 3.6 | 14.3 | 53.6 | 40.8 | 26.5 | 1.7 | 8.2 | 5.3 | 18.9 | 65 |
| 24–35 months | (58.9) | (38.0) | (16.2) | (0.0) | (22.5) | (42.9) | (34.9) | (27.0) | (0.0) | (8.6) | (0.0) | (29.3) | 48 |
| **Sex of child** | | | | | | | | | | | | | |
| Male | 69.6 | 32.8 | 16.5 | 0.0 | 16.6 | 50.9 | 48.3 | 28.6 | 3.5 | 8.8 | 1.1 | 16.9 | 99 |
| Female | 64.8 | 22.4 | 12.6 | 2.7 | 13.0 | 58.8 | 33.3 | 26.6 | 1.4 | 9.7 | 3.0 | 26.9 | 87 |
| **Residence** | | | | | | | | | | | | | |
| Urban | 72.3 | 29.0 | 26.4 | 1.7 | 21.6 | 44.2 | 53.6 | 33.9 | 3.4 | 11.2 | 3.8 | 15.0 | 67 |
| Rural | 64.5 | 27.3 | 8.1 | 1.0 | 11.1 | 60.5 | 34.3 | 24.2 | 2.0 | 8.1 | 1.0 | 25.3 | 118 |
| Chennai | (76.2) | (49.9) | (44.7) | (0.0) | (7.9) | (31.6) | (36.7) | (21.0) | (0.0) | (15.8) | (2.6) | (18.4) | 12 |
| **Mother's education** | | | | | | | | | | | | | |
| Illiterate | 65.1 | 33.7 | 10.5 | 0.0 | 12.7 | 51.2 | 25.2 | 23.7 | 0.0 | 4.4 | 1.9 | 32.1 | 76 |
| Literate, < middle school complete | (57.8) | (23.9) | (18.1) | (2.4) | (10.1) | (58.0) | (43.2) | (27.9) | (2.5) | (13.2) | (5.0) | (20.0) | 46 |
| Middle school complete | (69.6) | (25.1) | (12.7) | (0.0) | (19.8) | (61.7) | (60.6) | (15.9) | (3.9) | (20.0) | (0.0) | (11.4) | 31 |
| High school complete and above | (84.4) | (22.7) | (21.9) | (3.7) | (22.5) | (51.2) | (58.4) | (48.5) | (7.3) | (4.7) | (0.0) | (8.4) | 32 |
| **Caste/tribe** | | | | | | | | | | | | | |
| Scheduled caste | (70.8) | (25.5) | (12.1) | (0.0) | (6.0) | (64.7) | (29.9) | (41.3) | (5.9) | (3.2) | (0.0) | (25.6) | 39 |
| Other backward class | 66.9 | 28.9 | 15.6 | 1.6 | 17.5 | 51.4 | 44.8 | 24.3 | 1.6 | 11.0 | 2.6 | 19.6 | 144 |
| **Standard of living index** | | | | | | | | | | | | | |
| Low | 65.2 | 23.4 | 10.6 | 0.0 | 11.1 | 60.8 | 29.7 | 26.4 | 2.7 | 12.1 | 1.4 | 25.8 | 85 |
| Medium | 64.4 | 32.6 | 15.3 | 1.4 | 15.1 | 51.6 | 52.3 | 25.7 | 1.5 | 6.6 | 3.2 | 19.1 | 80 |
| Total | 67.3 | 27.9 | 14.7 | 1.2 | 14.9 | 54.6 | 41.3 | 27.7 | 2.5 | 9.2 | 2.0 | 21.6 | 185 |

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 1 scheduled-tribe child, 18 children from households having a high standard of living index, and 1 child with missing information on the standard of living index, who are not shown separately.
( ) Based on 25–49 unweighted cases

Table 6.14 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, Tamil Nadu, 1999

| Source | Percent |
|---|---|
| **Public medical sector** | 57.9 |
| Government/municipal hospital | 23.7 |
| UHC/UHP/UFWC | 1.8 |
| CHC/rural hospital/PHC | 11.5 |
| Sub-centre | 16.3 |
| Other public medical sector | 4.6 |
| **NGO or trust** | |
| Hospital/clinic | 2.2 |
| **Private medical sector** | 31.9 |
| Private hospital/clinic | 19.3 |
| Private paramedic | 5.7 |
| *Vaidya/hakim*/homeopath | 0.6 |
| Pharmacy/drugstore | 6.3 |
| **Other source** | |
| Shop | 7.9 |
| Total percent | 100.0 |
| Number of children treated with ORS | 51 |

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

drugs is widespread across all socioeconomic groups and is particularly common for children living in urban areas other than Chennai.

Table 6.14 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 58 percent of children who were treated with ORS, the packets were obtained from public-sector medical sources, for 32 percent the packets were obtained from private-sector medical sources, and for 8 percent the packets were obtained from shops. NGO hospitals and clinics were the source of ORS packets for 2 percent of children who received ORS. Among the public-sector medical sources, government and municipal hospitals (24 percent), sub-centres (16 percent) and community health centres, rural hospitals, and Primary Health Centres (12 percent) are most commonly mentioned. Among the private-sector medical sources, ORS packets were usually obtained from a private hospital or clinic (19 percent). The pharmacy or drugstore category accounts for only 6 percent of all cases. If this category is added to the 'shop' category, the proportion purchasing ORS packets from shops, pharmacies, or drugstores becomes 14 percent, lower than the all-India average of 26 percent.

## 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 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 6.15 shows the percentage of women who have heard about AIDS by background characteristics. Eighty-seven percent of women in Tamil Nadu have heard of AIDS, more than twice the national average of 40 percent. The level of knowledge of AIDS in Tamil Nadu has increased almost fourfold from just 23 percent in NFHS-1 in 1992, a tremendous improvement, no doubt contributed by the AIDS awareness and prevention campaign in Tamil Nadu.

There are substantial differentials by women's background characteristics. Knowledge of AIDS is higher among younger women age 15–24 (92 percent) and 25–34 (90 percent) than among older women age 35–49 (83 percent). Knowledge of AIDS in Chennai and urban areas is close to universal (at least 97 percent), compared with 82 percent in rural areas. Knowledge of AIDS is universal (100 percent) for women who have completed at least a high school education and nearly universal (99 percent) for women from households with a high standard of living. Nevertheless, even among illiterate women and women from households with a low standard of living, more than three-fourths (76–77 percent) have heard of AIDS, indicating a high level of AIDS awareness in Tamil Nadu. Knowledge of AIDS is higher among Muslims and Christians than among Hindus and higher among women who do not belong to a scheduled caste, scheduled tribe, or other backward class. Media exposure shows a strong positive relationship with knowledge of AIDS, with 93 percent of women who are regularly exposed to any media—radio, television, cinema, theatre, or print media—saying that they have heard about AIDS, compared with 67 percent for women who are not regularly exposed to any media. Ninety-nine percent of women who read newspapers or magazines weekly have heard about AIDS.

**Source of Knowledge About AIDS**

As part of its 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 have heard of AIDS about their sources of AIDS information. Table 6.15 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 Tamil Nadu. Seventy-five percent of women who know about AIDS received information from television. Other important sources of information about AIDS are radio (52 percent), friends and relatives (51 percent), newspapers or magazines (19

Table 6.15 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, Tamil Nadu, 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 | 91.8 | 1,018 | 55.4 | 79.3 | 12.3 | 19.7 | 17.4 | 4.1 | 0.9 | 45.0 | 1.1 | 6.4 | 935 |
| 25–34 | 89.5 | 1,789 | 54.3 | 77.6 | 12.7 | 21.1 | 14.5 | 3.6 | 0.3 | 51.4 | 1.0 | 9.5 | 1,601 |
| 35–49 | 82.6 | 1,869 | 48.7 | 70.0 | 10.5 | 16.9 | 12.4 | 2.8 | 0.2 | 54.0 | 0.7 | 9.7 | 1,544 |
| **Residence** | | | | | | | | | | | | | |
| Urban | 96.7 | 1,620 | 56.8 | 88.6 | 18.2 | 28.3 | 22.2 | 2.7 | 0.3 | 42.7 | 1.0 | 6.2 | 1,566 |
| Rural | 82.3 | 3,056 | 49.7 | 66.7 | 7.8 | 13.5 | 9.4 | 3.9 | 0.5 | 56.0 | 0.8 | 10.5 | 2,514 |
| Chennai | 99.7 | 289 | 59.2 | 94.6 | 16.6 | 33.5 | 33.7 | 4.4 | 0.4 | 32.1 | 0.9 | 4.2 | 288 |
| **Education** | | | | | | | | | | | | | |
| Illiterate | 75.6 | 2,221 | 40.9 | 57.9 | 4.0 | 0.2 | 1.9 | 1.9 | 0.4 | 62.1 | 0.4 | 11.3 | 1,679 |
| Literate, < middle school complete | 95.9 | 1,085 | 54.0 | 80.6 | 10.9 | 16.4 | 14.3 | 3.3 | 0.2 | 46.9 | 0.1 | 5.5 | 1,040 |
| Middle school complete | 98.7 | 629 | 60.5 | 89.3 | 17.4 | 29.7 | 22.6 | 4.2 | 0.5 | 42.9 | 0.6 | 4.2 | 620 |
| High school complete and above | 100.0 | 741 | 69.7 | 94.7 | 25.8 | 57.4 | 35.5 | 6.3 | 0.6 | 37.8 | 3.3 | 12.0 | 741 |
| **Religion** | | | | | | | | | | | | | |
| Hindu | 86.5 | 4,145 | 52.0 | 74.2 | 11.4 | 17.8 | 13.2 | 3.2 | 0.4 | 51.8 | 0.8 | 9.1 | 3,584 |
| Muslim | 94.1 | 277 | 49.5 | 81.4 | 8.5 | 16.4 | 16.5 | 2.8 | 0.1 | 41.1 | 2.7 | 3.0 | 260 |
| Christian | 93.6 | 242 | 63.1 | 80.9 | 22.0 | 43.2 | 29.0 | 8.0 | 0.5 | 48.6 | 0.6 | 12.6 | 226 |
| **Caste/tribe** | | | | | | | | | | | | | |
| Scheduled caste | 83.1 | 1,089 | 53.2 | 67.6 | 8.4 | 10.5 | 10.5 | 4.1 | 1.1 | 56.7 | 1.0 | 12.1 | 904 |
| Scheduled tribe | (56.9) | 39 | * | * | * | * | * | * | * | * | * | * | 22 |
| Other backward class | 88.7 | 3,469 | 51.6 | 76.9 | 12.3 | 21.0 | 14.9 | 3.3 | 0.2 | 49.7 | 0.9 | 8.0 | 3,076 |
| Other | 98.6 | 79 | 77.4 | 98.2 | 30.4 | 51.0 | 36.8 | 2.0 | 0.0 | 37.4 | 1.9 | 6.8 | 78 |
| **Standard of living index** | | | | | | | | | | | | | |
| Low | 77.3 | 1,756 | 42.9 | 56.6 | 6.7 | 6.5 | 6.3 | 3.1 | 0.7 | 59.9 | 0.4 | 11.6 | 1,358 |
| Medium | 91.6 | 2,168 | 55.0 | 80.2 | 11.5 | 18.2 | 14.2 | 3.6 | 0.3 | 49.0 | 0.7 | 7.3 | 1,984 |
| High | 98.7 | 704 | 63.8 | 96.9 | 22.6 | 47.4 | 30.7 | 3.5 | 0.4 | 39.2 | 2.5 | 8.1 | 694 |
| **Exposure to mass media** | | | | | | | | | | | | | |
| Exposed to any media | 92.5 | 3,728 | 55.7 | 81.9 | 13.3 | 22.0 | 16.1 | 3.5 | 0.5 | 47.2 | 1.1 | 7.8 | 3,448 |
| Listens to radio weekly | 93.0 | 2,416 | 69.0 | 80.9 | 14.5 | 24.2 | 17.1 | 4.0 | 0.5 | 46.9 | 1.3 | 8.3 | 2,248 |
| Watches television weekly | 94.1 | 2,944 | 53.6 | 91.0 | 14.3 | 24.2 | 17.8 | 3.4 | 0.4 | 44.4 | 1.2 | 7.4 | 2,769 |
| Goes to cinema/theatre monthly | 92.5 | 1,024 | 55.3 | 80.3 | 22.8 | 23.6 | 16.2 | 4.3 | 0.3 | 50.5 | 1.0 | 7.8 | 947 |
| Reads newspaper/magazine weekly | 99.1 | 1,079 | 67.1 | 90.9 | 24.1 | 54.4 | 33.6 | 5.5 | 0.4 | 40.9 | 2.3 | 8.7 | 1,069 |
| Not regularly exposed to any media | 66.7 | 948 | 34.7 | 38.2 | 3.4 | 3.8 | 4.5 | 2.9 | 0.0 | 71.0 | 0.0 | 14.5 | 632 |
| Total | 87.3 | 4,676 | 52.4 | 75.1 | 11.8 | 19.2 | 14.3 | 3.4 | 0.4 | 50.9 | 0.9 | 8.9 | 4,080 |

Note: Total includes a small number of women belonging to other religions and women with missing information on religion, caste/tribe, and the standard of living index, who are not shown separately.
( ) Based on 25–49 unweighted cases
* Percentage not shown; based on fewer than 25 unweighted cases

percent), posters or hoardings (14 percent), and cinema (12 percent). Only 3 percent of women report that they received information about AIDS from a health worker.

Table 6.15 shows that television, followed by radio, is the most important source of information about AIDS for almost all groups of women. However, friends and relatives are the most important source of AIDS information for illiterate women, women who live in households with a low standard of living, and women who are not regularly exposed to any media.

**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 6.16 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, a large majority of women know some way to avoid infection; only 12 percent do not know any way to avoid infection, compared with 33 percent for India as a whole. The percentage of women who are not aware of any way to avoid infection is higher among older women, rural women, Hindu women, and women not regularly exposed to mass media. The percentage is also higher among women from a scheduled caste or from an other backward class than among women who do not belong to a scheduled caste, a scheduled tribe, or an other backward class. The proportion who do not know any way to avoid becoming infected with AIDS decreases with increasing levels of education and household standard of living.

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 (75 percent), avoiding sex with commercial sex workers (38 percent), and avoiding injections or using clean needles (29 percent). Substantial proportions of women also mention avoiding blood transfusions (23 percent) and using condoms (11 percent). Very few women mention abstaining from sex completely, avoiding sex with homosexuals, and avoiding IV drug use as ways of avoiding AIDS. The percentage reporting most specific ways of avoiding AIDS is lower among rural than among urban women and women not regularly exposed to mass media than other women. The level of education and the household standard of living are positively associated with women mentioning every way of avoiding AIDS. Christian women are the most knowledgeable and Hindu women the least knowledgeable about specific ways of avoiding AIDS. The use of condoms as a way of avoiding AIDS is mentioned most often by women in urban areas, women who have completed at least high school, Christian women, women who do not belong to a scheduled caste, scheduled tribe, or other backward class, women from households with a high standard of living, and women who read newspapers or magazines weekly.

Both knowledge of AIDS and knowledge of ways to avoid infection are very high among women in Tamil Nadu. However, only 11 percent of women know of condom use as a way to avoid infection, the third lowest level of all the states. This implies that the AIDS prevention awareness programme in Tamil Nadu should increase efforts to educate people about condom use as a way to avoid infection.

Table 6.16 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, Tamil Nadu, 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 | 1.8 | 11.3 | 76.7 | 37.4 | 1.4 | 23.2 | 30.1 | 0.7 | 2.7 | 8.5 | 935 |
| 25–34 | 1.1 | 12.5 | 75.7 | 39.5 | 1.5 | 23.9 | 30.0 | 0.8 | 3.4 | 10.3 | 1,601 |
| 35–49 | 0.9 | 9.2 | 72.5 | 35.7 | 1.5 | 20.5 | 26.2 | 0.5 | 4.1 | 14.5 | 1,544 |
| **Residence** | | | | | | | | | | | |
| Urban | 1.5 | 17.3 | 76.9 | 48.8 | 2.2 | 31.8 | 38.6 | 1.2 | 3.9 | 7.3 | 1,566 |
| Rural | 1.0 | 7.0 | 73.4 | 30.6 | 1.0 | 16.6 | 22.3 | 0.3 | 3.3 | 14.1 | 2,514 |
| Chennai | 1.0 | 18.7 | 81.4 | 78.6 | 2.8 | 31.4 | 34.9 | 1.5 | 3.0 | 5.0 | 288 |
| **Education** | | | | | | | | | | | |
| Illiterate | 0.3 | 1.6 | 67.4 | 28.1 | 0.6 | 6.5 | 11.7 | 0.2 | 3.3 | 20.8 | 1,679 |
| Literate, < middle school complete | 1.2 | 8.6 | 76.2 | 37.5 | 1.2 | 19.9 | 27.4 | 0.6 | 3.4 | 8.6 | 1,040 |
| Middle school complete | 1.9 | 16.9 | 82.4 | 44.4 | 0.8 | 33.2 | 39.9 | 0.7 | 3.0 | 3.4 | 620 |
| High school complete and above | 2.4 | 30.4 | 82.8 | 53.4 | 4.5 | 53.3 | 59.1 | 1.9 | 4.5 | 1.2 | 741 |
| **Religion** | | | | | | | | | | | |
| Hindu | 1.1 | 10.3 | 74.0 | 36.8 | 1.2 | 20.7 | 26.8 | 0.6 | 3.5 | 12.0 | 3,584 |
| Muslim | 1.3 | 11.4 | 79.3 | 39.5 | 2.8 | 26.5 | 34.9 | 0.6 | 2.1 | 7.8 | 260 |
| Christian | 2.3 | 21.0 | 80.1 | 48.0 | 4.0 | 45.2 | 49.1 | 2.1 | 5.8 | 7.7 | 226 |
| **Caste/tribe** | | | | | | | | | | | |
| Scheduled caste | 1.1 | 7.1 | 74.6 | 32.5 | 0.7 | 16.3 | 20.4 | 0.4 | 3.5 | 13.6 | 904 |
| Other backward class | 1.2 | 11.6 | 74.5 | 39.0 | 1.7 | 23.8 | 30.4 | 0.7 | 3.5 | 11.0 | 3,076 |
| Other[1] | 3.7 | 32.7 | 84.6 | 47.9 | 2.4 | 47.5 | 58.3 | 1.2 | 5.5 | 2.6 | 78 |
| **Standard of living index** | | | | | | | | | | | |
| Low | 0.8 | 3.9 | 67.0 | 27.8 | 0.5 | 9.7 | 15.4 | 0.1 | 3.1 | 18.6 | 1,358 |
| Medium | 1.2 | 11.2 | 77.8 | 39.4 | 1.4 | 23.2 | 29.6 | 0.7 | 3.6 | 9.3 | 1,984 |
| High | 1.9 | 24.3 | 81.8 | 51.6 | 3.6 | 45.7 | 52.3 | 1.7 | 4.1 | 3.0 | 694 |
| **Exposure to mass media** | | | | | | | | | | | |
| Exposed to any media | 1.3 | 12.5 | 76.3 | 40.5 | 1.6 | 25.5 | 31.5 | 0.8 | 3.7 | 9.5 | 3,448 |
| Listens to radio weekly | 1.7 | 14.1 | 77.2 | 42.1 | 2.1 | 27.2 | 34.3 | 0.9 | 4.0 | 8.3 | 2,248 |
| Watches television weekly | 1.3 | 14.2 | 77.2 | 43.0 | 1.8 | 28.1 | 33.3 | 0.9 | 3.7 | 8.7 | 2,769 |
| Goes to cinema/theatre monthly | 1.6 | 14.4 | 78.5 | 37.1 | 2.2 | 23.8 | 28.9 | 0.7 | 4.6 | 10.2 | 947 |
| Reads newspaper/magazine weekly | 3.0 | 27.3 | 82.9 | 52.4 | 3.7 | 47.1 | 53.0 | 1.7 | 4.6 | 2.3 | 1,069 |
| Not regularly exposed to any media | 0.4 | 2.3 | 66.1 | 21.7 | 0.6 | 6.1 | 12.4 | 0.0 | 2.2 | 22.4 | 632 |
| Total | 1.2 | 11.0 | 74.7 | 37.6 | 1.5 | 22.5 | 28.6 | 0.7 | 3.5 | 11.5 | 4,080 |

Note: Total includes 7 women belonging to other religions, 22 scheduled-tribe women, and 2, 1, and 43 women with missing information on religion, caste/tribe, and the standard of living index, respectively, who are not shown separately.

[1]Not belonging to a scheduled caste, a scheduled tribe, or an other backward class