

This chapter provides information on levels, trends, and differentials in neonatal, postneonatal, infant, child, and under-five mortality, as well as levels and differentials in perinatal mortality. These mortality rates are relevant to a demographic assessment of the population and are an important measure of a country's level of socioeconomic development and quality of life. They can also be used for monitoring and evaluating population and health programmes.

7.1 INFANT AND CHILD MORTALITY

NFHS-3 asked all 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:

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

7.2 LEVELS AND TRENDS

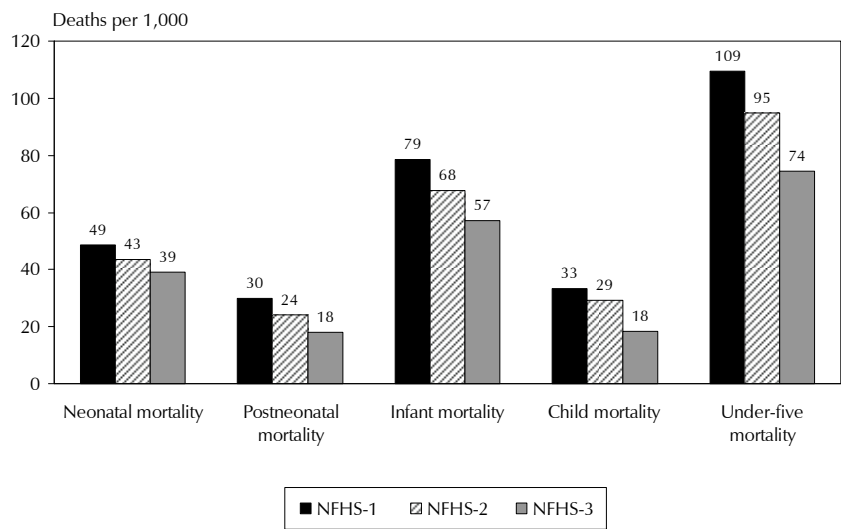
Table 7.1 and Figure 7.1 present various measures of infant and child mortality by residence for the three five-year periods preceding the survey. According to these estimates, infant mortality in India has declined from 77 deaths per 1,000 live births in 1991-95 (10-14 years before the survey) to 57 deaths per 1,000 live births in 2001-05 (0-4 years before the survey), thus implying an average rate of decline of 2 infant deaths per 1,000 live births per year. All other measures of infant and child mortality presented in Table 7.1 also show declining trends during the years before the survey. By comparing the estimates for the period 10-14 years before the survey with the estimates for the period 0-4 years before the survey, it is seen that the neonatal mortality rate has decreased by 12 deaths per 1,000 live births (from 51 to 39), the postneonatal mortality rate has decreased by 7 deaths per 1,000 live births (from 25 to 18), and the child mortality rate (at age 1-4 years) has decreased by 14 deaths per 1,000 children age 1 (from 32 to 18). In spite of these impressive declines, one out of every 14 children born during the five years before NFHS-3 will die before reaching age five.

Table 7.1 Early childhood mortality rates
Neonatal, postneonatal, infant, child, and under-five mortality rates for five-year periods preceding the survey by residence, India, 2005-06

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	13.0	41.5	10.6	51.7
5-9	35.9	18.8	54.7	14.8	68.7
10-14	34.6	18.1	52.7	17.7	69.5
RURAL					
0-4	42.5	19.7	62.2	21.0	82.0
5-9	53.9	24.2	78.1	28.7	104.5
10-14	57.5	28.1	85.5	38.4	120.6
TOTAL					
0-4	39.0	18.0	57.0	18.4	74.3
5-9	49.3	22.8	72.2	25.0	95.4
10-14	51.3	25.3	76.6	32.3	106.5

¹ Computed as the difference between the infant and neonatal mortality rates.

Figure 7.1 Early Childhood Mortality Rates for the Five-Year Period preceding the Survey, NFHS-1, NFHS-2, and NFHS-3



Infant and child mortality rates are considerably higher in rural areas than in urban areas. In 2001-05, the infant mortality rate was 50 percent higher in rural areas (62) than in urban areas (42). The rural-urban difference in mortality is especially large for children in the age interval 1-4 years, for whom the rate in rural areas is twice as high as the rate in urban areas. In both the neonatal and postneonatal periods, mortality in rural areas is about 50 percent higher than mortality in urban areas.

Infant and child mortality rates have declined slightly faster in rural areas than in urban areas. Between 1991-95 and 2001-05, infant mortality declined by 27 percent in rural areas, compared with 21 percent in urban areas. During the same period, the child mortality rate

declined by 45 percent in rural areas, compared with 40 percent in urban areas. Even in the neonatal period, the decline in mortality was slightly faster in rural areas (26 percent) than in urban areas (18 percent).

Rather than relying only on NFHS-3 data for the trend analysis, one can also use the estimates from NFHS-1 and NFHS-2 to discern the trends in infant and child mortality. For the period 0-4 years before the survey, NFHS-1 and NFHS-2 recorded infant mortality rates of 79 and 68, respectively (see Table 7.2). Comparison of these estimates with the NFHS-3 estimate of 57 indicates that the infant mortality rate declined by 22 deaths per 1,000 live births in approximately 13 years (with similar declines in the two periods). This implies an average reduction of 1.7 infant deaths per year, which is slightly slower than the reduction of 2 infant deaths per annum implied by the birth history data from NFHS-3. It should also be noted that the estimated infant mortality rate of 57 for 2001-05 from NFHS-3 is very close to the average Sample Registration System (SRS) estimate of 60 for the period 2002-05.

Table 7.2 Early childhood mortality rates by background characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the five-year period preceding the survey, by background characteristics and residence, India, 2005-06, and for NFHS-2 and NFHS-1

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality ¹ (PNN)	Infant mortality (${}_1q_0$)	Child mortality (${}_4q_1$)	Under-five mortality (${}_5q_0$)
URBAN					
Education					
No education	38.2	23.1	61.3	21.4	81.4
<5 years complete	39.9	13.4	53.3	6.5	59.4
5-7 years complete	31.4	16.7	48.1	7.5	55.2
8-9 years complete	25.8	5.4	31.2	4.7	35.7
10-11 years complete	16.2	8.3	24.5	4.3	28.7
12 or more years complete	19.4	4.2	23.6	4.7	28.2
Religion					
Hindu	30.9	13.3	44.3	10.9	54.7
Muslim	21.6	13.9	35.5	9.6	44.8
Christian	11.3	5.0	16.3	9.4	25.5
Sikh	*	*	*	*	*
Buddhist/Neo-Buddhist	*	*	*	*	*
Other	*	*	*	*	*
Caste/tribe					
Scheduled caste	35.0	15.7	50.7	15.5	65.4
Scheduled tribe	29.0	14.8	43.8	10.4	53.8
Other backward class	26.4	15.8	42.2	12.9	54.5
Other	27.5	8.6	36.1	6.2	42.1
Wealth index					
Lowest	39.4	25.4	64.8	29.2	92.1
Second	40.8	21.6	62.4	21.5	82.5
Middle	32.0	17.8	49.8	16.4	65.3
Fourth	31.3	14.9	46.2	8.0	53.9
Highest	21.1	6.3	27.4	5.6	32.8
Total	28.5	13.0	41.5	10.6	51.7
NFHS-2	31.7	15.4	47.0	16.9	63.1
NFHS-1	34.1	22.0	56.1	19.6	74.6
RURAL					
Education					
No education	47.0	24.1	71.1	27.8	97.0
<5 years complete	50.5	18.6	69.2	15.8	83.8
5-7 years complete	35.8	14.4	50.1	13.3	62.8
8-9 years complete	35.1	11.6	46.7	6.1	52.5
10-11 years complete	35.0	10.5	45.5	3.0	48.3
12 or more years complete	20.0	9.6	29.6	2.3	31.8

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Table 7.2 Early childhood mortality rates by background characteristics—Continued

Background characteristic	Neonatal mortality (NN)	Postneonatal mortality ¹ (PNN)	Infant mortality (₁ q ₀)	Child mortality (₄ q ₁)	Under-five mortality (₅ q ₀)
Religion					
Hindu	43.3	19.7	63.0	20.9	82.5
Muslim	40.1	20.3	60.4	23.1	82.2
Christian	42.0	12.8	54.8	12.9	67.0
Sikh	34.3	11.7	46.0	8.7	54.3
Buddhist/Neo-Buddhist	(36.7)	(10.0)	(46.6)	(17.3)	(63.2)
Other	44.7	42.0	86.7	49.2	131.7
Caste/tribe					
Scheduled caste	49.6	21.4	71.0	25.6	94.7
Scheduled tribe	40.9	23.0	63.9	38.3	99.8
Other backward class	42.1	19.1	61.1	18.7	78.7
Other	38.1	17.5	55.7	13.3	68.2
Wealth index					
Lowest	48.8	21.9	70.7	32.5	100.9
Second	44.9	24.2	69.2	22.8	90.4
Middle	41.2	19.4	60.6	13.8	73.6
Fourth	32.4	9.9	42.3	7.1	49.1
Highest	24.3	9.2	33.6	2.7	36.2
Total	42.5	19.7	62.2	21.0	82.0
NFHS-2	46.7	26.6	73.3	32.8	103.7
NFHS-1	52.9	32.2	85.0	37.6	119.4
TOTAL					
Education					
No education	45.7	24.0	69.7	26.9	94.7
<5 years complete	48.4	17.6	66.0	13.8	78.8
5-7 years complete	34.5	15.1	49.5	11.5	60.5
8-9 years complete	32.0	9.5	41.5	5.6	46.9
10-11 years complete	26.9	9.6	36.5	3.6	40.0
12 or more years complete	19.6	6.3	25.9	3.9	29.7
Religion					
Hindu	40.3	18.2	58.5	18.5	76.0
Muslim	34.1	18.2	52.4	18.6	70.0
Christian	31.5	10.1	41.7	11.6	52.8
Sikh	35.9	9.7	45.6	6.8	52.1
Buddhist/Neo-Buddhist	43.0	9.8	52.8	17.1	69.0
Other	43.3	41.4	84.6	50.4	130.7
Caste/tribe					
Scheduled caste	46.3	20.1	66.4	23.2	88.1
Scheduled tribe	39.9	22.3	62.1	35.8	95.7
Other backward class	38.3	18.3	56.6	17.3	72.8
Other	34.5	14.5	48.9	10.8	59.2
Wealth index					
Lowest	48.4	22.0	70.4	32.3	100.5
Second	44.6	24.0	68.5	22.6	89.6
Middle	39.3	19.1	58.3	14.4	71.9
Fourth	31.9	12.1	44.0	7.5	51.2
Highest	22.0	7.2	29.2	4.8	33.8
Total	39.0	18.0	57.0	18.4	74.3
NFHS-2	43.4	24.2	67.6	29.3	94.9
NFHS-1	48.6	29.9	78.5	33.4	109.3

Note: All estimates are for the five years preceding the survey (approximately 1988-1992 for NFHS-1, 1994-1998 for NFHS-2, and 2001-2005 for NFHS-3). Totals include Jains, cases with missing information on education, religion, and caste/tribe, and cases in which the respondent does not know the caste/tribe, which are not shown separately.
 () Based on 250-499 unweighted children surviving to the beginning of the age interval.
 * Rate not shown; based on fewer than 250 unweighted children surviving to the beginning of the age interval.
¹ Computed as the difference between the infant and neonatal mortality rates.

7.3 SOCIOECONOMIC DIFFERENTIALS

Table 7.2 presents data on differentials in infant and child mortality rates for the five-year period preceding the survey by selected background characteristics, separately for rural, urban, and total areas of India. Examining the data for all India first, it is seen that infant and child mortality rates decrease steadily with an increase in mother's schooling. The infant mortality rate is 70 for children whose mothers have no schooling, compared with 50 for children whose mothers have 5-7 years of schooling and 26 for children whose mothers have 12 or more years of schooling. Mother's schooling has a greater effect on the mortality of older children. During the neonatal period, children of mothers with 12 or more years of school have a mortality rate that is 43 percent as high as the rate for children of mothers with no education. That percentage decreases to 26 percent during the postneonatal period and 15 percent during the age interval 1-4 years.

Among the largest religious groups, Hindus have the highest rate of infant mortality (59), followed by Buddhists/Neo-Buddhists (53), Muslims (52), Sikhs (46), and Christians (42). Christians and Sikhs have relatively low mortality rates at all ages under five years. Although scheduled tribes have a lower infant mortality rate (62) than scheduled castes (66), the under-five mortality rate is higher among scheduled tribes (96) than among scheduled castes (88). Other Backward Classes (OBCs) have lower mortality than scheduled castes or scheduled tribes, but have higher mortality than other castes at all childhood ages. Overall, the under-five mortality rate is 23 percent higher among OBCs than among the population in the general category.

The infant mortality rate is 70 among children in households in the lowest wealth quintile, 58 in middle wealth quintile households, and only 29 in the highest wealth quintile households. Households in the highest wealth quintile experience only one-third the under-five mortality rate of households in the lowest quintile. The ratio between the highest and lowest quintiles in child mortality is lowest in the neonatal phase (1:2) and highest in the age interval 1-4 years (1:7).

More or less similar socioeconomic differentials in infant and child mortality are seen in rural and urban areas. One exception is the mortality difference between Hindus and Muslims. In urban areas, the under-five mortality rate is higher among Hindus (55) than Muslims (45). But in rural areas, both have the same level of under-five mortality (82-83).

7.4 DEMOGRAPHIC DIFFERENTIALS

Table 7.3 and Figure 7.2 show differentials in infant and child mortality rates for the five-year period preceding the survey by demographic characteristics, separately for rural, urban, and total areas of India. Considering first the data for India as a whole, it is seen that the infant mortality rate is marginally higher for females (58) than males (56). However, in the neonatal period, like elsewhere, mortality in India is lower for females (37) than for males (41). As children get older, females are exposed to higher mortality than males. Females have 36 percent higher mortality than males in the postneonatal period, but a 61 percent higher mortality than males at age 1-4 years.

Table 7.3 Early childhood mortality rates by demographic characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the five-year period preceding the survey, by demographic characteristics and residence, India, 2005-06

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality ¹ (PNN)	Infant mortality (₁ q ₀)	Child mortality (₄ q ₁)	Under-five mortality (₅ q ₀)
URBAN					
Child's sex					
Male	33.0	10.7	43.7	9.0	52.3
Female	23.4	15.7	39.1	12.4	51.0
Mother's age at birth					
<20	30.5	13.8	44.3	9.7	53.6
20-29	28.4	12.6	41.0	10.4	51.0
30-39	27.4	14.2	41.6	12.2	53.4
40-49	*	*	*	*	*
Birth order					
1	29.7	9.8	39.5	5.9	45.2
2-3	23.9	11.6	35.5	10.1	45.2
4-6	38.5	20.1	58.6	18.9	76.4
7 or more	36.5	38.4	74.9	28.1	100.9
Previous birth interval²					
<2 years	43.5	22.2	65.7	20.9	85.2
2 years	25.8	14.7	40.5	14.1	54.1
3 years	14.1	7.5	21.6	9.6	31.0
4 years or more	22.2	12.0	34.3	4.2	38.3
Birth size					
Very small	84.8	29.6	114.4	22.0	133.8
Small	28.9	10.6	39.6	13.5	52.5
Average or larger	22.6	11.9	34.4	9.0	43.1
Total	28.5	13.0	41.5	10.6	51.7
RURAL					
Child's sex					
Male	43.7	17.0	60.7	16.0	75.8
Female	41.3	22.6	63.9	26.5	88.7
Mother's age at birth					
<20	60.2	24.5	84.6	23.0	105.7
20-29	36.3	17.7	54.0	17.9	71.0
30-39	41.2	19.8	61.0	29.9	89.1
40-49	(50.6)	(31.3)	(81.9)	(39.7)	(118.3)
Birth order					
1	55.9	19.3	75.2	14.0	88.2
2-3	32.7	17.9	50.5	18.9	68.5
4-6	42.2	20.5	62.7	26.6	87.6
7 or more	50.5	30.0	80.6	40.8	118.1
Previous birth interval²					
<2 years	62.2	29.4	91.6	35.9	124.3
2 years	32.2	19.6	51.8	21.7	72.4
3 years	20.6	11.5	32.1	16.7	48.3
4 years or more	25.0	13.1	38.1	10.3	48.0
Birth size					
Very small	93.4	39.5	133.0	46.4	173.2
Small	45.9	22.4	68.4	14.6	82.0
Average or larger	35.8	17.8	53.6	21.3	73.7
Total	42.5	19.7	62.2	21.0	82.0

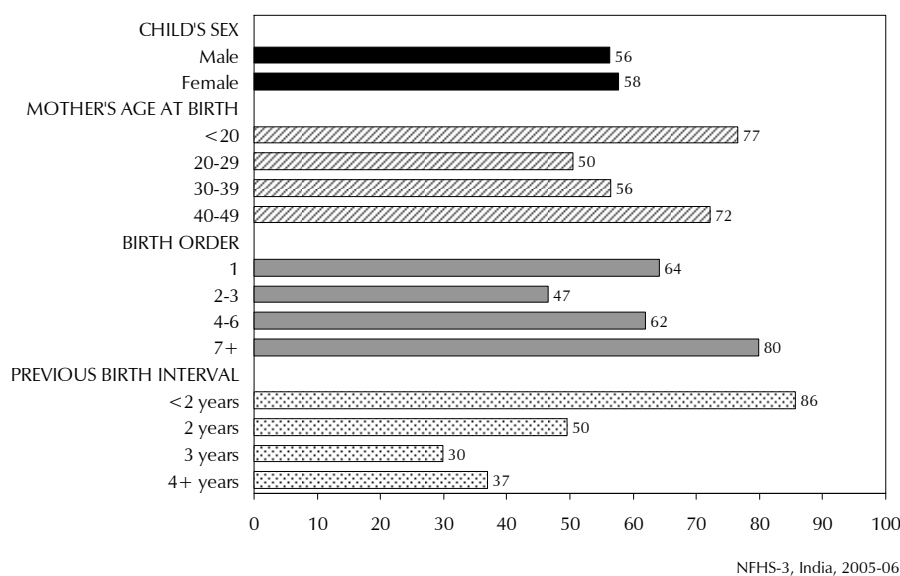
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Table 7.3 Early childhood mortality rates by demographic characteristics—Continued

Demographic characteristic	Neonatal mortality (NN)	Postneonatal mortality ¹ (PNN)	Infant mortality (₁ q ₀)	Child mortality (₄ q ₁)	Under-five mortality (₅ q ₀)
TOTAL					
Child's sex					
Male	40.9	15.4	56.3	14.2	69.7
Female	36.8	20.9	57.7	22.9	79.2
Mother's age at birth					
<20	54.2	22.3	76.5	20.1	95.0
20-29	34.2	16.3	50.4	15.9	65.5
30-39	37.9	18.5	56.4	25.7	80.6
40-49	42.9	29.2	72.1	(37.3)	106.7
Birth order					
1	47.8	16.4	64.1	11.4	74.8
2-3	30.3	16.2	46.5	16.5	62.3
4-6	41.5	20.4	61.9	25.2	85.6
7 or more	48.6	31.2	79.8	39.0	115.7
Previous birth interval²					
<2 years	57.9	27.8	85.7	32.5	115.5
2 years	30.9	18.6	49.5	20.1	68.6
3 years	19.2	10.6	29.8	15.1	44.4
4 years or more	24.2	12.8	37.0	8.6	45.3
Birth size					
Very small	91.4	37.2	128.6	40.2	163.6
Small	42.1	19.8	61.9	14.3	75.3
Average or larger	32.3	16.2	48.6	18.0	65.7
Total	39.0	18.0	57.0	18.4	74.3

() Based on 250-499 unweighted children surviving to the beginning of the age interval.
 * Rate not shown; based on fewer than 250 unweighted children surviving to the beginning of the age interval.
¹ Computed as the difference between the infant and neonatal mortality rates.
² Excludes first-order births.

Figure 7.2 Infant Mortality Rates by Demographic Characteristics



The maternal age at birth shows a U-shaped relationship with infant and child mortality rates. The infant mortality rate is lowest for mothers age 20-29 years (50) and is substantially higher for mothers age less than 20 years (77) and 40-49 years (72). Similar age differentials are seen in neonatal mortality, postneonatal mortality, and child mortality (at age 1-4 years). The birth order also shows a similar effect. The infant mortality rate is lowest for births of order 2 or 3 (47), and higher for first order births (64) and for births of later orders (62 or higher). Similar differentials by birth order are observed at age less than one month, but child mortality increases steadily with birth order.

The interval between the previous birth and the current birth shows a strong negative effect on infant and child mortality rates. When a birth occurs less than two years after an earlier birth, the infant mortality rate is 86. If the interval is 24-35 months, the infant mortality rate is 50, and if the interval is 36-47 months, it is only 30. But when the interval is four years or more, the infant mortality rate is somewhat higher (37). This pattern is observed for both neonatal and postneonatal mortality rates. Child mortality, however, is negatively related to the previous birth interval throughout, with mortality being lowest for intervals of four years or more.

In India, the weight of babies is not measured at birth in most cases. Taking the reported size of the baby at birth as a proxy for birth weight, one finds that birth weight has a substantial effect on infant and child mortality rates. The infant mortality rate is 49 for an average or large size baby, but it is 62 for a smaller than average baby and 129 for a very small baby. The risk of mortality is particularly high for small babies during the neonatal period. When compared with an average size baby, the neonatal mortality rate is 30 percent higher for a smaller than average baby and 183 percent higher for a very small baby.

Similar demographic differentials are observed in infant and child mortality in rural and urban areas, with the exception of sex differentials. Infant and under-five mortality rates are higher for females in rural areas and are higher for males in urban areas. But even in urban areas, mortality is higher among females than males in the postneonatal period and at 1-4 years of age.

7.5 STATE DIFFERENTIALS

Table 7.4 presents estimates of infant and child mortality rates for the five-year period preceding the survey for all 29 states of India. According to these estimates, infant mortality is highest in Uttar Pradesh (73) and lowest in Kerala and Goa (15). With respect to under-five mortality, Uttar Pradesh also has the highest rate (96) and Kerala has the lowest rate (16). Aside from Uttar Pradesh, high levels of infant and child mortality are found in Chhattisgarh and Madhya Pradesh in the central region, Assam and Arunachal Pradesh in the northeastern region, Jharkhand, Orissa, and Bihar in the eastern region, and Rajasthan in the northern region. In contrast, all states in the southern and western regions have lower levels of infant and child mortality. Three states in the northeastern region that have lower than average reported levels of neonatal mortality have higher than average rates of postneonatal and child mortality (Arunachal Pradesh, Meghalaya, and Nagaland).

Table 7.4 Early childhood mortality rates by state

Neonatal, postneonatal, infant, child, and under-five mortality rates for the five-year period preceding the survey, by state, India, 2005-06

State	Neonatal mortality (NN)	Postneonatal mortality ¹ (PNN)	Infant mortality (₁ q ₀)	Child mortality (₄ q ₁)	Under-five mortality (₅ q ₀)
India	39.0	18.0	57.0	18.4	74.3
North					
Delhi	29.3	10.5	39.8	7.3	46.7
Haryana	23.6	18.1	41.7	11.1	52.3
Himachal Pradesh	27.3	8.9	36.1	5.6	41.5
Jammu & Kashmir	29.8	14.9	44.7	6.8	51.2
Punjab	28.0	13.7	41.7	10.8	52.0
Rajasthan	43.9	21.4	65.3	21.5	85.4
Uttaranchal	27.6	14.3	41.9	15.5	56.8
Central					
Chhattisgarh	51.1	19.7	70.8	21.0	90.3
Madhya Pradesh	44.9	24.7	69.5	26.5	94.2
Uttar Pradesh	47.6	25.0	72.7	25.6	96.4
East					
Bihar	39.8	21.9	61.7	24.7	84.8
Jharkhand	48.6	20.2	68.7	26.1	93.0
Orissa	45.4	19.3	64.7	27.6	90.6
West Bengal	37.6	10.4	48.0	12.2	59.6
Northeast					
Arunachal Pradesh	34.0	26.7	60.7	28.8	87.7
Assam	45.5	20.6	66.1	20.2	85.0
Manipur	18.7	11.1	29.7	12.6	41.9
Meghalaya	23.6	21.0	44.6	27.1	70.5
Mizoram	16.3	17.7	34.1	19.5	52.9
Nagaland	19.8	18.5	38.3	27.5	64.7
Sikkim	19.4	14.3	33.7	6.7	40.1
Tripura	33.1	18.3	51.5	8.2	59.2
West					
Goa	8.8	6.5	15.3	5.0	20.3
Gujarat	33.5	16.2	49.7	11.9	60.9
Maharashtra	31.8	5.7	37.5	9.5	46.7
South					
Andhra Pradesh	40.3	13.2	53.5	10.2	63.2
Karnataka	28.9	14.3	43.2	12.1	54.7
Kerala	11.5	3.8	15.3	1.0	16.3
Tamil Nadu	19.1	11.2	30.4	5.3	35.5

¹ Computed as the difference between the infant and neonatal mortality rates.

7.6 PERINATAL MORTALITY

Although perinatal mortality is an extremely sensitive indicator of health status of the population, high quality data on perinatal mortality are difficult to obtain because of underreporting of stillbirths and infant deaths at age 0-6 days. Table 7.5 presents the survey estimates of the perinatal mortality rate for the five-year period preceding the survey by selected demographic and socioeconomic characteristics. For India, perinatal mortality is estimated to be 49 deaths per 1,000 pregnancies lasting seven or more months (including live births and stillbirths) during the period 2001-05. As per the Sample Registration System, the perinatal mortality rate was 35 during 2002-05. Thus, NFHS-3 has captured more stillbirths and early neonatal deaths than the SRS.

Table 7.5 Perinatal mortality

Number of stillbirths and early neonatal deaths, and perinatal mortality rates for the five-year period preceding the survey, by background characteristics, India, 2005-06

Background characteristic	Number of stillbirths ¹	Number of early neonatal deaths ²	Perinatal mortality rate ³	Number of pregnancies of 7 or more months' duration
Mother's age at birth				
<20	307	507	66.8	12,189
20-29	654	962	43.4	37,260
30-39	134	201	44.2	7,585
40-49	10	16	51.1	509
Previous pregnancy interval in months				
First pregnancy	465	605	66.1	16,182
<15	87	233	71.3	4,481
15-26	264	451	49.6	14,409
27-38	130	206	30.3	11,073
39 or more	159	192	30.8	11,398
Residence				
Urban	201	325	36.3	14,504
Rural	904	1,361	52.6	43,039
Education				
No education	602	978	54.8	28,840
<5 years complete	77	152	54.9	4,178
5-7 years complete	186	214	47.7	8,375
8-9 years complete	122	170	42.8	6,845
10-11 years complete	60	85	33.4	4,342
12 or more years complete	57	86	28.9	4,962
Religion				
Hindu	838	1,384	49.4	44,990
Muslim	231	233	47.0	9,872
Christian	21	24	40.1	1,130
Sikh	3	19	31.1	720
Buddhist/Neo-Buddhist	7	14	54.8	384
Jain	0	0	0.0	87
Other	2	11	42.8	308
Caste/tribe				
Scheduled caste	247	409	55.0	11,940
Scheduled tribe	70	153	40.6	5,512
Other backward class	467	676	49.3	23,183
Other	309	438	45.3	16,485
Don't know	3	3	30.8	223
Wealth index				
Lowest	321	532	58.0	14,697
Second	298	415	55.0	12,952
Middle	235	321	48.7	11,416
Fourth	162	266	41.4	10,316
Highest	90	152	29.6	8,162
Total	1,105	1,686	48.5	57,543

Note: Total includes cases with missing information on education, religion, and caste/tribe, which are not shown separately.

¹ Stillbirths are foetal deaths in pregnancies lasting seven or more months.

² Early neonatal deaths are deaths at age 0-6 days among live-born children.

³ The sum of the number of stillbirths and early neonatal deaths divided by the number of pregnancies of seven or more months' duration.

Perinatal mortality is lowest (43-44) when the mother's age at birth is 20-39 years. It is substantially higher for mothers giving birth at age less than 20 years (67) and at ages 40-49 years (51). The interval between the previous pregnancy and the current pregnancy has a strong negative effect on perinatal mortality. The perinatal mortality rate is 71 when the interval is less than 15 months, but only 30-31 when the interval is 27 months or more. The perinatal mortality rate is also high for first pregnancies (66).

Perinatal mortality is about two-thirds as high in urban areas as in rural areas. Perinatal mortality is only half as high when the mother has completed 12 or more years of schooling as when she has no education. Perinatal mortality is also half as high for households in the highest wealth quintile as households in the lowest wealth quintile. Among the four largest religious communities, Hindus have the highest levels of perinatal mortality (49), followed by Muslims (47), Christians (40), and Sikhs (31). Interestingly, scheduled tribes reported lower levels of perinatal mortality (41) than scheduled castes (55), other backward classes (49), or others (45).

Table 7.6 shows state-level differentials in perinatal mortality. Chhattisgarh has the highest level of perinatal mortality (64) and Kerala has the lowest level (11). Assam, Uttar Pradesh, Bihar, Jharkhand, Orissa, and Rajasthan also have high levels of perinatal mortality. In addition to Kerala, Goa and Sikkim have very low levels of perinatal mortality. Compared to their ranking in the levels of infant mortality, Madhya Pradesh, Meghalaya, and Arunachal Pradesh show relatively low levels of perinatal mortality.

Table 7.6 Perinatal mortality by state			
Perinatal mortality rates for the five-year period preceding the survey, by state, India, 2005-06			
State	Perinatal mortality rate	State	Perinatal mortality rate
India	48.5		
North		Northeast	
Delhi	35.0	Arunachal Pradesh	40.2
Haryana	36.7	Assam	63.3
Himachal Pradesh	30.2	Manipur	26.3
Jammu & Kashmir	37.6	Meghalaya	23.4
Punjab	33.2	Mizoram	26.6
Rajasthan	49.4	Nagaland	22.5
Uttaranchal	38.1	Sikkim	16.0
		Tripura	42.0
Central		West	
Chhattisgarh	63.5	Goa	12.4
Madhya Pradesh	46.1	Gujarat	40.2
Uttar Pradesh	59.5	Maharashtra	35.8
East		South	
Bihar	58.7	Andhra Pradesh	47.3
Jharkhand	57.6	Karnataka	35.3
Orissa	55.6	Kerala	10.8
West Bengal	46.8	Tamil Nadu	33.0

Note: The perinatal mortality rate is the sum of the number of stillbirths and early neonatal deaths divided by the number of pregnancies of seven or more months' duration.

7.7 HIGH-RISK FERTILITY BEHAVIOUR

As discussed above, mother's age at birth, birth order, and the interval between births have a strong influence on infant and child mortality. In theory, parents can increase the chances of their children's survival by controlling these proximate determinants. For the purpose of the present analysis, a birth is classified as high risk if it has one or more of the following characteristics: (i) mother's age is less than 18 years, (ii) mother's age is more than 34 years, (iii) previous birth interval in less than two years, and (iv) birth order is more than three. Table 7.7 shows the percentage of births and the percentage of currently married women that fall into different child survival risk categories. It also shows the relative magnitude of each risk and different combinations of risks.

As per the employed definition of risk, 70 percent of births in India are in the high-risk category. Nearly half (48 percent) of currently married women would have a high-risk birth if they were to conceive a child at the time of the survey. However, 24 percent of births in the five years before the survey fall into the unavoidable risk category as they are first-order births for mothers aged 18-34 years at birth. These births have a 52 percent elevated mortality risk compared with low-risk births (that is, births to women who are not in any high-risk category). However, only 8 percent of currently married women were in this category at the time of the survey.

A total of 46 percent of births in the last five years are in an avoidable risk category. These births have nearly twice the risk of dying as births that are not in any high-risk category. Forty percent of currently married women fall in an avoidable risk category. The avoidable risk category is further subdivided into two groups that are associated with either single or multiple high-risk behaviours. Thirty-five percent of the births and 23 percent of currently married women are in a single high-risk category that has an elevated risk of 72 percent. Eleven percent of the births and 17 percent of currently married women are in a multiple high-risk category, which has an elevated risk of 182 percent. Thus, infant and child mortality can be reduced substantially in India by postponing marriage and using contraception to space and limit births.

Table 7.7 High-risk fertility behaviour

Percent distribution of children born in the five years preceding the survey by category of elevated risk of mortality and the risk ratio, and percent distribution of currently married women by category of risk if they were to conceive a child at the time of the survey, India, 2005-06

Risk category	Births in the 5 years preceding the survey		Percentage of currently married women ¹
	Percentage of births	Risk ratio	
Not in any high-risk category	29.9	1.00	52.3 ^a
Unavoidable risk category			
First order births between ages 18 and 34 years	24.1	1.52	8.1
Single high-risk category			
Mothers age <18	6.8	2.33	1.2
Mothers age >34	0.6	1.11	6.1
Birth interval <24 months	11.3	1.85	7.6
Birth order >3	16.3	1.40	7.9
Subtotal	35.0	1.72	22.8
Multiple high-risk category			
Age <18 and birth interval <24 months ²	0.9	4.22	0.3
Age >34 and birth interval <24 months	0.0	0.10	0.1
Age >34 and birth order >3	3.0	1.70	11.6
Age >34 and birth interval <24 months and birth order >3	0.6	3.11	0.7
Birth interval <24 months and birth order >3	6.4	3.13	4.0
Subtotal	11.0	2.82	16.7
In any avoidable high-risk category	46.0	1.98	39.6
Total	100.0	na	100.0
Number of births	56,438	na	93,089

Note: Risk ratio is the ratio of the proportion dead among births in a specific high-risk category to the proportion dead among births not in any high-risk category.

na = Not applicable

¹ Women are assigned to risk categories according to the status they would have at the birth of a child if they were to conceive at the time of the survey: current age less than 17 years and 3 months or greater than 34 years and 2 months, latest birth less than 15 months ago, or latest birth of order 3 or higher.

² Includes the category age <18 and birth order >3.

^a Includes sterilized women.