

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Survey

India's first National Family Health Survey (NFHS-1) was conducted in 1992–93 (International Institute for Population Sciences, 1995). The Ministry of Health and Family Welfare (MOHFW) subsequently designated the International Institute for Population Sciences (IIPS), 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, reproductive health, child health, nutrition of women and children, and quality of health and family welfare services. Another important objective is to examine this information in the context of related socioeconomic and cultural factors. The survey is also intended to provide estimates at the regional level for five states (Bihar, Jammu and Kashmir, Madhya Pradesh, Rajasthan, and Uttar Pradesh) and estimates for three metro cities (Chennai, Kolkata, and Mumbai), as well as slum areas in Mumbai. This information will assist policymakers and programme administrators in planning and implementing strategies for improving population, health, and nutrition programmes. Comparative state results from NFHS-2 have already been published (International Institute for Population Sciences and ORC Macro, 2000). The current report provides a more comprehensive picture of the findings for Kerala.

The NFHS-2 national sample covers more than 99 percent of India's population living in the 26 states that existed at the time of the survey. It does not cover the union territories. NFHS-2 is a household sample survey with an overall sample size of 90,303 ever-married women in the age group 15–49 living in 92,486 households.

NFHS-2 was conducted with financial support from the United States Agency for International Development (USAID), with additional funding from UNICEF. Technical assistance was provided by ORC Macro, Calverton, Maryland, USA, and the East-West Center, Honolulu, Hawaii, USA. Thirteen field organizations were selected to collect the data. Eight of the field organizations are private sector organizations and five are Population Research Centres (PRCs) established by the Government of India in various states. Each field organization had responsibility for collecting the data in one or more states. ORG Centre for Social Research (ORG-CSR), New Delhi, was selected as the field organization for NFHS-2 in Kerala.

### 1.2 Basic Socioeconomic and Demographic Features of Kerala

Kerala acquired the status of a state within the Indian Union, with Thiruvananthapuram as its capital, on 1 November 1956, when the States Reorganization Act of 1956 came into force. It has a total land area of 38,863 square kilometres. On the basis of physical features, Kerala may be divided into three natural regions—highlands, midlands, and lowlands. The state accounts for 3.1 percent of India's population in 2001 and for 1.18 percent of its land area. At the time of the 1991 census, the state was divided into 14 districts and 61 taluks. Since then, the number of taluks has risen to 63.

Kerala is predominantly an agricultural state with 73 percent of the population living in rural areas. The importance of various economic sectors in the economy has changed only slightly over time. The contribution of the agricultural sector to the state domestic product declined from 34 percent in 1980–81 to 31 percent in 1996–97. During the same period, the share of the manufacturing sector was almost constant at 14 percent and the contribution of other sectors increased slightly, from 52 percent to 55 percent (EPW Research Foundation, 1998). At the time of the 1991 Census, the agricultural sector provided a livelihood for 48 percent of the labour force (Office of the Registrar General and Census Commissioner, 1992). Rice is the only major cereal crop grown in Kerala. Nearly 76 percent of agricultural land is under nonfood crops, the highest among the major states. By comparison, the proportion of agricultural land under nonfood crops in India as a whole is only 28 percent. Coconut palms and other cash crops such as tea, coffee, and rubber are among the most important products of the state.

Kerala is an industrially backward state with only a few industries that manufacture cement, fertilizer, aluminium, and automobiles. The average annual per capita net domestic product of the state increased from Rs. 1,508 in 1980–81 to Rs. 2,363 in 1996–97 at constant 1980–81 prices or Rs. 9,066 at current prices (EPW Research Foundation, 1998). As per the estimates given by the Planning Commission for 1993–94, 25 percent of the population were below the poverty line, lower than for the country as a whole (36 percent) (Central Statistical Organization, 1999).

Kerala had a population of 31.8 million at the time of the 2001 Census. The total population of the state was 21 million in 1971, 25 million in 1981, and 29 million in 1991. The decadal growth rate decreased from 26 percent in 1961–71 to 19 percent in 1971–81, and to 14 percent in 1981–91. The 1991–2001 intercensal increase in population (9.4 percent) was much lower than that for the country as a whole (21.3 percent). Population density per km<sup>2</sup> in Kerala increased from 549 in 1971 to 655 in 1981 and 749 in 1991. In 1991, the population density in Kerala was three times the density for the country as a whole (273). The increase in population density indicates an increasing pressure on land and other resources. Population density has increased further to 819 in 2001. The only other states with a population density greater than Kerala are Bihar and West Bengal (Office of the Registrar General and Census Commissioner, 2001).

Kerala has been undergoing slow but steady urbanization. The percentage of the total population living in urban areas increased from 16 percent in 1971 to 19 percent in 1981 and 27 percent in 1991. According to the 1991 Census, 10 percent of the population of Kerala belonged to the scheduled castes and 1 percent belonged to the scheduled tribes.<sup>1</sup> By contrast, in India as a whole 17 percent of the population belonged to the scheduled castes and 8 percent to the scheduled tribes in 1991.

According to the 2001 Census, Kerala is the most literate state in India with a literacy rate of 91 percent for the population age 7 and above. By contrast, the corresponding literacy rate for India as a whole is only 65 percent. The literacy rates are 94 percent for males and 88 percent for females in the state, compared with 76 percent for males and 54 percent for females in India as a whole (Office of the Registrar General and Census Commissioner, 2001).

---

<sup>1</sup>Scheduled castes and scheduled tribes are castes and tribes that the Government of India officially recognizes as socially and economically backward and in need of special protection from injustice and exploitation.

Kerala has attracted worldwide attention in recent years as a major exporter of labour, especially to the oil-rich Gulf countries. According to the first National Family Health Survey (1992-93), 21 percent of the 4,387 households interviewed in Kerala had at least one migrant currently working outside the country (Population Research Centre, University of Kerala and International Institute for Population Sciences, 1995). A recent survey shows that nearly 1.5 million Keralites now live outside India (Zachariah et.al, 2001).

For 1999, the Sample Registration System estimated the infant mortality rate in Kerala at 14 per 1,000 live births, which is five times lower than the rate of 70 from the same source for India as a whole. For the period 1996–2001, life expectancy was projected to be 71 years for males and 75 years for females, a substantial increase from the estimates of 67 for males and 72 for females for the period 1986–1991 (Ministry of Health and Family Welfare, 1999a). The sex ratio of the population (number of females per 1,000 males) has increased steadily from 1,016 in 1971 to 1,058 in 2001. The share of the population age 0–14 years in the total population has declined steadily over time from 40 percent in 1971 and 35 percent in 1981 to 30 percent in 1991. The demographic transition in Kerala, its determinants and consequences, have been extensively discussed and documented (see Zachariah, 1984 and Zachariah and Rajan, 1997).

The couple protection rate (defined as the percentage of eligible couples effectively protected against pregnancy by various methods of contraception) in Kerala increased steadily from 15 percent in 1971 to 55 percent in 1991, and then declined to 41 percent in 1998 (Ministry of Health and Family Welfare, 1999a). Between 1971 and 1997, fertility declined sharply in the state. According to estimates from the Sample Registration System, the crude birth rate (per 1,000 population) declined from 31 in 1971 to 18 in 1998. The crude death rate has also declined, from 9 per 1,000 population in 1971 to 7 per 1,000 population in 1981 and has hovered around 6 thereafter (Registrar General, 2000; 2001).

### **1.3 Questionnaires**

NFHS-2 used three types of questionnaires: the Household Questionnaire, the Woman's Questionnaire, and the Village Questionnaire. The overall content and format of the questionnaires were determined through 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 in Kerala were bilingual, with questions in both Malayalam and English.

The Household Questionnaire listed all usual residents in each sample household plus any visitors who stayed in the household the night before the interview. For each listed person, the survey collected basic information on age, sex, marital status, relationship to the head of the household, education, and occupation. The Household Questionnaire also collected information on the prevalence of asthma, tuberculosis, malaria, and jaundice, as well as three life-style related 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, religion of the household head, caste/tribe of the household head, ownership of a house, ownership of agricultural land, ownership of livestock, and ownership of other selected items. In addition, a test was conducted to assess whether the household uses cooking salt that has been fortified with iodine. Finally, the Household Questionnaire asked

about deaths occurring to household members in the two years preceding the survey, with particular attention to maternal mortality. The information on the age, sex, and marital status of household members was used to identify eligible respondents for the Woman's Questionnaire.

The Woman's Questionnaire collected information from ever-married women age 15–49 who were usual residents of the sample household or visitors who stayed in the sample household the night before the interview. The questionnaire covered the following topics:

Background characteristics: Questions on age, marital status, education, employment status, and place of residence provide information on characteristics likely to influence demographic and health behaviour. Questions are also asked about the characteristics of a woman's husband.

Reproductive behaviour and intentions: Questions cover dates and survival status of all births and current pregnancy status and future childbearing intentions of each woman.

Quality of care: Questions assess the quality of family planning and health services.

Knowledge and use of contraception: Questions cover knowledge and use of specific family planning methods. For women not using a contraceptive method, questions are included on reasons for not using contraception and intentions concerning future use.

Sources of family planning: Questions determine where a user obtained her contraceptive method.

Antenatal, delivery, and postpartum care: The questionnaire collects information on whether women received antenatal and postpartum care, who attended the delivery, and the nature of complications during pregnancy for the last two births since January 1996.

Breastfeeding and health: Questions cover feeding practices, the length of breastfeeding, immunization coverage, and recent occurrences of diarrhoea, fever, and cough for young children.

Reproductive health: Questions assess various aspects of women's reproductive health and the type of care sought for health problems.

Status of women: The questionnaire asks about gender roles, women's autonomy, and violence against women.

Knowledge of AIDS: Questions assess women's knowledge of AIDS and the sources of their knowledge, as well as their knowledge about ways to avoid getting AIDS.

In addition, the health investigator on each survey team measured the height and weight of each woman and each of her children born since January 1996. This height and weight information is useful for assessing levels of nutrition prevailing in the population. The health investigators also took blood samples from each woman and each of her children born since January 1996, to assess haemoglobin levels. This information is useful for assessing prevalence rates of anaemia among women and children. Haemoglobin levels were measured in the field at the end of each interview using portable equipment (the HemoCue) that provides test results in

less than one minute. Severely anaemic women and children were referred to local medical authorities for treatment.

For each village selected in the NFHS-2 sample, the Village Questionnaire collected information on the availability of various facilities in the village (especially health and education facilities) and amenities such as electricity and telephone connections. Respondents to the Village Questionnaire were also asked about development and welfare programmes operating in the village. The village survey included a short, open-ended questionnaire that was administered to the village head, with questions on major problems in the village and actions that could be taken to alleviate the problems.

## **1.4 Survey Design and Sample Implementation**

### **Sample Size and Reporting Domains**

The overall target sample size for Kerala was 3,000 completed interviews with eligible women. The NFHS-1 nonresponse rates at the household and individual levels were used to estimate the sample size that would be required to achieve the target number of completed interviews in NFHS-2.

The sample was designed to provide estimates for the state as a whole and for its urban and rural areas separately. The sample is not large enough to provide reliable estimates for individual districts. The required sampling rates for urban and rural areas were determined by allocating the sample proportionally to the population of the two areas taking into account their expected nonresponse rates (based on nonresponse rates of urban and rural areas in the state as a whole in NFHS-1).

### **Sample Design**

Within each of the two sampling domains (rural and urban areas of the state), a systematic, multi-stage stratified sampling design was used. The rural sample was selected in two stages: the selection of Primary Sampling Units (PSUs), which are villages or groups of villages (in the case of small linked villages), with probability proportional to size (PPS) in the first stage, followed by the selection of households using systematic sampling within each selected PSU in the second stage. In urban areas, a three-stage sampling procedure was followed. In the first stage, wards were selected with PPS. From each selected ward, one census enumeration block (CEB) was selected with PPS in the second stage, followed by selection of households using systematic sampling within each selected CEB in the third stage.

### **Sample Selection in Rural Areas**

In rural areas, the 1991 Census list of villages served as the sampling frame. The list was stratified by a number of variables. The first level of stratification was geographic, with villages classified into four contiguous regions. The district composition of the four geographic regions is as follows:

- Region I: Kasaragod, Kannur, Wayanad, Kozhikode  
 Region II: Malappuram, Palakkad, Idukki  
 Region III: Thrissur, Ernakulam, Kottayam  
 Region IV: Alappuzha, Pathanamthitta, Kollam, Thiruvananthapuram

In each region, villages were further stratified by the percentage of female population that was literate. Table 1.1 provides details of the sample stratification in rural areas along with the population of each stratum. The final level of stratification was implicit for all strata, consisting of an ordering of villages within each stratum by the percentage of males in the non-agricultural sector. From the list of villages arranged in this manner, villages were selected systematically with probability proportional to the 1991 Census population of the village. Small villages with 5–49 households were linked with one or more adjoining villages to form PSUs with a minimum of 50 households. Villages with fewer than five households were excluded from the sampling frame.

| Table 1.1 Sampling stratification                        |        |                           |                                |                         |
|--|--------|---------------------------|--------------------------------|-------------------------|
| Sampling stratification procedure in rural areas, Kerala |        |                           |                                |                         |
| Stratification variables                                 |        |                           |                                |                         |
| Stratum  | Region | Village size (population) | Percentage of females literate | Population <sup>1</sup> |
| 1  | 1      | ≤ 12,500                  | NU                             | 1,273,173               |
| 2  | 1      | > 12,500 and ≤ 20,000     | NU                             | 1,557,137               |
| 3  | 1      | > 20,000                  | NU                             | 1,435,846               |
| 4  | 2      | ≤ 21,000                  | ≤ 83.0                         | 1,840,945               |
| 5  | 2      | ≤ 21,000                  | > 83.0                         | 1,051,919               |
| 6  | 2      | > 21,000                  | ≤ 83.0                         | 1,139,298               |
| 7  | 2      | > 21,000                  | > 83.0                         | 1,816,557               |
| 8  | 3      | ≤ 12,500                  | NU                             | 1,553,500               |
| 9  | 3      | > 12,500 and ≤ 20,000     | NU                             | 1,748,245               |
| 10   | 3      | > 20,000                  | NU                             | 1,666,762               |
| 11   | 4      | ≤ 22,500                  | ≤ 89.0                         | 1,743,283               |
| 12   | 4      | ≤ 22,500                  | > 89.0                         | 1,743,205               |
| 13   | 4      | > 22,500 and ≤ 27,000     | NU                             | 1,324,091               |
| 14   | 4      | > 27,000                  | NU                             | 1,524,263               |
| Total  | NA     | NA                        | NA                             | 21,419,224              |

Note: Percentage of males in the non-agricultural sector is used for implicit stratification  
 NA: Not applicable  
 NU: Not used for stratification  
<sup>1</sup>The population shown is the 1991 Census population, excluding persons living in villages with fewer than five households.

The domain sampling fraction, i.e., the probability of selecting a woman in rural Kerala ( $f$ ) was computed as:

$$f = \frac{n}{N}$$

where  $n$  = number of rural women to be interviewed (after adjusting upward to account for nonresponse and other loss), and

$N$  = projected rural population of eligible women in the state in May 1999.

The probability of selecting a PSU from rural Kerala ( $f_1$ ) was computed as:

$$f_1 = \frac{a \times s_i}{\sum s_i}$$

where  $a$  = number of rural PSUs selected from the state,

$s_i$  = population size of the  $i^{\text{th}}$  PSU, and

$\sum s_i$  = total rural population of the state.

A mapping and household listing operation carried out in each sample area provided the necessary frame for selecting households at the second stage. The household listing operation involved preparing up-to-date notional and layout sketch maps of each selected PSU, assigning numbers to structures, recording addresses of these structures, identifying residential structures, and listing the names of heads of all the households in residential structures in the selected PSUs. Sample villages larger than 500 households were segmented into three or more segments, and two segments were selected randomly using the PPS method. The household listing in these PSUs was carried out only in the selected segments. The work of listing was carried out by 10 teams, each comprising one lister and one mapper, under the supervision of five field supervisors and one field executive. The teams were trained from 15–18 January 1999 in Kochi by two officials from ORG-CSR, who were earlier trained in a workshop conducted by IIPS. The mapping and household listing operation was carried out between 19 January and 25 April 1999. The households to be interviewed were selected with equal probability from the household list in each selected enumeration area using systematic sampling.

The probability of selecting a household from a selected rural PSU ( $f_2$ ) was computed as:

$$f_2 = \frac{f}{f_1}$$

On average, 28 households were initially targeted for selection in each selected enumeration area. To avoid extreme variations in the workload, minimum and maximum limits were put on the number of households that could be selected from any area, at 14 and 56, respectively. All the selected households were visited during the main survey, and no replacement was allowed if a selected household was absent during data collection.

### **Sample Selection in Urban Areas**

The 1991 Census list of urban wards in each of the four major regions was arranged according to districts and within districts by the level of female literacy, and a sample of wards was selected systematically with probability proportional to population size. Next, one census enumeration block (CEB), consisting of approximately 150–200 households, was selected from each selected ward using the PPS method. As in rural areas, a household listing operation was carried out in the selected CEBs and, on average, 28 households per block were targeted for selection.

The domain sampling fraction, i.e., the probability of selecting a woman in urban Kerala ( $f$ ) was computed as:

$$f = \frac{n}{N}$$

where  $n$  = number of urban women to be interviewed (after adjusting upward to account for nonresponse and other loss), and

$N$  = projected urban population of eligible women in the state in May 1999.

The probability of selecting an urban ward ( $f_1$ ) was computed as:

$$f_1 = \frac{a \times s_i}{\sum s_i}$$

where  $a$  = number of urban wards selected from the state,

$s_i$  = population size of the  $i^{\text{th}}$  ward, and

$\sum s_i$  = total urban population of the state.

The probability of selecting a CEB from a selected ward ( $f_2$ ) was computed as:

$$f_2 = \frac{B_i}{\sum B_i}$$

where  $B_i$  = population size of the  $i^{\text{th}}$  block, and

$\sum B_i$  = total population of the ward.

A household listing operation carried out in each selected block provided the necessary frame for selecting households in the third stage of sample selection. The probability of selecting a household from a selected CEB ( $f_3$ ) was computed as:

$$f_3 = \frac{f}{f_1 \times f_2}$$

### Sample Weights

Sample weights for households and women are based on design weights adjusted for the effect of differential nonresponse in different geographical areas. The method of calculating the weights is specified below.

Let  $R_{Hi}$  and  $R_{wi}$  be the response rates for household and eligible women, respectively. Then the household weight ( $w_{Hi}$ ) is calculated as follows:

$$w_{Hi} = \frac{w_{Di}}{R_{Hi}}$$



where  $w_{Di}$  = the design weight for the  $i^{\text{th}}$  domain (i.e., the rural or the urban domain) calculated as the ratio of the overall sampling fraction ( $F = n/N$ ) and the sampling fraction for the  $i^{\text{th}}$  domain ( $f = n_i/N_i$ ). Note that  $n = \sum n_i$  and  $N = \sum N_i$ .

An eligible woman's weight ( $w_{wi}$ ) is calculated as follows:

$$w_{wi} = \frac{w_{Di}}{R_{Hi} \times R_{wi}}$$

After adjustment for nonresponse, the weights are normalized so that the total number of weighted cases is equal to the total number of unweighted cases. The final weights for households and eligible women are:

$$W_{Hi} = \frac{\sum n_i}{\sum w_{Hi} \times n_i} \times w_{Hi}$$

$$W_{wi} = \frac{\sum n_i}{\sum w_{wi} \times n_i} \times w_{wi}$$

where  $n_i$  refers to the actual number of cases (households or eligible women) interviewed in the  $i^{\text{th}}$  domain.

For the tabulations on anaemia and height/weight of women and children, two separate sets of weights were calculated using a similar procedure. In this case, however, the response rates for anaemia (for both women and children) are based on the percentage of eligible women whose haemoglobin level was measured, and the response rates for height/weight (for both women and children) are based on the percentage of eligible women whose height or weight was measured.

### Sample Implementation

A total of 100 PSUs were selected, of which 33 were urban and 67 were rural. Table 1.2 shows response rates for households and individuals and reasons for nonresponse. Nonresponse can occur at the stage of the household interview or at the stage of the woman's interview. The last row of the table shows the total effect of nonresponse at the two stages. The survey achieved an overall response rate of 91 percent. The overall rural and urban response rates are almost identical.

Of the 3,003 households selected in Kerala, interviews were completed in 94 percent of cases. In 1 percent of cases the selected households were absent for an extended period, and in 2 percent each of cases, no household member or no competent respondent was at home at the time of interview or the dwelling was vacant or the address was not a dwelling (Table 1.2). The household response rate—the number of households interviewed per 100 occupied households—was 98 percent.

In the interviewed households, 3,105 women were identified as eligible for the individual interview. Interviews were successfully completed with 93 percent of the eligible women.

**Table 1.2 Sample results**

Sample results for households and ever-married women age 15–49 by residence, Kerala, 1999

| Result   | Urban  |         | Rural  |         | Total  |         |
|--|--------|---------|--------|---------|--------|---------|
|  | Number | Percent | Number | Percent | Number | Percent |
| <b>Households selected</b>   | 914    | 100.0   | 2,089  | 100.0   | 3,003  | 100.0   |
| Households completed (C)   | 855    | 93.5    | 1,979  | 94.7    | 2,834  | 94.4    |
| Households with no household member at home or no competent respondent at home at the time of interview (HP) | 18     | 2.0     | 26     | 1.2     | 44     | 1.5     |
| Households absent for extended period (HA)   | 13     | 1.4     | 27     | 1.3     | 40     | 1.3     |
| Households postponed (P)   | 0      | 0.0     | 0      | 0.0     | 0      | 0.0     |
| Households refused (R)   | 2      | 0.2     | 2      | 0.1     | 4      | 0.1     |
| Dwelling vacant/address not a dwelling (DV)  | 21     | 2.3     | 34     | 1.6     | 55     | 1.8     |
| Dwelling destroyed (DD)  | 3      | 0.3     | 6      | 0.3     | 9      | 0.3     |
| Dwelling not found (DNF)   | 2      | 0.2     | 9      | 0.4     | 11     | 0.4     |
| Other (O)  | 0      | 0.0     | 6      | 0.3     | 6      | 0.2     |
| <b>Households occupied</b>   | 877    | 100.0   | 2,016  | 100.0   | 2,893  | 100.0   |
| Households interviewed   | 855    | 97.5    | 1,979  | 98.2    | 2,834  | 98.0    |
| Households not interviewed   | 22     | 2.5     | 37     | 1.8     | 59     | 2.0     |
| Household response rate (HRR) <sup>1</sup>   | NA     | 97.5    | NA     | 98.2    | NA     | 98.0    |
| <b>Eligible women</b>  | 904    | 100.0   | 2,201  | 100.0   | 3,105  | 100.0   |
| Women interviewed (EWC)  | 846    | 93.6    | 2,038  | 92.6    | 2,884  | 92.9    |
| Women not at home (EWNH)   | 45     | 5.0     | 124    | 5.6     | 169    | 5.4     |
| Women postponed (EWP)  | 0      | 0.0     | 0      | 0.0     | 0      | 0.0     |
| Women refused (EWR)  | 6      | 0.7     | 23     | 1.0     | 29     | 0.9     |
| Women partly interviewed (EWPC)  | 4      | 0.4     | 8      | 0.4     | 12     | 0.4     |
| Other (EWO)  | 3      | 0.3     | 8      | 0.4     | 11     | 0.4     |
| Eligible women's response rate (EWRR) <sup>2</sup>   | NA     | 93.6    | NA     | 92.6    | NA     | 92.9    |
| Overall response rate (ORR) <sup>3</sup>   | NA     | 91.2    | NA     | 90.9    | NA     | 91.0    |

Note: Eligible women are defined as ever-married women age 15–49 who stayed in the household the night before the interview (including both usual residents and visitors). This table is based on the unweighted sample; all other tables are based on the weighted sample unless otherwise specified.

NA: Not applicable

<sup>1</sup>Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as:

$$\text{HRR} = \frac{C}{C + \text{HP} + \text{P} + \text{R} + \text{DNF}} \times 100$$

<sup>2</sup>Using the number of eligible women falling into specific response categories, the eligible women's response rate (EWRR) is calculated as:

$$\text{EWRR} = \frac{\text{EWC}}{\text{EWC} + \text{EWNH} + \text{EWP} + \text{EWR} + \text{EWPC} + \text{EWO}} \times 100$$

<sup>3</sup>The overall response rate (ORR) is calculated as:

$$\text{ORR} = \frac{\text{HRR} \times \text{EWRR}}{100}$$

Nonresponse at the individual level was primarily due to eligible women not being at home despite repeated household visits (5 percent). One percent of eligible women refused to be interviewed.

## 1.5 Recruitment, Training, and Fieldwork

Field staff for the main survey were trained in Kochi by officials of ORG-CSR, who were trained earlier in a Training of Trainers Workshop conducted by IIPS. Training in Kerala consisted of three weeks of classroom training, general lectures, and demonstration and practice interviews, as well as field practice and supplementary training for field editors and supervisors. The

classroom training included instructions in interviewing techniques and survey field procedures, a detailed review of each item in the questionnaires, instruction and practice in weighing and measuring women and children, and mock interviews between participants. Special guest lectures on family planning and on child health were also arranged. Health investigators attached to interviewing teams were given additional specialized training on measuring height and weight and testing for anaemia in a centralized training programme conducted by the All India Institute of Medical Sciences (AIIMS), New Delhi, in collaboration with IIPS. This specialized training took place in Mumbai. It included classroom training and extensive field practice in schools, *anganwadis*, and communities.

Five interviewing teams conducted the main fieldwork in Kerala, each team consisting of one field supervisor, one female field editor, four female interviewers, and one health investigator. The fieldwork was carried out between 22 March and 20 July 1999. Coordinators and senior staff of ORG-CSR monitored and supervised the data collection operations. IIPS also deputed two research officers to help with monitoring throughout the training and fieldwork period in order to ensure that correct survey procedures were followed and data quality was 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, visited the field sites to monitor the data collection operation. Medical health coordinators appointed by IIPS monitored the nutritional component of the survey. Field data were quickly entered into microcomputers, and field-check tables were produced to identify certain types of errors that might have occurred in eliciting information and filling out questionnaires. Information from the field-check tables was fed back to the interviewing teams and their supervisors so that they could improve their performance.

## **1.6 Data Processing**

Completed questionnaires were sent to the office of ORG-CSR in New Delhi for data processing, which consisted of office editing, coding, data entry, and machine editing, using the Integrated System for Survey Analysis (ISSA) software. Data entry was done in New Delhi by eight data entry operators under the supervision of ORG-CSR senior staff who were trained at a data-processing workshop in Vadodara. Data entry and editing operations were completed by September 1999. Tabulations for the preliminary report as well as for the present final report were carried out at IIPS in Mumbai.