NATIONAL FAMILY HEALTH SURVEY, 1998-99 (NFHS-2)

MAHARASHTRA

PRELIMINARY

REPORT

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And

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March 2000

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FOREWORD

The first National Family Health Survey conducted in 1992-93 was a major landmark in the development of the demographic database for India. It not only inspired research on various important issues related to population, health and nutrition but also sensitized the policymakers at various levels towards utilization of demographic data for effective management of health and family welfare programmes. The second National Family Health Survey (NFHS-2), conducted in 1998-99, is another important step to strengthen the database further for implementation of the Reproductive and Child Health approach, adopted by India after the International Conference on Population and Development (ICPD) in Cairo.

The second National Family Health Survey is the outcome of collaborative efforts of many organizations. The International Institute for Population Sciences (IIPS) was designated as the nodal agency for this project by the Ministry of Health and Family Welfare (MOHFW), Government of India, New Delhi. The project was funded by the United States Agency for International Development (USAID) through ORC Macro, USA, with additional support from UNICEF. Technical guidance was provided by ORC Macro and the East-West Center, USA. Responsibility for data collection was entrusted to 13 reputed organizations in India, including some Population Research Centres. We are grateful to the Ministry of Health and Family Welfare, Government of India, New Delhi, and all the above-mentioned organizations for the excellent co-operation extended by them.

The survey covers a representative sample of about 94,000 eligible women from 25 states in India who were covered in two phases, the first starting in November 1998 and the second in March 1999. The survey provides state-level estimates of demographic and health parameters as well as data on various socioeconomic and programmatic dimensions, which are critical for bringing about the desired change in demographic and health parameters. One important feature of NFHS-2 is the data on the nutritional status of women and children collected by carrying out blood tests for haemoglobin levels in addition to the measurement of their height and weight.

The state of Maharashtra was covered in the second phase of the survey. The preliminary report for the state was prepared by IIPS and Centre for Operations Research and Training, Vadodara, which is the field organization for the state of Maharashtra.

I hope the findings of the preliminary report will help provide some insight into the changes that are taking place in the state and meet the needs of policymakers and programme managers to identify the indicators for the effective management of health and family welfare programmes with emphasis on reproductive health dimensions.

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I. BACKGROUND

A. INTRODUCTION

India's first National Family Health Survey (NFHS-1) was conducted in 1992-93. The Ministry of Health and Family Welfare (MOHFW) subsequently designated the International Institute for Population Sciences, Mumbai, as the nodal agency to initiate a second survey (NFHS-2), which was conducted in 1998-99. An important objective of NFHS-2 is to provide state-level and national-level information on fertility, family planning, infant and child mortality, maternal and child health, and nutrition of women and children, and to examine this information in the context of related socioeconomic and cultural factors. This information is intended to assist policymakers and programme administrators in planning and implementing strategies for improving population, health and nutrition programmes.

The NFHS-2 sample covers more than 99 percent of India's population living in 25 states. It does not cover, however, the union territories. The covered areas contain more than 99 percent of the country's population. NFHS-2 is a household survey with an overall target sample size of approximately 94,000 ever-married women in the age group 15-49.

NFHS-2 is being conducted with financial support from the United States Agency for International Development (USAID) and UNICEF and technical assistance from ORC Macro, Calverton, Maryland, USA, and the East-West Center, Honolulu, Hawaii, USA. Thirteen field organizations were selected to collect the data. Some of the field organizations are private sector organizations, and some are Population Research Centres established by the Government of India in various states. Each field organization had responsibility for collecting the data in one or more states. The Centre for Operations Research and Training (CORT) in Vadodara, Gujarat, was selected as the field organization for NFHS-2 in Maharashtra.

An important purpose of this preliminary report is to make the basic findings of NFHS-2 in Maharashtra available to decisionmakers as soon as possible in order to maximize the usefulness of the findings. A more comprehensive final survey report for Maharashtra will be published later.

II. SURVEY DESIGN AND IMPLEMENTATION

A. SAMPLE DESIGN

The sample for the Maharashtra state survey consisted of 5,830 successfully interviewed households and 5,391 ever-married women age 15-49. The sample selection and implementation procedures were designed to ensure that the survey provides statistically valid estimates for population parameters and their sampling variances.

Reporting Domains

The sample was designed to provide estimates for the state as a whole and for urban and rural areas of the state. The survey was also designed to provide separate estimates for slum and non-slum areas in Mumbai. The sample size is not large enough to provide estimates for individual districts.

Design

Within the domain, of rural, urban (excluding Mumbai) and Mumbai metropolitan areas the sample was selected in two stages: the selection of primary sampling units (PSUs)—villages or census enumeration areas—with probability proportional to population size (PPS) at the first stage, followed by the selection of households within each sample area so as to achieve a self-weighting sample of households (i.e., to give every household in the domain the same chance of being included in the survey). It should be noted that the sample is not self-weighting in either the state as a whole or its urban areas since the sampling rates was different in Mumbai and other urban areas.

Selection of Sample Areas

In rural areas, the 1991 Census list of villages was used as the sampling frame, and a two-stage sample design was adopted, with selection of villages in the first stage and households in selected villages, in the second stage. A stratified sample selection procedure was adopted to select villages. The list of villages was stratified on the basis of the following hierarchy of variables:

- by region, which are groupings of districts according to their location and physical characteristics

- within a region, by categories of village size and percentage of scheduled caste and scheduled tribe population in the village[1]

- within each stratum, by level of female literacy in the village (obtained from the 1991 Census Village Directory)

From the list so arranged, villages were selected systematically with probability proportional to the 1991 Census population of the village. Small villages were linked together to form PSUs of at least 50 households. Larger villages with more than 500 households were segmented, and two segments per village were selected using the PPS method.

The procedure was similar in urban areas excluding Mumbai metropolitan areas. The 1991 Census list of wards was arranged according to districts and within districts by level of female literacy and a sample of wards was selected systematically with probability proportional to size. Next, one census enumeration block, consisting of approximately 150–200 households, was selected from each selected ward using the PPS method.

For Mumbai, a separate procedure was adopted. The 1991 census list of wards were arranged accordingly to two segments, - one consisting of self-selected wards and the other with the remaining wards. Number of urban PSUs were allocated to the segments accordingly to their respective share of population. For the self-selected wards, number of PSUs were assigned to each ward according to their proportion of population. This means that for a big self-selected ward there might be more than the one PSU attached to it. One census enumeration block, consisting of 150-200 households, was selected per PSU, using the PPS method. For the segment consisting of remaining wards, the list was first arranged by level of female literacy, and a sample of wards was selected systematically with population proportional to size. Next, one census enumeration block was selected from each selected ward using the PPS method.

Selection of Households

A mapping and household listing operation carried out in each sample area provided the necessary frame for selecting households at the second sampling stage. The work was carried out by eight teams, each comprising of a lister and a mapper. The operation was supervised by four field supervisors and one field executive. The teams were trained from 22-26 January 1999 in Pune. The houselisting operation was carried out from 28 January 1999 to 10 April 1999.

[1]Scheduled castes and scheduled tribes are groups that are officially recognized by the Government of India as underprivileged.

The households to be interviewed were selected with equal probability from the household list for an area using a systematic sampling procedure. The interval applied for the selection was determined so as to obtain a self-weighting sample of households. On average, 36 households were initially selected in each selected sample area (PSU) in rural and urban (excluding Mumbai) Maharashtra. Within Mumbai metropolitan area, on average 20 households were selected in each selected PSU. However to avoid extreme variations in the workload, however, minimum and maximum limits (15 and 45, respectively) were put on the number of households that could be selected from any area.

B. QUESTIONNAIRES

Three types of questionnaires were used in NFHS-2: the Household Questionnaire, the Woman's Questionnaire and the Village Questionnaire. The village questionnaire was administered only in rural areas. The overall content and format of the questionnaires was determined in a series of workshops held at IIPS in Mumbai in 1997 and 1998. The workshops were attended by representatives of a wide range of organizations in the population and health fields, as well as experts working on gender issues.

The questionnaires used for NFHS-2 in Maharashtra were bilingual, comprising questions in Marathi and English. The Household Questionnaire was used to list all usual residents of each sample household plus visitors who slept in the household the night before the interview. Basic information collected on each listed person includes age, sex, marital status, relationship to the head of the household, education and occupation. In addition, information was collected on the prevalence of certain diseases (asthma, tuberculosis, malaria, and jaundice) and on certain risk behaviours (chewing *paan masala* or tobacco, drinking alcohol, and smoking). Information was also collected on the usual place where household members go for treatment when they get sick, the main source of drinking water, type of toilet facility, source of lighting, type of cooking fuel used, religion of the head of the household, caste/tribe of the head of the household, ownership of a house, ownership of agricultural land, ownership of livestock, and ownership of selected items. In addition, a small sample of cooking salt used by the household was tested to see if it was fortified with iodine. The Household Questionnaire also asked about deaths occurring to household members in the two years before the survey. Basic information on the age, sex, and marital status of household members and visitors was used to identify eligible respondents for the Woman's Questionnaire.

The Woman's Questionnaire was used to collect information from eligible women in the selected households. Eligible women were defined as all ever-married women in the age group 15-49 years who were either usual residents of the household or were visitors who had slept in the household the night before the household interview. The questionnaire covered the following topics:

- Background characteristics
- Marriage
- Reproductive history
- Knowledge and use of contraception
- Antenatal, natal and postnatal care
- Quality of care
- Pregnancy
- Feeding practices for children
- Immunization and the health of children
- Reproductive health
- Fertility preferences
- Status of women
- Husband's background and woman's work
- Acquired immune deficiency syndrome (AIDS)

In addition, the health investigator on each survey team measured the height and weight of each respondent and each of her children born since January 1996. The height and weight information is useful for assessing levels of nutrition prevailing in the population. The health investigators took blood samples in order to assess the haemoglobin level of the respondent and each of her children born since January 1996. This information is useful for assessing prevalence rates of anaemia among women and children. Haemoglobin levels were assessed in the field at the end of the interview using the portable HemoCue System, which provides test results in less than one minute. Severely anaemic persons received immediate referral to local medical authorities for treatment. Further, in Mumbai only, a blood sample (about 3 drops of blood) collected from respondents' children born since January 1996 was used to test for the level of lead in the blood. High levels of lead in the blood can undermine the normal development of the brain and nervous system of young children. The lead analysis of children's blood was done in the field at the end of the interview using a LeadCare portable analyzer. Total analysis time for the lead test was three minutes. Results of the lead analysis were given to the respondent, and children with severe lead poisoning were referred for treatment.

C. TRAINING AND FIELDWORK

Training of the field staff for the main survey was conducted in Pune. The training was conducted by officials of the Centre for Operation Research and Training who were themselves trained in a Training of Trainers Workshop conducted earlier by IIPS. The training in Maharashtra consisted of classroom training, general lectures, and demonstration and practice interviews, as well as actual field practice and additional training for field editors and supervisors. Health investigators attached to interviewing

teams for height and weight measurements, anaemia and lead testing were given additional specialized training in a centralized training programme conducted by IIPS in collaboration with the All India Institute of Medical Sciences (AIIMS), New Delhi. Experts from the Centers for Disease Control and Prevention, Atlanta, USA, assisted with the training for the testing of lead in children. This specialized training took place in Mumbai. It included not only classroom training but also extensive field practice in schools, *anganwadis*, and communities.

The main fieldwork for NFHS-2 in Maharashtra was carried out by seven interviewing teams, each of which consisted of one field supervisor, one female field editor, four female interviewers, and one health investigator. The fieldwork was carried out between 22 March 1999 and 20 June 1999. Monitoring and supervision of the data collection operations were carried out by the coordinators and senior staff of Centre for Operations Research and Training. IIPS also appointed one research officer who was assigned to help with the monitoring throughout the training and fieldwork period, in order to ensure that correct survey procedures were being followed and the quality of the data was being maintained. From time to time, project coordinators, senior research officers and other faculty members from IIPS, as well as staff members from ORC Macro and the East-West Center, also visited the field sites to monitor the data collection operation. The work of the health investigators was monitored separately by medical health coordinators appointed by IIPS. The data were quickly entered into microcomputers and field-check tables were produced to enable timely checks for certain commonly occurring errors in eliciting information and filling out questionnaires. Information from the field-check tables was fed back to the interviewing teams and their supervisors in the field so that they could improve their performance if needed.

D. DATA PROCESSING

All completed questionnaires for NFHS-2 in Maharashtra were sent to the office of the Centre for Operations Research and Training in Vadodara for data processing. This processing consisted of office editing, coding, data entry and machine editing. The data were processed using eight microcomputers in conjunction with the data entry and editing software known as the Integrated System for Survey Analysis (ISSA). Data entry was done by five data entry operators under the supervision of senior staff at the Centre for Operations Research and Training who were trained at a data processing workshop in Vadodara. Data entry and editing operations were completed by August 1999. The tabulations for the preliminary report were produced at IIPS, Mumbai.

E. SAMPLE IMPLEMENTATION

Basic features of the sample are summarized in Table 1. A total of 218 PSUs were selected, out of which 136 (62 percent) were urban and 82 (38 percent) were rural. Of the urban PSUs, 101 were selected from Mumbai. A total of 5,830 households and 5,391 eligible women were interviewed. The sample interviewed from Mumbai consisted of 2,435 households and 2,010 eligible women. The average number of women interviewed per PSU was 25 overall, 27 in rural areas and 24 in urban areas. In Mumbai, an average of 20 women were interviewed per PSU.

Table 1 also shows the response rate for the household interview and the woman's interview, as well as the overall response rate for the survey. Nonresponse can occur at the stage of the household interview, and subsequently, at the stage of the woman's interview. The last row of the table shows the overall effect of nonresponse at the two stages. The survey succeeded in achieving a high overall response rate of 92 percent for Maharashtra as a whole, 91 percent in urban areas, and 93 percent in rural areas.

Table 1 Sample results

Number of Primary Sampling Units and sample results for households and ever-married women age 15-49, Maharashtra, 1999

Result	Urban	Rural	Mumbai	Total
Number of Primary Sampling Units (PSU)	136	82	101	218
Number of households interviewed	3,662	2,168	2,435	5,830
Number of eligible women interviewed	3,191	2,200	2,010	5,391
Average number of interviewed women per PSU	23.5	26.8	19.9	24.7
Household response rate	97.5	97.8	97.5	97.6
Individual response rate	93.5	95.0	93.7	94.1
Overall response rate	91.1	92.9	91.3	91.8

Note: Eligible women are defined as ever-married women age 15-49 who stayed in the household the night before the interview. This table is based on the unweighted sample.

III. RESULTS

A. HOUSEHOLD CHARACTERISTICS

A sociodemographic profile of the household sample covered in NFHS-2 in Maharashtra is presented in this section. Table 2 shows the distribution of the usual-resident household population based on the weighted sample by selected characteristics, namely age, sex, marital status, female education, and male education. There are 29,917 persons in the weighted sample.[2]

The age distribution of the household population shows that the child population (0-14 years) is proportionately larger in rural areas (35 percent) than in urban areas (30 percent). This is as expected, because fertility is higher in rural areas than in urban areas. The overall sex ratio for the state as a whole is 932 females per 1,000 males. The urban sex ratio, at 885, is much lower than the rural sex ratio, at 968. This differential is likely to be the result of sex-selective migration to urban areas favoring males.

The data on marital status show that among women age 15 years or older, 69 percent are currently married, 14 percent are widowed, 15 percent have never been married and 2 percent are divorced, separated, or deserted. A negligible proportion of women age 15 years or more were reported as married but whose *gauna* ceremony had not yet been performed. The percentage of never married women is higher in urban areas (20 percent) than in rural areas (11 percent). This is as expected, since rural women tend to marry at younger ages than urban women.

The data on education levels of the population age six and above show that the proportion of females who are illiterate (39 percent) is more than twice the proportion of males who are illiterate (17 percent). For both males and females, literacy levels are substantially higher in urban areas than in rural areas. The proportion of females with at least a high school education is also much higher in urban areas (25 percent) than in rural areas (7 percent).

[2]The sample is designed so that the weighted total sample size is the same for households and women as the unweighted total sample size. This equality does not generally hold, however, for subgroups of the population.

Table 2 Background characteristics of the household population

Percent distribution of the usual-resident household population in the survey by background characteristics, Maharashtra, 1999

Background characteristic	Urban	Rural	Total
Age			
0-4	9.3	10.6	10.0
5-9	9.9	11.8	11.0
10-14	10.6	12.8	11.9
15-19	11.2	9.7	10.3
20-24	10.9	8.1	9.3
25-29	9.6	7.9	8.6
30-34	7.6	7.5	7.6
35-39	7.1	6.7	6.8
40-44	5.6	5.2	5.4
45-49	4.8	4.0	4.3
50-54	3.7	3.4	3.5
55-59	2.8	3.0	2.9
60-64	2.5	3.4	3.0
65+	4.5	6.1	5.4
Total population	12,839	17,078	29,917
Sex			
Male	53.0	50.8	51.8
Female	47.0	49.2	48.2
Total population	12,839	17,078	29,917
Sex ratio (females per 1,000 males)	885	968	932
Marital status of women age 15+			
Currently married	65.0	71.5	68.7
Married, *gauna* not performed	0.1	0.2	0.1
Separated	0.5	0.7	0.6
Deserted	0.7	0.8	0.8
Divorced	0.6	0.6	0.6
Widowed	12.7	14.8	13.9
Never married	20.4	11.4	15.3
All women age 15+	4,202	5,501	9,703
Female education[1]			
Illiterate	25.2	48.6	38.8
Literate, < primary school complete	17.7	18.7	18.3
Primary school complete	19.4	16.5	17.7
Middle school complete	12.7	9.1	10.6
High school complete	12.4	4.4	7.8
Higher secondary complete and above	12.6	2.6	6.8
All females age 6+	5,325	7,328	12,653
Male education[1]			
Illiterate	10.3	23.0	17.4
Literate, < primary school complete	17.9	24.4	21.5
Primary school complete	18.6	19.2	18.9
Middle school complete	17.2	14.8	15.9
High school complete	16.8	10.3	13.2
Higher secondary complete and above	19.2	8.3	13.1
All males age 6+	6,041	7,562	13,603

Note: This table and all subsequent tables are based on the weighted sample.
[1]In this report, "primary school complete" means 5-7 completed years of education, "middle school complete" means 8-9 completed years of education, "high school complete" means 10-11 completed years of education, and "higher secondary complete and above" means 12 or more completed years of education.

B. CHARACTERISTICS OF RESPONDENTS

Table 3 shows the distribution of respondents (ever-married women age 15-49 years who stayed in the household the night before the interview) by selected background characteristics. Forty-seven percent of respondents in Maharashtra are below age 30. The age distributions of rural and urban respondents are similar with the exception that the proportion of women age 15-19 in rural areas (12 percent) is twice the proportion in urban areas (6 percent). Out of 5,391 women interviewed, 92 percent are currently married, 5 percent are widowed, and 3 percent are divorced, separated, or deserted.

Table 3 also shows that the majority (56 percent) of ever-married women in Maharashtra did work other than their own housework during the 12 months preceding the survey. Among all respondents, 21 percent worked either on a family farm or family business, 29 percent were employed by someone else, and 6 percent were self-employed. The proportion of women who worked in a family farm or family business or who were employed by someone else, is substantially higher in rural areas (67 percent) than in urban areas (24 percent).

Table 3 Background characteristics of respondents

Percent distribution of ever-married women age 15-49 by background characteristics, Maharashtra, 1999

Background characteristic	Urban	Rural	Total	Number of women
Age				
15-19	6.0	11.5	9.3	499
20-24	17.8	17.6	17.7	954
25-29	19.9	20.5	20.3	1,092
30-34	17.6	17.8	17.7	956
35-39	15.9	13.4	14.4	778
40-44	14.1	11.8	12.8	688
45-49	8.7	7.3	7.9	424
Marital status				
Currently married	91.7	92.3	92.1	4,963
Separated	0.8	1.1	1.0	52
Deserted	1.3	1.0	1.1	61
Divorced	0.7	0.5	0.6	32
Widowed	5.5	5.1	5.3	283
Employment status				
Working in family farm/business	3.9	32.6	20.7	1,116
Employed by someone else	20.2	34.6	28.7	1,546
Self-employed	6.9	5.9	6.3	341
Not worked in the past 12 months	69.0	26.9	44.3	2,388
Education				
Illiterate	29.0	55.6	44.6	2,405
Literate, < primary school complete	7.5	9.7	8.8	473
Primary school complete	20.8	16.2	18.1	975
Middle school complete	12.4	9.6	10.8	582
High school complete	15.8	5.6	9.8	529
Higher secondary complete and above	14.4	3.3	7.9	427
Number of women	2,229	3,162	5,391	5,391

Regarding educational qualifications, 45 percent of respondents are illiterate, and only 18 percent have completed high school or gone on to a higher level. Urban respondents are substantially more educated than rural respondents. For example, the percentage of respondents who have completed at least high school is 30 percent in urban areas and only 9 percent in rural areas.

C. WOMEN'S AUTONOMY

NFHS-2 also provides information on selected indicators of women's autonomy and status. The indicators in Table 4 pertain to women's participation in household decisionmaking, freedom of movement and access to money. Only 7 percent of respondents are not involved in any household decisionmaking at all. Eighty-eight percent are involved in decisions about cooking, 50 percent each in decisions about their own health care and purchases of jewellery and other major items, and 44 percent in decisions about going to stay with parents or siblings. Regarding freedom of movement, 49 percent of respondents do not need permission to go to the market, and 32 percent do not need permission to visit relatives or friends. Sixty-four percent of respondents are allowed to have at least some money that they can spend as they wish.

Table 4 also shows differences in the indicators of women's autonomy by selected background characteristics. In general, all three indicators of autonomy, participation in household decision-making, freedom of movement and access to some money, increase with age. The proportion not involved in any decision making does not vary substantially by residence, although women's participation in some of the specific decisions does vary substantially by residence. For example, 58 percent of urban women participated in decisions with regard to their own health compared with 44 percent of rural women. Urban women are also much more likely than rural women to have freedom of movement and to have access to some money. Women who are working on a family farm or in a family business are less likely than women in any other employment category to participate in most of the household decisions, to have freedom of movement or to have access to money. Women who have completed at least high school are more likely than women in other educational categories to participate all decisions, except decisions about food, and to have freedom of movement. Access to money increases steadily with the level of education: 55 percent of illiterate women have access to some money they can spend as they wish compared with 84 percent of women who have completed at least high school. Jain women are more likely than women of any other religion to not participate in any decision making, however, they are more likely than women of any other religion to have access to money. Women's participation in decision making does not vary much by caste/tribe status; however, compared with women in any other caste/tribe status, women who do not belong to a schedule caste, scheduled tribe or other backward class are somewhat less likely to have freedom of movement, and scheduled tribe women are less likely to have access to money.

Table 4 Women's autonomy

Percentage of ever-married women involved in household decisionmaking, percentage of women with freedom of movement and percentage of women with access to money by background characteristics, Maharashtra, 1999

Background characteristic	Percentage not involved in any decision-making	Percentage involved in decisionmaking about:				Percentage who do not need permission to:		Percentage with access to money	Number of women
		Cooking	Own health care	Purchase of jewellery, etc.	Staying with parents/ siblings	Go to the market	Visit friends/ relatives		
Age									
15-19	24.9	67.0	31.1	29.8	26.3	21.3	13.0	44.4	499
20-24	12.7	80.2	41.6	40.7	37.1	36.8	25.0	55.8	954
25-29	7.1	88.0	50.4	49.8	41.6	45.0	26.9	62.3	1,092
30-34	3.7	91.7	51.4	54.7	45.9	51.9	29.6	66.4	956
35-39	1.9	94.9	54.7	58.7	54.0	58.0	39.9	72.8	778
40-44	1.0	93.9	60.9	59.5	54.4	65.1	49.0	74.8	688
45-49	1.2	93.2	59.5	56.9	52.0	63.4	48.1	73.7	424
Residence									
Urban	6.3	87.1	58.3	55.2	49.1	64.8	41.6	73.6	2,229
Rural	7.8	87.8	44.0	46.8	41.1	37.0	25.5	57.6	3,162
Employment status									
Working in family farm/business	9.9	84.9	43.9	43.2	38.7	34.1	24.6	52.1	1,116
Employed by someone else	5.3	90.3	54.5	52.9	49.1	49.2	34.4	64.7	1,546
Self-employed	5.1	91.1	44.1	65.0	49.6	54.3	37.8	75.6	341
Not worked in the past 12 months	7.4	86.4	50.5	49.8	43.3	53.9	33.3	67.9	2,388
Education									
Illiterate	5.8	89.6	46.7	50.6	42.4	40.7	29.1	54.6	2,405
Lit., < middle school complete	7.8	87.9	49.0	48.6	43.0	49.0	29.7	65.0	1,448
Middle school complete	12.8	81.7	47.7	43.5	38.4	48.7	29.7	69.7	582
High school complete and above	6.2	85.1	60.7	56.2	55.1	67.1	44.7	83.8	956
Religion									
Hindu	7.2	87.8	49.3	49.7	44.3	47.2	31.6	62.6	4,318
Muslim	7.7	85.4	48.3	48.3	40.4	50.2	32.4	71.0	531
Christian	9.0	79.8	67.3	60.2	55.0	57.0	37.6	69.4	71
Buddhist	4.7	89.3	57.2	57.4	51.7	57.3	37.0	70.5	368
Jain	12.4	83.9	47.6	47.6	35.2	62.2	33.1	73.8	68
Other	(4.1)	(83.8)	(41.0)	(56.5)	(40.9)	(47.9)	(28.4)	(65.2)	36
Caste/tribe									
Scheduled caste	5.4	88.9	52.4	52.6	50.4	53.9	32.6	68.3	728
Scheduled tribe	6.5	87.1	46.3	50.5	44.0	46.6	32.1	53.5	552
Other backward class	7.3	87.5	47.3	50.9	42.8	53.9	36.2	67.4	1,162
Other[1]	7.6	87.3	51.1	49.4	43.5	45.3	30.4	64.0	2,923
Total	7.2	87.5	49.9	50.3	44.4	48.5	32.1	64.2	5,391

Note: Total includes 25 women with missing information on caste/tribe, who are not shown separately.
( ) Based on 25-49 unweighted cases
[1]Women who do not belong to a scheduled caste, a scheduled tribe, or an other backward class.

D. FERTILITY AND REPRODUCTIVE PREFERENCES

Fertility levels have been estimated from the birth history data collected for each eligible woman in the survey. The fertility estimates pertain to the three-year period immediately preceding the survey, which, in Maharashtra, corresponds roughly to the period from 1996 to 1998. Estimates of age-specific fertility rates and total fertility rates (TFR) are shown in Table 5 and Figure 1.

The NFHS-2 estimate of the TFR for the state as a whole is 2.52 children per woman, which is the average number of children that would be born to a woman if she experienced current age-specific fertility rates (for the three-year period before the survey) as she lived through her reproductive years, ages 15-49. By way of comparison, the level of the TFR in the state as estimated by the Sample Registration System was 2.7 in 1997. Under the age schedule of fertility estimated from NFHS-2, in Maharashtra, a rural woman would have, on average, 0.5 more children than an urban woman.

Table 5 also shows how fertility changed between NFHS-1 and NFHS-2. Over the six-year period between the two surveys, the TFR for women age 15-49 decreased by 0.3 children in urban areas and by 0.4 children in rural areas. Fertility has declined by about 12 percent in both rural and urban areas.

Table 5 Current fertility

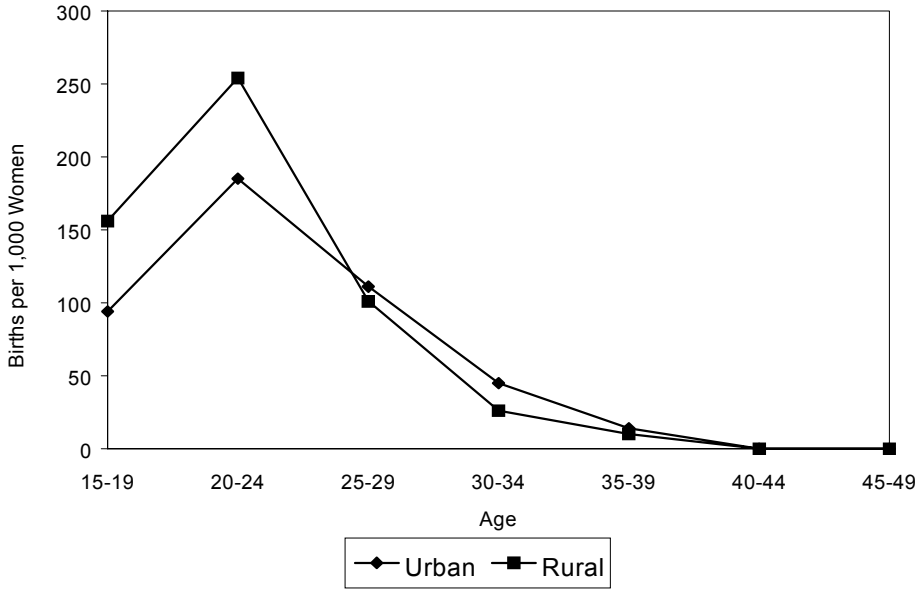
Age-specific and total fertility rates (TFR) for the three-year period preceding the survey, NFHS-1 and NFHS-2, Maharashtra

	Age-specific fertility rates					
	Urban		Rural		Total	
Age	NFHS-1 1990-92	NFHS-2 1996-98	NFHS-1 1990-92	NFHS-2 1996-98	NFHS-1 1990-92	NFHS-2 1996-98
15-19	0.088	0.094	0.183	0.156	0.141	0.129
20-24	0.196	0.185	0.252	0.254	0.227	0.223
25-29	0.151	0.111	0.118	0.101	0.132	0.106
30-34	0.054	0.045	0.052	0.026	0.053	0.034
35-39	0.014	0.014	0.010	0.010	0.012	0.012
40-44	0.003	0.000	0.009	0.000	0.006	0.000
45-49	0.000	0.000	0.000	0.000	0.000	0.000
TFR 15-49	2.54	2.24	3.12	2.74	2.86	2.52
TFR 15-44	2.54	2.24	3.12	2.74	2.86	2.52

The age pattern of fertility reveals a peak in the age group 20-24 years. This is true for both urban and rural areas. Fertility shows a sharp decline beyond the age of 25 years. Age-specific fertility rates in rural areas are higher than the corresponding urban rates for women age 15-24 years, but are lower than the corresponding urban rates for women age 25-39. The contribution of older women (35 years and above) to fertility in Maharashtra is marginal both in urban (3 percent) and in rural areas (2 percent).

Figure 1

Age-specific Fertility Rates by Residence



Note: Rates are for the three years preceding the survey

NFHS-2, Maharashtra, 1999

Future fertility preferences of currently married women, classified by the number of living children that a woman has, are shown in Table 6 and Figure 2. Overall, 20 percent of women in Maharashtra do not want any more children, and an additional 55 percent cannot have another child because either the wife or the husband has been sterilized or the woman says she cannot get pregnant. About one-fourth (24 percent) of all women say they would like to have another child. Among women who want another child 39 percent say they would like to wait at least two years before the birth of the next child. Only 10 percent of all women say they want a child within two years. The results also show that the desire to stop childbearing increases rapidly with the number of living children. Only 12 percent of women with no living children report that they either do not want any children or cannot have any children because of a sterilization operation or for other reasons. This percentage is calculated by adding the percentages in the rows "Want no more", "Sterilized", and "Declared infecund". This figure rises to 83 percent for women with two living children and to 97 percent for those with four or more living children. A very negligible number of women (0.3 percent) say that the decision about having any (more) children is up to God.

Table 6 Reproductive preferences by number of living children

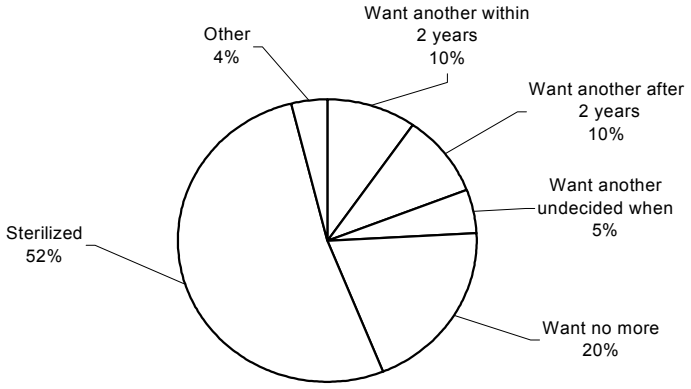
Percent distribution of currently married women by desire for children, according to number of living children, Maharashtra, 1999

Desire for children	Number of living children					Total
	None	One	Two	Three	Four or more	
Want another						
Within 2 years	43.2	20.6	5.9	2.4	0.7	9.8
After 2 years	24.5	31.5	5.7	2.4	1.1	9.5
Undecided when	19.2	10.3	3.4	1.5	0.7	4.9
Undecided	0.4	2.0	1.8	0.7	0.4	1.0
Up to God	0.6	0.3	--	0.1	0.5	0.3
Want no more	1.3	26.8	31.8	15.0	16.2	19.8
Sterilized	1.5	5.3	49.9	76.9	78.6	52.3
Declared infecund	9.5	3.3	1.5	0.8	1.8	2.5
Missing	--	--	--	0.1	--	--
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	513	719	1,263	1,343	1,126	4,963

-- Less than 0.05 percent

Figure 2

Fertility Preferences Among Currently Married Women Age 15-49



Note: Percentages add to more than 100 due to rounding

NFHS-2, Maharashtra, 1999

E. FAMILY PLANNING

In NFHS-2, women were asked about their knowledge of specific contraceptive methods and whether they had ever used each of the methods they knew about. In addition, women were asked if they were currently using a method. Women who said they were using a method were asked which method they were using. Women were also asked about their source of contraceptives and the kind of care they received from health and family planning workers.

Knowledge of Family Planning

In the contraception section of the NFHS-2 Woman's Questionnaire, women were asked whether they had heard of each of seven contraceptive methods. If a respondent did not know a method just by its name, the interviewer read a description of the method to her. For each method about which a woman was aware, she was asked if she had ever used that method.

Table 7 and Figure 3 contain information on currently married women's awareness of specific methods. Knowledge of at least one modern method of family planning (either spontaneously or after probing) is nearly universal in both urban and rural areas.

Women are most familiar with female sterilization (99 percent), followed by male sterilization (88 percent), the pill (84 percent), the IUD (80 percent) and the condom (72 percent). Each of these methods is known by more than 86 percent of women in urban areas and 62 percent of women in rural areas. The proportion of women who know about at least one traditional method is also higher in urban areas (43 percent) than in rural areas (28 percent). Overall, 35 percent of the women know of at least one traditional method of contraception.

Ever Use of Family Planning

Among currently married women age 15-49 in Maharashtra, 66 percent have ever used a contraceptive method, 65 percent have ever used a modern method, and 4 percent have ever used a traditional method (Table 7). Among modern methods, female sterilization is the most popular (49 percent), followed by the condom (11 percent), the pill (9 percent), the IUD (7 percent) and male sterilization (4 percent). Among traditional methods, 3 percent of respondents have used the rhythm or safe-period method, and 1 percent have used withdrawal. Ever use of any modern method does not vary by urban-rural residence, however, ever use of all temporary modern methods is much higher in urban areas than in rural areas. It is particularly notable that 17 percent of urban women have used a condom compared with 7 percent of rural women.

Table 7 Knowledge, ever use and current use of family planning methods

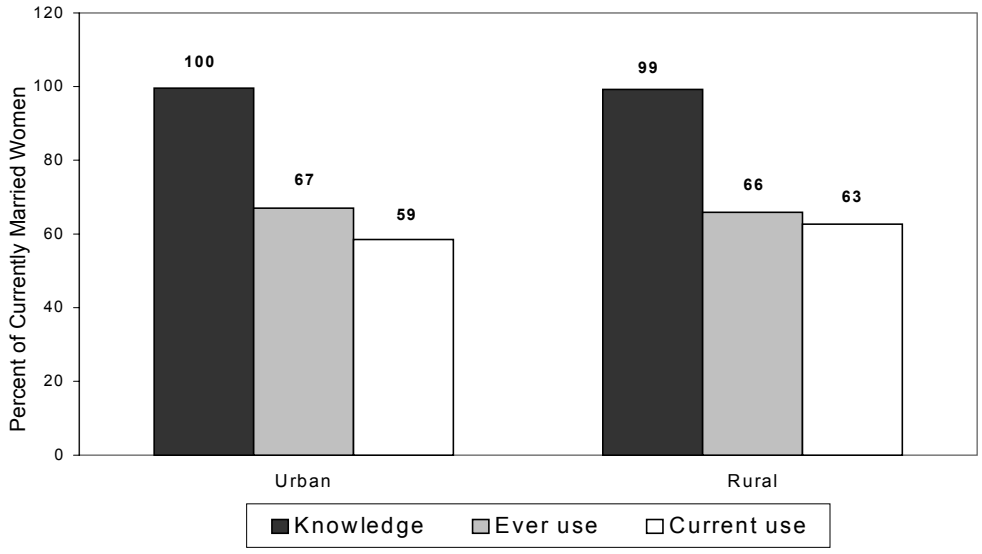
Percentage of currently married women by knowledge, ever use and current use of family planning methods, Maharashtra, 1999

Contraceptive method	Percentage who know method	Percentage who ever used method	Percentage currently using method
	URBAN		
Any method	99.6	67.0	58.5
Modern method	99.6	65.5	56.7
Pill	92.5	12.4	2.5
IUD	87.7	12.0	3.5
Condom	85.8	16.6	5.6
Female sterilization	99.2	43.6	43.6
Male sterilization	89.3	1.6	1.5
Traditional method	43.1	5.8	1.7
Rhythm/safe period	41.1	5.2	1.4
Withdrawal	23.2	1.5	0.3
Other method[1]	2.7	0.2	0.1
Number of women	2,044	2,044	2,044
	RURAL		
Any method	99.2	65.9	62.7
Modern method	99.2	65.3	62.1
Pill	78.3	6.5	1.2
IUD	74.4	4.1	0.8
Condom	61.8	7.2	2.9
Female sterilization	98.8	52.0	51.9
Male sterilization	86.5	5.7	5.3
Traditional method	28.4	2.3	0.4
Rhythm/safe period	26.4	1.7	0.2
Withdrawal	15.3	1.1	0.2
Other method[1]	1.0	0.3	0.1
Number of women	2,919	2,919	2,919
	TOTAL		
Any method	99.4	66.4	60.9
Modern method	99.4	65.4	59.9
Pill	84.1	8.9	1.7
IUD	79.9	7.4	1.9
Condom	71.7	11.1	4.0
Female sterilization	98.9	48.5	48.5
Male sterilization	87.6	4.0	3.7
Traditional method	34.5	3.7	1.0
Rhythm/safe period	32.4	3.1	0.7
Withdrawal	18.6	1.3	0.3
Other method[1]	1.7	0.3	0.1
Number of women	4,963	4,963	4,963

[1]"Other method", which in the questionnaire was a write-in (not pre-coded) category, may be either modern or traditional.

Figure 3

Knowledge and Use of Family Planning Methods Among Currently Married Women Age 15-49



NFHS-2, Maharashtra, 1999

Current Use of Family Planning

Regarding current use of contraception, Table 7 shows that 61 percent of currently married women age 15-49 are using some method of contraception. Sixty percent are using a modern method and 1 percent are using a traditional method. The NFHS-1 estimates for modern and traditional method use were 53 percent and 1 percent, respectively. There has been an increase of 13 percent (7 percentage points) in the use of modern methods of contraception over the six-year period between NFHS-1 and NFHS-2.

In Maharashtra, as in almost all other Indian states, female sterilization is the most popular contraceptive method, used by 49 percent of currently married women. Male sterilization is used by 4 percent, oral contraceptive pills by 2 percent, IUDs by 2 percent, condoms by 4 percent, the rhythm or safe-period method by 1 percent, and withdrawal by less than 1 percent.

In Maharashtra, contraceptive prevalence is higher in rural areas (63 percent) than in urban areas (59 percent). The prevalence of modern methods is also higher in rural areas (62 percent) than in urban areas (57 percent). The higher contraceptive

Table 8 Current use of family planning methods by background characteristics

Percent distribution of currently married women by contraceptive method currently used, according to background characteristics, Maharashtra, 1999

Background characteristic	**Any method**	**Modern method**	Pill	IUD	Condom	Female sterilization	Male sterilization	**Traditional method**	Rhythm/ safe period	Withdrawal	**Other method** [1]	**Not using any method**	Total percent	Number of women
Age														
15-19	6.5	6.2	0.9	0.9	1.2	3.2	--	0.3	--	0.3	--	93.5	100.0	490
20-24	34.5	33.0	3.3	3.0	6.7	20.1	--	1.5	1.3	0.2	--	65.5	100.0	922
25-29	65.4	65.2	3.3	2.9	5.4	52.1	1.5	0.3	0.2	0.1	--	34.6	100.0	1,032
30-34	80.7	79.1	0.6	2.9	5.4	68.4	1.8	1.4	0.9	0.5	0.3	19.3	100.0	891
35-39	77.9	76.6	1.2	0.7	2.0	67.8	4.9	1.3	1.2	0.2	--	22.1	100.0	697
40-44	80.1	78.7	0.6	0.5	1.9	65.5	10.1	1.2	0.8	0.3	0.3	19.9	100.0	582
45-49	77.5	77.0	--	--	0.9	58.3	17.7	0.5	0.4	0.1	--	22.5	100.0	350
Residence														
Urban	58.5	56.7	2.5	3.5	5.6	43.6	1.5	1.7	1.4	0.3	0.1	41.5	100.0	2,044
Rural	62.7	62.1	1.2	0.8	2.9	51.9	5.3	0.4	0.2	0.2	0.1	37.3	100.0	2,919
Education														
Illiterate	62.5	62.2	0.5	0.2	0.3	55.0	6.2	0.2	0.2	0.1	0.1	37.5	100.0	2,17
Lit., < middle school complete	63.3	63.1	2.4	1.3	2.4	54.4	2.6	0.2	0.2	--	--	36.7	100.0	1,322
Middle school complete	50.7	48.2	2.2	3.1	4.8	37.0	1.0	2.3	1.7	0.6	0.2	49.3	100.0	553
High school complete and above	60.0	56.9	3.5	6.3	14.7	31.2	1.2	3.0	2.2	0.8	--	40.0	100.0	916
Number of living children														
None	3.5	3.1	0.5	0.1	1.1	0.6	0.9	0.4	0.1	0.3	--	96.5	100.0	513
1	25.0	23.0	3.5	4.3	9.9	3.5	1.8	1.8	1.4	0.4	0.2	75.0	100.0	719
2	64.2	62.4	2.4	3.6	6.5	47.0	3.0	1.8	1.6	0.1	--	35.8	100.0	1,263
3	82.0	81.4	1.2	1.1	2.2	72.2	4.7	0.5	0.2	0.3	--	18.0	100.0	1,343
4+	81.4	80.8	1.1	0.4	0.9	72.4	6.0	0.4	0.1	0.3	0.3	18.6	100.0	1,126
Total 15-49	60.9	59.9	1.7	1.9	4.0	48.5	3.7	1.0	0.7	0.3	0.1	39.1	100.0	4,963
Total 15-44	59.7	58.6	1.9	2.1	4.2	47.7	2.7	1.0	0.7	0.3	0.1	40.3	100.0	4,613

-- Less than 0.05 percent

[1] "Other method", which in the questionnaire was a write-in (not pre-coded) category, may be either modern or traditional.

prevalence rate in rural areas is due to the much higher rates of female and male sterilization in rural areas (57 percent) than in urban areas (45 percent). The use of each of the modern spacing methods and of the traditional methods is, however, higher in urban areas than in rural areas.

Differences in rates of current contraceptive use for population subgroups are shown in Table 8. The use of any method increases sharply with respondents' age through age 30-34 (where it reaches 81 percent) and declines thereafter. Female sterilization is the single most popular method at all ages. Modern contraceptive use is lower among more educated women than among illiterate or less educated women, and is lowest among women who have completed only middle school. Among modern methods, the use of female and male sterilization decreases with education, whereas, the use of spacing methods increases with education. One percent of illiterate women are currently using a modern spacing method compared with 25 percent of women who have completed at least high school. More substantial differences in current use are found by number of living children. Current use of modern methods increases from 3 percent for women with no living children to 81 percent for women with three or more living children. There is also a clear shift from reliance on non-terminal methods among women with fewer than two living children (who may be primarily interested in spacing children) to female sterilization among women with two or more living children (who are likely to have achieved their desired family size).

Source of Methods

In NFHS-2, women who reported use of a modern method of contraception at the time of the survey were asked where they had obtained the method the last time. Results are presented in Table 9.

In Maharashtra the majority (75 percent) of users get their contraceptive method from a public-sector source. Private-sector medical institutions provide methods to another 21 percent of users, 2 percent of users obtain their supply from a shop, and 1 percent each from an NGO or trust hospital or clinic and other sources.

There are some differences in the source of contraceptive methods between urban and rural areas, although the public sector is the main source for the majority of both urban and rural users. Fifty-nine percent of urban users of modern methods obtain their supply from a public sector source. In rural areas, the public sector is even more dominant, with 86 percent of users obtaining their supply from this sector alone. The private sector is the prime source of supply for pills and condoms in both urban and rural areas. Shops are the source of condoms for 21 percent of urban condom users but for only 5 percent of rural condom users.

Table 9 Source of modern contraceptive methods

Percent distribution of current users of modern contraceptive methods by source of method, according to specific method, Maharashtra, 1999

Source of method	Contraceptive method					
	Pill	IUD	Condom	Female sterilization	Male sterilization	**All modern methods**[1]
			URBAN			
Public medical sector	10.6	28.1	14.4	69.4	(77.0)	59.1
NGO/Trust hospital/clinic	--	9.2	--	1.5	(--)	1.7
Private medical sector	73.0	62.7	55.9	28.1	(23.0)	34.8
Shop	15.1	--	21.4	--	(--)	2.8
Other	0.7	--	2.0	0.9	(--)	0.9
Don't know[2]	0.6	--	6.3	--	(--)	0.7
Missing	--	--	--	0.1	(--)	0.1
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Number of users	50	71	115	891	31	1,159
			RURAL			
Public medical sector	(28.6)	*	27.3	89.9	96.4	85.5
NGO/Trust hospital/clinic	(--)	*	--	0.5	0.9	0.5
Private medical sector	(51.4)	*	60.9	9.4	1.8	12.7
Shop	(20.0)	*	5.2	--	--	0.6
Other	(--)	*	1.6	0.1	0.9	0.2
Don't know[2]	(--)	*	5.0	--	--	0.2
Missing	(--)	*	--	0.2	--	0.2
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Number of users	36	24	84	1,514	154	1,814
			TOTAL			
Public medical sector	18.1	29.8	19.9	82.3	93.1	75.2
NGO/Trust hospital/clinic	--	6.8	--	0.9	0.7	1.0
Private medical sector	64.0	63.4	58.0	16.3	5.4	21.3
Shop	17.2	--	14.5	--	--	1.5
Other	0.4	--	1.8	0.4	0.7	0.5
Don't know[2]	0.4	--	5.8	--	--	0.4
Missing	--	--	--	0.2	--	0.1
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Number of users	87	96	199	2,405	186	2,972

Note: NGO denotes a nongovernmental organization.
( ) Based on 25-49 unweighted cases
*Percentages not shown; based on fewer than 25 unweighted cases
-- Less than 0.05 percent
[1]In this table, "all modern methods" refers to the five modern methods indicated.
[2]For pill and condom, includes women who say their husband or a friend or other relative obtained the method, but they do not know the original source of supply

Quality of Family Planning Services

One of the most important factors influencing family planning use is the quality of family planning services, which has been receiving increasing emphasis in the government's reproductive and child health care efforts. Table 10 shows, by urban-rural residence, the percentage of current users of contraception who were told about

other methods by the person who motivated them to use their current method. The table also shows the percentage of current users who were told about side effects or other problems associated with the method by a health or family planning worker at the time of accepting the method, and the percentage who received follow-up services from any source after accepting the method.

Among all current users, 19 percent were told about other methods by the person who motivated them to use their current method and 22 percent were told about side effects or other problems by a health or family planning worker at the time of accepting the current method. Twenty-five percent of women in urban areas and 15 percent of women in rural areas were told about other methods of family planning. The proportion of urban users (20 percent) told about possible side effects is only slightly smaller than the proportion of rural users (23 percent) told about side effects. These results indicate that the provision of counselling services which would permit women to make an informed contraceptive choice continue to be available to only a small minority of both the urban and rural populations.

With regard to follow-up services after accepting the method, about 72 percent of current users report having received such services. The proportion who received follow-up services was higher in urban areas (78 percent) than in rural areas (68 percent).

Table 10 Quality of family planning services

Percentage of current users of modern contraceptive methods who were told about other methods, who were told about side effects or other problems and who received follow-up services by residence, Maharashtra, 1999

Residence	Percentage who were told about other methods by motivator[1]	Number of users[1]	Percentage who were told about side effects or other problems with current method[2]	Percentage who received follow up after acceptance of current method	Number of users
Urban	24.6	597	19.6	77.5	1,159
Rural	15.0	1,053	22.7	67.7	1,814
Total	18.5	1,651	21.5	71.5	2,972

[1]Excludes women who were self motivated.
[2]By a health and family planning worker at the time of accepting the current method

F. QUALITY OF CARE

Table 11 shows additional quality-of-care indicators that pertain to the last home visit by a health practitioner or to the last visit by the respondent to a health facility during the 12 months preceding the survey, specified by source of services received (public or private/NGO[3]) and by the type of visit (home visit or visit to a health facility). In this table, the visit could be for any health-related reason or for family planning or for both. Regarding home visits, 71 percent were for health only, 3 percent were for family planning only, and 3 percent were for both family planning and health. Almost all home visits were made by health workers in the public sector. Ninety-three percent of respondents said that the health worker spent enough time with them and 84 percent said the worker talked nicely to them.

Regarding visits to a health facility, 98 percent were for health only, less than 1 percent were for family planning only, and 2 percent were for both. The proportion of visits that were for health services only is slightly higher in the private/NGO sector (98 percent) than in the public sector (96 percent). Almost all the respondents in both the private/NGO sector and the public sector, actually received the services they went for. On all other indicators of quality, the private/NGO sector performs better than the public sector. The median waiting time is about half as long in the private/NGO sector (15 minutes) than in the public sector (29 minutes). Ninety-nine percent of respondents who went to a private/NGO health facility said that the staff spent enough time with them compared with 96 percent of respondents who went to a public health facility. The proportion of respondents reporting that the health practitioner spoke nicely to them is also higher in the private/NGO sector (87 percent) than in the public sector (80 percent), as is the proportion reporting that their need for privacy was respected (96 percent in the private/NGO sector compared with 91 percent in the public sector). Finally, the proportion who rated the facility as very clean is also higher in the private/NGO sector (88 percent) than in the public sector (72 percent).

[3] An NGO is a nongovernmental organization.

Table 11 Quality of care

Quality-of-care indicators for last home visit/visit to a health facility within the last 12 months by public/private source of service and by type of visit, Maharashtra, 1999

Quality indicator	Source of most recent service received		
	Public sector	Private sector/NGO	Total
HOME VISIT			
Percentage who received different services			
Family planning only	3.2	*	3.1
Health only	70.6	*	70.9
Both	3.1	*	3.1
Only other services received	23.1	*	22.9
Percentage who said worker spent enough time with her	92.4	*	92.5
Percentage who said worker talked to her			
Nicely	83.2	*	83.5
Somewhat nicely	15.0	*	14.7
Not nicely	1.8	*	1.7
Missing	0.1	*	0.1
Number receiving home visit	1,244	18	1,262
VISIT TO A HEALTH FACILITY			
Percentage who went for different services			
Family planning only	0.5	0.2	0.3
Health only	95.6	98.2	97.5
Both	3.9	1.5	2.2
Percentage who received service they went for	98.8	99.9	99.6
Median waiting time (minutes)	29.1	14.5	14.9
Percentage who said the staff spent enough time with her	95.6	98.6	97.7
Percentage who said staff talked to her			
Nicely	79.5	86.7	84.6
Somewhat nicely	19.9	13.0	15.0
Not nicely	0.6	0.3	0.4
Percentage who said staff respected her need for privacy[1]	90.7	95.5	94.2
Percentage who rated facility as			
Very clean	72.1	87.6	83.2
Somewhat clean	27.4	12.2	16.6
Not clean	0.5	0.1	0.2
Number visiting a health facility	1,131	2,803	3,934

Notes: NGO denotes a nongovernmental organization. Cases where the source of service was neither public sector nor private sector/NGO are excluded from the table.
*Percentages not shown; based on fewer than 25 unweighted cases
[1]Based on women who said they needed privacy

G. MATERNAL CARE

Safe motherhood and child survival constitute one of the most important programmes run by the Government of India. Proper care during the antenatal period and during delivery is crucial for the good health of both the mother and the child. In NFHS-2, respondents who gave birth to at least one child during the three years preceding the survey were asked a series of questions about maternal care and services received for each of the two most recent births during that period. Results from these questions are shown in Tables 12 and 13.

Table 12 shows that, by and large, women in Maharashtra made substantial use of antenatal care services for their births during the three years preceding the survey. Seventy-five percent of women received at least two tetanus toxoid injections during pregnancies leading to live births in the last three years. Although 85 percent received iron/folic acid (IFA) tablets or syrup, only 72 percent received the recommended three-month course of IFA. Mothers of 86 percent of births received antenatal check-ups outside the home and an additional 5 percent received antenatal check-ups through home visits only. For 69 percent of pregnancies, women visited doctors and for 17 percent they visited other health practitioners.

Analysis of the data by current age of mother shows that the level of utilization of antenatal services is higher among younger women (age 15-34) than among older women (age 35-49). Consistent with this finding, level of utilization is also higher among women of lower parities than among women of higher parities. Analysis by place of residence shows that antenatal services are utilized more by urban women than by rural women. Higher-educated women are much more likely to utilize antenatal care services than less-educated women. Education is also positively associated with the likelihood of getting care from doctors. The proportion who received antenatal care from a doctor is 48 percent for illiterate women compared with 94 percent for women who have completed at least high school.

Another important aspect of maternal and child care services is encouraging institutional deliveries and conducting deliveries under the supervision of trained health professionals, in order to ensure safe delivery and better health of the mother and child. NFHS-2 accordingly asked women, for the two most recent births that occurred during the three years preceding the survey, where they gave birth and who assisted at the delivery.

Table 12 Antenatal care

Percentage of births whose mothers received various types of antenatal services among births in the three years preceding the survey by background characteristics, Maharashtra, 1999

Background characteristic	Received 2 or more doses of tetanus toxoid	Received iron and folic acid tablets or syrup	Received iron and folic acid tablets or syrup for 3 or more months	Received antenatal check-up only through home visit	Received antenatal check-up outside the home from:[1]			Number of births
					Doctor	Other health professional	Other person	
Mother's current age								
15-19	74.2	85.2	64.4	5.8	61.0	22.1	0.9	315
20-34	75.2	85.1	73.5	4.3	70.5	15.7	0.3	1,444
35-49	69.0	72.2	63.3	0.7	64.6	13.7	--	50
Residence								
Urban	79.4	88.6	80.0	0.8	89.6	4.4	--	707
Rural	72.0	82.3	66.2	6.9	55.3	24.7	0.6	1,103
Mother's education								
Illiterate	61.0	74.7	58.5	8.6	48.2	23.4	0.6	735
Lit., < middle school complete	81.5	87.8	73.9	3.4	73.8	16.6	0.6	465
Middle school complete	84.1	91.2	81.4	0.6	83.8	12.4	--	260
High school complete and above	88.4	97.3	88.8	0.1	93.7	6.2	--	351
Birth order								
1	82.7	90.7	78.7	1.7	78.5	13.4	0.5	594
2-3	74.3	84.2	70.4	5.2	67.3	18.5	0.5	890
4-5	63.2	78.0	65.2	6.4	56.6	20.1	--	251
6+	58.5	67.4	51.7	12.3	49.0	12.2	--	75
Total	74.9	84.8	71.6	4.5	68.7	16.8	0.4	1,810

Note: Table includes only the two most recent births in the three years preceding the survey.
-- Less than 0.05 percent
[1]Includes all women who received an antenatal check-up outside the home, even if they also received a check-up at home from a health worker. If more than one source was mentioned, only the provider with the highest qualification is considered.

Table 13 shows that 53 percent of the deliveries took place in institutions such as government-operated district, tehsil or taluk, town or municipal hospitals, primary health centres, private hospitals and private nursing homes. A little more than half (54 percent) of institutional deliveries were conducted in private institutions where 89 percent were attended by doctors. By comparison, only 69 percent of deliveries in government institutions were attended by doctors.

Noninstitutional deliveries constituted 47 percent of all deliveries. Only 15 percent of noninstitutional deliveries were attended by a doctor or other health professional. The remaining 85 percent of noninstitutional deliveries were attended by other persons, including traditional birth attendants, relatives and friends.

Examining the data on assistance at delivery by background characteristics of respondents reveals, as expected, that delivery in institutions is more common among urban women, more educated women and women having lower-order births. Notably,

however, women age 15-19 are much less likely than older women to have an institutional delivery.

Table 13 Assistance at delivery

Percentage who received assistance at delivery among births in the three years preceding the survey by place of delivery, type of assistance and background characteristics, Maharashtra, 1999

Background characteristic	Delivered in institution				Not delivered in institution				Don't know/ missing	Total percent	Number of births
	Public		Private								
	Doctor	Other	Doctor	Other	Doctor	Other health profes-sional	TBA[1]	Other			
Mother's current age											
15-19	14.3	5.7	19.7	2.6	5.4	2.2	21.9	28.2	--	100.0	315
20-34	17.4	7.9	26.5	3.2	4.4	2.3	19.2	18.6	0.6	100.0	1,444
35-49	16.9	6.8	32.4	--	6.0	2.6	19.2	16.2	--	100.0	50
Residence											
Urban	25.5	10.6	40.8	4.0	1.3	1.9	8.8	6.9	0.2	100.0	707
Rural	11.3	5.4	15.6	2.3	6.7	2.5	26.7	28.8	0.6	100.0	1,103
Mother's education											
Illiterate	10.6	6.1	8.0	2.3	3.9	2.0	30.4	35.7	1.1	100.0	735
Lit., < middle school complete	21.7	11.0	26.0	2.9	3.3	2.7	15.5	16.8	--	100.0	465
Middle school complete	20.3	8.1	33.5	5.2	7.3	3.4	15.3	6.9	--	100.0	260
High school complete and above	20.8	5.2	55.4	2.9	5.7	1.6	6.1	2.2	--	100.0	351
Birth order											
1	22.6	6.1	31.5	3.4	5.1	2.7	16.1	12.5	--	100.0	594
2-3	14.9	8.4	24.8	2.5	4.8	2.3	21.2	20.6	0.5	100.0	890
4-5	10.9	8.2	15.3	3.4	3.1	0.7	23.7	33.0	1.7	100.0	251
6+	13.1	4.3	20.1	3.9	3.9	4.1	16.6	34.1	--	100.0	75
Total	16.8	7.5	25.5	3.0	4.6	2.3	19.7	20.2	0.5	100.0	1,810

Note: Table includes only the two most recent births in the three years preceding the survey.
-- Less than 0.05 percent
[1]TBA is a traditional birth attendant.

H. IMMUNIZATION OF CHILDREN

The Expanded Programme on Immunization (EPI) was initiated in India in 1978. Consistent with guidelines issued by the World Health Organisation (WHO), this programme has the objective of immunizing children against six preventable killer diseases: tuberculosis, polio, diphtheria, pertussis (whooping cough), tetanus, and measles. One dose of BCG vaccine for tuberculosis, one dose of measles vaccine, three doses of DPT vaccine, and three doses of polio drops should be given by the time a child is 12 months old. Booster doses of DPT and polio vaccines may be given after 12 months of age.

In order to step up the pace of immunization, the Government of India initiated a special programme called the Universal Immunization Programme (UIP) in 1985-86. This scheme has been introduced in every district of the country, and the target is to achieve 100 percent immunization coverage. Pulse Polio Immunization Campaigns

(PPIC) began in December 1995 as part of a major national effort to eliminate polio.

An immunization card is issued for each child who is brought for routine vaccinations. This card indicates the particulars of each type of vaccination (number of doses and date of each dose) received by a child[4]. Caregivers are instructed to bring the card with them for updating each time a child is vaccinated. Sometimes they forget to bring the card, however, in which case the card may be incomplete.

In NFHS-2, respondents were asked whether they had an immunization card for each child under 3 years of age. If the card was available, the interviewer was instructed to copy the dates of each vaccination on the questionnaire. Women were then asked about any vaccinations received by the child that were not listed on the card. If a child never received a vaccination card, or if the mother was unable to show the card, the purpose of the various vaccinations was explained to the mother, and she was asked if the child received those vaccinations.

Table 14 and Figure 4 present findings on completeness of vaccinations for respondents' children age 12-23 months, an age group by which children should have received all vaccinations scheduled for infancy (i.e., for the first 12 months of life). The table shows that the immunization coverage for children in Maharashtra is high but still far from 100 percent, and more effort is required to achieve universal immunization coverage for young children. Out of 591 children age 12-23 months, mothers showed a vaccination card in 49 percent of cases. Based on information recorded on the card or reported by the mother, 78 percent of these children had received all the required vaccinations, and only 2 percent had not received any of the vaccinations.

Analysis of the vaccine-specific data shows that immunization coverage of children is 94 percent for BCG, 89 percent for three doses of DPT vaccine, 91 percent for three doses of polio vaccine, and 84 percent for the measles vaccine. The coverage is about the same for DPT and polio because these two vaccines are usually administered together. The proportion of children who received DPT vaccinations decreases from 95 percent for DPT 1 to 89 percent for DPT 3, and the proportion who received polio vaccinations decreases from 97 percent for Polio 1 to 91 for Polio 3. These findings indicate some dropping out of children before completing these two series of vaccinations.

Some interesting differentials exist between population groups in the proportion of children for whom the mother showed a vaccination card. Urban respondents were more likely than rural respondents to show a card for their children. A card was also

[4] Vaccinations received in the Pulse Polio Campaign are not recorded on immunization cards, but they were included in the survey.

Table 14 Vaccinations by background characteristics

Percentage of children age 12-23 months with immunization cards seen by the interviewer, and the percentage who have received each vaccine (according to the immunization card or mother's report), by background characteristics, Maharashtra, 1999

Background characteristic	Percent-age with a card	Percentage of children age 12-23 months who received:											Number of children
		BCG	Polio0	DPT1	DPT2	DPT3	Polio1	Polio2	Polio3	Measles	All[1]	None	
Sex of child													
Male	51.5	95.5	9.7	95.8	94.0	90.6	96.4	94.4	90.9	85.3	80.3	2.1	276
Female	46.6	92.1	7.1	94.2	89.7	88.4	97.6	94.5	90.3	83.4	76.3	1.8	316
Residence													
Urban	53.6	98.3	15.1	96.4	94.4	92.2	98.7	97.7	93.1	84.3	80.4	--	229
Rural	45.9	90.8	4.0	94.0	90.0	87.7	96.0	92.4	88.9	84.3	76.8	3.2	362
Mother's education													
Illiterate	42.9	87.0	5.1	87.6	82.0	78.7	92.9	87.7	80.9	74.6	65.2	5.1	229
Lit., < middle school complete	55.4	96.4	6.2	99.2	97.4	95.5	99.2	97.4	95.0	89.0	83.8	--	166
Middle school complete	42.8	100.0	11.7	99.5	97.1	97.1	100.0	100.0	97.6	85.8	83.9	--	70
High school complete and above	54.5	98.7	15.0	100.0	98.9	96.6	100.0	99.7	98.4	94.8	91.2	--	127
Total	48.9	93.7	8.3	94.9	91.7	89.4	97.0	94.5	90.5	84.3	78.2	2.0	591
Adjusted total from NFHS-1, 1992-1993	39.2	86.9	5.9	90.0	85.9	83.1	90.4	85.5	81.8	70.2	64.3	7.5	510

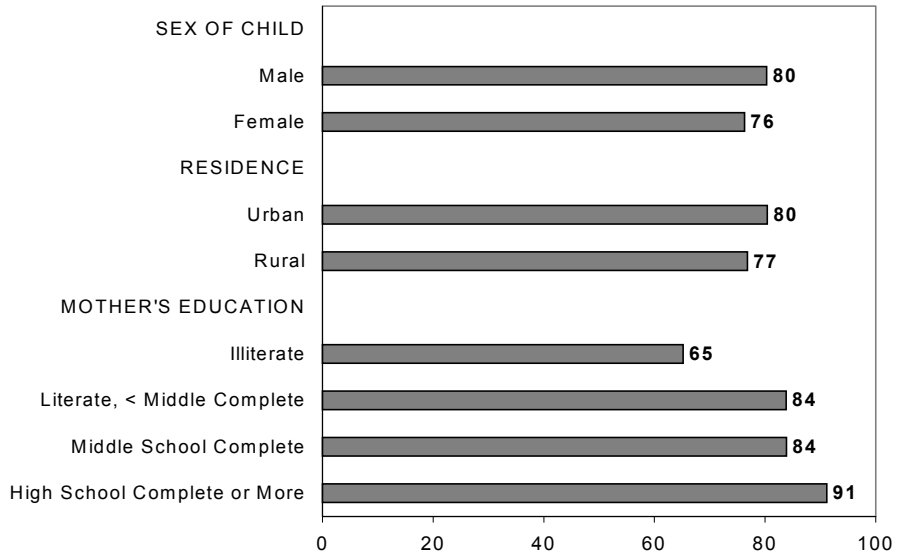
Note: Except for the last line of the table, the table is based on NFHS-2. The last line of the table shows comparable results from NFHS-1.
-- Less than 0.05 percent
[1]Children who are fully vaccinated, i.e., those who received BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio0)

shown somewhat less often for female children (47 percent) than for male children (52 percent). A card was also shown less often for children whose mothers were illiterate or had only completed middle school than for children whose mothers were in other educational categories.

Figure 4

Percentage of Children 12-23 Months

Who Have Received All Vaccinations



NFHS-2, Maharashtra, 1999

There are notable differentials in vaccination coverage by background characteristics. The largest differential is with regard to mother's education. Only 65 percent of children of illiterate mothers are fully vaccinated compared with 91 percent of children of mothers who have completed at least high school. The likelihood that a child is fully vaccinated is slightly higher for male than female children and for children in urban areas than in rural areas.

Table 14 also shows how vaccination rates have changed between NFHS-1 and NFHS-2. The proportion of children who have received no vaccinations fell from 8 percent to 2 percent over the six-year period between NFHS-1 and NFHS-2. Further, the percentage of children fully immunized increased from 64 percent in NFHS-1 to 78 percent in NFHS-2. The coverage improved for each of the different vaccines during this period.

I. CHILDHOOD DIARRHOEA

Diarrhoea is a major killer of children under five years of age in India. In order to control diarrhoea, more than a decade ago, the government launched an Oral Rehydration Therapy (ORT) Programme as one of its priority activities for child survival. Under this programme, an effort has been made to increase the awareness of women and the community at large about the dangers of dehydration from diarrhoea and how to treat dehydration. The government makes Oral Rehydration Salt (ORS) packets widely available to deal with cases of acute dehydration.

In order to assess the current situation regarding the prevalence of diarrhoea in Maharashtra and the use of oral rehydration therapy, all respondents were asked a series of questions about diarrhoea and its treatment among children under three years of age. Table 15 shows that 25 percent of children under age three suffered from diarrhoea during the two weeks before the survey. It should be noted, however, that there are major seasonal variations in the prevalence of diarrhoea, so that current prevalence cannot be assumed to reflect the situation throughout the year.

Table 15 Prevalence of diarrhoea and use of oral rehydration therapy (ORT)

Among children under three years of age, the percentage reported by the mother to have had diarrhoea in the past two weeks, and the percentage of those with diarrhoea in the past two weeks who were given ORS packets or other ORT, by background characteristics, Maharashtra,1999

Background characteristic	Percentage of children who had diarrhoea in the past 2 weeks	Number of children	Percentage of children with diarrhoea who were given:			Number of children with diarrhoea
			ORS packets	Other ORT	Any ORT	
Age of child						
< 6 months	24.6	274	19.3	23.6	38.8	67
6-11 months	30.1	318	29.7	21.6	42.5	96
12-23 months	27.4	591	41.9	35.4	62.4	162
24-35 months	19.5	549	31.8	29.4	51.2	107
Sex of child						
Male	24.4	907	28.8	29.9	49.3	221
Female	25.6	825	37.8	28.1	53.9	211
Residence						
Urban	28.8	680	30.5	37.2	54.6	196
Rural	22.4	1,052	35.4	22.2	49.0	236
Mother's education						
Illiterate	26.0	696	37.4	28.5	53.6	181
Lit., < middle school complete	29.2	446	28.5	26.1	48.1	130
Middle school complete	23.7	248	38.6	35.2	53.4	59
High school complete and above	18.1	343	25.6	30.9	51.0	62
Total	24.9	1,732	33.2	29.0	51.5	432

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

The findings on prevalence of diarrhoea by age of child show that the percentage who suffered from diarrhoea in the two weeks prior to the survey is highest for children age 6-11 months (30 percent) and lowest for children age 24-35 months. The prevalence of diarrhoea does not vary much by the sex of the child but is higher among children living in urban areas and among children of less educated or illiterate mothers.

Among children who suffered from diarrhoea during the last two weeks, 52 percent received any ORT (i.e., one or more of the following: a solution made from ORS packets, gruel, increased fluid intake, or a home-made solution of sugar, salt and water) and 33 percent received a solution made from ORS packets. The proportion of children who received any ORT increases with the age of the child from 39 percent for children age less than 6 months to 62 percent for children age 12-23 months and then declines to 51 percent for children age 24-35 months. Girls are somewhat more likely than boys to receive ORT when sick with diarrhoea. Children in urban areas are more likely to receive ORT than children in rural areas. The provision of any ORT varies little by mother's education, however, it is notable that children of mothers who have completed at least high school are much less likely than children of other mothers to receive a solution made from ORS packets when they are sick with diarrhoea.

J. INFANT AND CHILD MORTALITY

The level of infant and child mortality is a basic indicator of the quality of life in a society. Although the questionnaire and interviewing procedures used in NFHS-2 were designed to collect complete and accurate mortality data, the reporting of date of birth and age at death of deceased children can be taxing for mothers, who may not remember the dates accurately. Indeed, some mothers may be reluctant to report childhood deaths at all. Accordingly, the data on childhood mortality should be viewed with caution until a more thorough analysis is conducted.

Table 16 and Figure 5 present several mortality rates for three five-year time periods: 0-4, 5-9, and 10-14 years before the survey. The following rates are presented:

- Neonatal mortality—the probability of dying within the first month of life;
- Post-neonatal mortality—the difference between infant mortality and neonatal mortality;
- Infant mortality—the probability of dying between birth and exact age one year;
- Child mortality—the probability of dying between the first and fifth birthdays;
- Under-five mortality—the probability of dying between birth and the fifth birthday.

Table 16 Infant and child mortality

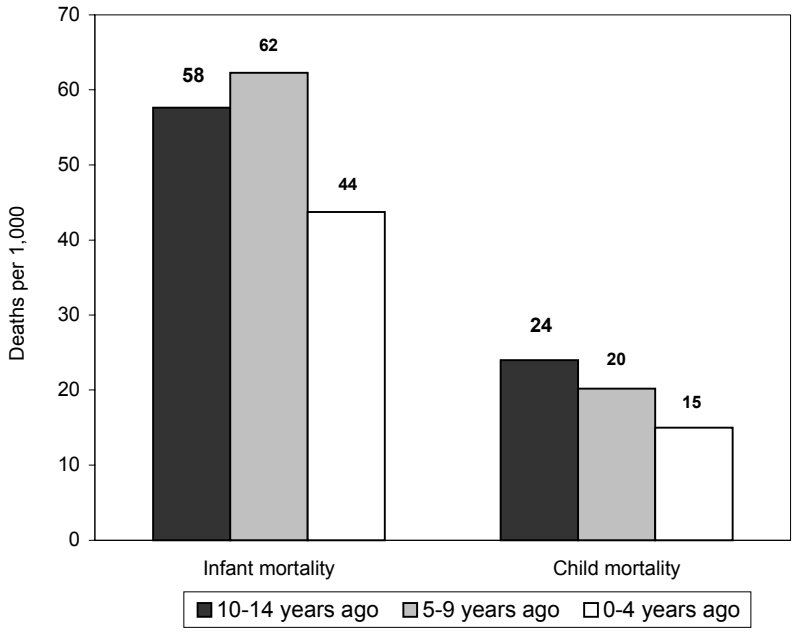
Infant and child mortality rates for three five-year periods preceding the survey, Maharashtra,1999

Years preceding survey	Neonatal mortality (NN)	Post-neonatal mortality (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-five mortality ($_5q_0$)
0-4	32.0	11.7	43.7	15.0	58.1
5-9	44.0	18.4	62.3	20.2	81.3
10-14	38.6	19.0	57.6	24.0	80.2

Note: The first 5-year period before the survey does not include the month of interview. Post-neonatal mortality is computed as the difference between infant and neonatal mortality. Rates are specified on a per-thousand basis. See text for definition of rates.

Figure 5

Infant and Child Mortality by Time Period



Note: Rates are for 5-year periods preceding the survey

NFHS-2, Maharashtra, 1999

The infant mortality rate for Maharashtra for the five-year period immediately preceding the survey is estimated to have been 44 per 1,000 live births. This means that 4 out of every 100 children born in Maharashtra did not survive until their first birthday. Child mortality for this period was 15 per 1,000, and the under-five mortality rate was 58 per 1,000. Thus, approximately, one in 17 children died before reaching the fifth birthday. A comparison of the mortality rates for children for the three five-year periods preceding the survey shows that, for most of the rates, a sharp decline has taken place only in the most recent period (0-4 years before the survey) compared with the earlier periods.

The infant mortality estimates from NFHS-2 for Maharashtra are slightly lower than recent estimates from the Sample Registration System (SRS) of the Office of the Registrar General, India. The average SRS estimate for infant mortality for the period 1995 to 1998 is 50 per 1,000 compared with the NFHS-2 estimate of 44 per 1,000 for the five-year period before the survey (approximately 1994-98).

K. ANAEMIA AMONG WOMEN AND CHILDREN

Anaemia is a condition that results when the level of haemoglobin in the blood is too low. Haemoglobin in the red blood cells transports oxygen from the lungs to other tissues and organs in the body, so that these tissues and organs can perform their functions. A deficiency of haemoglobin means a deficiency of the body's ability to deliver oxygen to those tissues and organs. Anaemia usually results from a nutritional deficiency of iron, folate, vitamin B_{12} and some other nutrients. This type of anaemia is commonly referred to as iron-deficiency anaemia.

Anaemia has detrimental effects on the health of women and children and may become an underlying cause of maternal death, antenatal loss, and perinatal loss. Anaemia among children can be associated with impaired cognitive performance, motor development, coordination, language development and scholastic achievement, as well as increased morbidity from infectious diseases. Early detection of anaemia can help to prevent complications of pregnancy and delivery as well as problems with child development. Measurement of the prevalence of anaemia can provide important information for development of health interventions, such as iron fortification, to prevent anaemia among women and children.

Because anaemia is such a serious health problem in India, NFHS-2 undertook direct measurement of haemoglobin levels of all ever-married women and their children under three years of age. This measurement was done in the field using the HemoCue system. In this system, a single drop of blood from a finger prick (or heel prick in the case of infants) is drawn into a cuvette, which is then inserted into a portable, battery-operated instrument. In less than one minute, the haemoglobin concentration is indicated on a digital read-out. Results are shown in Tables 17 and 18. These tables distinguish four levels of anaemia:

- no anaemia—haemoglobin concentration of 11.0 grams/decilitre (g/dl) or higher for children or pregnant women and 12.0 g/dl or higher for nonpregnant women
- mild anaemia—10.0-10.9 g/dl for children or pregnant women and 10.0-11.9 g/dl for nonpregnant women
- moderate anaemia—7.0-9.9 g/dl
- severe anaemia—less than 7.0 g/dl

Appropriate adjustments in these cutoff points have been made for persons living at altitudes above 1,000 metres and women who smoke, since both of these groups require more haemoglobin in their blood.

Table 17 Anaemia among women

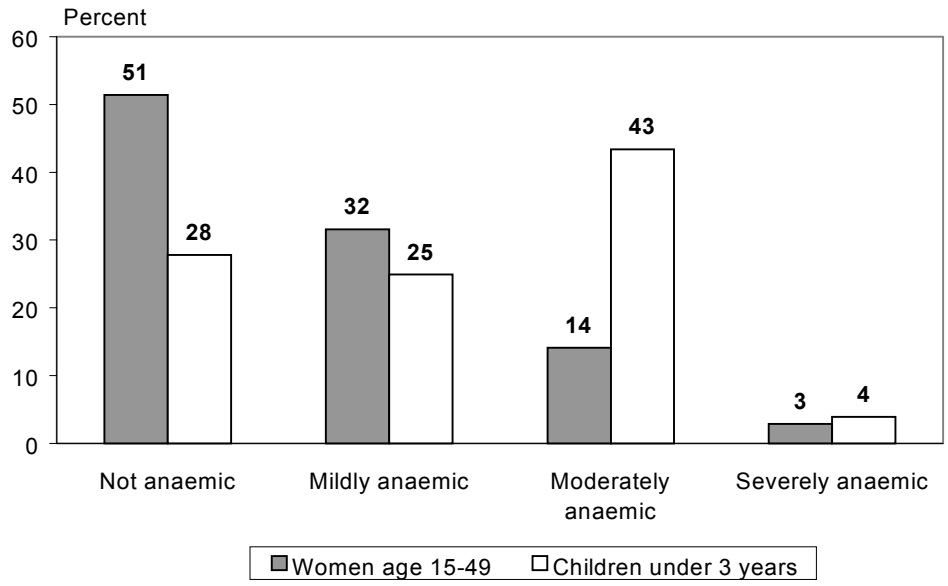
Percent distribution of women by degree of iron-deficiency anaemia, according to background characteristics, Maharashtra, 1999

Background characteristic	Percentage of women with: No anaemia	Mild anaemia	Moderate anaemia	Severe anaemia	Total percent	Percentage with any anaemia	Number of women
Age							
15-24	50.0	30.3	16.9	2.8	100.0	50.0	1,359
25-34	52.0	32.6	12.7	2.7	100.0	48.0	1,941
35-49	51.9	31.4	13.5	3.2	100.0	48.1	1,764
Number of living children							
0	52.6	30.1	14.2	3.1	100.0	47.4	532
1	51.1	31.0	15.1	2.7	100.0	48.9	721
2	51.8	29.3	15.1	3.8	100.0	48.2	1,294
3	49.7	33.6	14.7	2.0	100.0	50.3	1,366
4+	52.6	32.6	11.7	3.1	100.0	47.4	1,151
Residence							
Urban	55.2	29.2	14.0	1.6	100.0	44.8	2,060
Rural	48.8	33.2	14.2	3.8	100.0	51.2	3,004
Education							
Illiterate	48.9	33.5	14.1	3.6	100.0	51.1	2,249
Lit., < middle school complete	49.7	31.8	15.3	3.1	100.0	50.3	1,374
Middle school complete	50.3	31.9	15.6	2.1	100.0	49.7	554
High school complete and above	61.0	26.1	11.4	1.5	100.0	39.0	887
Religion							
Hindu	49.6	32.7	14.5	3.2	100.0	50.4	4,062
Muslim	63.0	25.1	11.2	0.7	100.0	37.0	491
Christian	58.5	28.9	10.1	2.5	100.0	41.5	58
Buddhist	54.3	28.5	14.0	3.2	100.0	45.7	362
Jain	62.7	22.0	15.3	--	100.0	37.3	56
Other	(42.4)	(36.5)	(17.0)	(4.1)	100.0	(57.6)	35
Caste/tribe							
Scheduled caste	50.5	31.4	15.2	2.9	100.0	49.5	701
Scheduled tribe	35.7	43.8	16.7	3.9	100.0	64.3	525
Other backward class	51.3	32.2	14.6	1.9	100.0	48.7	1,100
Other[1]	54.8	29.0	13.1	3.1	100.0	45.2	2,715
Employment status							
Working in family farm/business	49.8	32.7	13.8	3.7	100.0	50.2	1,054
Employed by someone else	47.6	33.3	14.7	4.4	100.0	52.4	1,463
Self-employed	56.8	28.6	12.5	2.2	100.0	43.2	320
Not worked in the past 12 months	53.9	30.3	14.1	1.7	100.0	46.1	2,227
Pregnancy/breastfeeding status							
Pregnant	47.2	20.2	27.6	5.1	100.0	52.8	367
Breastfeeding (nonpregnant)	49.6	36.2	12.7	1.4	100.0	50.4	1,077
Nonpregnant/non-breastfeeding	52.4	31.3	13.2	3.1	100.0	47.6	3,620
Total	51.4	31.6	14.1	2.9	100.0	48.6	5,064

Note: Haemoglobin levels are adjusted for altitude and smoking when calculating the severity of anaemia. Total includes 23 women with missing information on caste/tribe, who are not shown separately.
( ) Based on 25-49 unweighted cases
-- Less than 0.05 percent
[1]Women who do not belong to a scheduled caste, a scheduled tribe, or an other backward class.

Figure 6

Anaemia Among Women and Children



NFHS-2, Maharashtra, 1999

Results for women are shown in Table 17 and Figure 6. Overall, 51 percent of women have no anaemia, 32 percent are mildly anaemic, 14 percent are moderately anaemic, and 3 percent are severely anaemic. From among all of the sub-groups of women, the prevalence of anaemia is highest among women belonging to the scheduled tribes (64 percent) and lowest among Jain women and Muslim women (both 37 percent) and women who have completed at least high school (39 percent). The prevalence of anaemia is also relatively high among women belonging to 'other' religions (57 percent), those who are employed by someone else (52 percent), and pregnant women (53 percent). Notably, pregnant women are more than twice as likely as non-pregnant women to be moderately anaemic.

Results for children are shown in Table 18 and Figure 6. Overall, 28 percent of children have no anaemia, 25 percent are mildly anaemic, 43 percent are moderately anaemic, and 4 percent are severely anaemic. A much higher proportion of children than women were found to be anaemic. In addition, children are more likely than women to be moderately or severely anaemic.

The prevalence of anaemia is never below 62 percent for any sub-group of children but is much higher than average among children age 12-23 months (80 percent), children belonging to the scheduled tribes or scheduled castes (78-79

percent), children at birth orders four and above (78 percent), children whose mothers are moderately anaemic (78 percent), male children (76 percent), children of women who are illiterate or have not completed middle school (75 percent) and rural children (74 percent). As expected, there is a positive relationship between the anaemia status of mothers and the prevalence of anaemia among children.

Table 18 Anaemia among children

Percent distribution of children under three years of age by degree of iron-deficiency anaemia, according to background characteristics, Maharashtra, 1999

Background characteristic	Percentage of children with: No anaemia	Mild anaemia	Moderate anaemia	Severe anaemia	Total percent	Percentage with any anaemia	Number of children
Age of child							
< 12 months	36.2	29.6	30.6	3.6	100.0	63.8	505
12-23 months	20.4	22.6	52.6	4.4	100.0	79.6	521
24-35 months	27.0	22.5	46.8	3.7	100.0	73.0	480
Residence							
Urban	30.1	25.8	39.7	4.4	100.0	69.9	568
Rural	26.4	24.4	45.6	3.6	100.0	73.6	938
Sex of child							
Male	24.3	24.3	47.1	4.3	100.0	75.7	785
Female	31.6	25.6	39.3	3.6	100.0	68.4	721
Birth order							
1	30.4	25.7	39.3	4.7	100.0	69.6	466
2-3	28.4	23.3	44.8	3.5	100.0	71.6	767
4-5	21.7	28.9	45.9	3.5	100.0	78.3	215
6+	21.7	24.7	48.3	5.2	100.0	78.3	57
Mother's education							
Illiterate	25.4	25.4	45.1	4.1	100.0	74.6	601
Literate, < middle school complete	24.6	25.3	45.2	5.0	100.0	75.4	403
Middle school complete	31.1	24.0	41.5	3.4	100.0	68.9	223
High school complete and above	34.9	24.1	38.5	2.4	100.0	65.1	278
Religion							
Hindu	27.8	24.5	44.0	3.7	100.0	72.2	1,162
Muslim	27.8	25.6	42.2	4.4	100.0	72.2	207
Christian	(38.1)	(18.8)	(35.3)	(7.8)	100.0	(61.9)	21
Buddhist	26.7	31.0	40.2	2.1	100.0	73.3	95
Caste/tribe							
Scheduled caste	21.1	27.4	45.9	5.7	100.0	78.9	201
Scheduled tribe	22.4	24.8	48.2	4.6	100.0	77.6	183
Other backward class	32.6	22.8	42.1	2.5	100.0	67.4	307
Other[1]	28.7	24.9	42.5	3.9	100.0	71.3	804
Mother's anaemia status							
Not anaemic	31.2	25.8	39.9	3.1	100.0	68.8	726
Mildly anaemic	25.9	23.4	46.3	4.4	100.0	74.1	516
Moderately anaemic	21.8	26.5	48.7	3.0	100.0	78.2	235
Total	27.8	24.9	43.4	3.9	100.0	72.2	1,506

Note: Haemoglobin levels are adjusted for altitude when calculating the severity of anaemia among children. Total includes 10 Jain children, 10 children belonging to 'other' religions, 29 children whose mothers are severely anaemic and 11 children with missing information on caste/tribe, who are not shown separately.
( ) Based on 25-49 unweighted cases
[1]Children who do not belong to a scheduled caste, a scheduled tribe, or an other backward class

L. LEAD POISONING AMONG CHILDREN

Lead is a toxicant that affects virtually every system in the body. It is particularly harmful to the developing brain and nervous system of young children. High levels of exposure (≥80.0 µg/dL) can cause severe brain damage or death. Even relatively low levels of lead exposure (as low as 10.0 µg/dL) decrease intelligence and the ability to learn. Lead poisoning also contributes to anaemia, decreases growth, and causes hearing impairment.

Childhood lead poisoning is thought to be widespread in India. Although few studies on children have been performed, recent research indicates that the percentage with elevated blood lead levels (≥10.0 µg/dL) may be above 50 percent. Recognizing the threat that widespread lead exposure has to the nation's physical and economic health, the Government of India has made a commitment to phase out the use of leaded petrol. However, many other known lead exposure sources remain common in India, including uncontrolled industrial emissions, cottage industries (e.g., battery recycling and jewellery-making), traditional medicines that include heavy metals, lead-glazed ceramics, some cosmetics used by women and children, and home flour mills with leaded grinding wheels.

NFHS-2 is the first survey to provide information on blood lead levels that is representative of the population of young children living in Mumbai. The estimates of lead levels in the blood of children under three years of age are shown in Table 19.

Overall 50 percent of the children have elevated lead levels in the blood (≥10.0 µg/dL). Forty-two percent have lead levels from 10.0-19.9 µg/dL and 8 percent have even higher levels of exposure to lead (20.0-44.9 µg/dL). No child was found in Mumbai to have a blood lead level of 45.0 µg/dL or higher. Older children (age 12-35 months) are much more likely than younger children (age less than 12 months) to have elevated levels of lead in their blood. In keeping with this, currently breastfeeding children (who are likely to be younger children) are also less likely to have elevated levels of lead than children who were breastfed but are no longer breastfeeding. Blood lead levels are higher for children at birth orders four and above than for children at lower birth orders. Elevated levels of lead are relatively less common among children whose mothers have completed high school, and among children who do not belong to scheduled caste/tribe and an other backward class. The lead levels vary among children coming from different household conditions in terms of the type of kitchenware and the cooking fuel used. The use of aluminium kitchenware and of kerosene as a cooking fuel is associated with higher levels of lead in children's blood. As expected, lead levels in children's blood vary by their anaemia status, being the lowest for children who are not anaemic and increasing with the severity of anaemia. Children who are moderately anaemic are about 4 times as likely to have a blood lead level of 20.0-44.9 µg/dL as children who are not anaemic.

Table 19 Lead levels among children

Percent distribution of children under three years of age by lead level in the blood, according to background characteristics, Mumbai, Maharashtra, 1999

Background characteristic	Percent of children with specific Levels of lead in their blood			Total percent	Weighted number of children	Unweighted number of children
	Less than 10.0 µg/dL	10.0-19.9 µg/dL	20.0-44.9 µg/dL			
Age of child						
< 12 months	70.3	25.4	4.3	100.0	47	138
12-23 months	39.1	52.7	8.2	100.0	50	148
24-35 months	43.3	46.6	10.1	100.0	57	169
Sex of child						
Male	50.5	41.0	8.4	100.0	81	238
Female	49.7	43.3	7.0	100.0	74	217
Birth order						
1	48.3	41.3	10.4	100.0	55	164
2-3	53.3	42.1	4.6	100.0	76	223
4-5	39.9	48.1	12.0	100.0	17	50
Mother's education						
Illiterate	49.7	39.1	11.2	100.0	42	124
Literate, < middle school complete	50.4	44.5	5.1	100.0	39	115
Middle school complete	40.7	50.5	8.7	100.0	27	81
High school complete and above	55.9	38.0	6.1	100.0	46	135
Religion						
Hindu	50.0	42.1	7.9	100.0	89	265
Muslim	54.0	37.6	8.4	100.0	50	146
Caste/tribe						
Scheduled caste	45.1	47.3	7.6	100.0	17	51
Other backward class	46.8	46.5	6.7	100.0	21	62
Other[1]	51.1	41.3	7.7	100.0	111	329
Child's anaemia status						
Not anaemic	63.4	33.3	3.3	100.0	42	123
Mildly anaemic	50.2	44.7	5.1	100.0	41	121
Moderately anaemic	41.6	46.2	12.2	100.0	66	197
Main type of cooking utensils						
Aluminium	42.5	50.0	7.5	100.0	22	66
Stainless steel	51.4	40.8	7.8	100.0	132	389
Main type of cooking fuel						
Kerosene	46.3	46.8	6.9	100.0	88	259
Liquid petroleum gas	55.0	36.1	9.0	100.0	66	193
Breastfeeding status						
Currently breastfeeding	54.4	37.7	7.9	100.0	93	276
Breastfed only in the past	42.3	49.9	7.8	100.0	58	172
Total	50.1	42.1	7.7	100.0	154	455

Note: Weighted total includes 6 children of birth order six or above, 5 Christian children, 8 Buddhist children, 1 Jain child, 1 child belonging to "other" religions, 4 scheduled tribe children, 4 children with severe anaemia, 1 child belonging to a household using charcoal as the main type of cooking fuel, and 2 children who have never been breastfed. These children are not shown separately.

[1]Children who do not belong to a scheduled caste, a scheduled tribe, or an other backward class.