

INTRODUCTION

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1.1 HISTORY, GEOGRAPHY, AND ECONOMY

History

Historical and archaeological evidence indicates that by the year 1500, much of modern Zambia was occupied by Bantu-speaking horticulturalists, farming people who were ancestors of the present inhabitants. In the late nineteenth century, various parts of what was to become Northern Rhodesia were administered by the British South Africa Company. In 1924, the British Colonial Office assumed responsibility for administering the territory, and in 1953, Northern Rhodesia (Zambia) and Southern Rhodesia (Zimbabwe) joined Nyasaland (Malawi) to form the Central African Federation of Rhodesia and Nyasaland, despite the opposition of Northern Rhodesia's Africans. The Federation was, however, dissolved in 1963. In October 1964, Zambia gained political independence and adopted a multiparty system of government. In December 1972, Zambia became a one-party state. The current multiparty system was implemented in 1991.

Geography

Zambia is a land-locked country covering an area of 752,612 square kilometres (about 2.5 percent of Africa). It shares borders with the Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south; Namibia in the southwest and Angola in the west. Administratively, the country is divided into nine provinces and 72 districts. Of the nine provinces, two are predominantly urban, namely Lusaka and Copperbelt provinces. The remaining provinces—Central, Eastern, Northern, Luapula, North-Western, Western and Southern—are predominantly rural provinces. Four of ten Zambians live in urban areas.

Zambia lies between 8 and 18 degrees south latitude and between 20 and 35 degrees east longitude. It has a tropical climate and vegetation with three distinct seasons: the cool dry winter from May to August, a hot dry season during September and October and a warm wet season from November to April.

Among the main river water sources in Zambia are the Zambezi, Kafue, Luangwa and Luapula. The country also has major lakes such as Tanganyika, Mweru, Bangweulu and the man-made Kariba. The northern part of the country receives the highest rainfall with an annual average ranging from 1,100 mm to over 1,400 mm. The southern and eastern parts of the country have less rainfall, ranging from 600 mm to 1,100 mm annually, which often results in droughts.

Economy

Zambia has a mixed economy consisting of a modern urban sector that, geographically, follows the rail line and a rural agricultural sector. For a long time, the modern sector has been dominated by parastatal organisations, while private businesses have predominated in construction and agriculture sectors. Since 1991, with the introduction of a liberalised market-oriented economy, the parastatals have been privatised and, in some cases, liquidated.

Copper mining is the country's main economic activity, accounting for 95 percent of export earnings and contributing 45 percent of government revenue during the decade following independence (1965-1975). In the mid-1970s following a sharp decline in copper prices and a sharp increase in oil prices, the country's economy deteriorated. Attempts were made to minimise dependency on copper exports by diversifying the economy through the creation of import substitution parastatals. This did not achieve the desired results.

The 1980s marked the start of the first phase of implementing Structural Adjustment Programmes (SAP) amidst a stagnating economy. However, the SAP failed to substantially alter the economy and increased the poverty of the majority of Zambians. Currently, around 73 percent of Zambians are classified as poor. Poverty is more prevalent in rural areas than urban areas (83 percent and 56 percent, respectively). Poverty in the Zambian context can be defined as lack of access to income, employment opportunities, entitlements for citizens to such things as freely determined consumption of goods and services, shelter and other basic needs of life (MOFNP, 2002).

In an effort to halt the economic recession, the Movement for Multiparty Democracy (MMD) Government has launched an Economic Recovery Programme (ERP) to turn around the protracted decline of the economy into sustained positive growth, leading to improvement in living standards and the quality of life of the people (Republic of Zambia, 1992).

1.2 POPULATION

The 1980, 1990, and 2000 national censuses reported total populations of 5.7 million, 7.8 million and 10.3 million, respectively, with a growth rate of 2.9 percent per annum in 2000 (see Table 1.1). During the 1990-2000 intercensal period, the growth rates varied by province, ranging from 1.3 percent in Copperbelt province to 4.3 percent in Northern province.

Table 1.1 Demographic characteristics			
Selected demographic indicators, Zambia, 1980, 1990, and 2001			
Indicator	Census year		
	1980	1990	2000
Population (millions)	5.7	7.8	10.3 ^a
Density (pop./sq. km.)	7.5	10.4	13.7
Percent urban	39.9	38	36
Total fertility rate	7.2	6.7	6.0
Completed family size (women age 45-49)	6.6	7.1	6.8
Infant mortality rate	97	123	110
Life expectancy at birth			
Male	50.4	46.1	47.5
Female	52.5	47.6	51.7
^a Adjusted preliminary estimate from the 2000 National Census			
Sources: Central Statistical Office, 1985a, 1985b, 1995b, and 2002b			

The population density in Zambia increased from 7.5 people per square kilometre in 1980 to 10.4 in 1990 and 13.7 in 2000. The average density in 2000 ranged from 65 people per square kilometre in Lusaka province to 5 people per square kilometre in North-Western province. In addition to being the most densely populated provinces, Lusaka and Copperbelt are also the most urbanised.

The decline in the economy has gradually reduced the proportion of the population in urban areas. The proportion of the population living in urban areas has decreased steadily from 40 percent in 1980 to 38 percent in 1990 and 36 percent in 2000. The proportion of the urban population varies by province, from 91 percent in Copperbelt province to 9 percent in Eastern province (CSO, 2002b).

Total fertility rates estimated from the 1969 and 1980 censuses are in the neighbourhood of 7.0 births per woman. The rate declined to 6.7 births per woman in 1990 and to 6.0 in 2000. Life expectancy at birth for males was 50 years in 1980 and was estimated to have declined to 46 years by 1990. In 2000, it increased to 48 years. Zambian women live, on average, 4 years longer than men. Mortality levels are highest in

Luapula followed by Western and Eastern provinces, with Lusaka, Copperbelt and North-Western provinces experiencing the lowest mortality rates (data not shown). Life expectancy at birth ranged from 44 years in Western Province to 56 years in North-Western province (CSO, 2002b). The overall infant mortality rate declined from 141 deaths per 1,000 live births in the mid-1960s (based on the 1969 census) to 99 in the late 1970s, after which it increased to 123 in the late 1980s. In the late 1990s, it declined again to 110 although this level is still higher than that experienced in the late 1970s.

1.3 THE POPULATION POLICY AND NATIONAL POPULATION AND DEVELOPMENT PROGRAMME OF ACTION

For the first decade and a half after independence, Zambia did not view the high rate of population growth as a development problem. The results of the 1980 Population and Housing Census exposed the rapidity with which the population was expanding and the implied adverse effect on development and individual welfare. This led the government to reappraise the role of population in national development efforts.

In 1984, the then National Commission for Development Planning (NCDP) was given a mandate to initiate a draft population policy which would aim at achieving a population growth rate consistent with the growth rate of the economy (NCDP, 1989). The National Population Policy was accepted in May 1989. Since then, the country's population growth rate has remained high and continues to be a serious impediment to sustainable development.

The original population policy was revised in December 1996. New objectives of the policy take account of concerns regarding HIV/AIDS, poverty, and gender issues. Among the objectives of the revised policy are:

1. To ensure that population issues and other development concerns are mutually integrated in the planning and implementation processes so as to attain development;
2. To ensure that all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so in order to enhance the health of families;
3. To contribute to the reduction of maternal, infant and child mortality in order to increase life expectancy;
4. To contribute to the reduction of HIV/AIDS and other sexually transmitted infections so as to improve the general health status of the population;
5. To improve the population's access to appropriate, affordable and high-quality reproductive health services including family planning and sexual health in order to have a healthy nation;
6. To promote and maintain equal access to education for both sexes at all levels in order to raise literacy levels.

The objectives of the policy will be achieved through related policies and strategic frameworks such as the Reproductive Health Policy and the Gender Policy. Institutions from all sectors are involved in implementing activities for the strategic frameworks.

1.4 HEALTH PRIORITIES AND PROGRAMMES

The Government's commitment to the objective of improving the quality of life of all Zambians is demonstrated through its efforts to improve health care delivery by reforming the health sector. In 1991, the Government of the Republic of Zambia articulated radical health policy reforms characterised by a move from a strongly centralised health system in which the central structures provided support and national guidance to

the peripheral structures. An important component of health policy reform is the restructured Primary Health Care (PHC) programme.

To ensure that the PHC programme operates efficiently in addressing the main health problems of the individual, the family, and the community, the health service has been decentralised, with the responsibility of planning, implementing, monitoring, and managing PHC programmes falling to the districts. The integrated health plans developed out of the District Health Boards' Basic Health Programme constitute the PHC package.

The reformulated PHC programme aims, among other things, to deal with the main health problems in the community, focusing on the needs of the underserved, high-risk, and vulnerable groups. Thus, attention is paid to the rural and peri-urban areas where the health needs of the people are greatest, with particular emphasis placed on maternal and child care, family planning, nutrition, control of communicable diseases (e.g., diarrhoea, cholera, dysentery, sexually transmitted infections, HIV/AIDS, malaria, etc.), immunisation, and environmental sanitation in order to secure adequate health care for all Zambians.

The health reforms established the government's commitment to improve the health of the population by progress towards the achievement of the following targets by the year 2000:

- To reduce the percentage of underweight children (0-5 years) from 23 to 18 percent;
- To bring under control 80 percent of tuberculosis cases;
- To increase accessibility to and acceptability of family planning services and appropriate use of information in order to increase family planning use;
- To improve the quality of, access to and utilisation of maternal and child health services in order to reduce maternal deaths and complications;
- To reduce the incidence of sexually transmitted infections (STIs), AIDS, and reproductive tract infections;
- To reduce the incidence of induced abortions in order to reduce maternal complications and deaths;
- To increase the percentage of the population having adequate sanitation from 66 to 75 percent in urban areas and from 37 to 57 percent in rural areas by 1996 (MOH, 1992).

The targets were to be achieved through a basic health care services package to be provided at all levels of the health care system.

1.4 Strategic Framework to Combat the National HIV/AIDS Epidemic

Once the first case of AIDS was diagnosed in Zambia in 1984, the government realised that HIV/AIDS required behavioural interventions as well as care and support. The National AIDS Prevention and Control Programme was formally established in 1986 with assistance from the WHO Global Programme on AIDS.

Consistent with the evolving epidemic, three national plans have been developed to respond to the HIV/AIDS epidemic. In 1987, an emergency short-term plan was developed to ensure safe blood and blood product supplies. In 1993, the Second Medium Term plan (1993-1998) was launched. This plan acknowledged that the initial response to HIV/AIDS was inadequate to contain a problem that was more than just medical in nature. It further acknowledged that the first plan did not incorporate in its planning process a mechanism for intersectoral coordination and collaboration. It was therefore decided that the cross-cutting and multi-dimensional nature of the HIV/AIDS epidemic needed a broad and multisectoral response. Thus, to ensure a coordinated, nationalised response, the AIDS, STI and TB programmes were integrated. The integrated programmes sought to foster political commitment at the highest level, develop intersectoral approaches encompassing all government ministries, the private sector and civil society, increase access to STI care, strengthen condom promotion and distribution, develop effective AIDS impact mitigation strategies, and control TB.

In the current national Strategic Framework 2001-2003, a combination of interventions are being implemented to (National HIV/AIDS/TB Council, 2000):

1. Reduce HIV/AIDS transmission, mainly focussing on children, youth, women and high risk populations; and
2. Reduce the socio-economic impact of HIV/AIDS on individuals and families at the workplace, in the homes and on the whole Zambian society.

The interventions include:

1. Information, education and communication to inform the general public about HIV/AIDS;
2. Condom promotion and distribution;
3. Early and effective diagnosis and treatment of sexually transmitted infections;
4. Blood screening;
5. Counselling and testing;
6. Special programmes for orphans, widows and widowers;
7. Support for persons living with AIDS;
8. Advocacy for the introduction of non-discriminatory practices and laws.

1.6 OBJECTIVES AND ORGANISATION OF THE SURVEY

Objectives

The Zambia Demographic and Health Survey (ZDHS) is a nationally representative sample survey of women and men of reproductive age designed to provide information on fertility, family planning, child survival and health of children.

The primary objectives of the ZDHS are:

1. To collect up-to-date information on fertility, infant and child mortality and family planning;
2. To collect information on health-related matters such as breastfeeding, antenatal care, children's immunisations and childhood diseases;
3. To assess the nutritional status of mothers and children;
4. To support dissemination and utilisation of the results in planning, managing and improving family planning and health services in the country;
5. To enhance the survey capabilities of the institutions involved in order to facilitate the implementation of surveys of this type in the future; and
6. To document current epidemics of sexually transmitted infections and HIV/AIDS through use of specialised modules.

Organisation

The 2001-2002 ZDHS was conducted by the Central Statistical Office (CSO) and the Central Board of Health (CBoH). ORC Macro of Calverton, Maryland provided technical assistance to the project through its contract with the U.S. Agency for International Development (USAID). Funding for the survey was supplied by ORC Macro (from USAID), the Government of Japan through a trust fund managed by the United Nations Development Programme (UNDP) and through bilateral agreements between the Government of the Republic of Zambia and the United Nations Population Fund (UNFPA), and the Danish International Development Agency (DANIDA).

1.7 SAMPLE DESIGN

The sample for the 2001-2002 Zambia Demographic and Health Survey covered the population resid-

ing in private households in the country. A representative probability sample of approximately 8,000 households was selected for the ZDHS. This sample was constructed in such a manner as to allow for separate estimates for key indicators for each of the 9 provinces in Zambia. As a result, the ZDHS sample is not self-weighting at the national level.

A list of Standard Enumeration Areas (SEAs) prepared for the 2000 Population Census constituted the frame for the ZDHS sample selection. A total of 320 clusters (100 urban and 220 rural) were selected from this frame. In general, the ZDHS clusters included only one SEA; however, in order to achieve the minimum cluster size of 85 households, 34 clusters comprised two SEAs. The final stage of selection involved the systematic sampling of households from a list of all households that was prepared for each of the selected SEAs.

All women age 15-49 who were either permanent residents of the households in the ZDHS sample or visitors present in the household on the night before the survey were eligible to be interviewed in the survey. In addition, in a subsample of one-third of all the households selected for the ZDHS, all men age 15-59 were eligible to be interviewed if they were either permanent residents or visitors present in the household on the night before the survey. Finally, all women and men (approximately 2,500 of each) living in the households selected for the men's survey and eligible for the DHS interview were asked to voluntarily give blood for syphilis and HIV testing.

1.8 QUESTIONNAIRES

Three questionnaires were used for the 2001-2002 ZDHS: the Household Questionnaire, the Women's Questionnaire and the Men's Questionnaire. The contents of these questionnaires were based on the model questionnaires developed by the MEASURE *DHS+* programme for use in countries with low levels of contraceptive use. The questionnaires are reproduced in Appendix E.

In consultation with technical institutions, local and international organisations, the CSO modified the DHS model questionnaires to reflect relevant issues in population, family planning and other health issues in Zambia. A series of questionnaire design meetings were organised by the CSO with the assistance of ORC Macro, and the inputs generated in these meetings were used to produce the first draft of the ZDHS questionnaires. These questionnaires were translated from English into the seven major languages, namely Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja, and Tonga.

The Household Questionnaire was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including his or her age, sex, education, and relationship to the head of the household. The main purpose of the Household Questionnaire was to identify women and men who were eligible for the individual interview. The Household Questionnaire collected information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor of the house, ownership of various durable goods, and ownership and use of mosquito nets. The Household Questionnaire was also used to record height and weight measurements of women 15-49 and children under the age of 6, and, where syphilis and HIV testing was conducted, to record the respondents' consent to the testing. In order to maintain confidentiality, separate forms were used for recording the results of the syphilis and HIV testing.

The Women's Questionnaire was used to collect information from all women age 15-49. These women were asked questions on the following topics:

- Background characteristics (education, residential history, media exposure, etc.)
- Knowledge and use of family planning methods
- Fertility preferences
- Antenatal and delivery care
- Breastfeeding and infant feeding practices
- Vaccinations and childhood illnesses
- Marriage and sexual activity
- Woman's work and husband's background characteristics

- Infant and child feeding practices
- Childhood mortality
- Awareness and behaviour regarding AIDS and other sexually transmitted infections (STIs)
- Adult mortality including maternal mortality.

The Women's Questionnaire included a series of questions to obtain information on women's experience of domestic violence. These questions were administered to one woman per household. In households with two or more eligible women, special procedures were followed in order to ensure the random selection of this woman.

The Men's Questionnaire was administered to all men age 15-59 living in every third household in the ZDHS sample. The Men's Questionnaire collected much of the same information found in the Women's Questionnaire, but was shorter because it did not contain a reproductive history or questions on maternal and child health, nutrition, or maternal mortality.

1.9 SYPHILIS AND HIV TESTING

In households selected for the male survey, the ZDHS involved the collection of blood specimens from all eligible women and men who voluntarily consented to the syphilis and HIV testing. The initial protocol for the blood specimen collection and testing as well as modifications made in the protocol during the course of the study were reviewed and approved by both the Institutional Review Board of ORC Macro and the Ethical Review Committee of the University of Zambia which approves research studies on human subjects conducted in Zambia.

For the syphilis and HIV testing activities, a nurse/nurse counselor and a laboratory technician were added to each of the 12 ZDHS field teams. The nurse/nurse counselors and laboratory technicians were recruited from the health facilities under the district health management boards with the assistance of the CBoH and had experience in blood collection and testing, respectively. According to the initial protocol, syphilis testing was done in the field by the laboratory technician, using a qualitative Rapid Plasma Reagin (RPR) as a screening test and the Abbott test strip Determine as the confirmatory test. Those individuals who were found to test positive for syphilis were offered treatment at home with one injection of benzathine penicillin, which is the standard treatment in Zambia. Alternative treatment was given to those allergic to penicillin and to pregnant women (erythromycin capsules for pregnant women and doxycycline capsules for men and non-pregnant women). An emergency kit (epinephrine) was provided to each nurse/nurse counselor for penicillin-allergic cases. Treatment was also offered to the partners of individuals who tested positive.

If the respondent tested positive for syphilis and did not want to be treated at home, a referral letter was given for free treatment at the nearest health facility. An effort was also made to ensure follow-up care for respondents (and their partners, whenever possible) who were tested and found to be positive but who were not at home when the nurse/nurse counselor returned to provide treatment. To facilitate the follow-up care, respondents (and their partners, whenever possible) were asked at the time they gave a blood specimen to consent to have their names, contact information, and test results given to the nearest health facility in the event that the subjects were unavailable for treatment during the survey.

The syphilis testing protocol was modified in January 2002 at the request of the CBoH. Although the Determine test had shown a high degree of accuracy in other settings, it was not considered appropriate to use as the confirmatory test in the ZDHS because it had not been validated and/or officially approved for use in Zambia. In the revised protocol, RPR was still performed in the field by the lab technician as a screening test for syphilis. The major change was that no confirmatory test was performed in the field. Instead, all RPR-reactive blood samples were collected in cryo vials, frozen in liquid nitrogen tanks and transported to the Tropical Diseases Research Centre (TDRC) in Ndola for syphilis confirmatory testing using *Treponema Pallidum* Haemagglutination Assay (TPHA).

Under the revised protocol, respondents testing positive on the RPR test were not treated in the field. Rather, subjects testing positive on the RPR were advised of their status and they (and their partners if the

subjects agreed) received a referral letter(s) to an appropriate local health facility for follow-up diagnosis and treatment. At the end of the fieldwork for each ZDHS sample point, the nurse/nurse counselor counted up the

number of RPR-positive subjects and dropped off a sufficient number of benzathine penicillin doses and syringes at the designated health centre closest to the sample point with instructions to health centre staff to use the supplies to treat ZDHS subjects. Again, as part of the informed consent process, the respondent was asked for his/her consent for the interviewing team to give contact information to a designated health facility for follow-up in case the respondent was not found at home at the time of result notification. To ensure that all confirmed positive cases would be adequately treated, the CBoH asked that the results of the TPHA testing be provided to the District Health Management Teams (DHMTs). The DHMTs and local health centre staff were instructed to conduct follow-ups in such a way as to minimise the loss of subject confidentiality.

The HIV testing in the ZDHS was anonymous and unlinked to the other variables collected in the survey except for sex, age and geographical location of the respondent. If a respondent consented to HIV testing, the laboratory technician prepared a dried blood spot (DBS) sample on a filter paper card from the venous blood specimen. Each DBS sample was given a serial identification number that was not related to survey identifiers for the respondent. The DBS samples from a cluster were then placed in Ziploc bags and transported to TDRC in Ndola for HIV testing. At TDRC, the DBS samples were first eluted and then screened using the Wellcozyme HIV 1&2 GACELISA. All the positive samples and 10 percent of the negative samples were re-tested using BIONOR HIV 1&2. Any discordant cases were tested with Western Blot.

HIV tests vary in their sensitivity, that is, their ability to correctly identify all cases with the virus and specificity, that is, their ability to avoid falsely identifying cases as having the virus when they do not. The DHS protocol employed three tests in order to reduce errors that might be introduced in the results by a single test's performance in detecting false positive or false negative cases. Specifically, the confirmatory testing with BIONOR (which has a reported sensitivity of nearly 100 percent and a specificity of 98 percent) of all positive samples and of 10 percent of the negative samples was aimed at detecting errors resulting from the initial testing with GACELISA, which has a somewhat lower reported sensitivity (97 percent) and specificity (96 percent). The third step of testing the discordant cases with Western Blot was the final effort to reduce the number of false positive or false negative cases to a minimum.

A total of 3,961 samples were collected in the ZDHS, of which 710 tested positive using the GACELISA. When these positive samples were retested using BIONOR, 570 tested positive and 140 tested negative. Western Blot was then performed for the 140 samples for which the results were discordant, i.e., the GACELISA result was positive and the BIONOR result was negative. Only one of the samples was confirmed as positive and 139 were confirmed as negative with Western Blot.

As an additional quality control measure 10 percent of the total number of samples found to be negative with the GACELISA test were also tested with BIONOR. Of the 325 negative samples retested, only two were found to be positive on BIONOR. These discordant cases were then tested with Western Blot and the result was considered as final.

Finally, the availability of the serum samples collected for syphilis testing allowed for a comparison of the results of testing using dried blood spots versus testing using serum for the same subjects. In this exercise, which was designed to validate the use of the dried blood spot approach, both plasma and dried blood spots samples were tested for HIV for a total of 505 respondents. Discordant results were obtained in only 3 cases; in all the discordant cases, the outcome of the plasma test was negative while the DBS test positive. Overall, 118 samples were positive for HIV on the plasma test and 121 samples were positive on the DBS.

The HIV and syphilis test results were entered on special forms by either the field or laboratory personnel involved in the testing. These forms were sent to CSO in Lusaka where the data were entered and processed separately from the DHS questionnaires. The syphilis test results were then linked to the individual DHS records in a special data file. Another data file was created for the HIV test data. Since the HIV testing was anonymous, the HIV testing results could not be linked to DHS interview data. Thus, the HIV data file

includes information only on the age, sex, and residence (urban-rural and province) for each of the individuals tested.

1.10 PRETEST ACTIVITIES, TRAINING, AND FIELDWORK

The ZDHS involved a number of activities to address various methodological and ethical concerns raised by the inclusion of HIV and syphilis testing as well as to pilot the ZDHS questionnaires. A total of three formal pretests were conducted during this phase of the survey. The training and fieldwork for the first pretest took place May 14-25, 2001. In addition to pretesting the survey questionnaires, the pretest included syphilis and HIV testing using a simple finger prick procedure from which blood spots were collected on filter paper. Four medical laboratory technicians, nine female interviewers, seven male interviewers, and six nurse counselors, were trained, forming seven teams, one for each local language. The pretest fieldwork was conducted in four areas, three urban and one rural. In total, 65 household questionnaires, 79 women's questionnaires and 106 men's questionnaires were completed in the course of three days. A total of 81 persons were identified as eligible for the blood collection. Of these, 52 persons voluntarily agreed to give a sample of blood.

After the first pretest was completed, it was decided that venous rather than capillary blood samples should be collected to be consistent with existing syphilis testing protocols in Zambia. To pilot all of the testing procedures, a second pretest was carried out July 18-24, 2001. Four medical laboratory technicians, five female interviewers and five male interviewers took part in the second pretest. The staff was selected from those individuals who had participated in the first pretest. In the second pretest, 130 questionnaires (38 household, 57 women's and 35 men's questionnaires) were administered. Sixty-nine persons were selected for the venous blood collection. Out of these, 67 (32 males and 35 females) agreed to have their blood tested. In the second pretest, RPR was used as the screening test for syphilis and Abbot Determine test strip as the confirmatory test. The pretest included follow-up treatment or referral for those who tested positive for syphilis. The laboratory technicians also tested the procedures for obtaining dried blood spots from the venous blood samples for later HIV testing.

Using the same staff who took part in the second pretest, a third pretest of the HIV/syphilis protocol was conducted July 26 through August 1, 2001. This pretest focused mainly on gaining additional experience with the informed consent statement in a variety of settings. Five areas were covered, three high-density areas (low income earners areas) and two low-density areas (high income earners areas). In the third pretest, 98 households and 286 individuals were covered. More than 85 percent of respondents agreed to HIV and syphilis testing.

In addition to the three pretests, an additional field exercise was conducted as part of the ZDHS to validate the use of dried blood spots for the HIV testing. In this study, matched DBS and plasma samples were collected and tested. The results of the testing of the matched DBS and plasma samples were similar, leading to the decision to collect DBS samples.

A total of 88 interviewers and 36 nurse/nurse counselors and laboratory technicians participated in the main survey training that took place August 20 through September 16, 2001. All participants were trained in interviewing techniques and the contents of the ZDHS questionnaires. The training was conducted following the standard DHS training procedures, including class presentations, mock interviews, and tests using the Women's Questionnaire. Special training was given to interviewers on the collection of the domestic violence data, especially on issues relating to informed consent and privacy. Male participants were additionally trained on the content of the men's questionnaire. The nurse/nurse counselors were trained to use the scales and height boards to collect anthropometric measurements of women and young children. All of the interviewers were trained in taking height and weight measurements so that they could assist the nurse/nurse counselors in performing these tasks.

During the last week of the training, the nurse/nurse counselors and laboratory technicians, who already had experience in blood collection and testing, were separated and trained on the specific procedures for drawing blood samples in the field and on syphilis testing using RPR. Additionally, they received training specifically focused on the internationally accepted procedures to minimise risk ("universal precautions") and

confidentiality.

Finally, in addition to the classroom instruction, the ZDHS training included practice interviews using the questionnaire in English and the participants' local languages.

Data collection for the 2001-2002 ZDHS took place over a seven-month period from November 2001 to May 2002. Twelve interviewing teams carried out data collection. Each team consisted of one team supervisor, one field editor, three to four female interviewers, one male interviewer, one nurse/nurse counselor, one lab technician, and one driver. Six staff assigned from the CSO coordinated and supervised fieldwork activities. They were assisted by staff from the TDRC and the University of Zambia Demography Division. ORC Macro participated in field supervision for interviews, height and weight measurements, and blood collection and testing.

1.11 DATA PROCESSING

The processing of the ZDHS results began shortly after the fieldwork commenced. Completed questionnaires were returned periodically from the field to CSO offices in Lusaka, where they were entered and edited by data processing personnel who were specially trained for this task. The concurrent processing of the data was an advantage because CSO was able to advise field teams of problems detected during the data entry. TDRC provided the results of the syphilis and HIV testing to CSO for entry and editing. The data entry and editing phase of the survey was completed in August 2002.

1.12 RESPONSE RATES

Table 1.2 shows response rates for the 2001-2002 ZDHS. Response rates are a source of concern because high non-response may affect the reliability of the results. A total of 8,050 households were selected in the sample, of which 7,260 were found at the time of the fieldwork. The shortfall is largely due to some structures being vacant. Of the 7,260 existing households, 7,126 were successfully interviewed, yielding a household response rate of 98 percent.

In the households interviewed in the survey, a total of 7,944 eligible women were identified; interviews were completed with 7,658 of these women, yielding a response rate of 96 percent. With regard to the male survey results, 2,418 eligible men were identified in the subsample of households selected for the male survey, of which 2,145 were successfully interviewed, yielding a response rate of 89 percent. The response rates are lower for the urban than for rural sample, especially for men.

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	2,167	5,883	8,050
Households occupied	2,059	5,201	7,260
Households interviewed	2,013	5,113	7,126
Household response rate	97.8	98.3	98.2
Interviews with women			
Number of eligible women	2,650	5,294	7,944
Number of eligible women interviewed	2,551	5,107	7,658
Eligible woman response rate	96.3	96.5	96.4
Interviews with men			
Number of eligible men	814	1,604	2,418
Number of eligible men interviewed	689	1,456	2,145
Eligible man response rate	84.6	90.8	88.7

Compared with the 1996 ZDHS, there has been a slight decline in response rates. In the 1996 survey, the response rates were 99 percent for households, 97 percent for women, and 91 percent for men (CSO, MOH, and Macro International, 1997).

The principal reason for non-response among both eligible men and women was the failure to find individuals at home despite repeated visits to the household. The substantially lower response rate for men reflects

the more frequent and longer absences of men from the household, principally related to their employment and life style.