# INTRODUCTION 1

## 1.1 BACKGROUND OF THE NATIONAL FAMILY HEALTH SURVEYS

The National Family Health Surveys (NFHS) are nationwide surveys conducted with a representative sample of households throughout the country. The Ministry of Health and Family Welfare (MOHFW), Government of India (GOI), initiated the NFHS surveys to provide high quality data on population and health indicators. The three NFHS surveys conducted to date are a major landmark in the development of a demographic and health data base for India. An important objective of the NFHS surveys has been to provide national and state estimates of fertility, family planning, infant and child mortality, reproductive and child health, nutrition of women and children, the quality of health and family welfare services, and socioeconomic conditions. The NFHS surveys use standardized questionnaires, sample designs, and field procedures to collect data. The information provided by NFHS surveys assists policymakers and programme administrators in planning and implementing population, health, and nutrition programmes. The MOHFW designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for each of the three rounds of NFHS.

### NFHS-1

The country's first National Family Health Survey (NFHS-1) was conducted in 1992-93. An important objective of NFHS-1 was to strengthen the survey research capabilities of the 18 Population Research Centres (PRCs) in the country. Interviews were conducted with a nationally representative sample of 88,562 households and 89,777 ever-married women age 13-49 years in 24 states and the National Capital Territory of Delhi. The East-West Centre, Hawaii, USA, and Macro International, Maryland, USA, provided technical assistance for NFHS-1. Funding was provided by the United States Agency for International Development (USAID).

### NFHS-2

The second National Family Health Survey (NFHS-2), conducted in 1998-99, was an important step in strengthening the database for implementation of the Reproductive and Child Health (RCH) approach adopted by India after the International Conference on Population and Development (ICPD) in 1994 in Cairo. In addition to the population and health components covered in NFHS-1, NFHS-2 collected information on the quality of health and family welfare services, reproductive health problems, the status of women, and domestic violence. Height and weight measurements were extended to cover ever-married women. Ever-married women and their children below three years of age had their haemoglobin levels measured to provide the first national estimates of the prevalence of anaemia. In Delhi and Mumbai, a test was also done to measure the lead content in the blood of children below age three years. A test was also conducted for the iodine content of household cooking salt.

NFHS-2 covered a representative sample of over 91,000 ever-married women age 15-49 years across all 26 states of India. NFHS-2 also provided 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. NFHS-3 was funded by the United States Agency for International Development, with additional support from the United Nations Children's Fund (UNICEF). Technical assistance for NFHS-2 was provided by Macro International, Maryland, USA, and the East-West Centre, Hawaii, USA.

**NFHS-3**

The third National Family Health Survey (NFHS-3) was conducted in 2005-06. In addition to the indicators covered in NFHS-2, NFHS-3 provides information on several new and emerging issues such as perinatal mortality, male involvement in the use of health and family welfare services, adolescent reproductive health, high risk sexual behaviour, family life education, safe injections, and knowledge about tuberculosis. A major new component of NFHS-3 is blood testing for HIV prevalence and behaviour-related information among adult men and women. In addition to interviewing ever-married women age 15-49, NFHS-3 included never married women age 15-49 and both ever-married and never married men age 15-54 as eligible respondents.

Interviews were conducted with 124,385 women age 15-49 and 74,369 men age 15-54 from all 29 states. Throughout India, 102,946 women and men were tested for HIV in NFHS-3. NFHS-3 provides estimates of HIV prevalence for adult women and men at the national level, for Uttar Pradesh and for five high HIV prevalence states (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu). NFHS-3 also provides estimates of population and health indicators for slum and non-slum populations for eight cities, namely Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur. Fieldwork for NFHS-3 was conducted in two phases from November 2005 to August 2006.

Funding for NFHS-3 was provided by the United Sates Agency for International Development (USAID), the United Kingdom Department for International Development (DFID), the Bill and Melinda Gates Foundation, UNICEF, UNFPA, and the Government of India. Technical assistance for NFHS-3 was provided by Macro International, Maryland, USA. Eighteen research organizations conducted fieldwork for NFHS-3. Thirteen of these are private sector research organizations and five are Population Research Centres (PRCs) established by the GOI in various states. Each research organization had responsibility for collecting the data in one or more states. A complete list of these research organizations is given in Appendix A.

## 1.2 Demographic Profile of India

The population of India rose from 361 million in 1951 to 1,028 million in 2001, nearly tripling in size. Between 1961-71 and 1971-81, the exponential growth rate of the population peaked at 2.2 percent. The growth rate declined marginally to 2.1 percent in 1981-91 and to 1.95 percent in 1991-2001. The female to male sex ratio has declined substantially since the beginning of this century, resulting in a substantial female deficit in the population. The sex ratio declined from 972 females per 1,000 males in 1901 to 930 in 1971, but it has been fairly constant since 1971. The density of the population per $km^2$ increased from 117 in 1951 to 325 in 2001, a nearly threefold increase in the last five decades. According to the 2001 Census, 35 percent of

the population is in the childhood ages (0-14 years), 8 percent is age 60 and over, and 57 percent is in the working-age group 15-59. The percentage of the population living in urban areas was 20 percent in 1971 and increased to 28 percent in 2001. The country's annual exponential growth rate of urban population peaked at 3.8 percent in 1971-81. Since then the urban growth rate has been decelerating, to 3.1 percent in 1981-91 and 2.7 percent in 1991-2001. The annual growth rate of the rural population was 1.8 percent in 1981-91 and 1.7 percent in 1991-2001. According to the 2001 Census, 16 percent of India's population belonged to scheduled castes and 8 percent belonged to scheduled tribes[1] (Registrar General, 2006a).

## 1.3 Performance of Indian Economy

India currently has one of the 10 fastest growing economies in the world. India's gross national product (at factor cost) rose from Rs. 20.7 trillion in 2001-02 to Rs. 32.5 trillion in 2005-06 at current prices, a rise of almost 60 percent in five years (Ministry of Finance, 2007). The Tenth Five Year Plan set a target of 8.0 percent GDP growth for 2002-07 and 9.3 percent in the Eleventh Five Year Plan (2007-12), with the aim of doubling per capita income by 2012. In accordance with this goal, the annual rate of growth of GDP has accelerated to 8.0 percent in 2006-07, compared with 6.1 percent per annum during the 1990s. The 1990s marked a period of structural reforms in the Indian economy, and the growth rate of GDP in this period was higher than the annual average GDP growth rate of about 4 percent during the four decades of 1950-1990 (Reddy, 2002). Between 1950-51 and 1998-99, gross domestic savings and gross domestic capital formation as a percentage of the gross domestic product (GDP) increased from around 10 percent to 22 percent. In recent years, both the gross domestic savings rate and the gross domestic investment rate have been increasing at a faster pace, from 23.5 and 23.8 percent in 2000-01 to 31.1 and 31.5 percent in 2004-05 (Ministry of Finance, 2007).

India's agricultural production increased nearly fourfold during the four decades from 1951-90, mainly due to the success of the green revolution since the 1970s. As a result, the country successfully emerged from being dependent on imports of food grains to becoming a marginal exporter of food grains. The country's production of food grains peaked at over 200 million tonnes in 2000-01. Although agriculture and allied sectors have been growing moderately, at 3.0 percent per annum in the last six years, the total production of food grains has plateaued, with the production of pulses remaining stagnant. The deceleration of agricultural growth in recent years is the result of the cumulative effect of inadequate policies related to agriculture and the degradation of natural resources (Ministry of Finance, 2007; Kapila and Kapila, 2002). With the slowdown in agricultural growth, the contribution of agriculture to GDP declined from 25 percent in 2000-01 to 19 percent in 2006-07. The drag in agriculture growth is a cause of concern because more than half of the population depends directly on this sector (Ministry of Finance, 2007).

On the other hand, India's GDP growth (at factor cost and at 1999-2000 prices) in the industrial and service sectors has been accelerating over the last five years, attaining double-digit growth in 2006-07, at 10.0 and 11.1 percent, respectively (Ministry of Finance, 2007). The share

[1] 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.

of the industrial and service sectors in GDP has grown in recent years, reaching 26.4 percent and 55.1 percent, respectively. The buoyancy in service sector growth contributed more than two-thirds of the overall growth in GDP between 2002-03 and 2006-07 (Ministry of Finance, 2007). The remarkable surge in the industrial and service sectors is the result of reforms undertaken in the 1980s and 1990s to increase India's competitiveness in the global market. This is in contrast to the weak industrial base that existed from independence into the 1970s.

## 1.4 Performance of Social and Health Sectors

In addition to setting economic goals, the Tenth Five Year Plan recognized the importance of introducing additional quantifiable targets related to social sector development. These are considered to be central to the attainment of the overall objectives of the plan. While economic policies in the 1990s have been able to remove the constraints on economic growth, the policies to remove impediments toward progress in social development and health have not been adequately addressed. There have been substantial improvements in literacy, some health indicators, and poverty reduction, with substantial variations between different indicators of human development and among the states in the last five decades. However, India's current picture with regard to literacy, health, and sanitation is not encouraging. India's relative rank in human development among 177 countries has risen by only two positions from 128 in 1999 to 126 in 2004 (United Nations Development Program, 2006). Therefore, the National Development Council (NDC) has emphasized that attaining targets in key human development areas such as education, health, and poverty reduction is extremely important and intimately linked to economic growth objectives (Ministry of Finance, 2007).

The percentage of the population living below the poverty line decreased from 55 percent in 1973-74 to 36 percent in 1993-94 (Central Statistical Organization, 1999). Evidence from the 61$^{st}$ round of NSSO data shows that the extent of poverty decreased further from 26.1 percent in 1999-2000 to 22.0 percent in 2004-05 (Ministry of Finance, 2007). India's literacy rate increased from 18 percent in 1951 to 66 percent in 2001. An important concern is the substantial gender gap in the literacy rate, with 54 percent of females and 76 percent of males being literate in 2001 (Registrar General, 2006a). Gross enrolment as a percentage of the total child population age 6-10 years increased from 43 percent in 1950-51 to 98 percent in 2003-04. The corresponding increase among children age 11-14 was from 13 percent to 63 percent (Central Statistical Organization, 2006).

An assessment of the country's performance in the areas of health, demographic behaviour, and family planning indicates the following improvements in the past five decades (Central Bureau of Health Intelligence, 2006; Registrar General, 2006a). The crude death rate declined from 25 per 1,000 population in 1951 to 8 in 2001. The infant mortality rate has been halved, from 120 per 1,000 live births in the 1970s to 60 in 2003. The expectation of life at birth has risen from 36 years in 1951 to 62.5 years in 1998-2002. The crude birth rate declined from 42 in 1951 to 25 in 2002 and the total fertility rate decreased from 6.0 in 1951 to 2.9 in 2003. The maternal mortality ratio is estimated to have declined from 400 maternal deaths per 100,000 live births in 1997-98 to 300 in 2001-03 (Registrar General, 2006b). However, these achievements have not met the population and health goals set by the Government of India, and the changes have been considerably slower than in many other Asian countries such as China, Indonesia, Thailand, Malaysia, the Republic of Korea, and Sri Lanka.

India is also grappling with major adult health problems such as tuberculosis, malaria, diarrhoea, and HIV/AIDS. In the coming years, the burden of chronic diseases is likely to rise further with the growing size of the elderly population. The country's population, which is currently more than 1.1 billion, is expected to reach 1.26 billion by March 2016 (Central Bureau of Health Intelligence, 2006). In view of the slow progress in health and demographic indicators during the 1990s, the Government of India has initiated several new population and health measures to remove impediments and to promote more broad-based success of health and population stabilization programmes.

## 1.5 Population and Health Related Policies and Programmes

India's family planning programme was initiated in 1951 in an effort to regulate the growth of the country's population. Since then, the programme has undergone a number of changes in policy, approach, and implementation. In the last five decades, the programme has embraced six major approaches. In chronological sequence, these are the clinic approach (1951-61), extension and education approach - low intensity HITTS (Health department operated, Incentive based, Target-oriented, Time-bound, and Sterilization-focused programme) approach (1962-69), high intensity HITTS approach (1969-75), coercive approach (1976-77), recoil and recovery phase (1977-94), and reproductive and child health approach (since 1995). The services provided under the programme have been expanded during the transition to each new phase.

From 1951-61, under the clinic-based approach, family planning coverage was negligible, with the couple protection rate (CPR) remaining at about 0.2 percent. With the introduction of the extension and education approach in 1962, the CPR rose to 15 percent in 1975. The programme, however, suffered a setback during the coercive approach of 1976-77. In the subsequent recovery phase, the scope of the programme broadened significantly by integrating family planning with maternal and child services. Since 1977, family planning has been provided as part of a variety of services to mothers and children, including antenatal, delivery, and postnatal care, immunization of children against various vaccine-preventable diseases, and counselling on maternal and child health problems and nutrition. The CPR increased from 24 percent in 1977 to 45 percent in 1992-93. In 1992, the government launched the Child Survival and Safe Motherhood (CSSM) Programme as part of the Family Welfare Programme. The aim was to have an integrated package of interventions for the betterment of the health status of mothers and children. The additional components of this programme were treatment of diarrhoea and acute respiratory infections, essential newborn care, and strengthening of emergency obstetric care services.

In 1994, a committee was constituted by the Government of India under the chairmanship of Dr. M.S. Swaminathan to draft a new National Population Policy. The report of the committee consisted of a number of important recommendations, one of which was to abolish the target-oriented approach. In the aftermath of United Nations 10$^{th}$ International Conference on Population and Development (ICPD), the Government of India launched the Reproductive and Child Health (RCH) programme in 1995. Under the RCH approach, Community Needs Assessment was introduced and treatment of reproductive tract infections (RTIs) and sexually transmitted diseases (STDs) was added to existing services provided under the family welfare and CSSM programmes. Under the new RCH approach, state-wide family planning targets were

abolished, contraceptive services were offered on demand, and gender equity was emphasized to promote male methods of contraception and to reduce reliance on female methods. The purpose of the RCH initiative was to overcome several shortcomings in the family planning programme, such as the reliance on sterilization targets among high parity couples, unhealthy competition, poor quality of services and care, and lack of focus on informed choice, counselling, and follow-up services to clients. However, despite the expansion of services and higher per capita input cost under the RCH programme, progress on various RCH indicators has been slow in the last 10 years.

The new National Population Policy (NPP), released in 2000, paid special attention to the health and education of women and children to achieve population stabilization for the country by 2045. The policy document begins with the statement that 'the overriding objective of economic and social development is to improve the quality of lives that people lead, to enhance their well-being, and to provide them with opportunities and choices to become productive assets in society (Ministry of Health and Family Welfare, 2000). The NPP has elaborated 12 strategies to achieve its socio-demographic goals. The policy proposes decentralized planning and programme implementation. Overall, the policy envisages free and compulsory school education up to age 14, a reduction in the infant mortality rate to less than 30 infant deaths per 1,000 live births, and a reduction in the maternal mortality ratio to less than 100 maternal deaths per 100,000 live births. The policy also aims to achieve universal immunization of children, delivery assistance by trained personnel for all births, and 100 percent registration of births, deaths, marriages, and pregnancies. Another important emphasis of the policy is the need to promote delayed marriages for girls, the provision of a wider choice and universal access to family planning information and services, and the prevention of major infectious diseases, including reproductive tract infections and AIDS. All these goals are to be achieved by 2010 to realize replacement level fertility by that year with an estimated population of 1.11 billion and population stabilization by 2045.

Following NPP, in the broader context of health system goals, the Government of India formulated a new National Health Policy in 2002 to cater to the changes in the determining factors related to the health sector since the National Health Policy of 1983. The previous health policy was revised and restructured based on the United Nations Millennium Development Goals. The National Health Policy of India (2002) noted the significant improvements achieved in the health status of the population in terms of indicators such as infant mortality and life expectancy (Ministry of Health and Family Welfare, 2002). However, the statistics also brought out the uneven progress across rural-urban areas and wide differences between the attainment of health goals in better and poorer performing states. Given a situation in which the national averages on most indices are themselves at unacceptably low levels, the wide interstate disparities imply that for vulnerable sections of society in several states, access to public health services is nominal and health standards are still grossly inadequate. The main objective of the National Health Policy 2002 is to achieve an acceptable standard of good health among the general population of the country. The approach aims to increase access to the decentralized public health system by establishing new infrastructure in existing institutions. A comprehensive evidence base is stated to be an important input for effective health policy interventions. The national goals of the National Health Policy (2002) have been revised under the National Rural Health Mission.

In 2005, recognizing the importance of health in the process of economic and social development and improving the quality of life of the people, the Government of India launched the National Rural Health Mission (NRHM) to undertake necessary corrections in the basic health care system (Ministry of Health and Family Welfare, 2005). The goal of NRHM is to improve the availability of and access to quality health care, especially for those residing in rural areas, the poor, women, and children. The Plan of Action includes an increase in health expenditures, reduction of regional imbalances, integration of organization structure, optimization of health manpower, decentralization and district management of health programmes, pooling resources, community participation and ownership of assets, induction of management and financial personnel into the district health system, and operationalization of Community Health Centres into functional hospitals meeting Indian public health standards in each block of the country.

The NRHM seeks to focus on 18 states which have weak public health infrastructure and indicators. These states are Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttaranchal and Uttar Pradesh. The expected national outcomes from the Mission during 2005-2012 are:

- Infant mortality rate reduced to 30 per 1,000 live births by 2012
- Maternal mortality reduced to 100 per 100,000 live births by 2012
- Total fertility rate reduced to 2.1 by 2012
- Malaria mortality reduction rate of 50% up to 2010, and an additional 10% by 2012
- Kala Azar mortality reduction rate of 100% by 2010 and sustaining elimination until 2012
- Filaria/microfilaria reduction rate of 70% by 2010, 80% by 2012, and elimination by 2015
- Dengue mortality reduction rate of 50% by 2010 and sustaining that level until 2012
- Cataract operations increasing to 46 *lakhs* until 2012
- Leprosy prevalence rate reduction from 1.8 per 10,000 in 2005 to less than 1 per 10,000 thereafter
- Tuberculosis DOTS series maintenance of an 85% cure rate through the entire mission period and sustaining the planned case detection rate
- Upgrading all Community Health Centres to Indian public health standards
- Increasing the bed occupancy rate of First Referral units from less than 20% of referred cases to over 75%
- Engaging 400,000 female Accredited Social Health Activists (ASHAs)

## 1.6 QUESTIONNAIRES

Each round of NFHS has had two specific goals: a) to provide essential state and national level data to monitor health and family welfare programmes and policies implemented by the Ministry of Health and Family Welfare and other ministries and agencies, and b) to provide information on important emerging health and family welfare issues.

NFHS-3 used three types of questionnaires: the Household Questionnaire, the Women's Questionnaire, and the Men's Questionnaire. The overall content and format of the questionnaires were determined through a series of workshops and meetings held in 2005-06. The workshops were attended by representatives of a wide range of research and development organizations in the population and health fields, officials from the Ministry of Health and Family Welfare and other government agencies, representatives from international agencies, and experts working on gender and HIV/AIDS issues. The questionnaires for each state were bilingual, with questions in both the principal language of the state and English.

The ***Household Questionnaire*** was used to list all usual residents in each sample household plus any visitors who stayed in the household the night before the interview. For each person listed, information was collected on age, sex, marital status, relationship to the head of the household, and education. For children age 0-4 years, information was collected on birth registration. Questions were asked about school/college attendance for children age 5-18 years, and questions were asked about the activities of children age 5-14 years. The Household Questionnaire also collected information on the main source of drinking water, type of toilet facility, source of lighting, type of cooking fuel, religion and caste/tribe of the household head, ownership of a house, ownership of agricultural land, ownership of livestock, ownership of other selected items, and whether the household had a BPL (Below Poverty Line) card. Information was also collected on health issues such as the prevalence of tuberculosis, use of private or public health facilities, and ownership of mosquito nets. In addition, a test was conducted to assess whether the household uses cooking salt fortified with iodine.

***Biomarker Measurement:*** The Household Questionnaire also included several biomarker measurements. Two health investigators on each survey team measured the height and weight of women age 15-49, men age 15-54, and children born since January 2000 (in states where fieldwork started in 2005) or January 2001 (in states where fieldwork started in 2006) [see Table 1.2 for the month and year of fieldwork in each state]. Height and weight data are used for assessing nutritional levels of the population. The health investigators also took blood samples from women age 15-49, men age 15-54, and children age 6-59 months to measure haemoglobin levels, which indicate the prevalence of anaemia. Haemoglobin levels were measured in the field using portable HemoCue instruments that provide test results in less than one minute. All respondents were given an informational brochure about anaemia and proper nutrition. Severely anaemic adults and children were referred to local public health facilities for treatment.

***HIV testing:*** One of the major biomarker components incorporated in NFHS-3 was the collection of Dried Blood Spots (DBS) on filter paper cards to test for HIV. This component of the survey was included in response to the urgent need to have nationally-representative data on HIV prevalence and comprehensive information on knowledge and attitudes about HIV/AIDS, high-risk sexual behaviour, and practices related to HIV testing in India. Blood spots from a

finger prick were collected on filter paper cards for HIV testing. If the respondent gave consent for blood collection for both HIV and anaemia testing, the standard protocol was to first collect 3-5 blood spots on the filter paper card for HIV testing, and then to collect an additional drop of blood from the same finger prick in a microcuvette for anaemia testing. The blood spots on filter paper cards were dried overnight in special drying boxes. The packaged filter paper cards were delivered to SRL Ranbaxy blood collections centres throughout the country, and they were shipped by courier from the blood collection centres to the SRL Ranbaxy laboratory in Mumbai for HIV testing. DBS were collected from consenting women age 15-49 and men age 15-54 to provide HIV prevalence estimates at the national level and for each of the six high HIV prevalence states identified by the National AIDS Control Organization (NACO), namely Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, and Tamil Nadu. However, blood for HIV testing and anaemia testing could not be collected in Nagaland due to local opposition. It was also decided to provide estimates of HIV prevalence for one low HIV prevalence state, Uttar Pradesh.

The HIV testing was anonymous. No names or other contact information were recorded on the DBS samples. Instead, a bar code label with randomly generated numbers was pasted on the filter paper sample and on the questionnaires. Respondents were not given the HIV test results since the protocol design made it impossible for the survey staff to know the HIV status of individual participants. All of the information obtained from the household and individual interviews, however, can be linked to the HIV test results through the bar codes. In order to preserve the anonymity of the results, the original cluster and household identifiers were replaced in the data set by randomly generated cluster and household numbers. All individuals who were eligible for testing in the survey, whether they accepted the testing or not, received referrals for free HIV counseling and testing at a local health facility.

The ***Women's Questionnaire*** was employed to interview all women (ever-married and never-married) age 15-49 who were usual residents of the sample household or visitors who stayed in the sample household the night before the survey. The questionnaire covered the following topics:

Background characteristics: age, marital status, caste/tribe, religion, education, employment status, exposure to mass media, place of residence, and husband's background.

Reproductive behaviour and intentions: dates and survival status of all births, current pregnancy status, pregnancy losses, use of ultrasound for recent pregnancies, and future childbearing intentions.

Marriage and cohabitation: duration of marriage and cohabitation, number of times married.

Knowledge and use of contraception: knowledge and use of specific contraceptive methods, source of family planning methods, and reasons for non-use of contraception and intentions not to use contraception in the future.

Quality of care and contacts with health personnel: quality of family planning and health services.

Antenatal, delivery, and postnatal care: antenatal and postnatal care, antenatal services received, place of delivery, attendance at delivery, and complications during pregnancy for recent births.

General health: smoking, alcohol use, injections, tuberculosis, asthma, diabetes, and thyroid disorders.

Child immunizations, child health, and child feeding practices: immunization coverage, breastfeeding and feeding practices, and recent occurrences of diarrhoea, fever, and cough for young children.

Women's and children's nutrition: food intake and nutrition-related practices for women and children.

Utilization of ICDS Services: utilization of various services of the Integrated Child Development Services (ICDS) Scheme for women and children.

Status of women and spousal violence: women's autonomy, gender relations, men's involvement in health care for women, and various forms of physical and sexual violence experienced by women.

Sexual life: sexual intercourse (first and recent intercourse), high-risk sexual behaviour, number of sexual partners, age difference between partners, and duration of sexual relationships.

HIV/AIDS and other sexually transmitted infections: knowledge of AIDS and the sources of knowledge, knowledge of ways to avoid getting HIV/AIDS, prior HIV testing, knowledge of places for HIV testing and medications for HIV/AIDS, perceptions and stigma related to HIV infected persons, attitudes about family life education for children, and knowledge and prevalence of other sexually transmitted infections.

The ***Men's Questionnaire*** was employed to interview men age 15-54 who were usual residents of the sample household or visitors who stayed in the sample household the night before the survey. The Men's Questionnaire contains a subset of questions that are covered in the Women's Questionnaire, plus some additional questions only administered to men. The questionnaire covered the following topics:

Background characteristics: age, marital status, caste/tribe, religion, education, employment status, exposure to mass media, and place of residence.

Reproductive behaviour and intentions: number of children, number of surviving children, fertility preferences, and future intentions to have children.

Knowledge and use of contraception: knowledge and use of specific contraceptive methods, and sources of family planning methods.

Male involvement in health care: men's involvement in health care for their child and the mother of their children, and quality of health services obtained by men.

Sexual life: sexual intercourse (first and recent intercourse), high-risk sexual behaviour, number of sexual partners, age difference between partners, and duration of sexual relationships.

Health and nutrition: food intake, smoking, alcohol use, injections, tuberculosis, asthma, diabetes, and thyroid disorders.

Attitude toward gender roles: attitude about gender roles, attitude about spousal violence, and men's perception of wife's involvement in decision making.

HIV/AIDS and other sexually transmitted infections: knowledge of AIDS and the sources of knowledge, knowledge of ways to avoid getting HIV/AIDS, prior HIV testing, knowledge of places for HIV testing and medications for HIV/AIDS, perceptions and stigma related to HIV-infected persons, knowledge and prevalence of other sexually transmitted infections, and attitudes about family life education for children.

## 1.7 Sample Design and Implementation

### Sample size

Since a large number of the key indicators to be estimated from NFHS-3 refer to ever-married women in the reproductive ages of 15-49, the target sample size for each state in NFHS-3 was estimated in terms of the number of ever-married women in the reproductive ages to be interviewed.

The initial target sample size was 4,000 completed interviews with ever-married women in states with a 2001 population of more than 30 million, 3,000 completed interviews with ever-married women in states with a 2001 population between 5 and 30 million, and 1,500 completed interviews with ever-married women in states with a population of less than 5 million. In addition, because of sample-size adjustments required to meet the need for HIV prevalence estimates for the high HIV prevalence states and Uttar Pradesh and for slum and non-slum estimates in eight selected cities, the sample size in some states was higher than that fixed by the above criteria. The target sample was increased for Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, Tamil Nadu, and Uttar Pradesh to permit the calculation of reliable HIV prevalence estimates for each of these states. The sample size in Andhra Pradesh, Delhi, Maharashtra, Tamil Nadu, Madhya Pradesh, and West Bengal was increased to allow separate estimates for slum and non-slum populations in the cities of Chennai, Delhi, Hyderabad, Indore, Kolkata, Mumbai, Meerut, and Nagpur.

The target sample size for HIV tests was estimated on the basis of the assumed HIV prevalence rate, the design effect of the sample, and the acceptable level of precision. With an assumed level of HIV prevalence of 1.25 percent and a 15 percent relative standard error, the estimated sample size was 6,400 HIV tests each for men and women in each of the high HIV prevalence states. At the national level, the assumed level of HIV prevalence of less than 1 percent (0.92 percent) and less than a 5 percent relative standard error yielded a target of 125,000 HIV tests at the national level.

Blood was collected for HIV testing from all consenting ever-married and never married women age 15-49 and men age 15-54 in all sample households in Andhra Pradesh, Karnataka,

Maharashtra, Manipur, Tamil Nadu, and Uttar Pradesh. All women age 15-49 and men age 15-54 in the sample households were eligible for interviewing in all of these states plus Nagaland. In the remaining 22 states, all ever-married and never married women age 15-49 in sample households were eligible to be interviewed. In those 22 states, men age 15-54 were eligible to be interviewed in only a subsample of households. HIV tests for women and men were carried out in only a subsample of the households that were selected for men's interviews in those 22 states. The reason for this sample design is that the required number of HIV tests is determined by the need to calculate HIV prevalence at the national level and for some states, whereas the number of individual interviews is determined by the need to provide state level estimates for attitudinal and behavioural indicators in every state. For statistical reasons, it is not possible to estimate HIV prevalence in every state from NFHS-3 as the number of tests required for estimating HIV prevalence reliably in low HIV prevalence states would have been very large.

**Sample Design**

The urban and rural samples within each state were drawn separately and, to the extent possible, unless oversampling was required to permit separate estimates for urban slum and non-slum areas, the sample within each state was allocated proportionally to the size of the state's urban and rural populations. A uniform sample design was adopted in all states. In each state, the rural sample was selected in two stages, with the selection of Primary Sampling Units (PSUs), which are villages, with probability proportional to population size (PPS) at the first stage, followed by the random selection of households within each PSU in the second stage. In urban areas, a three-stage procedure was followed. In the first stage, wards were selected with PPS sampling. In the next stage, one census enumeration block (CEB) was randomly selected from each sample ward. In the final stage, households were randomly selected within each selected CEB.

**Sample Selection in Rural Areas**

In rural areas, the 2001 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 districts being subdivided into contiguous regions. Within each of these regions, villages were further stratified using selected variables from the following list: village size, percentage of males working in the nonagricultural sector, percentage of the population belonging to scheduled castes or scheduled tribes, and female literacy. In addition to these variables, an external estimate of HIV prevalence, i.e., 'High', 'Medium' or 'Low', as estimated for all the districts in high HIV prevalence states, was used for stratification in high HIV prevalence states. Female literacy was used for implicit stratification (i.e., villages were ordered prior to selection according to the proportion of females who were literate) in most states although literacy was an explicit stratification variable in a few states.

In every state, a mapping and household listing operation was carried out in each sample area. The listing 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 or the location of these structures, identifying residential structures, and listing the names of the heads of all the households in residential structures in the selected PSUs. Large sample villages (with more than

a specified number of households, usually 500) were segmented, and two segments were selected randomly using the PPS method. Household listing in the segmented PSUs was carried out only in the selected segments. Each household listing team comprised one lister and one mapper. Senior field staff of the concerned research organization supervised the listing operation.

The households to be interviewed were selected with equal probability from the household list in each area using systematic sampling. The interval applied for the selection was determined to obtain a self-weighting sample of households within each domain. On average, 30 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 15 and 60, respectively. Each survey team supervisor was provided with the original household listing, layout sketch map, and the list of selected households for each PSU. All the households which were selected were contacted during the main survey, and no replacement was made if a selected household was absent during data collection. However, if a PSU was inaccessible, a replacement PSU with similar characteristics was selected by IIPS and provided to the research organization.

**Sample Selection in Urban Areas**

The procedure adopted for the first stage of the sample design in urban areas was similar to the one followed in rural areas. The 2001 Census list of wards 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 size. Next, one census enumeration block, 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 each selected census enumeration block, which provided the necessary frame for selecting households in the third stage of sample selection. On average, 30 households were targeted for selection from each census enumeration block with minimum and maximum limits from any area of 15 and 60 households.

**Sample Weights**

NFHS-3 is designed for self weighting at the domain level. The domains are the urban and rural areas of each state, and the slum and non-slum areas of each of the eight selected cities. This means that all households and individuals in the same domain will share a common household weight and individual weight, respectively. The design weight is the inverse of the overall sampling fraction in each domain. The overall sampling fraction is the product of the selection probabilities at each sampling stage (two stages in rural areas and three stages in urban areas). The design weight was adjusted for household non-response in the calculation of the household sampling weight. The household sampling weight was further adjusted for individual non-response to obtain the individual sampling weight. Both adjustments for non-response were done at the domain level in order to preserve the self-weighting nature of the sample within domains. The sampling weights were further normalized at the national level to obtain national standard weights and at the state level to obtain standard state weights for each of the 29 states. The national standard weights were normalized so that the total number of weighted cases equals the total number of unweighted cases at the national level. The state standard weights were calculated to ensure that the total number of weighted cases equals the total number of

unweighted cases for each state. Weights for the men's subsample, the HIV subsample, and the subsample of women selected for the domestic violence section of the questionnaire were calculated in a similar way.

## Sample Implementation and Data Collection

NFHS-3 fieldwork was carried out in two phases, in order to achieve better coordination and supervision in the implementation of the survey. Twelve states were canvassed in the first phase and the remaining 17 states were canvassed in the second phase. First-phase data collection was carried out from November 2005 to May 2006. Second-phase data collection was carried out from April to August 2006.

The first phase of fieldwork covered Andhra Pradesh, Assam, Chhattisgarh, Delhi, Gujarat, Maharashtra, Meghalaya, Orissa, Punjab, Rajasthan, Uttar Pradesh, and West Bengal. The second-phase states were Arunachal Pradesh, Bihar, Goa, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Manipur, Madhya Pradesh, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, and Uttaranchal.

Table 1.1 shows the number of household interviews, the number of interviews with women and men, and response rates for the entire country by urban-rural residence. Table 1.2 shows the period of fieldwork, number of households and eligible women and men interviewed, and response rates for each state. A total of 109,041 households were interviewed. The household response rate, i.e., the number of households interviewed per 100 occupied households, was 98 percent for India as a whole, 97 percent in urban areas, and 99 percent in rural areas. The household response rate was 96 percent or higher in all states.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews with women and men, and response rates, according to residence, India, 2005-06

| Result | Residence | | Total |
|---|---|---|---|
| | Urban | Rural | |
| **Household interviews** | | | |
| Households selected | 54,453 | 62,199 | 116,652 |
| Households occupied | 51,846 | 59,713 | 111,559 |
| Households interviewed | 50,236 | 58,805 | 109,041 |
| Household response rate[1] | 96.9 | 98.5 | 97.7 |
| **Interviews with women age 15-49** | | | |
| Number of eligible women | 61,028 | 70,568 | 131,596 |
| Number of eligible women interviewed | 56,961 | 67,424 | 124,385 |
| Eligible women response rate[2] | 93.3 | 95.5 | 94.5 |
| **Interviews with men age 15-54** | | | |
| Number of eligible men | 45,133 | 40,240 | 85,373 |
| Number of eligible men interviewed | 38,199 | 36,170 | 74,369 |
| Eligible men response rate[2] | 84.6 | 89.9 | 87.1 |

Note: Eligible women and men are women age 15-49 and men age 15-54 who stayed in the household the night before the household interview (including both usual residents and visitors). This table is based on the unweighted sample.
[1] Households interviewed/households occupied.
[2] Respondents interviewed/eligible respondents.

In the interviewed households, individual interviews were completed with 124,385 women out of 131,596 who stayed in the household the night before the household interview. The individual response rate, i.e., the number of completed interviews per 100 eligible women identified in the households, was 95 percent for the country as a whole (93 percent in urban areas and 96 percent in rural areas). The response rate for eligible women varied from 90 percent in Maharashtra and Meghalaya to 99 percent in Madhya Pradesh and Chhattisgarh. Individual interviews were completed with 74,369 eligible men out of 85,373 who stayed in the household the night before the household interview. The response rate for eligible men was 87 percent for the country as a whole (85 percent in urban areas and 90 percent in rural areas). The response rate for eligible men varied from 76 percent in Delhi to 98 percent in Madhya Pradesh.

Table 1.2 Number of households, women, and men interviewed by state

Month and year of fieldwork, number of households, women, and men interviewed, and response rates by state, India, 2005-06

| State | Month and year of fieldwork | | Households interviewed | | Women interviewed | | Men interviewed | |
|---|---|---|---|---|---|---|---|---|
| | From | To | Number | Response rate | Number | Response rate | Number | Response rate |
| **India** | 11/05 | 8/06 | 109,041 | 97.7 | 124,385 | 94.5 | 74,369 | 87.1 |
| **North** | | | | | | | | |
| Delhi | 12/05 | 4/06 | 3,324 | 96.1 | 3,349 | 91.1 | 1,436 | 75.9 |
| Haryana | 4/06 | 6/06 | 2,302 | 98.8 | 2,790 | 95.5 | 1,083 | 85.3 |
| Himachal Pradesh | 4/06 | 7/06 | 2,790 | 96.3 | 3,193 | 95.0 | 1,067 | 88.2 |
| Jammu & Kashmir | 4/06 | 8/06 | 2,415 | 97.3 | 3,281 | 92.2 | 1,076 | 77.8 |
| Punjab | 12/05 | 3/06 | 2,968 | 98.0 | 3,681 | 93.5 | 1,329 | 82.2 |
| Rajasthan | 12/05 | 4/06 | 3,282 | 99.0 | 3,892 | 98.4 | 1,471 | 95.5 |
| Uttaranchal | 4/06 | 7/06 | 2,659 | 97.5 | 2,953 | 91.2 | 983 | 81.5 |
| **Central** | | | | | | | | |
| Chhattisgarh | 11/05 | 3/06 | 3,031 | 99.4 | 3,810 | 98.6 | 1,384 | 96.6 |
| Madhya Pradesh | 4/06 | 8/06 | 5,488 | 99.1 | 6,427 | 98.8 | 2,725 | 98.1 |
| Uttar Pradesh | 12/05 | 4/06 | 10,026 | 96.6 | 12,183 | 93.9 | 11,458 | 86.9 |
| **East** | | | | | | | | |
| Bihar | 4/06 | 7/06 | 3,016 | 98.5 | 3,818 | 97.3 | 1,214 | 92.7 |
| Jharkhand | 4/06 | 8/06 | 2,483 | 96.3 | 2,983 | 94.0 | 996 | 86.5 |
| Orissa | 11/05 | 4/06 | 3,910 | 98.9 | 4,540 | 96.1 | 1,592 | 92.7 |
| West Bengal | 12/05 | 5/06 | 5,992 | 97.8 | 6,794 | 95.6 | 2,669 | 90.0 |
| **Northeast** | | | | | | | | |
| Arunachal Pradesh | 4/06 | 7/06 | 1,526 | 98.8 | 1,647 | 96.9 | 711 | 94.7 |
| Assam | 12/05 | 4/06 | 3,437 | 98.3 | 3,840 | 95.0 | 1,394 | 85.7 |
| Manipur | 5/06 | 8/06 | 3,498 | 98.7 | 4,512 | 94.7 | 3,951 | 88.4 |
| Meghalaya | 12/05 | 5/06 | 1,900 | 97.8 | 2,124 | 89.8 | 720 | 78.0 |
| Mizoram | 5/06 | 7/06 | 1,513 | 99.7 | 1,791 | 98.3 | 665 | 97.4 |
| Nagaland | 4/06 | 8/06 | 3,866 | 97.9 | 3,896 | 95.1 | 3,971 | 91.6 |
| Sikkim | 4/06 | 7/06 | 1,902 | 98.7 | 2,127 | 95.6 | 810 | 92.4 |
| Tripura | 4/06 | 7/06 | 1,574 | 97.7 | 1,906 | 97.4 | 711 | 91.6 |
| **West** | | | | | | | | |
| Goa | 4/06 | 7/06 | 3,231 | 97.2 | 3,464 | 91.0 | 1,185 | 79.5 |
| Gujarat | 12/05 | 3/06 | 3,216 | 97.7 | 3,729 | 95.4 | 1,428 | 88.7 |
| Maharashtra | 12/05 | 3/06 | 8,315 | 95.9 | 9,034 | 89.5 | 8,867 | 77.9 |
| **South** | | | | | | | | |
| Andhra Pradesh | 12/05 | 4/06 | 6,668 | 97.8 | 7,128 | 93.5 | 7,128 | 89.4 |
| Karnataka | 4/06 | 7/06 | 5,342 | 96.7 | 6,008 | 92.3 | 5,528 | 83.4 |
| Kerala | 4/06 | 8/06 | 3,023 | 99.3 | 3,566 | 96.4 | 1,121 | 90.3 |
| Tamil Nadu | 4/06 | 7/06 | 6,344 | 98.6 | 5,919 | 97.6 | 5,696 | 95.6 |

Note: This table is based on the unweighted sample; all subsequent tables are based on the weighted sample unless otherwise specified. The number of women and men is based on the de facto population. The household response rate is defined as the number of households interviewed per 100 occupied households. The response rates for women and men are the percentages of eligible women and men with completed interviews.

## 1.8 RECRUITMENT, TRAINING, AND FIELDWORK

### Survey manuals

To maintain standardized survey procedures across states and to minimize non-sampling errors, eight different manuals were prepared for various training programmes. These manuals were the manual for household listing and mapping, the interviewer's manual, the supervisor's and editor's manual, the health investigator's manual, the manual on household relations, training guidelines, the manual for data entry coordinators, and a project director's manual.

The *manual for household listing and mapping* describes the procedures for drawing location and layout maps of sampled areas, listing households, and selecting households for the survey. This manual also describes the roles and responsibilities of mappers and listers. The *interviewer's manual* describes standard interviewing techniques and procedures for completing questionnaires. The manual also includes a discussion on individual questions in all three questionnaires and an explanation of all fieldwork procedures. The *supervisor's and editor's manual* describes the roles and responsibilities of supervisors and editors, including the preparation, organization, and monitoring of fieldwork. The *manual on household relations* is an addendum to the interviewer's manual. Domestic violence is a sensitive issue and some women may be reluctant to disclose experiences of violence; thus, the training guidelines are geared to develop the necessary awareness and skills for facilitating disclosure without placing respondents or staff at risk.

The *health investigator's manual* describes all the field procedures to be followed in the process of measurement of biomarkers, including illustrative diagrams and photographs. The steps to be followed in the measurement of height, weight, and haemoglobin content in the blood of children and adults are discussed in detail. Comprehensive procedures for blood collection, creating Dried Blood Spots (DBS), and transporting DBS to the collection centres of the central laboratory for HIV testing are described. Ethical issues, including informed consent procedures, are covered. The protocol for disposal of biohazardous waste is also described. The *training guidelines* provide standards for all organizations involved in implementing NFHS-3 fieldwork. The manual covers important aspects of the organization and implementation of the training programme for field staff. The *manual for data entry coordinators* describes methods for data entry and secondary editing. The *project director's manual* provides a list of all the activities and protocols involved in NFHS-3. This manual is designed for the Project Director and other senior staff in the central office who are in charge of NFHS-3 in each state. In addition, several laboratory manuals covered all laboratory protocols and procedures.

### Training

Many organizations were involved in NFHS-3 and a large number of individuals with various skills were required to successfully implement all stages of the survey. Centralized training workshops were held to train representatives of each of the 18 field organizations, as well as personnel at IIPS who assisted with supervision and monitoring of all NFHS-3 activities. Persons who were trained in each workshop subsequently trained the staff in each state according to the standard procedures discussed in the Training Workshops. The purpose of these workshops was to ensure uniformity in data collection procedures in different states.

The following five types of training workshops were held for personnel involved in NFHS-3 project implementation:

Health Coordinator Training: A training workshop for health coordinators was conducted in June 2005 for two weeks at IIPS, Mumbai. Eight health coordinators, who had some medical background, were employed by IIPS for the supervision of data collection for biomarkers. They were trained in methods of blood collection, haemoglobin measurement, height/weight measurement, ethical requirements, and biohazard waste disposal. Biomarker specialists from Macro International served as resource persons. The training involved classroom teaching, practice sessions in the classroom, and practice sessions at health centres and in the community.

Household Listing and Mapping Workshops: Two household listing and mapping workshops of three days' duration were organized at IIPS, one for each phase of fieldwork. The workshop for the states participating in the first phase of fieldwork was held on 8-10 September 2005, and for the second-phase states the training workshop was held on 15-18 January 2006. Two persons responsible for coordinating mapping and household listing from each Research Organization were trained in mapping and household listing operations. The training involved classroom sessions and field practice in rural and urban areas. IIPS coordinators and a consultant from Macro International imparted the training.

Training of Trainers (ToT) Workshops: Two training workshops were conducted to train the trainers who would in turn train the field investigators in each state. At least two trainers for each state were trained in the training of interviewers, supervisors, and editors. The ToT for the first-phase states was held from 16 September to 5 October 2005 in Goa, and the ToT for the second-phase states was held from 30 January to 15 February 2006 in Ooty. The training involved field procedures, the content of questionnaires, guest lectures on HIV/AIDS, domestic violence, and family planning methods, and classroom and field practice. NFHS-3 coordinators from IIPS and Macro International consultants imparted the training.

Health Investigator Training: Two centralized training courses of two weeks' duration were organized at IIPS for all the health investigators, separately for Phase 1 and Phase 2 states. Health investigator training was not held at the state level. The training programme was conducted on 7-19 November 2005 for the first-phase states and on 10-23 March 2006 for the second-phase states. More than 250 health investigators participated in each training workshop. IIPS health coordinators and Macro International consultants served as resource persons. Training included classroom lectures, demonstrations, classroom practice, and practice in public hospitals and in the community.

Data Processing Training: Two data coordinators from each Research Organization were trained at IIPS in office editing of questionnaires and in use of the data entry and editing software (CSPro). A separate training course of two weeks' duration was conducted at IIPS for each phase of data collection. The training for first-phase states was conducted from 28 November to 9 December 2005 and the training for second-phase states was conducted from 3-14 April 2006. Consultants from Macro International imparted the training.

### Fieldwork

The fieldwork in each state was carried out by a number of interviewing teams, each team consisting of one field supervisor, one female field editor, four interviewers, and two health investigators. In the states in which all sample households were eligible for the men's interviews, two of the interviewers were males and the other two were females. In the remaining states, each team included three female interviewers and one male interviewer. The number of interviewing teams in each state varied according to the sample size. In each state, interviewers were hired by the Research Organizations specifically for NFHS-3, taking into consideration their educational background, experience, and other relevant qualifications. Male and female interviewers were assigned respondents of the same sex to ensure that respondents felt comfortable talking about topics that they may find somewhat sensitive. Assignment of Primary Sampling Units (PSUs) to the teams and various logistical decisions were made by the survey coordinators from each Research Organization. Each interviewer was required to make a minimum of three callbacks if no suitable informant was available for the household interview or if an eligible woman or man in the household was not present at the time of the interviewer's visit.

The main responsibility of the field editor was to examine questionnaires for completeness, consistency, and legibility of the information collected, and to ensure that all necessary corrections and clarifications were made while still in the field. Special attention was paid to missing information, skip instructions, filter questions, age information, and completeness of the birth history and the health section. If major problems were detected, such as discrepancies between the birth history and the health section, the interviewers were required to revisit the respondent to rectify the inconsistencies. An additional duty of the field editor was to observe ongoing interviews and verify the accuracy of the method of asking questions, recording answers, and following skip instructions.

The field supervisor was responsible for the overall management of the field team. In addition, the field supervisor conducted spot-checks to verify the accuracy of key information, particularly with respect to the eligibility of respondents. IIPS also appointed one or more research officers in each state for monitoring and supervision throughout the training and fieldwork period to ensure that correct survey procedures were followed and that data quality was maintained. Project directors and other senior staff from the Research Organizations, project coordinators from IIPS, senior research officers, and technical consultants from Macro International also visited the field sites to monitor data collection operations. Health coordinators appointed by IIPS and a medical consultant from Macro International monitored the biomarker component of the survey. Field data were quickly entered into microcomputers, and field-check tables were produced on a regular basis 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 during the fieldwork so that their performance could be improved, if required.

## 1.9 Data Processing

NFHS-3 data processing involved office editing, data entry using CSPro software, verification of data entry, and secondary editing by the research organizations. Final data

cleaning and recoding of the data into a standard structure and variable naming conventions was done at IIPS.

All completed questionnaires were sent to the office of the concerned Research Organization for editing and data processing (including office editing, coding, data entry, and machine editing). Although field editors examined every completed questionnaire in the field, the questionnaires were re-edited at the research organization headquarters by specially trained office editors. The office editors checked all skip sequences, response codes that were circled, and information recorded in filter questions. Special attention was paid to the consistency of responses to age questions and the accurate completion of the birth history. In the second stage of office editing, appropriate codes were assigned for open-ended responses on occupation. For each state, the data were processed with microcomputers using the CSPro data entry and editing software. The data were entered directly from the precoded questionnaires, usually starting within one week of the receipt of the first set of completed questionnaires. Data entry and editing operations were usually completed a few days after the end of fieldwork in each state. Computer-based checks were used to clean the data, and inconsistencies were resolved on the basis of information recorded in the questionnaires. All completed data sets were sent to IIPS for final processing. At this stage, secondary editing programs were run again to detect any remaining errors and inconsistencies. Age imputation was also completed at this stage for records that did not have complete age information. Age variables such as the woman's current age and the year and month of birth of all of her children were imputed for those cases in which information was missing or incorrect entries were detected. Another major activity at this stage was the manual review of all responses that were recorded verbatim in the 'other' response categories. There were more than 100,000 such responses. Some of these responses were added to the coding scheme if a large number of cases had the same response, other responses were recoded into an existing category if appropriate, and the remaining responses were left as recorded on the questionnaire.

## 1.10 NFHS-3 PUBLICATIONS

Fact sheets presenting key indicators were prepared for each state and India as a whole within three months of the end of data collection in the last state. These fact sheets have been widely distributed to policymakers and programme administrators responsible for appropriate interventions in health and family welfare programmes and to other key stakeholders.

The current publication is the first volume of the NFHS-3 national report, which was prepared by IIPS in collaboration with Macro International. The second volume of the national report provides additional information on sampling and on standard errors of key indicators, as well as the questionnaires used in NFHS-3. An additional report on key findings from NFHS-3 has been prepared as a companion volume to the comprehensive national report. Short state reports will also be produced with a summary discussion on major population, health, and nutrition indicators, and selected state-level tables. Several specialized subject reports on key topics will also be published.