CHAPTER 1

INTRODUCTION

This chapter presents a brief overview of the Republic of Yemen, its geographical and historical aspects, the existing population, and socioeconomic conditions. The purpose is to provide the reader with a comprehensive background on the country and conditions in Yemeni society before presenting the results and methodological and administrative aspects of the Yemen Demographic, Maternal and Child Health Survey undertaken in 1997 (YDMCHS-97).

The first YDMCHS was implemented in 1991-92, after the unification of Yemen on May 22, 1990. The second round of the survey was carried out during 1997 by the Central Statistical Organization with Yemeni personnel who participated in all phases of the study (including planning, preparation, implementation, supervision, and writing of this report) in cooperation with the Ministry of Planning and Development, the Ministry of Public Health and the National Council for Population on the one hand, and Macro International Inc. (Macro) on the other.

This survey is considered an important benchmark in statistical work since it covers all the governorates of the Republic and went through highly precise phases during preparation and set-up, training and testing, follow-up and implementation. The survey comes after the first census (1994) under a unified country, the Yemen Republic.

1.1 Geography of Yemen

The Republic of Yemen is located in the southern part of the Arabian Peninsula and is bordered by the Kingdom of Saudi Arabia to the north, the Arabian Sea and Gulf of Aden to the south, the Sultanate of Oman in the east, and the Red Sea to the west. The Bab Al Mandab strait lies off the southwestern tip of the Republic, Mayoun, a Yemeni island in the middle of the strait, controls the passage into and out of the Red Sea.

There are over 112 Yemeni Islands in the Red Sea and the Arabian Sea. The largest is Sucotra, which has an area of 3,650 square kms and is inhabited by a population of 37,623, according to the results of the 1994 census. Socotra Island lies 510 kilometers southeast of the Yemeni seaport of Mukalla. Next is Kamaran Island with an area of 110 square kms and inhabited by 2,220 persons. In addition, there are the islands of Larger Hunaish and Smaller Hunaish, Zaqar, Al Zubair, and Al Tair as well as other islands. Yemen is characterized by an irregular terrain that accounts in large part for the dispersion of population aggregates. Despite the country’s small size, the terrain makes it hard for statistical work to be undertaken in many areas. Yemen can be divided geographically into five major areas: the Mountainous area, the Coastal area, the Plateau area, the Desert (Al-Ruba Al-Khali) area, and the Yemeni islands..

Mountainous Area

The Mountainous area consists of two mountain ranges. The first, the north-south mountain range, runs parallel to the Red Sea. The second is the east-west mountain range, which parallels the Gulf of Aden. The height of these mountains varies from 1,000 to 3,700 meters, the highest elevation being on the level of the Arab peninsula and Greater Syria, where the land is around 3,666 meters above sea level at the peak of Nabi Shuaib Mountain. Water from the mountains drains in all directions into a number of agricultural wadis. These mountain ranges contain several plains and basins forming extensive agricultural areas.
Coastal Area

The coastal plains overlooking the Red Sea, the Gulf of Aden, and the Arabian Sea stretch along a coastal strip approximately 2,000 kms long from the Omani border in the east to Bab Al Mandeb in the west, and then to the border of Saudi Arabia in the north. The width of this coastal area varies from 30 to 60 kilometers.

Plateau Area

The highest elevation in the Plateau area is around 1,000 meters and lies to the east and north of the mountainous highlands and parallel to them. The Plateau becomes wider towards Al-Ruba Al-Khali (the empty quarter). The outer parts of this hilly area are contiguous in the north with the Al-Rub Al-Khali region, which extends deep into the Arabian Peninsula and comprises almost a quarter of the area of the Arabian Sub-Peninsula.

Desert (Al-Ruba Al-Khali) Area

The Al-Ruba Al-Khali region is part of the Yemen Desert. It contains some desert plants and herbs, particularly in the outermost parts that are contiguous with the Plateau area. Fewer plants are seen as one goes deeper into the Al-Ruba Al-Khali region of the Arabian Sub-Peninsula where sand dunes increase.

Yemeni Islands

There are 112 islands scattered in the Yemeni territorial waters of the Red Sea and the Arabian Sea. Many of these islands are inhabited by people and are used by Yemeni fishermen as waiting centers and for fishing purposes. The majority are situated in the Red Sea adjacent to the Yemeni coast.

The largest and most important island is Sucotra in the Arabian Sea, which is known world wide as the home of rare trees such as the ormosia, dracaena draco, and pterocarpus draco trees from which gum, various medicines, incense, and pigments are obtained. Kamaran Island is another important Yemeni island.

For the purposes of this survey, data were collected from hilly and desert areas, as can be observed from the results presented in this report. Sample segments were selected based on three main regions: the coastal region, the mountainous region, and the plateau and desert region. The islands were excluded from the sample because of the small size of the populations, and the difficulty in accessing them.

1.2 Historical Review

In ancient times Yemen’s geographical location and favorable natural conditions played an important role in population settlement and the development of civilization in the territory of Yemen, particularly in the valleys opening into the Al-Ruba Al-Khali desert in the east, the Arabian Sea in the south, and the Red Sea in the west.

The eras of Mae’en, Hadramaut, and Saba’a are considered to be the first organized political entities in Yemen before the birth of Christ. The Hemyar era flourished later and ended with the Abyssinian invasion in 525 A.D.

The most important activities of the people of these regimes were agriculture and trade; they invented agricultural terracing on the mountains and erected dams, the most famous of which was the Ma’arib dam.
They also controlled mercantile caravans and roads which transported commodities from India and East Africa across the Arabian Sub-Peninsula to areas around the Mediterranean Sea (Al-Zoghbi, 1990).

Yemen civilization flourished in those years; it was called Arabia Felix (Arabia the Happy) by the ancient Greeks.

At the end of the Hamiarite era, Yemen was dominated first by the Abyssinians and then by the Persians. This lasted until the emergence of Islam when the Yemenis embraced the Islamic religion and Yemen became part of the central Islamic state. This period lasted from 628 A.D. to 824 A.D. Small independent states emerged thereafter leaving Yemen weak and divided. The Turks (Ottomans) occupied Yemen from the sixteenth century until the beginning of the seventeenth century; then the British occupied Aden in 1839.

The Turks invaded the northern part of Yemen again in 1873 and continued their occupation until the outbreak of World War I, when Yemen came under the rule of the Hamid Al Deen family in the north. This lasted until the outbreak of the Yemeni revolution on September 26, 1962.

The British remained in the south until the outbreak of the revolution of October 14, 1963, which resulted in independence on November 30, 1967 (Mustapha, 1984).

With the success of these two revolutions, Yemen entered a new era of economic, social, cultural and political change. The latest of these changes was the unification of the two parts of Yemen on May 22, 1990.

1.3 Population

The first Population Census under the Republic of Yemen was conducted in 1994. The de facto population of the country reached 15,831,757 persons, of which 14,587,807 were residents distributed in urban and rural areas. The urban population was 3,423,518 and the rural population was 11,164,289, representing 23.5 percent and 76.5 percent of the total population, respectively. The population residing outside Yemen was 737,669.

The population density for the country in 1994 was estimated at 28 per square kilometer, distributed among 18 governorates. Including the capital area (Sana’a city), these governorates comprise 226 districts. The cities of Sana’a, Aden, Taiz, Hodeida, Mukalla, and Ibb are considered Yemen’s largest cities from the standpoint of population density. The annual population growth rate resulting from the difference between births and deaths in Yemen was approximately 3.4 percent. The crude birth rate was 45.4 per thousand population according to 1996 estimates, while the crude mortality rate in the same year was 11.3 per thousand. This indicates a tangible decrease in mortality, as the crude mortality rate was 11.4 per thousand in 1994. However, these rates are still high and are a clear sign that the state must adopt a sound population policy aimed at solving current and anticipated population problems. For example, infant and child mortality remain high in Yemen compared with other countries in the region and most third world countries. The impact of high mortality is reflected in life expectancy, which is relatively low. Results of the 1994 census indicate that life expectancy is only 58 years for both sexes.

The total fertility rate is still high as well, despite a decrease from 7.7 births per woman in 1991-92 to 7.4 in the 1994 census.
1.4 Socioeconomic Conditions

Education

Education is one of the most important indicators of socioeconomic development; hence, the State has paid great attention to this sector since the revolution in the early 1960's. Illiteracy among Yemenis was the highest among Arab and other developing countries. At the time of the revolution there was not one secondary school in the country, with the exception of Aden.

Statistics indicate that considerable progress has been achieved in the area of education. The number enrolled in basic education for the year 1996/97 was 2,557,329 students of both sexes, distributed over 10,355 schools. The number enrolled in secondary education for the same year was approximately 289,578 students of both sexes, distributed over 1993 schools. As for higher education, the enrollment figures in the Yemeni public universities reached 104,784 students of both sexes.

The private sector has taken on an effective role in education that needs encouragement, guidance, and supervision in order to maintain a strong supporting role with the State. The private sector can serve the community in this important area by becoming involved in all stages of basic, secondary, and higher education, as well as pre-school nurseries and kindergartens, and technical and vocational training.

Illiteracy still characterizes, half the Yemeni population. The results of the 1994 census indicate the illiteracy rate among males 10 years and over is 37 percent while it reaches 76 percent among females in the same age group. Illiteracy is most marked among females, particularly in rural areas.

The enrollment rate in basic education for the age group 6-15 years is around 71 percent for males and 38 percent for females. This means the State, the community, and the private sector continue to have an important role in extending basic education throughout the population, while still taking into account the high rate of population growth, which remains a significant challenge.

Health

Health conditions in any community are the result of various social, economic, cultural and environmental factors. Yemen witnessed many changes in the period following the revolution. The number of hospitals in 1997 reached 84 in addition to 421 health centers, with a total capacity of 9,788 beds and a staff of 4,070 doctors, of whom 3,803 are Yemeni doctors.

Despite development in the health sector, the rate of coverage by health services for the population is still at the 45 percent level, and this is basically concentrated in urban centers. At the same time rural areas are relatively deprived of these health services, especially the remote areas which have difficult geographical terrain. In fact the private sector has participated in a tangible and effective manner, whether on the level of cooperative or charitable societies or by individual effort. In spite of its growth throughout the country, the private sector for the most part is still confined to the main cities. There is no precise monitoring of the role of the private sector which is in need of support, sponsorship, and supervision from the state and the community, in order to have a more improved and effective role.

Labor Force and Food Production

The age group 15–64 years represents 46 percent of the country’s population in 1994 compared with 50 percent for children in the age group under 15 years, and about 4 percent in the age group 65 years and
over. Therefore, the dependency ratio in Yemen is high: for every 100 persons in the age group 15-64 years approximately 117 persons in the nonproductive age groups are being supported.

Around 53 percent of the Yemeni labor force is involved in the agriculture and fishing sectors, while the rest of its labor force is distributed among other sectors.

Total arable land in the country is approximately 1.66 million hectares, representing 67 percent of the total land area. Only 1.11 million hectares are under cultivation. Agriculture depends mainly on rain water, thus production is subject to changing climatic conditions. Generally, locally grown fruits and vegetables are sufficient to meet the needs of the population. However, Yemen imports some essential food products such as wheat; two-thirds of flour consumed is imported from other countries. There are indications that Yemen has considerable unexploited mineral wealth, especially oil, which has gained great attention from the state. Oil exploration operations have increased considerably since unification of the country. It is likely that Yemen will be exporting oil in large quantities in coming years.

1.5 Population Policy

The National Committee for Population and Family Planning (NCPFP) was established in 1984 to strengthen the government’s capacity to implement population policy in North Yemen. After the achievement of Yemen’s unity in May 1990, the government drafted a national population strategy which, after revision, was adopted as national policy at the National Population Conference in October 1991. The National Population Council was established to oversee implementation of the policy. The overall objectives of the National Population Strategy for the period 1990-2000 are:

1. Reduce the crude death rate (CDR) by at least 50 percent by the year 2000.
2. Reduce the total fertility rate (TFR) to reach 6 births per woman for the same period.
3. Reduce the infant mortality rate to 60 deaths per 1,000 live births and maternal mortality by 50 percent of its 1990 level.
4. Achieve a population growth rate of 2 percent by the year 2000.
5. Achieve a tangible change in the quality of life of the population through the following goals:
   a) Increase the enrollment rate in formal education to 85 percent of the children in the age group 6-12, especially among girls in rural areas.
   b) Intensify work in the health sector, especially in primary health care, and improve the preventive and curative areas of the health system; expand family planning and family care services.
   c) Improve the living conditions of the population, satisfy their basic needs and raise income levels.
6. Achieve a population distribution between urban and rural areas that corresponds to the prevailing environmental, economic, and production requirements.
7. Care about, protect, and improve the environment.
8. Follow up and assess overall comprehensive development programs and develop their capacities.

9. To develop and improve population-related legislation.

1.6 Objectives of Family Planning Strategy

The objectives of the family planning program in Yemen are:

1. Increase the use of contraception to 35 percent among women of reproductive age and expand family planning services to men, and

2. Make family planning a free choice for couples, a basic human right as well as a factor for social change. Family planning must also include the right to treatment for infertility.

The general secretariat of the NCPFP prepared for the Second Conference on Population Policy (held in October 1996) with the aim of evaluating and assessing progress in the implementation of strategy and revising the work plan on population in light of international, regional, and local events. Many participants, experts, politicians, interested persons, and concerned international and local organizations attended the Conference and issued an updated work plan on population that took into account the necessity of updating the following fields and work areas:

- In the field of health, a few modifications in reproductive health were made regarding quantitative targets especially those concerned with maternal and child health and family planning.

- In the field of human resources, in addition to some modifications in the objectives and means of achieving them, two main areas of concern were the specific groups of children, adults, older ages, and invalids, as well as the household.

- In the area of ongoing development, issues of poverty were included and the necessity for full incorporation of environmental and population factors into the plans and programs of economic development were discussed.

1.7 Objectives of the Survey

The 1997 Yemen Demographic, Maternal and Child Health Survey (YDMCHS-97) has the following objectives:

1. Provide policymakers and decisionmakers with a reliable database and analyses useful for policy choices and population programs, and provide researchers, other interested persons, and scholars with such data.

2. Update and expand the national population and health database through collection of data which will allow the calculation of demographic rates, especially fertility rates, and infant and child mortality rates;

3. Analyse the direct and indirect factors which determine levels and trends of fertility. Indicators related to fertility will serve to elaborate plans for social and economic development;

4. Measure the level of contraceptive knowledge and practice by method, by rural and urban residence including some homogeneous governorates (Sana’a, Aden, Hadhramaut, Hodeidah, Hajjah and Lahj).
5. Collect quality data on family health: immunizations, prevalence and treatment of diarrhea and other diseases among children under five, prenatal visits, assistance at delivery and breastfeeding;

6. Measure the nutritional status of mothers and their children under five years (anthropometric measurements: weight and height);

7. Measure the level of maternal mortality at the national level.

8. Develop skills and resources necessary to conduct high-quality demographic and health surveys.

This survey is part of the worldwide Demographic and Health Surveys (DHS) program. Macro International Inc. (Macro) provides technical and administrative support for the DHS program, which is funded by the U.S. Agency for International Development (USAID).

1.8 Survey Activities

A number of basic tasks were implemented from May 1, 1997 to September 25, 1997:

1. Preparation of the project document including the work plan, the time table, and the budget;

2. Formation of the survey committees and administrative structure (supervisory and technical);

3. Preparation of the technical documents;

4. Sample design;

5. Household listing to update the selected areas of the sample;

6. Pretest of the survey documents;

7. Estimation for the provision of human and material resources required for the survey.

Below are some of the important details for this phase.

Preparation of the Survey Project Document

The first draft of the survey subcontract between the Central Statistical Organization (CSO), the implementing agency of the YDMCHS-97, and Macro was prepared in December 1996, and finalized a few months later. The subcontract was signed by the CSO and Macro in June 1997 after the delivery order for the Yemen survey was finalized by the USAID Mission in Cairo.

Formation of Committees

The Council of Ministers decree No. 234 of 1997 was issued to form the Supreme Committee of the Survey or the Steering Committee headed by the chairman of the CSO. The tasks of this committee are defined as the facilitation and provision of the required support to make the survey a success, and implementation of alternative strategies as needed to resolve survey problems.

A technical committee was also formed and charged with preparation and approval of all survey technical documents and other tasks associated with specified activities at various stages of the survey, as well as provision of survey personnel and, material and financial resources (see Appendix A for the names
of the Supreme Committee and the Technical Committee, the field personnel and other persons involved in the YDMCHS-97).

**Preparation of Documents**

The survey documents include the following:

*Household Questionnaire*: The household questionnaire consists of two parts: a household schedule and a series of questions relating to the health and socioeconomic status of the household. The household schedule was used to list all usual household members. For each of the individuals included in the schedule, information was collected on the relationship to the household head, age, sex, marital status (for those 10 years and older), educational level (for those 6 years and older) and work status (for those 10 years and older). It also collects information on fertility, general mortality and child survival. The second part of the household questionnaire included questions on housing characteristics including the type of dwelling, location, materials used in construction, number of rooms, kitchen in use, main source of drinking water and health related aspects, lighting and toilet facilities, disposal of garbage, durable commodities, and assets, type of salt the household uses for cooking, and other related residential information.

*Individual Questionnaire*: The individual questionnaire was administered to all ever-married women age 15-49 years who were usual residents. It contained 10 sections on the followings topics:

- Respondent’s background
- Reproduction
- Family planning
- Pregnancy and breastfeeding
- Immunization and health
- Birth preferences
- Marriage and husband’s background
- Maternal mortality
- Female circumcision
- Height and weight

(see Appendix E for the English version of the questionnaires).

*Other Documents*: Other documents prepared for use in survey activities were training manuals and field reporting forms (interviewer’s and supervisor’s assignment sheets, and editing and coding instructions).

**Sample Design**

The 1997 YDMCHS was based on a national sample in order to provide estimates for general indicators for the following domains: Yemen as a whole, urban and rural areas (each as a separate domain), three ecological zones identified as Coastal, Mountainous, and Plateau and Desert, as well as governorates with a sample size of at least 500 completed cases. The survey sample was designed as a two-stage cluster sample of 475 enumeration areas (EA), 135 in urban areas and 340 in rural areas. The master sample, based on the 1994 census frame, was used as the frame for the 1997 YDMCHS. The population covered by the Yemen survey was the universe of all ever-married women age 15-49. The initial target sample was 10,000 completed interviews among eligible women, and the final sample was 10,414. In order to get this number of completed interviews, and using the response rate found in the 1991-92 YDMCHS survey, a total of 10,701 of the 11,435 potential households selected for the household sample were completed (see Appendix B for a complete description of the sample design).
In each selected EA, a complete household listing operation took place between July and September 1997, and was undertaken by nineteen (19) field teams, taking into consideration the geographical closeness of the areas assigned to each team.

Pretest

The household and individual questionnaires were pretested in August 1997 following a three-week training course. Four male supervisors and 15 female interviewers participated in the pretest. Two hundred and fifty households were interviewed in Sana’a City (70 households) and in rural areas of Sana’a Governorate (180 households). At the end of the pretest fieldwork, a meeting was held with the two teams which conducted the interviews. At the meeting the experiences of interviewers, editors, and supervisors were discussed. The pretest was extremely helpful in revising and modifying the questionnaires and in producing the final version of the questionnaires that was used for the main fieldwork. The completed pretest questionnaires were checked for data quality and completeness of answers to some questions considered “sensitive” such as the questions on female circumcision.

The questionnaires were modified and interviewer’s instructions were revised in light of feedback from the field staff and review of the pretest questionnaires.

Printing of Survey Documents

After finalizing the questionnaires and fieldwork manuals, the basic documents and other forms to be used in the field for monitoring fieldwork operations and checking quality control were printed. The number of documents printed was as follows:

- Training manuals (200 copies)
- Household questionnaire (15,000 copies)
- Individual questionnaire (15,000 copies).

Training and Data Collection Activities

Training: The CSO organized the interviewer training for the main fieldwork by recruiting interviewers from all over the country. The CSO staff from the central and regional offices who had worked on the household listing were recruited as supervisors. From almost 500 applicants, 132 were selected for training as interviewers. Some of the interviewers had participated in the 1991-92 YDMCHS. From over 55 persons who had participated in the household listing, 32 were selected as candidates for supervisors. Because of the large number of the trainees, two groups were formed to be trained separately, and training on height and weight was given in four MCH centers in Sana’a.

The training program included: 1) general lectures related to basic interview techniques and to survey topics (i.e. fertility and family planning, and maternal and child health); 2) opportunities for role playing and mock interviews; 3) field practices in areas not covered in the survey; and quizzes. Training lasted from the end of September to mid-October 1997. After the completion of training and practice interviews, 84 female candidates were selected as interviewers or editors, and 31 men were selected to work as supervisors or editors.

Fieldwork: Fieldwork for the 1997 YDMCHS began on October 20, and was completed on December 30, 1997. The field staff was divided into 19 teams; each team had a male supervisor, 4-5 female interviewers, and a male or female editor. During the fieldwork period, the senior project staff from Sana’a visited the teams regularly to monitor the quality of the completed questionnaires and to solve any technical or field problems the teams encountered.
In addition, the teams were encouraged to keep the survey operations desk informed about the progress of the work and any problems requiring assistance. Whenever possible, the monitoring staff returned to Sana’a with completed questionnaires so that data processing could be carried out simultaneously with fieldwork. On receipt of the questionnaires at the central office, the process of revising, editing, coding and processing the data was carried out.

**Data Processing Activities**

The central office in Sana’a was responsible for collecting questionnaires from the field as soon as each cluster was completed. Questionnaires were reviewed for consistency and completeness by office editors, and a few questions (e.g., occupation and type of illness) were coded in the office prior to data entry. The machine entry and editing phase began while interviewing teams were still in the field.

The CSO made its network of 12 computers available to the survey for data entry. The computer programs that had been prepared at Macro headquarters for use in the 1997 YDMCHS were modified to take into account the network environment. The data from the questionnaires were entered and edited using the Integrated System for Survey Analysis (ISSA), a software package developed especially for the Demographic and Health Surveys program.

Twelve data entry personnel participated in processing the survey data. During machine entry, 50 percent of each segment was reentered for verification. The data processing started at the beginning of November 1997 and was completed at the end of February 1998. Tables for the preliminary report were prepared in March 1998 and tables for the final report were completed in June 1998.

### 1.9 Results of the Household and Individual Interviews

A summary of the outcome of the fieldwork for the survey by place of residence is presented in Table 1.1. The table shows that 10,701 households, distributed between urban (3,008 households) and rural areas (7,693), households which were successfully interviewed in the 1997 YDMCHS. This represents a country-wide response rate of 98.2 percent (98.7 and 98.0 percent, respectively, for urban and rural areas).

A total of 11,158 women were identified as eligible to be interviewed. Questionnaires were completed for 10,414 women, which represents a response rate of 93.3 percent. The response rate in urban areas was 93 percent; and in rural areas it was 93.5 percent.

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<th>Table 1.1 Results of the household and individual interviews</th>
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<td>Number of households and eligible women, and response rates by residence, Yemen 1997</td>
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<th>Sample/ response rate</th>
<th>Residence</th>
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<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
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<tr>
<th>Household interviews</th>
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<tbody>
<tr>
<td>Households sampled</td>
<td>3,255</td>
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<tr>
<td>Households found</td>
<td>3,049</td>
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<tr>
<td>Households interviewed</td>
<td>3,008</td>
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<th>Household response rate</th>
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<td></td>
<td>98.7</td>
<td>98.0</td>
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<table>
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<tr>
<th>Individual interviews</th>
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<tr>
<td>Number of eligible women</td>
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<td>Number of eligible women interviewed</td>
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| Eligible woman response rate | 93.0 | 93.5 | 93.3 |