INTRODUCTION 1

Sri Lanka is a pear-shaped Island in the Indian Ocean. The Island is separated from the southern tip of the Indian sub-continent by a 35km long narrow strip of water called Polk Straight. Sri Lanka lies between the northern latitudes of 5° 55′ and 9° 50′ and the eastern longitudes of 79° 42′ and 81° 52′. The land size of Sri Lanka is 65,608 square kilo meters and the greatest length of the island is 435km and stretches from Point Pedro in the North to Dondra Head in the South. The width between the broadest point is 225km, from Colombo in the West to Sangamankanda in the East.

1.1 History

The history of Sri Lanka goes back about 2500 years. During its early history, "Yaksha, Raksha, Naga and Deva" tribes inhabited the blessed land of Lanka. During the period 543–505 BC, the Indian Prince Vijaya and his men established the foundation of a civilization. Later, Sinhala kings ruled the country. Even today, one can see the prosperity, skills and talents of these ancestors in the form of huge tanks, irrigation systems and architecture. From its early history, Sri Lanka has been well known for various spices and precious stones. Due to Sri Lanka's strategic location in the Indian Ocean and the precious products found in the country, many western traders settled in this land. As a result of trade, the Portuguese, Dutch and British colonized this land from 1505 to 1948. The island's history of immigration, trade, and colonial invasion has led to the formation of several ethnic groups, each with its own language, religious traditions and shared cultural practices, beliefs, and values. The majority of Sri Lankans are Sinhala (74.9%) and Buddhists (70.1%), while other ethnic groups consists of Sri Lankan Tamils (11.2%), Tamils of Indian origin (4.1%), Muslims (9.3%), Burghers and a few others (0.5%).

1.2 Climate

Sri Lanka's climate is tropical and can be divided into wet and dry zones based on precipitation. The country receives rainfall mainly from two monsoons, the Yala and the Maha. The Yala monsoon brings abundant rainfall to the country's western and southern regions from May to September; this area generally experiences its dry season from December to March. The Maha monsoon affects the Northern and Eastern part of Sri Lanka and often lasts from October to January, with the dry season usually lasting from May to September. This region receives approximately 1000 mm of precipitation annually, significantly less than the other half of the country. There is also an inter-monsoonal period in October and November during which rain and thunderstorms occur frequently across the island.

The country's coastal belt consists mainly of beaches and bays, with rocky cliffs in the North-East and South-West. Due to the southwestern location of the mountain range, precipitation is heavily weighted towards this area, with the Northern and Eastern parts falling in the rain shadow of the central highlands. The wettest parts of the country in the South and West receive around 4,000 mm of rainfall annually. With this year-round rainfall, the country enjoys immense biodiversity. Average humidity is typically high in Sri Lanka, averaging around 80% year-round. The coastal areas are warmer than the central hilly areas. Average temperature from West to South is around 27°C (80° F). During the March-June season slightly higher temperatures (up to 33°C / 92°F) are usual, while temperatures in November-January are a few degrees lower (around 24°C / 75°F at the coast). Sri Lankan weather along the shores is made more comfortable by cooling sea breezes. The temperature of the surrounding sea remains rather constant at roughly 27°C (80°F) year-round.

1.3 Economy

Sri Lanka has a middle level developing economy based largely on agriculture, services, and light industry. Agriculture accounts for approximately 10 percent of the gross domestic product (GDP) and employs 38 percent of the workforce. One-third of the land of this country is arable and both cash crops and principal food crops are largely grown in every corner. The majority of rural people depend on rice production and at present the country is self-sufficient in rice production. Manufacturing industries account

for approximately 34 percent of the gross domestic product and employ about 17 percent of the workforce. The main manufacturing industries include textiles, ceramics, petroleum products, fertilizers, and cement. The service sector is the largest of the Sri Lankan economy, employing 45 percent of the workforce and contributing roughly 56 percent of GDP. Tourism, banking, finance, and retail trade are major components of the service sector. In Sri Lanka, both the private sector and the estate sector engage in the production process. Sri Lanka has followed free market ideology since 1977. Foreign investments are encouraged and attractive concessions have been given to establish free trade zones. The country's banking system is well developed and both foreign and local banks function in the economy.

1.4 Demography

The total population of the country in the year 2012 was around 20.4 million and the sex ratio was 93.8, according to the Census of Population and Housing (CPH) conducted in 2012. The population density was 323 per square kilometer. Census data revealed that more than half of the island's population is distributed in Western, Central and Southern parts of the country. In addition 18.2 percent of the population lives in urban areas of the country, while 4.4 percent live in the estate sector. The majority of the population lives in the rural sector (77 percent, CPH 2012) Urban areas were defined as areas declared as municipal councils and urban councils. However, an attempt has been initiated by the Department of Census and Statistics to re-define this classification using Census of Population and Housing data, as the urban percentage seems to be under-estimated according to the former classification.

When considering the total population based on broad age groups, nearly one fourth (25.2%) of the population are children (less than 15 years) while 12.4 percent belong to the elderly population (age 60 years and older). The work force of the country, defined as those 15-59 years of age, is 62.4 percent of the total population. Education indicators show that the majority of the population has completed up to secondary level while 4.7 percent of the population has never attended a school. The literacy rate of Sri Lankans stands at 95.7 percent and the computer literacy rate is 24.2 (CPH 2012).

Marital status and fertility data were analyzed for age groups 15 years and above. The Census data reveal that 70 percent of males in that population and 78 percent of females were ever married at the time of Census taking. The singulate mean age at marriage is 27.2 years for males and 23.4 years for females. This implies that males are on average 3.8 years older than their spouses. According to the Census data, 28.4 percent of the ever-married female population had two children. One fifth of the ever-married female population had one child and the proportion of ever married women who had three children was reported as 20.5 percent. However, 8 percent of the ever-married female urban population, 7 percent of the same rural population and 5.1 percent of the same estate population had no children. Census data were used to calculate the total fertility rate (TFR) as 2.4. The Sri Lanka Yonaka (3.3) and Indian Tamil (2.9) populations reported a higher TFR than Sinhala (2.3) and Sri Lankan Tamil (2.3) population.

1.5 Health system

Western, Ayurvedic, Unani, Sidda and Homeopathy are the components of the Sri Lankan Health system. Among these, the majority of services are provided through Western medicine which is provided free of charge by the government. The Ministry of Health is the central agency established for addressing health issues of the Sri Lankan population. Key functions of the institution include setting policies, guidelines, and programs to improve the quality of the health system in the country, managing and supplying medical needs of institutions under the ministry, as well as training and appointing staff. The Ministry of Health is headed by a cabinet minister who is assisted by a deputy minister and a secretary.

The main objective of the government health policy is to provide good quality, free health care for all Sri Lankan citizens. The overall objective of the health policy is to improve the quality of life and increase the life expectancy of the general public. This health policy ensures individual health care by improving accessibility to care on an equal basis. The policy focuses on alleviating malnutrition of mothers and children, promoting preventive medicine, improving health care facilities in remote areas, improving existing medical facilities, developing additional services to meet a wider range and level of medical needs, providing focused, immediate and intensive health interventions to underserved, under-privileged and vulnerable population, and improving facilities and services for children with special needs. Further, the Ministry of Health provides rules and regulations for streamlining private sector health institutions.

1.6 Demographic and health survey

The fifth round of the Sri Lanka Demographic and Health Survey was conducted in 2016. This survey was funded by the World Bank under the Second Health Sector Development Project (SHSDP) – Component II. Survey planning, data collection, data processing and dissemination of final data of this survey were carried out by the Department of Census and Statistics (DCS). The primary objective of the SLDHS is to provide updated and reliable data to policy planners, program managers in the Ministry of Health (MOH), and other relevant institutions and researchers. This data includes information on maternal and child health, reproduction and fertility preferences, family planning, evaluation of maternal and child health services, women's status, and knowledge and behavior regarding HIV/AIDS and other sexually transmitted diseases. This information can contribute to policy decisions, planning, monitoring, and program evaluation at both the national and regional levels. For the first time in the DCS history, the Computer Assisted Personal Interview (CAPI) method was used in this survey. Because the new technology was challenging, moving to CAPI for the 2016 DHS was a great achievement for the department.

1.7 Sample design

As in many other household surveys, the Demographic and Health Survey 2016, uses a multistage stratified area probability sample design. The survey uses a two-stage stratified sampling design. At the first stage, 2500 Census Blocks were selected as primary sampling units (PSUs). At the second stage, 12 housing units were selected from each selected PSU as the secondary sampling unit (SSU) from all strata except from the strata of the districts in Western Province (ie : Colombo, Gampaha and Kalutara). In these districts, 10 housing units were selected from each selected PSU. A total of 28,800 housing units were selected for the survey.

A sampling frame is the complete list of all sampling units that entirely covers the target population. For the SLDHS 2016 the frame consisted of the Enumeration Areas (EAs) that were prepared for the Census of Population and Housing 2012. These EAs are also called Census Blocks. A Census Block is a subdivision of a Grama Niladhari division, which consists of about 150 building units. The Census Frame covers about 65,000 Census Blocks.

Stratification is the process by which the survey population is divided into subgroups or strata that are as homogeneous as possible using certain criteria. Two- stage stratification was utilized for this survey, which involves stratifying the population by district at the first level and then by Urban, Rural and Estate within each district. The total sample of 2500 Census Blocks (PSUs) were allocated by districts and then by sectors using the proportional allocation method and some adjustments considering the proportion of eligible respondents by each district. All the selected PSUs were updated and separate lists of housing units were prepared to be used for SSUs. This procedure is important for correcting errors existing in the sampling frame, and it provides an updated sampling frame for household selection.

At the first stage, a stratified sample of PSUs was selected with probability proportional to size (PPS): in each stratum, a sample of Census Blocks was selected independently with probability proportional to the measure of size of the Census Block. In the selected PSUs, the list of households was updated making sure that all and each household/dwelling were listed separately. At the second stage, a fixed number of households was selected by equal probability systematic sampling in the selected PSUs. In each selected household, a household questionnaire was completed to list all usual residents and visitors who stayed in that household the night before the day of interview. During the planning stage, it had been decided to identify ever-married women aged as eligible women for the interviews of individual women. Every eligible woman was interviewed with an individual questionnaire.

1.8 Questionnaire

The 2016 SLDHS questionnaire was used to collect information from households and eligible women through personal interviews, to provide essential national level data for monitoring programs of the Ministry of Health, Nutrition and Indigenous Medicine and to provide information on important emerging health and family welfare issues. The questionnaire was extensively adapted from the standard ICF DHS core questionnaires with a large number of new country specific questions to reflect the health issues relevant to Sri Lanka. A number of data user meetings were held with the Ministry of Health, Nutrition and Indigenous

Medicine and representatives from relevant other agencies to discuss the questionnaire before finalization.

The questionnaire had two main sections, namely, a household section and a section on women and children. The first section 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 and relationship to the head of the household. For persons aged 10 or above, information was collected on marital status. Questions were asked about school attendance for children aged 5-22 years and adequacy of their basic requirements. For children under 17, the survival status of the parents was determined. The household section was used to identify eligible women and children for the main interview and women who were eligible for the interview focusing on domestic violence. The household section also collected information on the main source of drinking water, type of toilet facility, source of lighting, type of cooking fuel, garbage disposal, ownership of a house, agricultural land, livestock and various durable goods, use of mosquito nets and use of iodized salt. Under the household section, information was also collected on non-communicable diseases, mental health, the use of smoking tobacco and smokeless tobacco, alcohol and drugs. The health officers on each survey team measured the height and weight of eligible ever-married women aged and children born since January 2011. The health officers also took blood samples from eligible women aged and children (6 – 59 months) to measure hemoglobin levels, which indicate the prevalence of anemia.

The second section was used to collect information from ever-married women aged 10-49. Women were asked questions on the following topics:

- Background characteristics (place of residence, age, education, religion, ethnicity, marital status, media exposure etc.)
- Reproductive history
- Knowledge and use of family planning methods
- Pregnancy and postnatal care
- Child immunization, health and nutrition
- Fertility preferences
- Husband's background and woman's work
- Awareness about AIDS and other sexually transmitted infections (STIs)
- Awareness about well-women clinics
- Children who need special care (disabled)
- Early childhood development
- Other health issues

Respondents were asked an extensive series of questions about their children who had been born since January 2011. Topics covered were vaccinations, childhood illnesses, nutritional status and breastfeeding. In addition, a calendar of events was used to record information related to the respondent's marriage, pregnancies and births, and contraceptives used. Paper-based and tablet-based questionnaires were pre-tested by a team of experienced DCS staff. Questionnaires were prepared in Sinhala, and translated into Tamil and English.

1.9 Training

There were two different training programms: one for the pre-test, and one for the main survey. Each training was conducted in two different stages. During the first stage, training was conducted on the paper-based questionnaire, and during the second stage training concentrated on the application of the CAPI-based program. For the pretest, three weeks of training in total (from February 8th to 27th, 2016) were conducted at the DCS. The training team consisted of three consultants from ICF as well as the staff of the DCS. A total of 50 trainees (supervisors, interviewers and field editors) attended the pretest training. The pretest included in-class training, as well as field training. Fieldwork for the CAPI pretest was carried out by six teams in four locations around DCS.

During the main training 172 interviewers, 38 field supervisors and 33 field editors were trained by ICF consultants and local trainers. Separate training programs were organized for Sinhala and Tamil officers from April 25th to May 8th, 2016 at the CHPB building in Battaramulla. During the last 2 days of the training program, all trainees were send the field to practice with CAPI. During the training period, questionnaires and instructions were clearly explained and interviewing techniques and field procedures, rules and regulations of SLDHS were also explained. All nursing officers were given instructions and training to measure height, weight and hemoglobin and all supervisors, enumerators and IT assistants were given through knowledge of use of tablet computers.

In both trainings, the trainers used various techniques including presentations, lectures, mock interviews, and role-plays. Additionally, in-class exercises included probing for age, checking age consistencies, completing the reproductive calendar and practicing the interview. Also, there were special lectures on child immunization, contraceptive use, domestic violence, epidemiology, mental health and non-communicable diseases. Resource persons from the Ministry of Health, Nutrition & Indigenous Medicine provided assistance. Officers of the Family Health Bureau assisted to train nursing officers.

1.10 Procument

Procurement activities for the Demographic and Health Survey (DHS) of Sri Lanka were conducted in accordance with the available provisions of the procurement guidelines of the Government of Sri Lanka and the World Bank. Standard Bidding Documents were used with the consent of the World Bank to procure goods, consultancy services and other services under the accepted procurement methods of National Competitive Bidding (NCB), National Shopping, and Single Source selection in line with the available provisions of the guidelines and depending on the prevailing situation in the market. The authority limit of the procurement activities vested from the level of Cabinet of Ministers to the Project Procurement Committee (PPC) with necessary assistance of Technical Evaluation Committees (TECs). The officers of the Ministry of Health, Nutrition and Indigenous Medicine and the Department of Census and Statistics closely monitored action plans and the detailed procurement activities. Budget for the International consulting was approved by the Budget for the (cabinet approved) project procument committee.

1.11 Selection of teams and fieldwork

An important feature of this survey was its coverage of the entire island. At the beginning of the survey, 32 teams for Sinhala speaking communities and 8 teams for Tamil speaking communities were formed for data collection. Each team was comprised of one female supervisor, four or five female interviewers, one male or female IT officer, a nursing sister and a field assistant. The nursing sister was recruited from the Ministry of Health, Nutrition and Indigenous Medicine in order to collect biomarker measurements (height, weight and hemoglobin measurements).

The supervisors had overall responsibility of fieldwork. The supervisors were responsible for reviewing all completed electronic questionnaires for their completeness, quality and consistency before transferring data to the central office. IT officers assisted supervisors to solve IT related issues.

Fieldwork started on May 14, 2016 and was completed by the middle of November, 2016 with a total of 40 teams. Time in the field for each team differed due to differences in the allocated number of clusters, the field environment, and the number of interviewers in the team. Supervision and technical assistance during fieldwork were provided by staff of the ICT division of DCS and two doctors specialized in IT from the Ministry of Health, Nutrition and Indigenous Medicine.

1.12 Data collection using CAPI

Computer-Assisted Personal Interviewing (CAPI), coupled with the use of mobile and wireless technology, is currently the data collection methodology of choice. Sri Lanka used tablet personal computers (tablet PCs) and wireless technology for the data collection for the 2016 DHS. Feedback from interviewers indicate that the use of tablet PCs and wireless technology can improve data quality and reduce data collection time, as well as improve accuracy and reduce missing data. Availability of Electricity is not significant in the use of tablets because almost all the country has a good electrical supply system.

The length and complexity of the DHS questionnaire was the main reason for using the Windows-based DHS software, CSPro (Census and Survey Processing System). A tablet computer with keyboard and touch screen was used as the primary data input device. The tablet computers were connected to Internet using mobile network technology using mobile phones and Bluetooth for transferring data over short distances.

Using CAPI, the interviewers enter the responses directly into a tablet computer database. The system helped in the selection of the appropriate language, skip-patterns and in selecting appropriate options from a drop down menu. The interviewers closed the respondents' data file and sent it to the supervisor via Bluetooth file transfer system. The supervisors reviewed the data for inconsistencies and provided immediate feedback to the interviewers. After that, the supervisor sent the data to the head office using Internet connections from a mobile phone.

1.13 Data processing and tabulation

The DHS 2016 benefited from the CAPI (Computer Assisted Personal Interviewing) method which uses the survey questionnaire interactively on-site in electronic format. Thus, in CAPI, the data entry and validation of DHS 2016 was also done on-site using the digital questionnaire on tablet computers for the first time in DCS history. When CAPI is compared to traditional paper-and-pencil data collection, CAPI allows the data entry and data validation in the field at the field enumerator level. CAPI therefore results in decreased cost of clerical editing, data entry, correction and related man power, printing and a vast reduction in time taken for the whole process of producing a clean data file.

The CAPI System designed for the DHS 2016, controlled the operation of data capture at three administrative levels namely enumerator, supervisor and central office. At the enumerator level, most of the range checks and consistency errors were identified and removed while interviewing the survey respondents, and at the supervisor level further checks in consistency and structural errors found in the questionnaires were eliminated based on an error report generated by the system. Dedicated staff at the central office conducted a series of checks which needed higher level decision making to correct country and regional level errors, such as resolving cluster and questionnaire identification discrepancies and resulting inconsistencies found in the questionnaires in the clusters assigned to different regions under different supervisors.

The DHS CAPI system uses Bluetooth technology to transmit data between tablet computers and that feature was successfully employed for the data communication between the enumerators and supervisors, i.e., assigning households selected for the survey and system updates to enumerators by supervisors and sending the survey data from the enumerators to the supervisors. The transmission of data from the supervisors to the central office internet facility was facilitated via a popular Internet Service Provider (ISP). Before transmitting the data via the Worldwide-Web using File Tranfer Protocol (FTP), the data files were encrypted using strong encryption keys and algorithms to safeguard the confidentiality of the data.

1.14 Data dissemination

The Demographic and Health Survey is the most important source for generating data for the development of the health sector in Sri Lanka. Key findings of this survey are presented in this report. This is available in the DCS Website: www. statistics.gov.lk. Policy makers, planners, researchers and students will have access to a large volume of health data through this final report.

Eventhough, it has been planned to collect information of ever-married women in the age group 10-49, according to the finding there were very few cases reported in 10-14 age group. Therefore please note that information were provided for ever-married women in the 15-49 age group.

1.15 Results of the survey interview

Table 1.1 shows response rates for the SLDHS 2016. A total of 28,720 housing units were selected for the sample, from which 27,455 were occupied at the time of the survey of those existing households 27,210 were successfully interviewed, yielding a household response rate of 99.1 percent. The household response rate is slightly higher in the rural sector than in urban and estates sectors. Within the households interviewed a total of 18,510 eligible women (ever married women age 10-49) were identified.

Analysis was done only for the women age 15-49 as the number of women aged 10-14 were very few.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Sri Lanka 2016

Result	Residence			
	Urban	Rural	Estate	Total
Household interviews				
Households selected	4,743	22,072	1,905	28,720
Households occupied	4,485	21,230	1,740	27,455
Households interviewed	4,413	21,083	1,714	27,210
Household response rate[1]	98.4	99.3	98.5	99.1
Interviews with women age 10-49				
Number of eligible women	2,963	14,454	1,093	18,510
Number of eligible women interviewed	2,910	14,344	1,048	18,302
Eligible women response rate[2]	98.2	99.2	95.9	98.9

[1] Households interviewed/households occupied
[2] Respondents interviewed/eligible respondents

Training on pre-testing

Testing readiness of CAPI system

DHS pre-test Team

Training on enumeretors on CAPI system

On their way to selected households

Collecting Bio-Maker Measurements

A team of enumerators

Some members of the report writting team