The Republic of Rwanda

NATIONAL INSTITUTE OF STATISTICS OF RWANDA

Mortality Assessment Survey

- 2015 -

The Republic of Rwanda

NATIONAL INSTITUTE OF STATISTICS OF RWANDA

Mortality Assessment Survey

- 2015 -

July 2018

Mortality Assessment Survey 2015 report is produced by the National Institute of Statistics of Rwanda (NISR).

Additional information about Mortality Assessment Survey 2015 report may be obtained from NISR:
P.O. Box 6139, Kigali, Rwanda; Telephone: (250) 252 571 035
E-mail: info@statistics.gov.rw; Website: http://www.statistics.gov.rw

ISBN: 978-99977-43-29-9

Recommended citation:

National Institute of Statistics of Rwanda (NISR), Mortality Assessment Survey 2015 report, July 2018

Acknowledgement

This report presents key mortality indicators from the 2015 Mortality Assessment Survey (MAS-2015) conducted from 27th November, 2015 to 31 December, 2015.

The National Institute of Statistics of Rwanda (NISR) wishes to acknowledge the efforts of a number of organizations and individuals who contributed substantially to the success of the survey.

First, we would like to acknowledge the financial assistance from the government of Rwanda, the United Kingdom Department for International Development (DFID), and the Swiss Agency for Development and Cooperation (SDC).

We would like to thank Dr Mohamed Abulata for the technical assistance throughout the survey. We gratefully acknowledge the NISR technical staff and NISR management, who contributed to the successful preparation and implementation of the survey. We wish to express great appreciation for the work carried out by all persons involved in the MAS-2015 who worked with dedication and enthusiasm to make the survey a success.

We would like to express our special thanks to all local authorities involved and the survey staff. Finally, we are grateful to the survey respondents who generously gave their time to provide the information that forms the basis of this and future reports.

Yusuf Murangwa
Director General, NISR

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ASDR:	Age Specific Death Rate
CDR:	Crude Death Rate
CMR:	Child Mortality Rate
CV:	Coefficient of Variation
Deff:	Design effect
DFID:	United Kingdom Department for International Development
DG:	Director General
DSS:	Demographic and Social Statistics
EA:	Enumeration Area
IMR:	Infant Mortality Rate
MAS:	Mortality Assessment Survey
MDGs:	Millennium Development Goals
MINALOC:	Ministry of Local Government
MINEDUC:	Ministry of Education
MMR:	Maternal Mortality Ratio
NISR:	National Institute of Statistics of Rwanda
PASS:	Population Analysis Spreadsheet
PHC:	Population and Housing Census
PSU:	Primary Sampling Units
RDHS:	Rwanda Demographic and Health Survey
SDC:	Suiss Agency for Development and Cooperation
SDGs:	Sustainable Development Goals
SPSS:	Statistical Package for Social Statistics
U5MR:	Under five Mortality Rate
UN:	United Nations

EXECUTIVE SUMMARY

The National Institute of Statistics of Rwanda (NISR) has conducted the Mortality Assessment Survey; a nationwide survey with the aim of providing estimates of contemporary mortality levels prevailed in the country in 2014 and 2015.Due to practical consideration, the survey reference period has been defined to start on the 1st December, 2013 until 30th November, 2015.

This survey must be viewed as supplementary to Demographic and Health Survey (DHS) that is regularly carried out by NISR, which will remain the prime source of demographic estimates until the civil registration system becomes nearly complete.

The General Mortality level measured by Crude Death Rate (CDR) in the indicated reference period is estimated as 2.17 per thousand, with the 95% confidence interval ranges from 1.38 to 2.97 per thousand.
Expectedly, Urban CDR (1.36) is much lower than Rural CDR (2.33). CDR is lowest in the City of Kigali (1.15) and highest in South (2.53) and East (2.56) Provinces. CDR is as low as 1.0 in Kicukiro district and as high as 3.2 per thousand in Kirehe and Ngoma districts each. Male Death Rate (2.6) is much higher than Female Death Rate (1.8 per thousand)

Infant Mortality Rate (IMR) has been estimated at 19.2 infant deaths per thousand live births. No significant Difference has been found between MAS estimate of IMR and linearly extrapolated DHS estimate of IMR so as to refer to the same MAS reference period.
IMR estimates comply with the standard sex differential where Male IMR (20.8 per thousand) is notably higher than female IMR (17.4 per thousand). As expected, IMR is higher in rural areas (20.2) compared with urban areas (13.6 per thousand). IMR is lowest in the City of Kigali and highest in East province (22.4 per thousand live births). IMR at district level reveals that the district of Kicukiro has the lowest (9.6) whereas the district of Ngoma has the highest IMR estimate (28.8 per thousand live births). IMR starts relatively high (19) for the first birth order, decreases with the second birth order (15) and moves upward with higher birth orders (24.1 per thousand live births for the fifth birth order and above). IMR is inversely associated with mother's education: it is as high as 22 when mothers have no education, it drops dramatically to 6.3 infant deaths per thousand live births for mothers having university education.

At national level, Neonatal Mortality Rate is estimated at 11.1 infant deaths per 1000 live births. Male Neonatal Mortality Rate is higher (11.7) than that of female (9.6). Urban Neonatal Mortality Rate (8.4) is lower than that of rural residence (11.7). At provincial level neonatal mortality rate ranges from 7.5 in the City of Kigali to 13.8 in Northern Province.

Post Neonatal Mortality Rate is measured at 8 per 1000 live births for the whole country, it is to somewhat higher for males (8.2) compared to that of females (7.8). Urban Post Neonatal Mortality Rate is as low as a half of the corresponding rate in rural areas. Post Neonatal Mortality Rate is 4.6 and 8.9 in urban and rural respectively. At provincial level post neonatal mortality rate ranges from 4.2 in the City of Kigali to 10.4 per 1000 live births in East Province.

Depending on the life table analysis, Under Five Mortality Rate is estimated as of 27.2 per 1000 live births for both sexes combined; 29.8 for males and 24.5 for females. Under Five mortality is lower in urban (18.1) compared to rural (28.9). At provincial level, Under-Five Mortality Rate (U5MR) ranges from 16.5 in the City of Kigali to 34.6 in East province.

Defined as the probability that a child of exact age one will die before reaching the exact age of five, Child Mortality Rate (CMR) was extracted from life table analysis as of 8.2 per thousand for both sexes combined; 9.2 for males and 7.2 for females. Rural Child Mortality Rate (8.9) is nearly as high as twice urban child mortality rate (4.6). At provincial level Child Mortality Rate ranges from 4.9 in the City of Kigali to 12.5 per thousand in East Province.

Maternal Mortality Ratio (MMR) for the whole country in the MAS reference period is estimated at 64.5 per 100000 live births. It is lower in urban areas (55.5) than in rural areas (66.3). The linearly extrapolated MMR of DHS to the MAS reference period shows no significant difference with the MAS MMR result.

The sex-age pattern of mortality measured by sex-age specific death rate exhibits the standard pattern prevalent in all countries of relatively high mortality incidence at earlier ages; lower mortality at middle ages followed by higher mortality incidence in older ages. Male mortality is higher than female mortality in younger and older ages, though, it is almost the same approximately in Middle Ages.

In addition to its own value in understanding how mortality varies with sex and age, the sex-age mortality pattern is an intermediate step to constructing Life Table in a very direct manner.
Life Tables have been constructed for each sex and for both sexes combined. The life expectancy at birth has been measured and the average number of years expected to be lived by a new born baby is **72.24** years depending upon that new born baby will experience throughout his/her life the same mortality level and pattern prevailed in Rwanda in the period of 01/12/2013 to 30/11/2015.
Life Tables for males and females have shown that Male and Female life expectancy at birth is 69.27 and 75.85 years respectively. The urban life expectancy at birth for both sexes combined is 73.76 compared with 71. 95 years for rural population.

INTRODUCTION

The National Institute of Statistics of Rwanda (NISR) has decided to consider the Direct Survey Method for assessing mortality level and differentials in Rwanda in a fairly recent time. The death data generated for this method is akin to the data derived from the civil registration system had it been complete or nearly complete. On the basis of the death data collected from the present an extraordinary big household sample, the direct estimation method of almost all current mortality measures have been attained. Specifically, the Mortality Assessment Survey (MAS) has produced estimates of Crude Death Rate; Infant Mortality Rate; Under-five Mortality rate; Neonatal and Post neonatal mortality rates; Maternal Mortality Ratio; the sex-age pattern of mortality and finally Life table construction.

The direct survey method has produced reasonably precise estimates at the province and even district levels for many mortality measures. More importantly, the MAS provides estimates of contemporary mortality level that prevail in Rwanda over the two-year period (1/12/2013 to 30/11/2015). In this respect, it is important to point out that the MAS should be viewed as a supplementary not a substitute of the Demographic and Health Survey (DHS). The later Survey will continue to be the prime source of demographic estimates until the civil registration system in Rwanda becomes nearly complete.

This report presents the analytic results of the Mortality Assessment Survey. It encompasses seven chapters: Chapter One presents Survey Methodology; Chapter Two handles the estimation of household population; Chapters from three to six are respectively designated to General Mortality; Infant Mortality; Maternal Mortality and; Age-Sex pattern of Mortality. Finally Chapter seven presents Life Table construction.

CHAPTER ONE: SURVEY METHODOLOGY

This introductory chapter presents the survey objectives which have been specified before starting the design stage; sample design; questionnaire design; recruitment of field personnel; field work training; data collection; data capture; data editing and processing and data analysis.

1.1. SURVEY OBJECTIVES

The objectives of the Mortality Assessment Survey are:

1- To Provide estimates of the more recent mortality level compared with DHS;
2- To Examine provincial and/or district differential of mortality as far as the data allow for further breakdowns;
3- To Estimate sex-age pattern of mortality
4- To Construct Life Tables

1.2. SAMPLE DESIGN AND IMPLEMENTATION

1.2.1. Sample Design

The sample design incorporates sample size determination; sampling stage; stratification; weighting and estimation. The sample has been selected from the Master Sample that NISR developed after the results of the 2012 Population and Housing Census (4th PHC) have been released.

1.2.2. Sample Size determination

Maternal death is a vital event which is characterized by an extremely low incidence level compared to other vital events. For this reason, a larger sample size is required to estimate this phenomenon with higher or reasonably accepted precision level. Yet, the cost of the field work is minimal as only few questions are addressed to households. As the incidence of maternal death is much lower than the incidence of other mortality indices, the sample size which produces precise Maternal Mortality Ratio (MMR) estimate will subsequently produce more precise estimates of other mortality indicators. The relative error margins of IMR and U5MR corresponding to the determined sample size is evaluated in the end of this section.

The MMR is a ratio of number of maternal deaths occurred in a year to the total number of live births occurred in the same year. Thus it is not of the proportion type that is usually used to estimate the sample size applying the Simple Random Sample (SRS) formula. For this reason MMR will be transformed into the proportion of households experiencing maternal death on the basis of the following logic:

Let:

MD: denotes the number of maternal deaths in a year, H: denotes the number of surveyed households,

B: number of live births occurred in the year,

CBR: denotes Crude Birth Rate, and

X: denotes average household size

Then:

MMR= $\frac{MD}{B}$ $\frac{MD}{H}\frac{H}{B}$ = $\frac{MD}{H}\frac{XH}{XB}$ = $\frac{MD}{H}\frac{1}{X(CBR)}$, since $CBR = \frac{B}{XH}$

Therefore MMR can be written as:

MMR= C $\frac{MD}{H}$

Where C= $\frac{1}{X(CBR)}$

If we make another assumption, which is really very tenable, that is no household experiences more than one maternal death in a year, or in other words, the probability of having multiple maternal death in a year within the same household is negligible, then MD is equivalent to the number of households experiencing maternal deaths in a given year, therefore $P = \frac{MD}{H}$ can be considered equivalent to the proportion of household having maternal death in a given year, while C= $\frac{1}{X(CBR)}$

Finally: MMR= CP

The SRS variance of MMR estimate conditional on a certain value of "C" can be expressed as:

V (MMR|C) = $C^2 \, V(p \mid C) = C^2 (1-f)\frac{p(1-p)}{n-1}$

$$\approx C^2 (1-f)\frac{p(1-p)}{n}, \text{ where } f = \frac{n}{N}, \text{ and "n" and "N" denotes the sample and population size respectively}$$

It is the last formula that is used to estimate the sample size for the MMR measurement.

The determination of the SRS sample of households has been obtained using the usual SRS formula of sample size determination shown next:

$$n = \frac{z^2_{1-\alpha/2}(1-p)\,N}{p\,N\,e^2 + z^2_{1-\alpha/2}(1-p)}$$

Where:

N: is the population size, i.e. the total number of households as estimated on mid-2014,

e: is the maximum allowable relative error for estimating MMR, (e= 0.125),

$z_{1-\alpha/2}$: is the value of standard normal distribution corresponding to 90% confidence level ($z_{1-\alpha/2}$ = 1.58), and

P: is the proportion of households experiencing maternal death in the year before the survey date. As shown above $p = \frac{MMR}{C}$, where MMR is extrapolated from the 2010 RDHS (350 per 100,000 live births) and C is to be estimated from external information: C = 1/(X*(CBR)). Where according to 2012 Census X = 4.3 and CBR = 30.9 per 1000 population.

Therefore, c = 7.526, and p = MMR/C = .0035/7.526 = 0.00046505. The total number of households in mid-2013 (mid reference period) is estimated at 2,496,923. Consequently, the sample size is estimated at 301,880; equivalent to 2,096 EA's. The size has been slightly reduced to 2000 EA's.

Since this sample design is of a stratified cluster sampling type, the design effect (*deff)* must be taken into considerations in determining the size of the cluster sample. Fortunately, the sampling literature indicates that the interclass correlation in MMR is extremely low (Turner, A., 1999) leading to a reasonably low design effect even with a size of cluster which is as big as the EA size (140 HH in average). The default value of *deff* (2) will be considered for sample size determination. Thus the SRS sample is supposed to be doubled in order to maintain the precision level as planned for (e $\leq$0.125). The resulting design effect estimate of MMR is much lower than 1 (0.109) at national level and nearly 1 (1.269) in Kigali Province and almost null in other provinces.

Nonetheless, since the survey methodology is such that each household is required to report the number of maternal deaths and live births in the preceding two years, the sample household is naturally doubled in order to provide average annual MMR estimate. As such, there is no need to double the sample size. In other words, the SRS-determined sample size is nearly adequate to provide the desired precision level with the cluster sample of the same size as long as the required information is collected for the two-year period prior to the interviewing date. The rationale of this argument lies on the following:

Assume that p_1 and p_2 denotes the probability that the household will experience maternal death in years 1 and 2 respectively, and MD_1 and MD_2 denote the maternal deaths in years 1 and 2 respectively. Let the random variables D_1 and D_2 denote whether the household experiences maternal death in years 1 and 2 respectively.

Then:

$$p_r(D_1 \cup D_2) = p_1 + p_2 - P_r(D_1 \cap D_2)$$

As it is unlikely that the household experiences maternal death in each of the two consecutive years, the last term of above equation can be ignored. Assume also that the MMR level is the same in both years. i.e. $p_1 = p_2 = P$. It follows that $MD_1 = MD_2 = MD$, as the sample is the same for both years, then

$$p_r(D_1 \cup D_2) = \frac{2MD}{n} = \frac{MD}{1/2\,\mathrm{n}}$$

Thus half of SRS sample "n" with two-year observation period can be considered as nearly equivalent to the whole "n" if the observation period is limited to only the year preceding the survey date.

The implemented household sample amounted to 453,920 households.

1.2.3. Expected error margins of other mortality indices

With the above extraordinary big sample size, the relative error margin for the estimated IMR and U5MR are expected to be as low as 4.1 percent and 3.4 percent respectively. Hence the precision of other mortality indicators, usually characterized by higher prevalence level than of MMR, is higher than that of MMR. Look at Annex one for precision estimates of various mortality estimates.

1.2.4. Sampling Stages

Apart from the master sample, a single-stage stratified sample has been planned for, considering the EA as the PSU. Death and birth information have been collected from each household within the sample EA. Thus the selection probability of a certain household is equivalent to the selection probability of the EA in which this household exists.

1.2.5. Stratification

Two types of stratification have been introduced; the first is explicit by stratifying the frame into urban/rural strata, while the second is implicit by ordering the frame according to geographic proximity. Thus a proportionally balanced geographic spread of the sample could be attained with the systematic selection of the first stage sample. The sample is allocated proportionally between urban and rural areas.

The EA sample was selected systematically from the Master Household Sample produced by NISR just after the 2012 census results were released.

Although the sample is of two stages, the first stage is merely the master sample and the second stage is the one through which the 2000 EA was selected.

1.2.6. Estimation Procedure

To obtain unbiased estimates from this Survey it has been necessary to apply appropriate weights to the sample data based on the probabilities of selection. Given the sample design, these weights vary by sample PSU. It is also important to calculate measures of sampling variability for all estimates of mortality indices. The procedures for calculating the weights and variances are specified in the following sections.

1.2.7. Weighting Procedures

In order for the sample estimates of mortality indices to be representative of the population, it is necessary to multiply the data by a sampling weight, or expansion factor. The basic weight for each sample household would be equal to the inverse of its probability of selection. Although the present sample design is approximately self-weighting within the main stratum (urban/rural), it is strongly recommended to weight the data in order to produce unbiased estimate for the whole country as well as its urban/rural break down for some indicators. Since survey data will be processed by computer, it should be easy to attach a weight to each sample EA in the computer files, and the analysis programs can weigh the data automatically. The sampling probabilities of selection have been maintained in an Excel spreadsheet so that the selection probabilities and corresponding weights can be calculated for each sample EA.

1. First stage sample (Master sample selection probability followed by a systematic selection of the sample EA's with equal probability)

$$p_{\alpha} = \frac{\lambda M_{\alpha}}{\sum_{\alpha} M_{\alpha}} . \frac{\lambda^{*}}{\lambda}$$, where

$P_{\alpha} =$ Probability of selection of the α^{th} PSU in the sample .

The first component on the right hand side of above equation denotes the selection probability of the master sample.

$M_{\alpha} =$ Household size of α^{th} PSU.

$\lambda =$ Number of PSUs has been selected in the Master Sample of a certain district

λ^{*} = Number of PSU to be selected from the master sample of a certain district in the MAS Sample.

The design weight 'w' equals the inverse of p_{α}, i.e. $w = \frac{1}{p_{\alpha}}$

It should be noted that **final weights** may be adjusted further at the time of processing the data. This may become necessary to take account of unit non-response which may occur at the time of data collection. In fact, when comparing the household count resulting from the listing operation preceded data collection with the actual count of surveyed households in sample EA's we found that the vast majority of sample EA's have actual counts higher than the listing counts. This indicates that adjusting for unit non-response is insensible in the present situation.

1.2.8. Estimation Procedure of Mortality Indices

CDR, IMR, MMR and ASDR are all ratio estimates which are calculated as a ratio of total number of corresponding death events occurring in the observation period to different denominators depending on the type of the mortality measure in question, with regard to IMR and MMR the denominator is the live births occurred in the observation period. While for CDR and ASDR the denominator is the estimate of number of person-years in the observation period. For IMR the death event is infant death, while for MMR the event is maternal deaths in the observation period and for CDR the death event is death of all ages and for both sexes in the two-year observation period. Thus if we make $\hat{R}$ denotes the estimate of any of above mortality indices, then the ratio estimate $\hat{R}$ is defined as:

$\hat{R} = \frac{\hat{Y}}{\hat{X}}$, where

$\hat{Y}$ and $\hat{X}$ are estimates of totals of corresponding death cases 'y' and appropriate denominators 'x', respectively, calculated as:

$\hat{Y} = \sum_{\forall i} w_i' y_i$, Where the summation is over all elements (households)

w_i is the weight assigned to the i^{th} household.

y_i is the value of variable y for the i^{th} household.

$\hat{X}$ is estimated similarly.

Concerning the estimates of CDR, $\hat{Y}$ denotes the estimate of total deaths occurred in the reference period for both sexes and all ages, while for ASDR, $\hat{Y}_{si}$ represents the estimate of total deaths of either sex in a specified age group. Dividing $\hat{Y}$ by the estimate of total number of person- years in the observation period we obtain CDR estimate. Similarly dividing $\hat{Y}_{si}$ by the corresponding person-years estimate we get ASDR. In case if the number of deaths classified by sex and 5-year age group had been too low to provide reasonably stable estimate of ASDR, a ten-year age grouping may have been used instead. This situation has not been encountered.

1.2.9. Sampling error Estimation Procedures

In the publication of the results of the present Survey, it is important to include a statement on the accuracy of the survey data. In addition to presenting tables with calculated sampling errors for the estimated mortality indicators, the different procedures followed to control the non-sampling errors are described in the following sections.

The standard error, or square root of the variance, is used to measure the sampling error. The variance estimator should take into account the different aspects of the sample design, such as the stratification and clustering. In order to avoid the time and effort it would require to develop custom variance program, it would be ideal to use an available software package to tabulate the sampling errors. One such software package available for calculating the sampling errors for survey data from stratified cluster sample design such as the present survey is SPSS (COMPLEX SAMPLE module), which is menu-driven and user-friendly.

For each estimate, COMPLEX SAMPLE calculates the standard error, coefficient of variation (CV), a 95 percent confidence interval and the design effect (*deff*). This software package uses an ultimate cluster variance estimator.

The ultimate cluster variance estimator for a total used by COMPLEX SAMPLE can be expressed as follows:

<u>Variance Estimator of a Total</u>

$$V(\hat{Y}) = \sum_{h=1}^{H}[\frac{n_h}{n_h - 1}\sum_{i-1}^{n_h}(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h})^2],$$

Where:

$\hat{Y}_{hi}$ = The estimate of the total of variable **y** in the i^{th} cluster of the h^{th} stratum,

$\hat{Y}_h$ = the estimate of the total of variable **y** in the stratum **h**.

n_h = the number of sample clusters in the h^{th} stratum.

Variance Estimator of a Ratio (for IMR, CDR and MMR, ASDR)

$$V(\hat{R}) = \frac{1}{\hat{X}^2}[V(\hat{Y}) + \hat{R}^2 V(\hat{X}) - 2\hat{R} COV(\hat{X}, \hat{Y})]$$

Where:

$$COV(\hat{X}, \hat{Y}) = \sum_{h=1}^{H}[\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}(\hat{X}_{hi} - \frac{\hat{X}_h}{n_h})(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h})]$$

V ($\hat{Y}$) and V ($\hat{X}$) are calculated according to the formula for the variance of a total.

1.3. QUESTIONNAIRE DESIGN

Very simple questionnaire is designed for the purpose of collecting data on live births, infant deaths, general deaths, and maternal deaths occurred in the household during the two-year period starting from 1 December 2013 to 30 November 2015. The questionnaire has four sections: the first section contains household schedule, section 2 deals with live births took place in the indicated two years and their survival status, the third section ascertains information on infant deaths occurred in the mentioned period but were born before the first of December 2013, and the fourth section deals with deaths beyond infancy as well as female death attributed to maternal causes. The cover page includes identification data, household size and interview results (See annex III).

1.4. PREPARATION OF TRAINING MANUAL

The survey core technical team has prepared a training manual for the completion of the questionnaire. Duties and responsibilities of all field personnel were specified in the manual which has been written in Kinyarwanda then translated into English.

1.5. RECRUITMENT OF FIELD WORKERS

Due to the big Sample size (2,000 EAs) and logistical considerations, the recruitment of field workers-amounted to 1610 primary school teachers, were selected from among those who previously worked in the 2012 Population and Housing Census (4^{th}PHC) and performed well. Interviewers have been chosen from the area of their residence if he/she resides in the EA or his/her residence village is nearest to the EA selected for the study.

For the sake of convenience, the training of fieldworkers was administered in five training centers spread all over the country. The number of the training rooms in each training center has been determined in view if the number of fieldworkers needed in each district, because it has been decided in advance that each training room should not exceed 150 trainees.

In order to ease the selection procedures and ensure the availability of selected teachers for the whole period of the training and data collection; the collaboration/facilitation of local authority, MINEDUC and MINALOC has been secured.

The school premises were given to the survey authorities with minimal charges to be used as training centers. They have been chosen from the list of the schools previously used during the 4th RPHC training sessions after being informed on the availability of the schools that have rooms large enough for training, dinning and sleeping rooms.

The survey technical team of NISR has been responsible for this project under the supervision of the Director of DSS Unit and the NISR's DG. MINALOC and MINEDUC have been invited to nominate a focal person for this survey, in order to support NISR in the implementation phase particularly the field work.

Immediately following the training sessions, every fieldworker was informed of his/her responsibility and work assignment.

1.6. TRAINING OF FIELD PERSONNEL

There have been three layers of training planned for this survey; the first training layer was basically intended to train senior NISR staff members other than the core technical survey team. This first layer of training was considered as a training of trainers who would help giving training in the other two layers of training programs.
The second training layer was held to potential team leaders where they were trained centrally in Kigali for 3 days on the questionnaire and field work organization. The trainers were the technical survey team assisted by some NISR senior staff who was trained in the first training layer.

The final training layer was held locally in the five training centers mentioned above to the selected interviewers and potential interviewer substitutes. The trainer again was the survey technical team assisted by those who were trained in the previous training layers.

In total, 1610 field staff was recruited by NISR for the needs of the main survey data collection. Each interviewer was assigned from 1 or 2 EAs (depending on the distance between the EAs and the size of each of the EA). All candidates, all teachers for the field staff positions have been selected on the basis of their performance in the 4th PHC, and availability to work for a period of 1 month. All considerations were given so that only qualified field personnel are selected. The survey technical team spared no efforts to ensure that the best available field workers are selected and trained on data collection.

Trainees have taken classroom training for about 3 days, dealing with all aspects of the survey. The training was administered in a venue of sufficient size to accommodate the candidates and where it was possible to take meals.

The interviewer training has taken place concurrently in the five training centers spread all over the country from 22/11 to 25/11/2015.

The training program included: explanations of the study objectives, a detailed description of the content of the questionnaires; a presentation of interview techniques; explanations on how to fill out the questionnaires, usage of the other study tools (manual, listing forms, and reporting forms), the organization of the data collection, deployment and distribution of materials.

The first day trainees were exposed to general information on the survey (objectives, sample, and expectation) followed by filling out the questionnaire, in the second day the training on how to fill the questionnaire continued in the morning session, in the afternoon session mock interview practices by the trainees was performed. On the third day, trainees gave observations from practices and thereafter focused on the organization of the field work, follow up of the activity by the team leaders and supervisors and the distribution of the questionnaires and other needed materials.

In sum, the training emphasized on the role of interviewer, Team leader and supervisor and the Quality control measures to be taken in the field.

The training included presentations, practice interviews in the classroom (mock interviews). Each interviewer carried out at least 2 interviews throughout the training period. Questions on confidentiality, good conduct have been dealt with during the training. After having completed the training sessions, every field staff member has got in depth knowledge of the role to play in the data collection activities so as to achieve maximum effectiveness in the fieldwork.

1.7. QUESTIONNAIRES AND OTHER MATERIALS DISTRIBUTION

Questionnaires, listing forms and other materials like pens, files were distributed to the fieldworkers at the end of the third day of the training. Each team leader received needed materials, as well as a number of packet's questionnaires and listing forms equal to the number of selected enumeration areas in the district he/she has to supervise. The team leaders were helped by the technical team present to the training center to distribute the materials to the fieldworkers.

1.8. FIELD WORK

The mortality survey field work consisted of two parts: Households listing and data collection. It consisted of listing of all structures and houses that exists in the enumeration area and putting a serial number on the door of each house and on the listing form.

In addition to the usual listing operation in the sampled EAs from 27th to 30 November, 2015, all households in each sampled EA have been interviewed for information about live births and deaths occurred in the fixed two years period (01/12/2013 until 30/11/2015).

Reported maternal deaths must carefully be verified to ensure that only female deaths due to maternal causes are reported as such. In this regard, maternal death refers to the death of a woman in reproductive age due to maternal causes. That is to say if it occurs during pregnancy, labor or within the 42 days after delivery, yet woman deaths due to accidents is disregarded in spite of being applicable to any of above conditions of maternal death. In addition, it has been emphasized in the field work training that live births must be correctly recorded without omissions or duplications, as women tend to forget live births that died immediately after birth.

The data collection continued for about 1 month from 1st December to 30 December, 2015. In all, 1,550 enumerators were assigned to 2000 EAs (1 Interviewer per EA or 2 EAs per interviewer) in their proximity. At District level, there have been two Team Leaders who were in charge of the data quality of all interviewers in their district. Above the District Team Leaders, there were 10 regional supervisors, 3 national technical coordinators and 1 National coordinator.

Team Leaders and supervisors have been provided with transportation facility (a car). They had to ensure every day data quality by visiting the maximum number of the enumerators in their working areas by taking samples of questionnaires and giving feedback on the most common mistakes encountered and giving instructions to all of the data collectors.

They were also in charge of completed Questionnaires transportation to NISR Office for editing and data entry.

1.9. TRANSPORT AND SUPERVISION

The team leaders had to visit at least three sectors per day. During this visit they had to observe the progress of the field work, select randomly a sample of questionnaires, review them and give feedback to the field workers.

There has been a strong communication strategy (Closer User Group) in order to enhance follow up on the progress and resolve problems encountered thus data quality has been maintained. The information received has to be communicated to the coordinators.

1.10. DATA ENTRY

Upon the completion of the field work, Completed questionnaires were shipped to NISR premises in Kigali. Questionnaires were checked for completeness prior to data entry operation. Forty experienced data entry clerks were recruited and briefly trained on the questionnaire prior to starting the data entry operation which continued for about two months.

1.11. QUALITY ASSURANCE MEASURES

Following data entry, an SPSS file was created where extensive machine data editing was performed. Special consideration was given to missing age at death; households were contacted by phone in most cases when both dates of birth and date at deaths are incomplete so as to establish age at death, in case of inconsistent data items households have helped in resolving such problems.

CHAPTER TWO: POPULATION

2.1. INTRODUCTION

In demographic analysis following direct estimation method, the total population count and population by sex and age is required to serve as the base population for measuring demographic estimates. Under-estimating, overestimating or misreporting of the population data should undermine demographic estimates. Also underestimating the number of the population should have effect on mortality indicators by overestimating or underestimating mortality estimates, thus, the population classification by age and sex is of fundamental importance in demographic analysis. Mortality analysis is not an exception.

The population data are essential in computing sex-age specific death rates and thus, life tables' construction. For this reason, it is important to assess the population data incorporated in mortality estimation. The 2015 Mortality Assessment Survey has provided data on age composition from which the level of recent mortality can be inferred. Mortality indices will show significant variations in relation to certain characteristics of the decedent and certain characteristics of the event like age, sex and other demographic characteristics of the population.

Before any estimation using population and deaths data, an assessment of the data quality should be made to ensure that the data are of high quality. For the evaluation of population data, total population count, population distribution by sex and age estimated from the MAS are assessed in the following sub-section.

2.2. EVALUATION OF POPULATION DATA

2.2.1. Total population

The population of Rwanda on 30th November, 2015 has been estimated as 11,270,768 persons. From 2012, the total population has increased from 10, 515, 973 to 11, 270,768 inhabitants in 2015 (Table 1), which shows an increase of 754, 795 inhabitants.

This means that the rate of population growth since the 2012 Population and Housing Census (PHC) is 2.1 percent. This figure is lower than the corresponding population growth rate between the Population and Housing Censuses of 2002 and 2012 (2.6 percent). The recent lower rate of population growth is expected as fertility has experienced dramatic decline in recent years, the total fertility rate has declined from 6.1 in 2005 to 4.2 in 2014-15 (RDHS-V).

Table 1 shows the population distribution by province, compared with the same distribution of the 2012 Population and Housing Census (PHC). The closeness of the province distribution of the population for the MAS survey to the corresponding distribution of 2012 PHC is evidence that the data is almost free of under-count or over-count errors.

Table 1: Population by Province, sex and total as of 30 November, 2015 and 16 August, 2012

Province			City of Kigali	South	West	North	East	Rwanda
POPULATION MAS as of 30 November, 2015	Male	Count	655,445	1,289,081	1,250,461	883,107	1,412,818	**5,490,912**
		%	11.9	23.5	22.8	16.1	25.7	**100**
	Female	Count	618,148	1,385,357	1,347,804	950,534	1,478,012	**5,779,856**
		%	10.7	24	23.3	16.4	25.6	**100**
	Total	Count	**1,273,593**	**2,674,438**	**2,598,265**	**1,833,641**	**2,890,831**	**11,270,768**
		%	**11.3**	**23.7**	**23.1**	**16.3**	**25.6**	**100**
POPULATION count as of 16 August, 2012	Male	Count	586,123	1,233,754	1,168,445	818,456	1,258,090	**5,064,868**
	Female	Count	546,563	1,356,221	1,302,794	907,914	1,337,613	**5,451,105**
	Total	Count	**1,132,686**	**2,589,975**	**2,471,239**	**1,726,370**	**2,595,703**	**10,515,973**
	Total	%	**10.8**	**24.6**	**23.5**	**16.4**	**24.7**	**100**

Source: Mortality Assessment Survey, 2015 (NISR) and 4th PHC, 2012

The table 1also indicates that the East Province is the most populated with 2,890,831 inhabitants, followed by the South Province with 2,674,438 inhabitants.
The West Province has 2,598,265 inhabitants and the North Province 1,833,641 residents, while City of Kigali has the smallest population with 1,273,593 inhabitants.

2.2.2. Analysis of sex ratio

The sex ratio of the total population has long been lower than 100%. The 2015 MAS population indicates that the sex ratio is 95% (Table 2), whereas the corresponding figure of the census 2012 is 93%. Thus, there is no clear indication of tangible under /over reporting errors.

Table 2: Population count, percent and sex ratio

Age Group	Sex				Both sexes		
	Male		Female				
	Count	%	Count	%	Count	%	Sex ratio
0-4	800,966	14.6	772,858	13.4	1,573,825	14.0	103.6
5-9	792,403	14.4	773,958	13.4	1,566,361	13.9	102.4
10-14	739,215	13.5	737,803	12.8	1,477,018	13.1	100.2
15-19	607,299	11.1	618,656	10.7	1,225,956	10.9	98.2
20-24	495,057	9.0	534,353	9.2	1,029,410	9.1	92.6
25-29	461,157	8.4	473,806	8.2	934,963	8.3	97.3
30-34	417,565	7.6	431,285	7.5	848,850	7.5	96.8
35-39	286,284	5.2	320,044	5.5	606,328	5.4	89.5
40-44	208,873	3.8	248,588	4.3	457,462	4.1	84.0
45-49	167,224	3.0	193,581	3.3	360,805	3.2	86.4
50-54	147,202	2.7	179,444	3.1	326,646	2.9	82.0
55-59	126,811	2.3	155,773	2.7	282,584	2.5	81.4
60-64	90,315	1.6	116,020	2.0	206,336	1.8	77.8
65-69	57,257	1.0	73,907	1.3	131,164	1.2	77.5

Age Group	Sex				Both sexes		
	Male		Female				
	Count	%	Count	%	Count	%	Sex ratio
70-74	33,972	.6	56,385	1.0	90,357	.8	60.2
75-79	26,077	.5	41,120	.7	67,197	.6	63.4
80-84	16,744	.3	25,967	.4	42,711	.4	64.5
85-89	9,649	.2	14,958	.3	24,607	.2	64.5
90-94	4,016	.1	6,382	.1	10,397	.1	62.9
95+	2,826	.1	4,967	.1	7,793	.1	56.9
Total	5,490,912	100.0	5,779,856	100.0	11,270,768	100.0	95.0

Source: Mortality Assessment Survey, 2015 (NISR)

2.2.3. Extent of age heaping, digit preference

The age heaping has been evaluated by applying Whipple and Meyer indices.

Whipple's index

The Whipple's index measures heaping on terminal digits "0" and "5". It ranges between 100, representing no preference for ages ending in "0" or "5" and 500, indicating that only digits "0" and "5" were reported in the population.

The Whipple's index[1] computed using the Population Analysis Spreadsheets (PAS) is estimated as 117, thus, since we are closer to the 100 level, there is no indication of substantial digit preference error for digits "0" and "5".

Myers' Blended Index

Conceptually similar to Whipple's index, except that the index considers preference (or avoidance) of age ending in each of the digits 0 to 9 in deriving overall age accuracy score.

The theoretical range of Myers's Index is from 0 to 90, where 0 indicates no age heaping and 90 indicates the extreme case where all ages are recorded in the same terminal digit.

The Meyer's index computed using the Population Analysis Spread sheets (PAS) is estimated as 8.8, thus, there is no indication of strong digit preference of all terminal digits 0 to 9.

[1]<= 105: Highly accurate data; 105 – 109.9: fairly accurate data; 110 – 124.9: approximate data; 125 – 174.9: rough data and >= 175: very rough data.

2.2.4. Evaluation of age reporting

- ***United Nations Age-sex accuracy index*[2]**

In order to assess the magnitude of age sex accuracy in the population data, the United Nations Age-sex accuracy index has been used for that purpose.

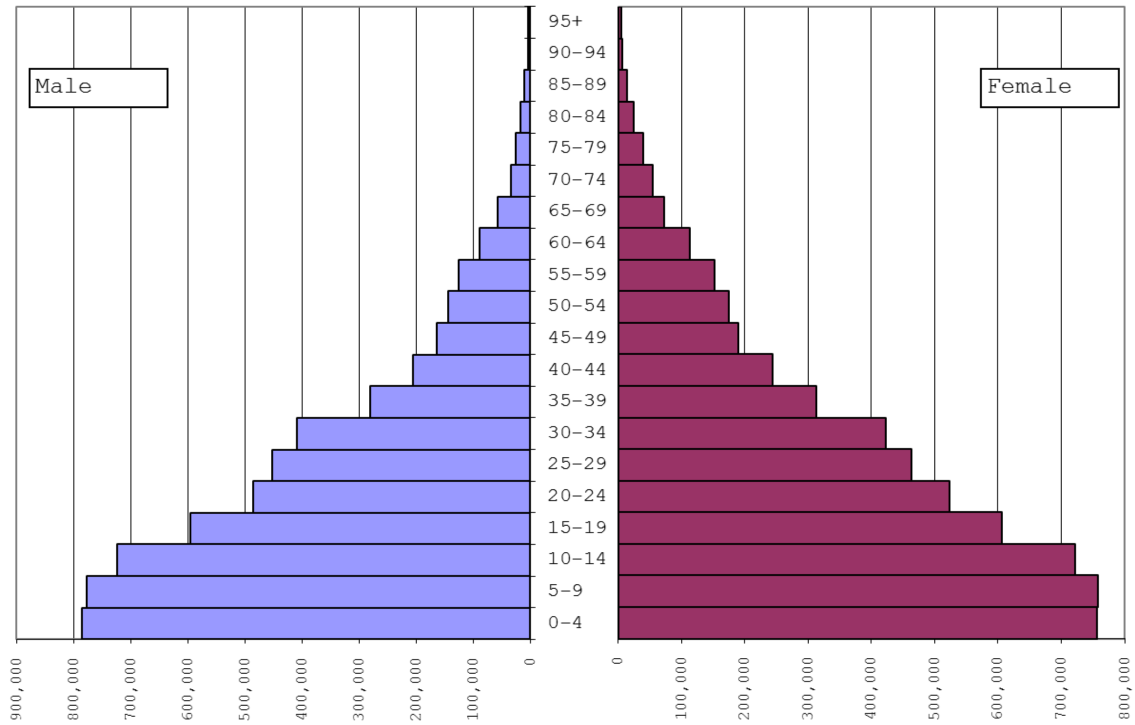
The UN Age-sex accuracy index computed using the Population Analysis Spreadsheets (PAS) is estimated as of 22.7, thus the age-sex reporting is of acceptable quality.

2.2.5. Population pyramid

The age pyramid below (Figure 1) graphically displays the population's age and sex composition. Horizontal bars represent the numbers of males and females in each age group.

The pyramid is wide at the base, narrowing rapidly as it reaches the upper age limit, this is an indication of a population with high fertility and relatively high mortality but the pattern reflects a recent decline in fertility and mortality.The age pyramid of Rwanda has a large base, implying that the majority of the population is young.

Figure 1: Population pyramid as of 30/11/2015



Source: Mortality Assessment Survey, 2015 (NISR)

[2]<20: accurate , ≥20 and ≤40: inaccurate, >40: highly inaccurate

CHAPTER THREE: GENERAL MORTALITY

3.1. INTRODUCTION

The 2015 Mortality Assessment Survey in Rwanda has been designed for the first time specifically to supplement the available sources of mortality statistics like the Rwanda Demographic and Health Survey (DHS) and the Population and Housing Census (PHC) and to assess the most recent levels of mortality: infant, early childhood mortality rates, adult and maternal mortality over the most recent period of 2 years (01/12/2013-30/11/2015). The age specific death rates for each sex has been examined to investigate the sex-age patterns of mortality in Rwanda, based on such patterns life tables have been constructed following a direct approach.

3.2. CRUDE DEATH RATE (CDR)

The simplest and most common measure of mortality is the crude death rate. The crude death rate is defined as the number of deaths in a year per 1000 of the midyear population or equivalently, it is the number of deaths per 1000 person-years in the year under consideration.

Data were collected on all deaths events in the surveyed households within the two years period starting from 1st December, 2013 to 30th November, 2015. In addition, the population has been counted on the reference night of 30th November, 2015 ($\boldsymbol{P_{2015}}$).

In order to estimate the number of person-years to be used as a basis of several mortality indicators, the mid-period population (30 November, 2014 denoted as P_{2014}) was first estimated, following the balancing equation concept, considering the net migration is negligible.

$\boldsymbol{P_{2015} = P_{2014} + B - D + M}$ (Population balancing equation)

Let's B denotes the reported births in two years, and D the number of deaths in the two years.
(B – D) denotes the population natural increase in the two years between December, 2013 and November, 2015, thus, the annual population natural increase is equal to (B – D)/2.
The mid-period population P_{2014} is: $P_{2015} - ((B - D)/2)$.
The estimated number of population on 30/11/2015 is 11,270,768 people; the number of births and deaths within the two years are respectively 658,574 and 47,655. The population natural increase is 610,919 in the two years equivalent to 305, 460 per year.

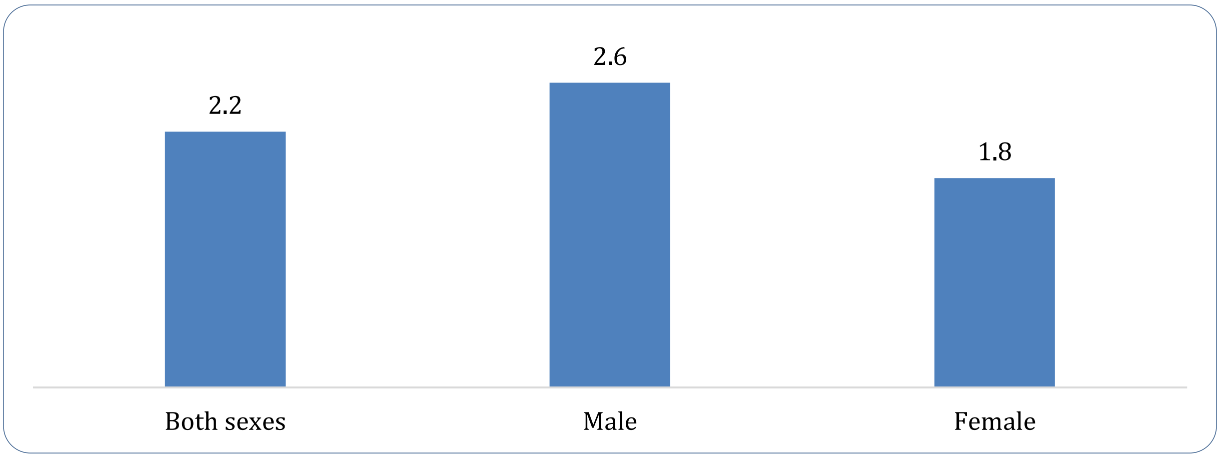
P_{2014} = 11,270,768 – 305, 460= 10, 965, 308
Since the total number of deaths is estimated for two years, the mid period population was used to get the number of person-years of the population in the two years.

Therefore, the number of person-years in the reference period equals $\mathbf{P_{2014}*2}$ assuming linear population change in the observation period.
As such, **CDR**= 47,655/ (10, 965, 308*2)*1000= 2.2 per thousand per year.

3.3. SEX SPECIFIC DEATH RATES

The crude death rate gives only a very general indication of the level of mortality and its differentials.
Figure 2 shows that the Crude Death Rate is much higher for males (2.6 deaths per 1000 male person-years) compared with that of females (1.8 deaths per 1000 female person-years).

Figure 2: Sex specific death rate

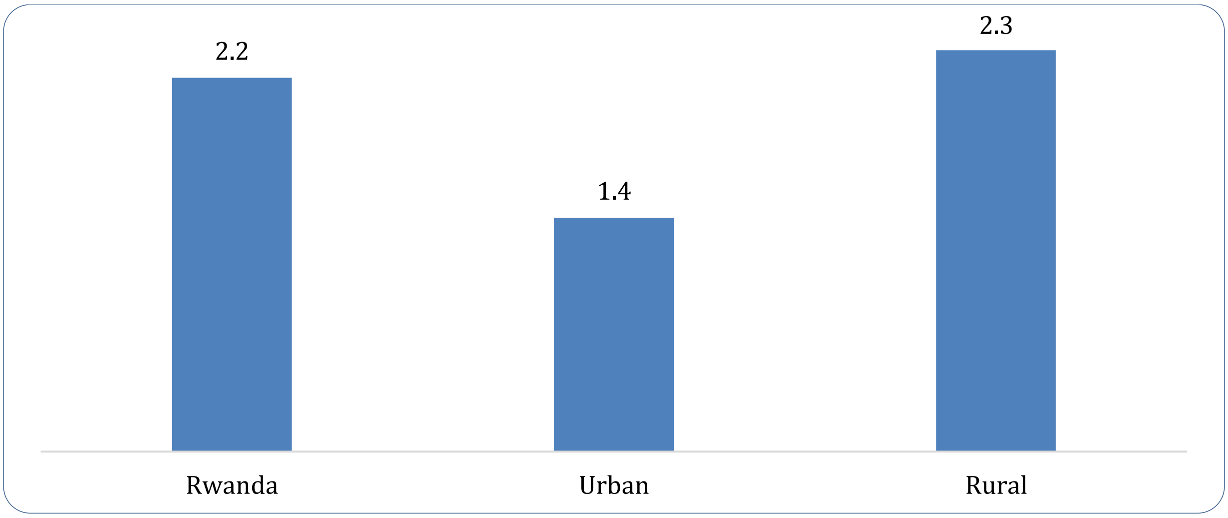


Source: Mortality Assessment Survey, 2015 (NISR)

3.4. GEOGRAPHICAL DIFFERENTIALS OF CRUDE DEATH RATES BY RESIDENCE TYPE, PROVINCES AND DISTRICTS

The differential of death rates by urban/rural residence shows that rural CDR (2.3 deaths per 1000 person-years) is nearly as high as twice (1.4) the CDR in urban areas (Figure 3).

Figure 3: Death rate by residence type

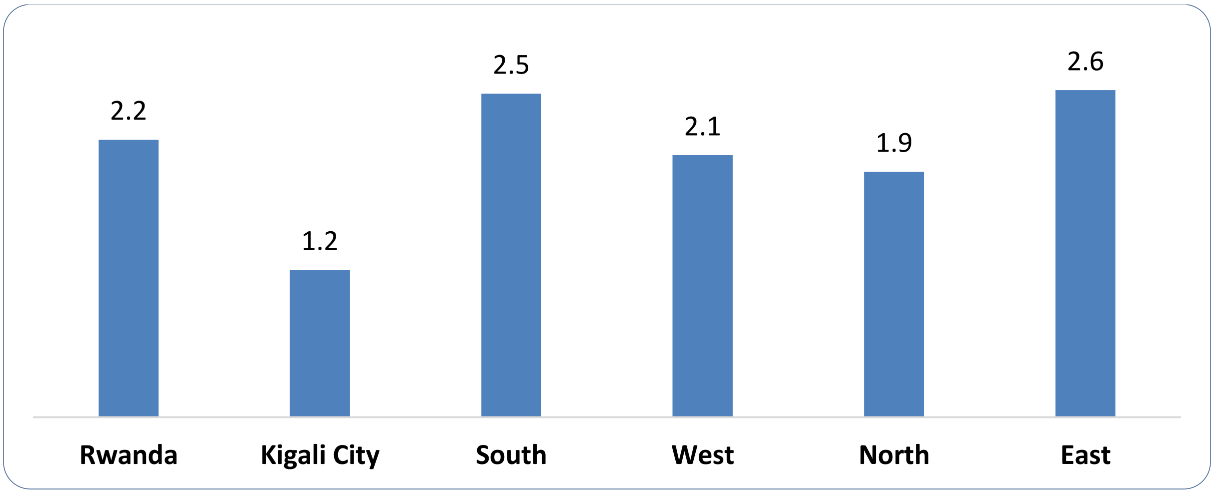


Source: Mortality Assessment Survey, 2015 (NISR)

The incidence of death is not the same in all provinces in Rwanda. Expectedly, provinces with higher socio-economic standards have lower death rates and vice versa.

The Figure 4 displays that the City of Kigali has the lowest CDR (1.2 deaths per 1000 person-years), while the provinces with middle mortality levels are North (1.9) and West (2.1). The remaining two provinces have the highest mortality level: East (2.6) and South (2.5).

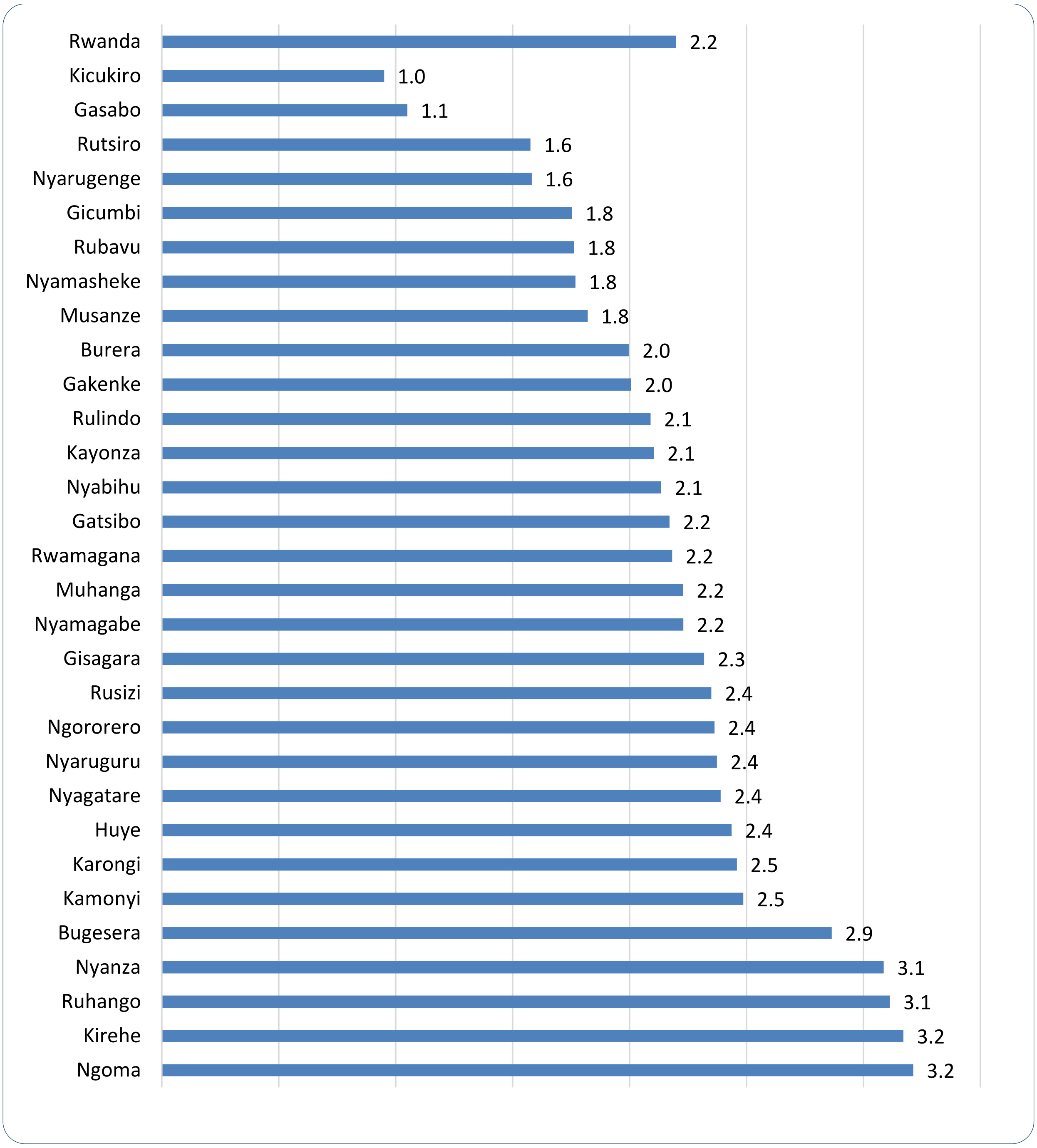
Figure 4: Death rate by province



Source: Mortality Assessment Survey, 2015 (NISR)

Figure 5 shows that mortality levels in 8 districts are below the national average, and other 8 districts having a mortality levels in the same vicinity as the national average. The remaining 14 districts have mortality level which is above the national average. Notably, district with the highest mortality levels are Bugesera (2.9), Nyanza, Ruhango with 3.1 each, Kirehe, and Ngoma with 3.2 each.

Figure 5: Death rate by District



Source: Mortality Assessment Survey, 2015 (NISR)

CHAPTER FOUR: INFANT AND CHILD MORTALITY

Undoubtedly, reliable infant and child mortality measures are best derived on the basis of Vital Registration Statistics. However, since the civil registration and vital statistics systems are not yet well developed in many developing countries including Rwanda, such countries continue to use national sample surveys as an alternative data source of such important mortality measures (e.g. DHS).

In this regard, the National Institute of Statistics of Rwanda (NISR) conducted for the first time the Mortality Assessment Survey (MAS) to supplement the Demographic and Health Survey program (RDHS) conducted in Rwanda since 1992. The RDHS usually use the Birth History of the mothers for 5 years preceding the Survey to measure the Infant and Child Mortality while the MAS followed two annual live births cohorts born during two non-calendar years from 01 December 2013 to 30 November 2015.

The information collected in the MAS allows the computation of Infant Mortality Rate, Neonatal Mortality Rate and Postnatal Mortality Rate. Direct estimation method analogous to those used if the vital registration system is complete has been adopted.

4.1. ASSESSMENT OF BIRTHS DATA

It has been necessary to evaluate the births reported in the MAS over the two year-period so as to find out however the reported birth data is complete. For this purpose, the sex ratio at birth has been analyzed and the annual Crude Birth Rate over the observation period has been evaluated.

4.1.1. Sex Ratio at birth

The estimate of total number of births in the two year period equals 658,574 out of which 339,145 are males and 319,429 are females. It follows that the sex ratio at birth is estimated at 106 male births per 100 female births. The 95% confidence interval of the sex ratio ranges from 103 to 109.
Evidently, the sex ratio at birth complies with the normal pattern in other countries giving no indication of substantial under-reporting.

4.1.2. Crude Birth Rate

On the basis of the estimated total number of births shown in 4.1.1, in conjunction with the number of person-years mentioned in section 3.2, the annual Crude Birth Rate in the two-year observation period is estimated at 30 births per 1000 person-years. The 95% confidence interval of the crude birth rate ranges from 29.6 to 30.4. On the other hand, the RDHS 2014-15 has shown the linearly extrapolated CBR to the MAS reference period is 31.6 births per 1000 population.
In view of the totally different approaches of measuring CBR in MAS and DHS, the closeness of MAS-CBR to DHS extrapolated CBR gives no evidence of substantial birth under-reporting.

Consequently, any concern as to under-reporting of live births is unverifiable in the MAS data.

4.2. INFANT MORTALITY RATE

The large sample used to collect data for the MAS produced large numbers of live births and infant deaths occurred over the reference period. The sample allowed measuring infant, neonatal and post-neonatal mortality rates.

In this context, it may be important to mention the definition of Infant Mortality Rate (IMR), which is the probability that a birth took place in the reference period (from 1st December, 2013 to 30 November, 2015) dies in the same reference period while being in infancy (before reaching one year of age).

For the sake of measuring above mentioned probability of dying before reaching age one for births occurred in the reference period, it is important to adjust the number of births occurred in the second non-calendar year so that the infant deaths occurred beyond the reference period could be accounted for. In this regards, a separation factor has to be used.

It is useful to define the two non-calendar years as follows:

The first non-calendar year starts from 1st December, 2013 to 30 November, 2014 and the second non-calendar year starts from1st December, 2014 to 30 November, 2015.

Separation factor (f)

Few live births occurred in the second non-calendar year will die in their infancy beyond the end of the reference period, for this reason the live births in the second non-calendar year are not fully exposed to infant death in the same non-calendar year. However, the births occurred in the first non-calendar year are followed for the two years, hence all births of the first non-calendar year are fully exposed to infant death (and even death beyond infancy) in the two non-calendar year- period under study. Evidently, separation factor is only needed for live births took place in the second non-calendar year.

The separation factor '*f*' is empirically calculated from the MAS data as follows:

$f = D''y_2 / (D''y_1 + D''y_2)$

Where, $D''y_1$ denotes infant deaths in the second non-calendar year but born in the first non-calendar year; $D''y_2$ denotes infant deaths in the second non-calendar year born in the same (second) non-calendar year.

Table 3: Separation factor

Year of birth	Year of death			
	Deaths in Year 1 ($D'y_1$)	Deaths in Year 2 ($D''y_1$ and $D''y_2$)	**%**	**Total**
Year of birth 1 (By_1)	4447	1282	18.4	5729
Year of birth 2 (By_2)	**-**	5693	**81.6**	5693
TOTAL	4447	6975	100	11422
Separation factor			**0.816226901**	

Source: Mortality Assessment Survey, 2015 (NISR)

Table 3 shows that the empirical separation factor is **0.816226901** which is consistent with relevant literature. The Methods and Materials of Demography have stated that the separation factor is greater than 80 % when IMR is below 20 infant deaths per 1000 live births. Thus, Infant mortality rate (IMR) is calculated as:

IMR= $(D'y_1 + D''y_1 + D''y_2) / (By_1 + f*By_2)$**,**

Where, $D'y_1$ is the infant deaths in the first non-calendar year and born in the same first non-calendar year, $D''y_1$ is the infant deaths in the second non-calendar year but born in the first non-calendar, $D''y_2$ **denotes** the infant deaths in the second non-calendar year and born in same second non-calendar year.

By_1 denotes the number of live births in the first non-calendar year, By_2 denotes the number of live births in the second non-calendar year and ***f***i s the calculated separation factor.

The MAS has exhibited that Infant Mortality Rate (IMR) at national level in the reference period under study (1st December, 2013 until 30th November, 2015) is 19.2 per 1000 live births.

4.2.1. Consistency of DHS results with the corresponding results of MAS regarding IMR

IMR measured in the last two DHS (DHS 2010 and DHS 2014-15) have been examined to quantify how much decline has occurred in IMR in the above inter-survey period. It has been found that DHS-IMR has declined from 50 per 1000 in the first to 32 per 1000 live births in the second survey.

It is worth mentioning that the reference period of DHS-IMR is the five years preceding the survey date. Above mentioned DHS results have been used to extrapolate DHS-IMR to the mid-reference period of MAS (01/12/2014). The linearly extrapolated DHS-IMR is found to be 22.2 infant deaths per 100,000 live births. With regard to the MAS, the 95% confidence interval of IMR is between 12.8 and 25.5.

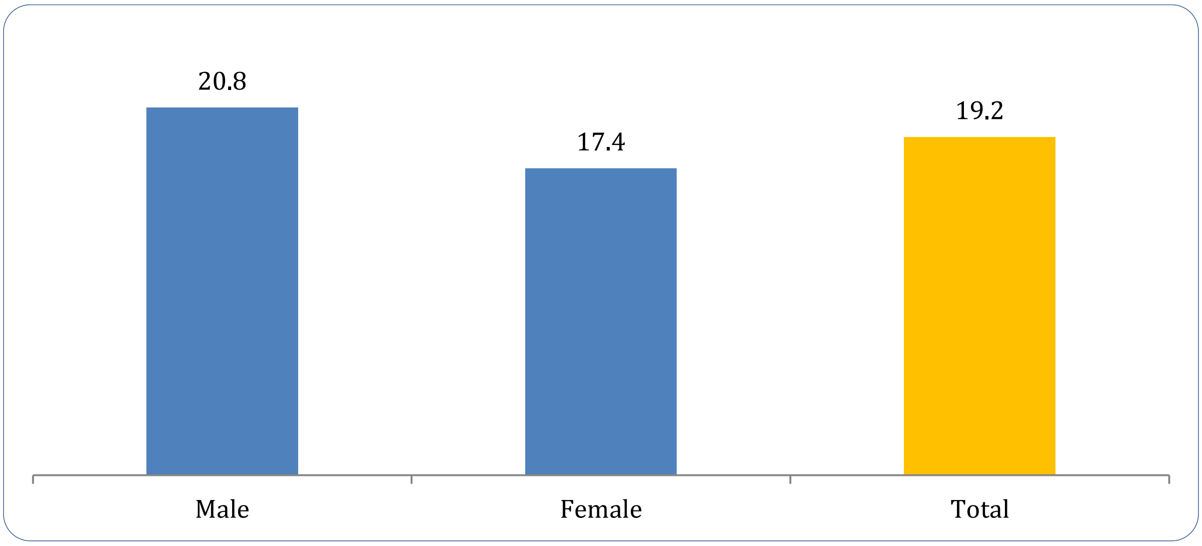
Evidently, the MAS confidence interval encompasses the extrapolated DHS-IMR. This means that the null hypothesis of the same IMR value of extrapolated DHS and MAS-IMR cannot be rejected.

In other words, there is no significant difference between DHS and MAS results as far as IMR is concerned.

4.2.2. Infant Mortality Rate by sex

Expectedly, male IMR must be higher than female IMR. Figure 6 confirms this fact, as male IMR amounts to 20.8 per 1000 live births compared with only 17.4 per 1000 female IMR.

Figure 6: Infant Mortality rate by sex



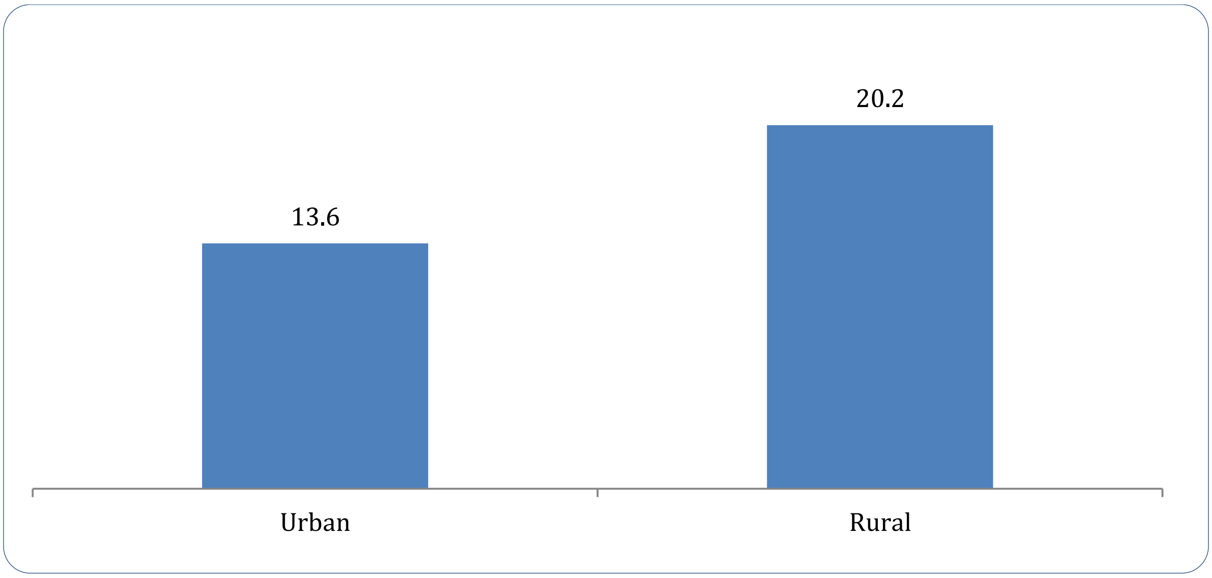
Source: Mortality Assessment Survey, 2015 (NISR)

4.2.3. Infant Mortality Rate by Residence type

Infant death is viewed as a thermometer reflecting improvement in health and living conditions of the population. In other words, infant death is very sensitive to detect improvement of environmental and health statuses of the population at large. In this regard, urban population enjoys better environmental and health services compared to the rural counterparts.

As such, rural IMR is found to be much higher (20.2 infant deaths per 1000 live births) than urban IMR (13.6).

Figure 7: Infant Mortality rate by Residence type

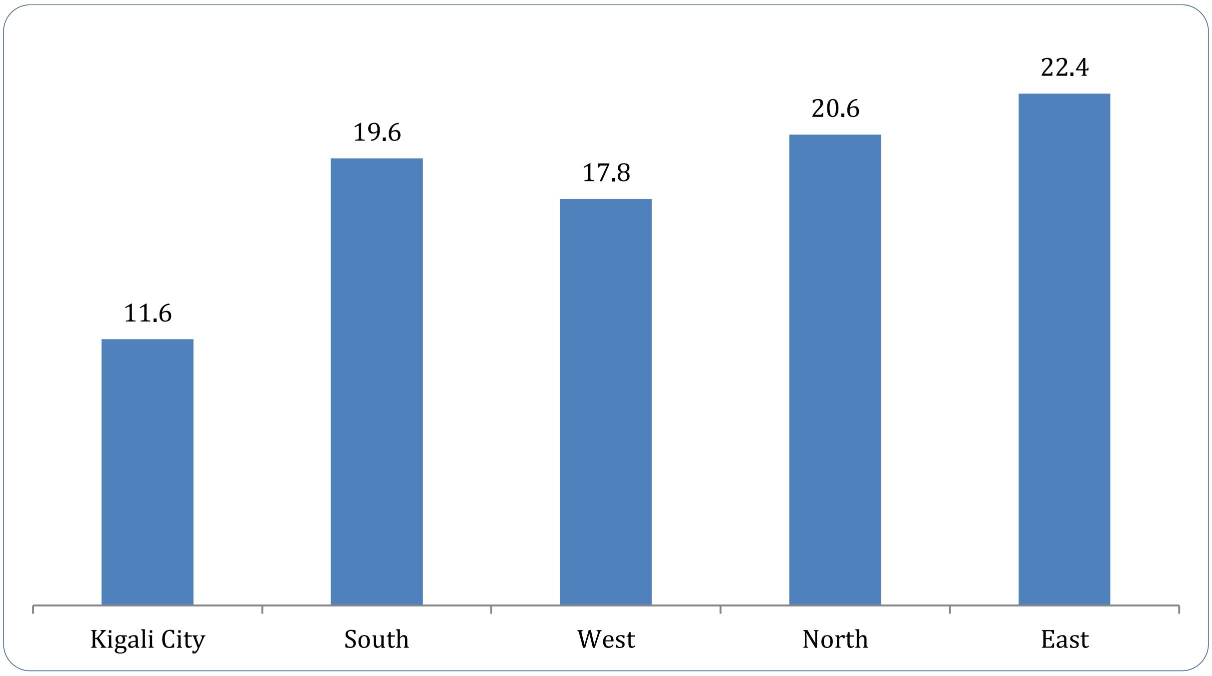


Source: Mortality Assessment Survey, 2015 (NISR)

4.2.4. Infant Mortality Rate by Province

Evidently, the City of Kigali has the lowest level of infant mortality (11.6 infant deaths per 1000 live Births) as far as IMR is concerned. The Figure 8 shows that three provinces have IMR which is almost in the same neighborhood; they are West (17.8), South (19.6) and North (20.6). The East province experienced the highest IMR (22.4 infant deaths per 1000 live Births).

Figure 8: Infant Mortality Rate by Province



Source: Mortality Assessment Survey, 2015 (NISR)

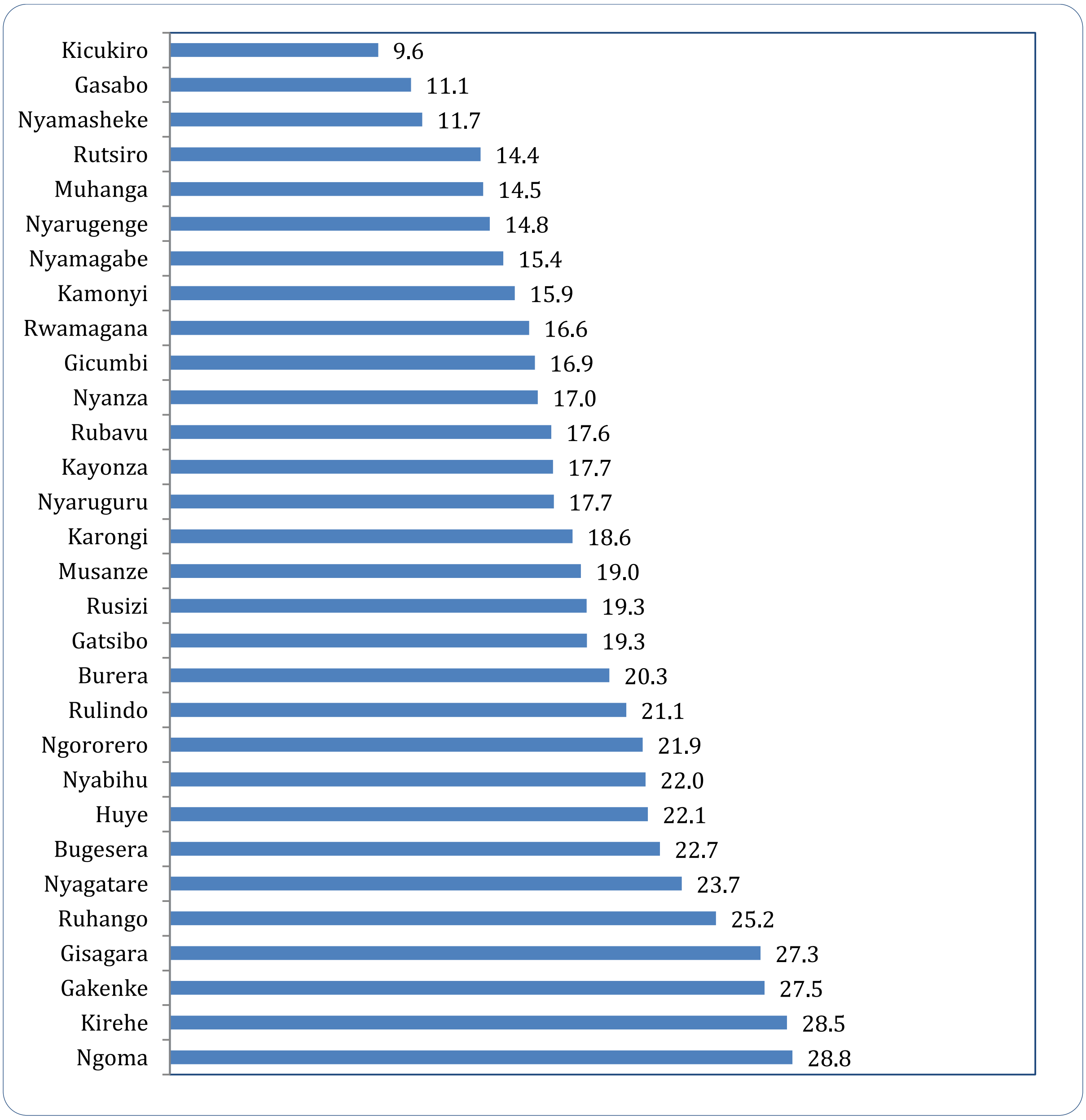
4.2.5. Infant Mortality Rate by District

Figure 9 shows that infant mortality levels in 11 districts are below the national average, and other 7 districts having infant mortality levels in the same vicinity as the national average. The remaining 12 districts are having infant mortality which is above the national average.

Notably, districts with the highest infant mortality levels are Ngoma (28.8 infant deaths per 1000 live Births), Kirehe (28.5) Gakenke (27.5) Gisagarara (27.3) and Ruhango with 25.2 infant deaths per 1000 live births.

In the contrary, Kicukiro, Gasabo and Nyamasheke districts have the lowest levels of infant mortality with 9.6, 11.1 and 11.7 infant deaths per 1000 live births respectively.

Figure 9: Infant Mortality Rate by District



Source: Mortality Assessment Survey, 2015 (NISR)

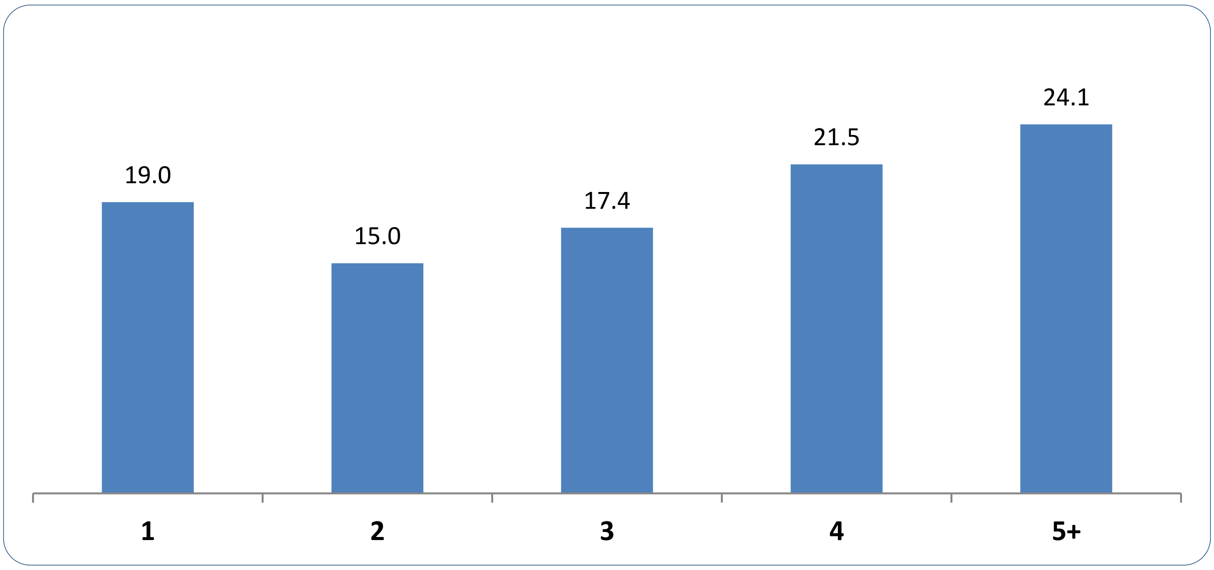
4.2.6. Infant Mortality Rate by Birth Order of the child

Empirically, IMR starts high with the first birth order, declines gradually in the few following birth orders then increases with high birth orders. Analysts explain this phenomenon as young women are not adequately experienced to look after their first baby, with acquired experience the death rates of following babies becomes lower. However, when women exposed to frequent pregnancies and/or late pregnancies, the risk of infant deaths becomes higher with later birth orders.

Figure 10 reflects the association between birth order and IMR in Rwanda conforms to the above mentioned assertion as IMR starts higher for the first birth order, decreases for the second and takes upward trend starting from the third birth order.

IMR in Rwanda is high at the first birth, 19 infant deaths per 1000 live births, and then it declines at the second Birth order (15 infant deaths per 1000 live births), and increases gradually with birth order until it reaches 24.1 for the fifth birth order or higher.

Figure 10: Infant Mortality Rate by Birth Order of the child

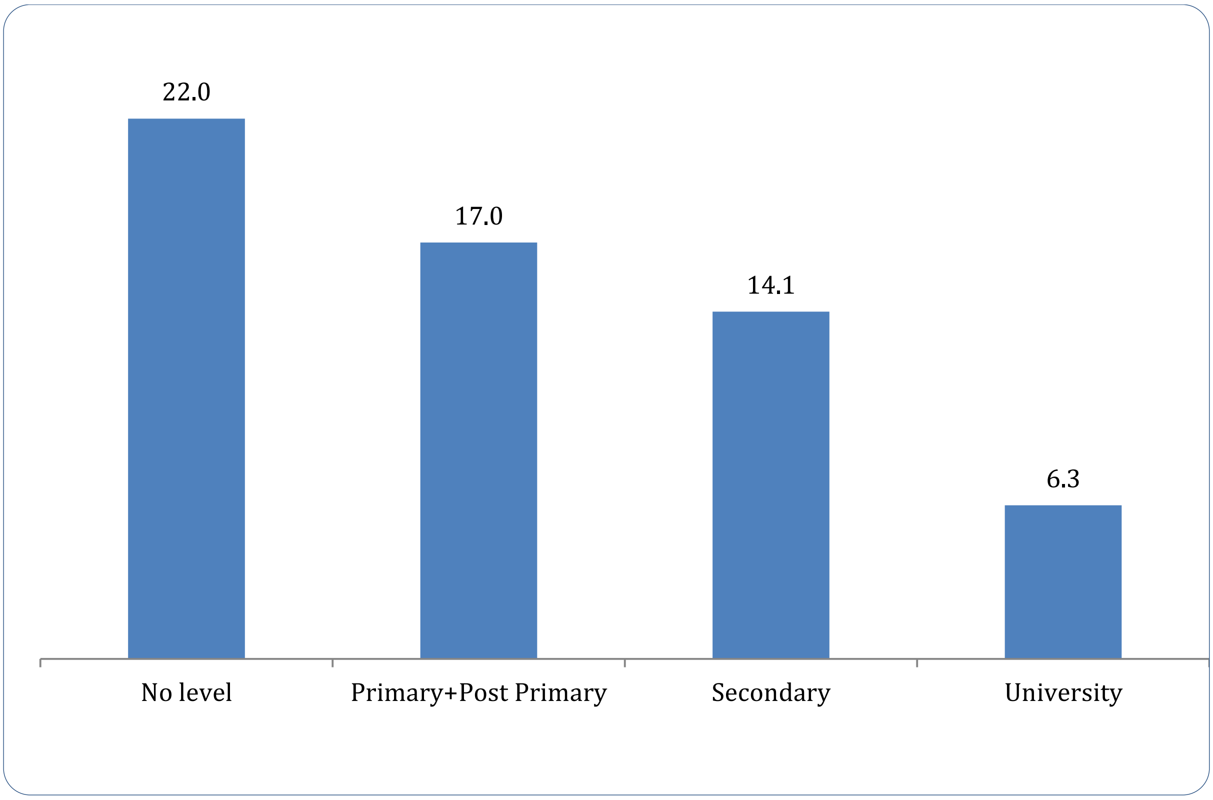


Source: Mortality Assessment Survey, 2015 (NISR)

4.2.7. Infant Mortality Rate by level of mother's education

It is known that education especially of mothers has fundamental influence in their fertility behavior as well as infant and maternal health. The MAS results (Figure 11) reveals that woman with no education have the highest IMR (22 infant deaths per 1000 live births). In the other extreme, women having university education and above experience the lowest IMR (6.3 infant deaths per 1000 live births).

Figure 11: Infant Mortality Rate by Level of Education of the mother



Source: Mortality Assessment Survey, 2015 (NISR)

4.3. NEONATAL MORTALITY RATE

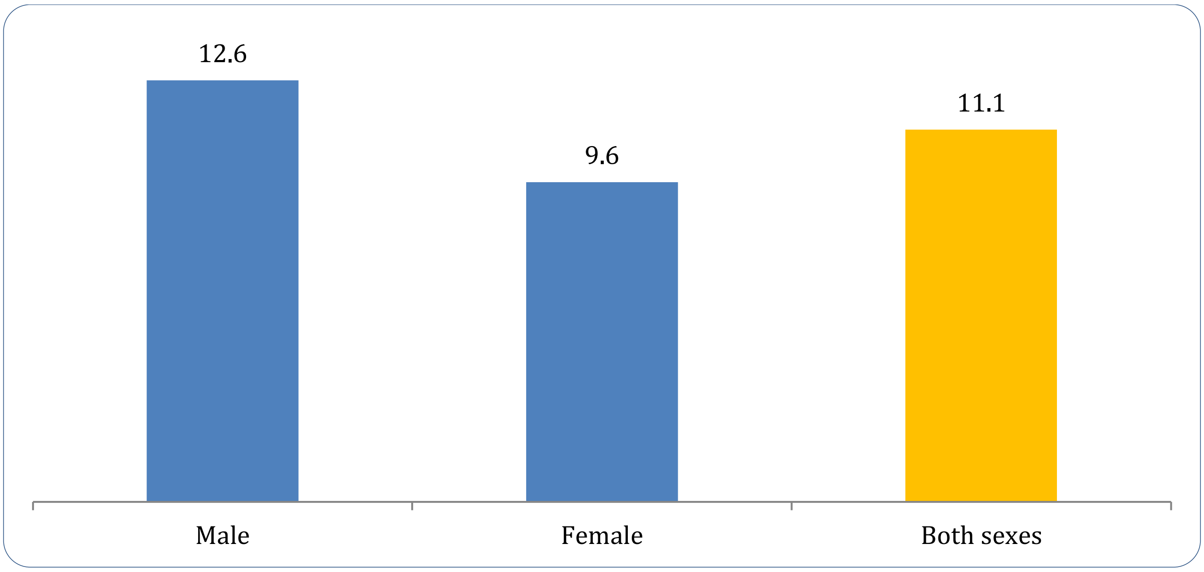
As documented in '*Methods and Materials of Demography (p283)*', because of the very high level of mortality in the first hours, days, and weeks of life and the difference in the causes accounting for infant deaths at the earlier and later ages of infancy, the conventional infant mortality rate may usefully be "broken up" into a rate covering the first month and a rate for the remainder of the year.

The rate for the first period is called the Neonatal Mortality Rate, and the rate for the second period is called the Post-neonatal Mortality Rate. The Neonatal Mortality Rate is defined as the probability that a live birth dies within his/her first month of life.

4.3.1. Neonatal Mortality Rate by Sex

From Figure 12, the MAS results indicate that the Neonatal Mortality Rate is 11 neonatal deaths per 1000 live births. As expected, the Neonatal Mortality Rate is higher among males (12.6) compared with females (9.6 neonatal deaths per 1000 live births).

Figure 12: Neonatal Mortality Rate by Sex

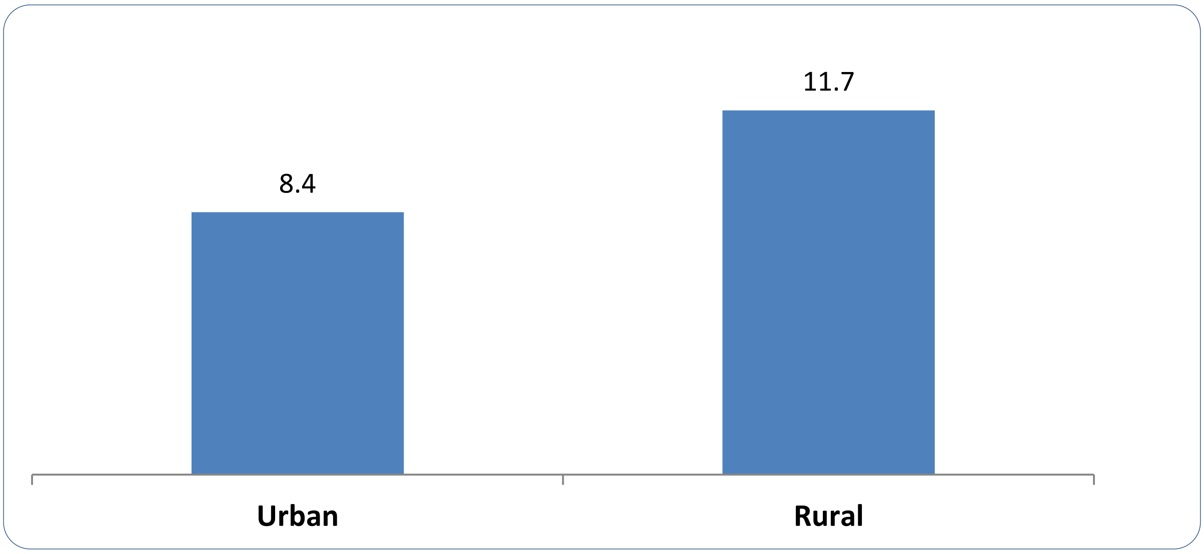


Source: Mortality Assessment Survey, 2015 (NISR)

4.3.2. Neonatal Mortality Rate by Residence type

The figure 13 shows that as usual, the Neonatal Mortality Rate is lower in urban area than in rural area. Both rates are estimated at 8.4 and 11.7 neonatal deaths per 1000 live births respectively.

Figure 13: Neonatal Mortality Rate by Area of Residence

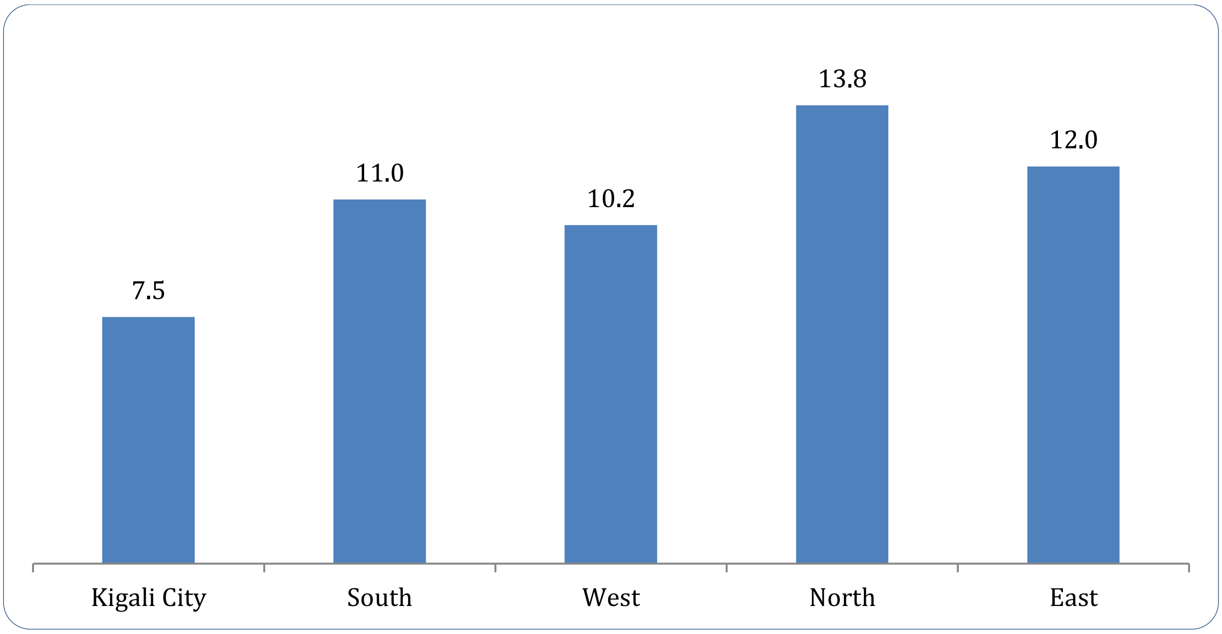


Source: Mortality Assessment Survey, 2015 (NISR)

4.3.3. Neonatal Mortality Rate by Province

The MAS results show that the City of Kigali has the lowest Neonatal Mortality Rate with 7.5 Neonatal deaths per 1000 live births, while the North province has the highest one, with 13.8 Neonatal deaths per 1000 live births. The remaining three provinces are almost in the same vicinity of neonatal mortality rates (Figure 14).

Figure 14: Neonatal Mortality Rate by Province



Source: Mortality Assessment Survey, 2015 (NISR)

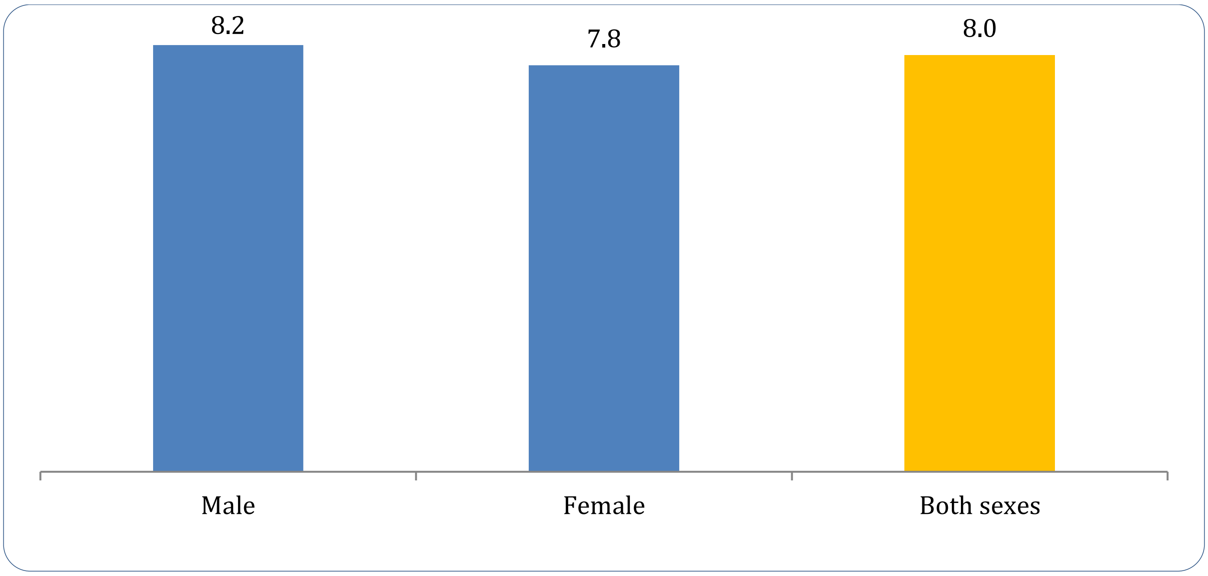
4.4. POST-NEONATAL MORTALITY RATE

The post-neonatal Mortality is defined as the probability that a child dies between his/her first month of life and his /her birthday.

4.4.1. Post-Neonatal Mortality Rate by sex

The MAS shows a Post-Neonatal Rate equals to 8.0 post-neonatal deaths per 1000 live births for both sexes combined. This estimate is slightly higher among males than females, 8.2 and 7.8 Post-Neonatal deaths per 1000 live births respectively (Figure 15).

Figure 15: Post-Neonatal Mortality Rate by Sex

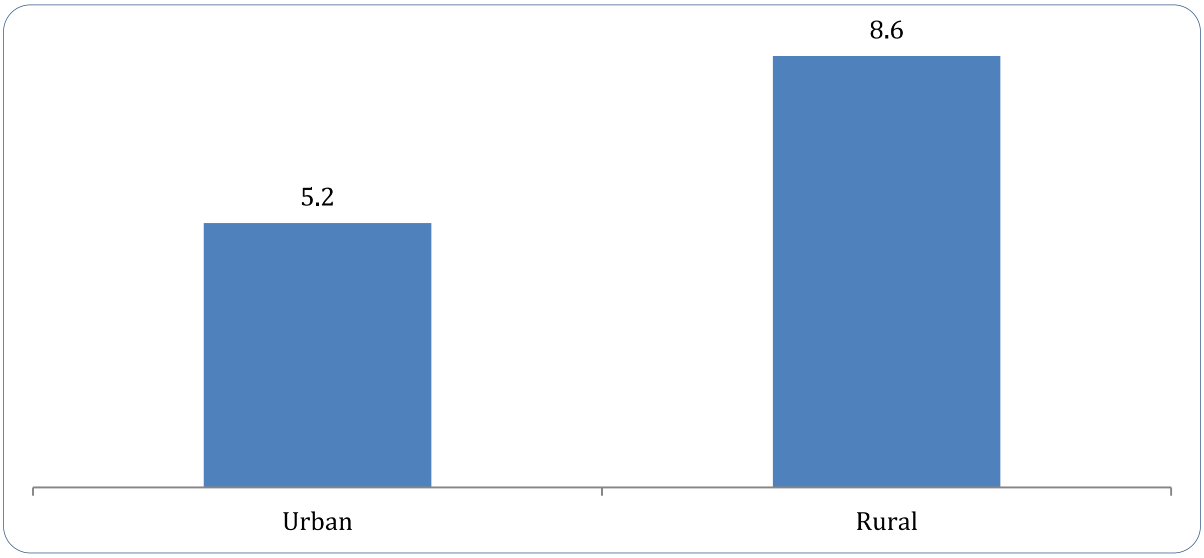


Source: Mortality Assessment Survey, 2015 (NISR)

4.4.2. Post-Neonatal Mortality Rate by Residence type

Expectedly, the Post-Neonatal Mortality Rate is lower in urban areas (5.2) than in rural areas (8.6 post-neonatal deaths per 1000 live births), and this situation is normal and similar to the urban/ rural differential patterns of IMR and Neonatal mortality rate (Figure 16).

Figure 16: Post-Neonatal Mortality Rate by Area of Residence

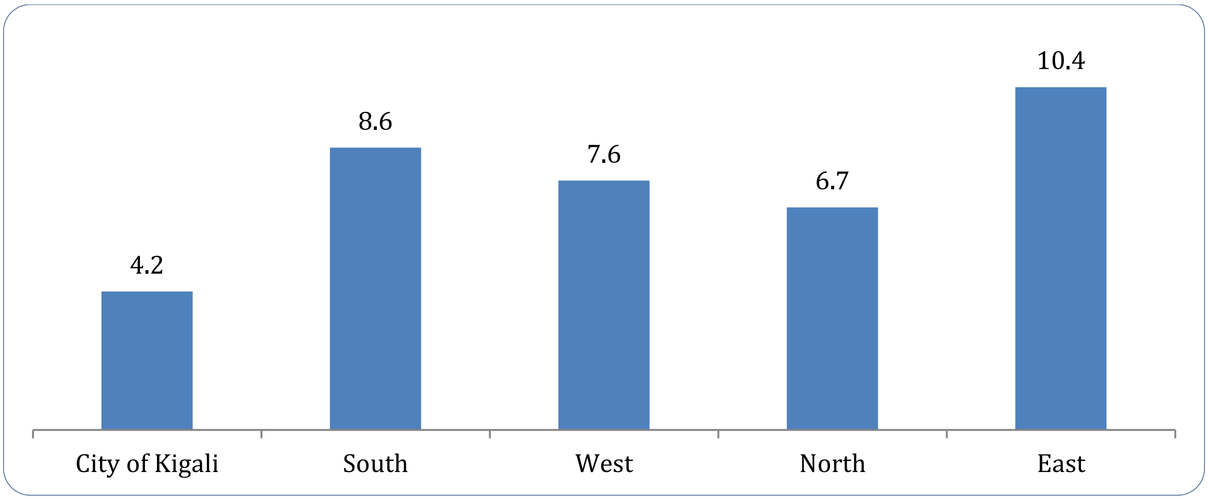


Source: Mortality Assessment Survey, 2015 (NISR)

4.4.3. Post-Neonatal Mortality rate by Province

As expected, provincial differential of post-neonatal mortality shows that the City of Kigali has the lowest level of Post-Neonatal Mortality Rate with 4.2 post-neonatal deaths per 1000 live births. The East province has the highest level with 10.4 post-neonatal deaths per 1000 live births. The remaining provinces fluctuate in a very narrow range (Figure 17).

Figure 17: Post-neonatal Mortality rate by Province



Source: Mortality Assessment Survey, 2015 (NISR)

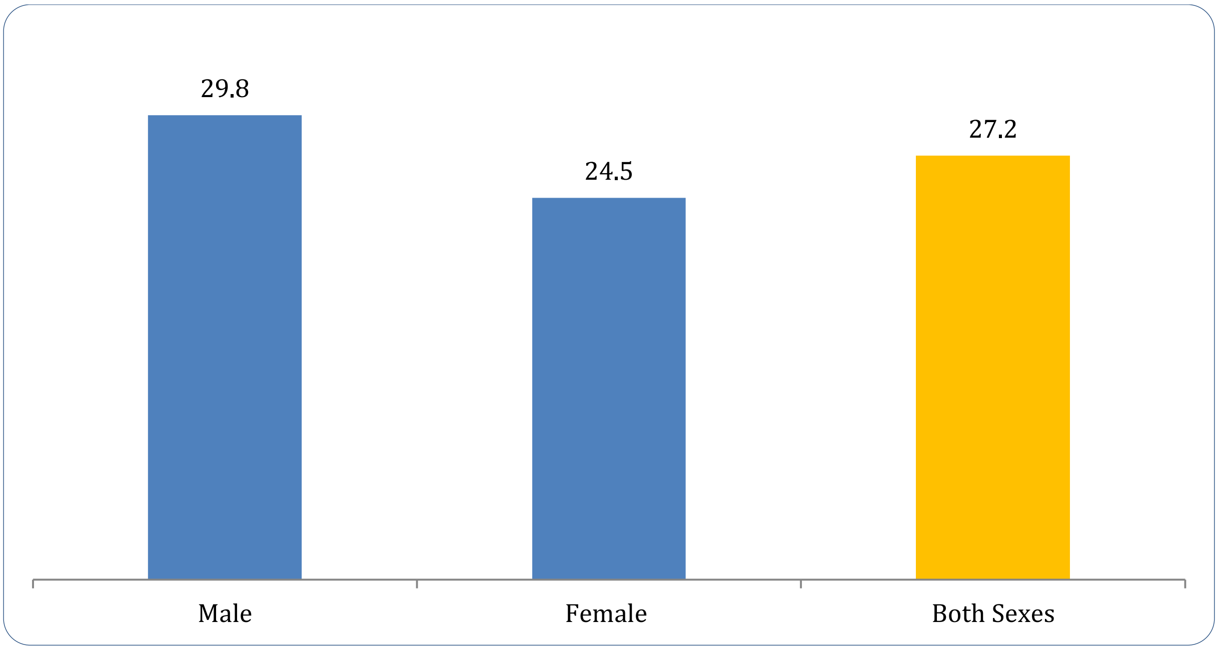
4.5. UNDER FIVE MORTALITY RATE

As our observation period is only two years, under five mortality estimates is derived from corresponding life tables. The under-five Mortality Rate is the probability that a birth dies before reaching 5 years of age.

4.5.1. Under five Mortality Rate at national level by sex

At national level, under five mortality rate is estimated at 27.7 deaths under age five per 1000 live births (Figure 18). Under-five mortality rate is higher among males than females, 29.8 and 24.5 under five deaths per 1000 live births respectively.

Figure 18: Under five Mortality Rate by sex

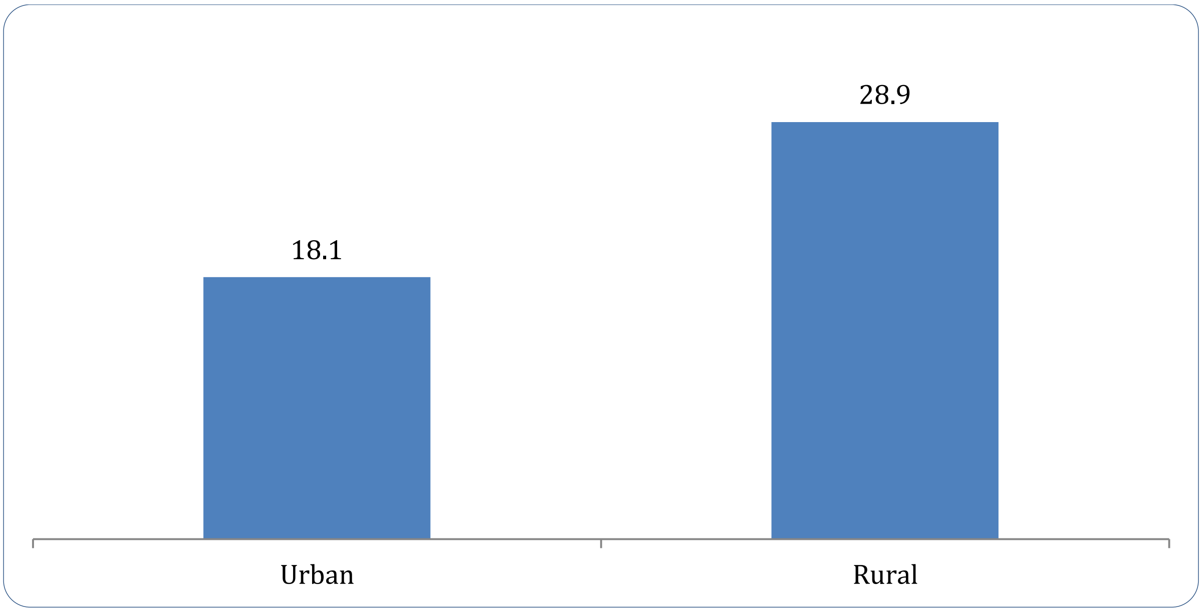


Source: Mortality Assessment Survey, 2015 (NISR)

4.5.2. Under five Mortality Rate by Residence type

Figure 19 shows that Under-five mortality in rural (28.9) is about sixty percent higher than the rate in urban (18.1 under-five deaths per 1000 live births).

Figure 19: Under five Mortality Rate by Residence type

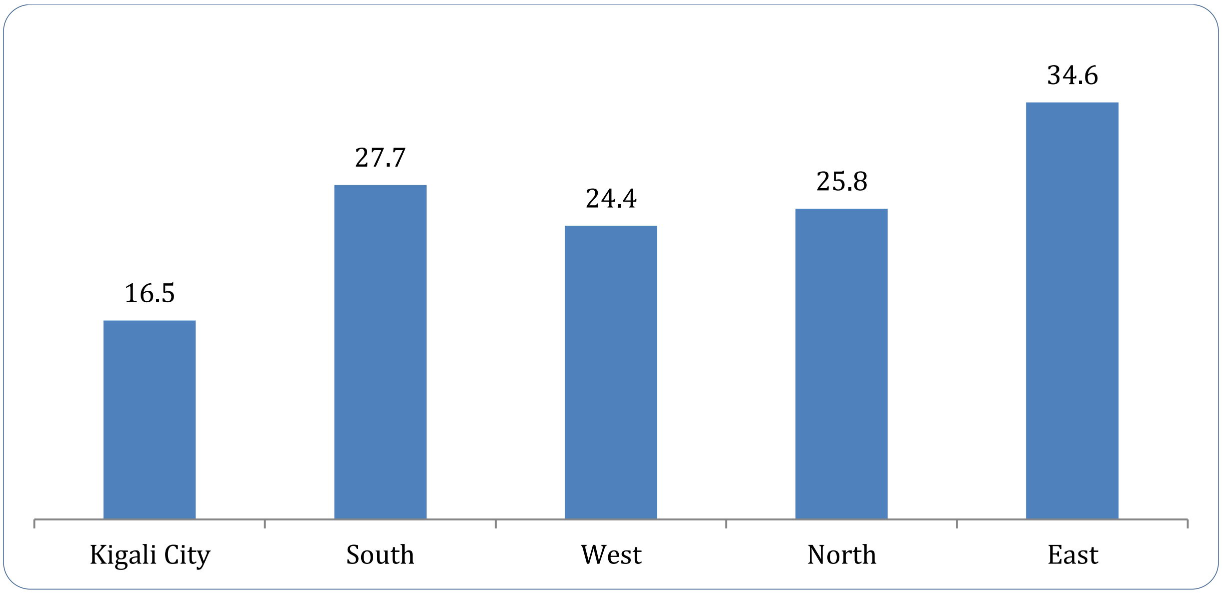


Source: Mortality Assessment Survey, 2015 (NISR)

4.5.3. Under five Mortality Rate by Province

Figure 20 shows the provincial differential of under-five mortality rate. The City of Kigali has the lowest level of Under-five Mortality Rate (16.5 under-five deaths per 1000 live births), while the East Province is more than twice higher (34.6). The level in the remaining 3 provinces fluctuates in a very narrow range.

Figure 20: Under five Mortality Rate by Province



Source: Mortality Assessment Survey, 2015 (NISR)

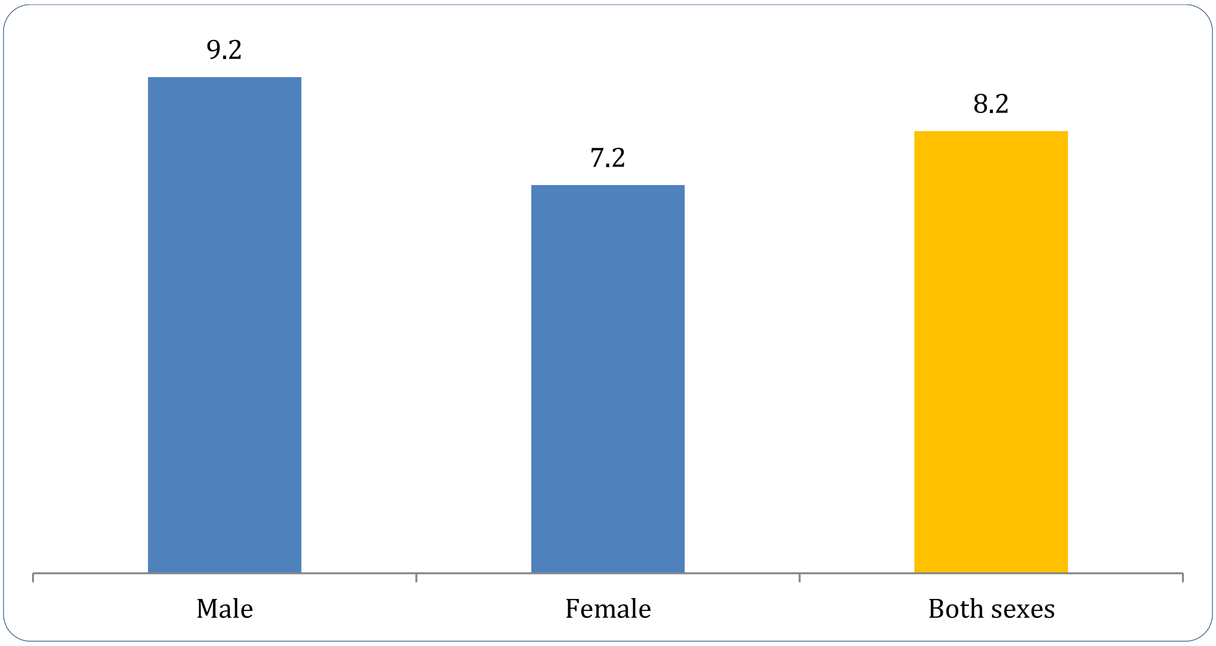
4.6. CHILD MORTALITY RATE

The Child Mortality Rate is the probability that a baby of age one will die before reaching age five ($_4Q_1$). Like Under-five mortality estimates, child mortality rates are derived from corresponding life tables.

4.6.1. Child Mortality Rate at National level and by Sex

At national level, the Child Mortality Rate is estimated at 8.2 child deaths per 1000 children of exact age one. The Child Mortality Rate is higher among males (9.2) than females with 7.2 child deaths per 1000 children of exact age one (Figure 21).

Figure 21: Child Mortality Rate at National Level and by Sex

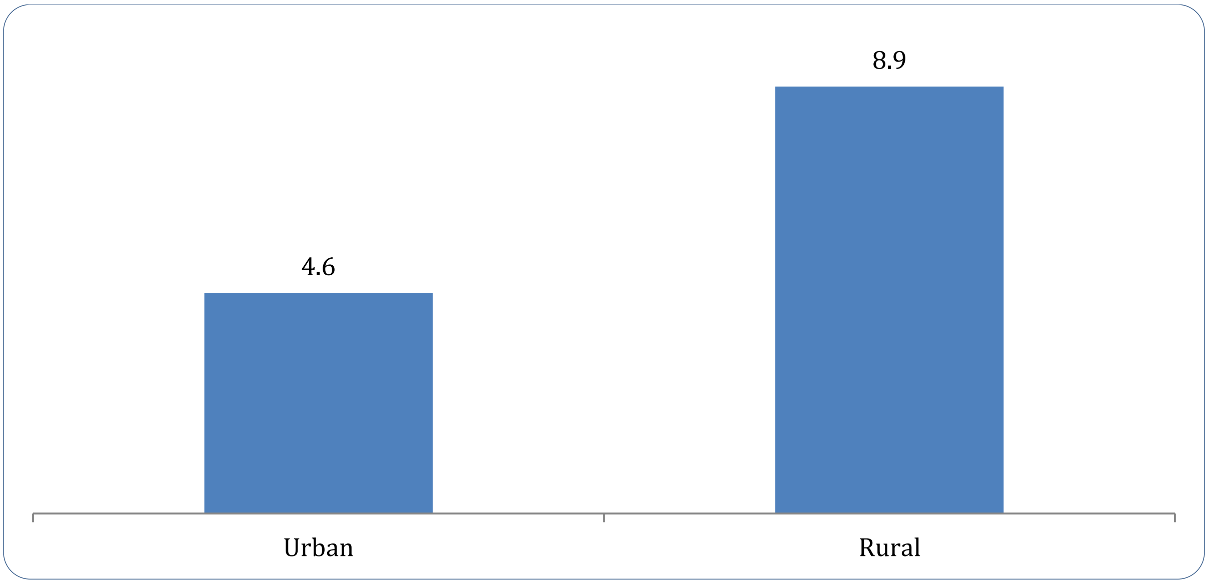


Source: Mortality Assessment Survey, 2015 (NISR)

4.6.2. Child Mortality rate by Residence type

By residence type, the Child Mortality Rate is lower in urban areas (4.6). It is almost twice in rural areas with 8.9 child deaths per 1000 children who reached age one (Figure 22).

Figure 22: Child Mortality Rate by Residence type

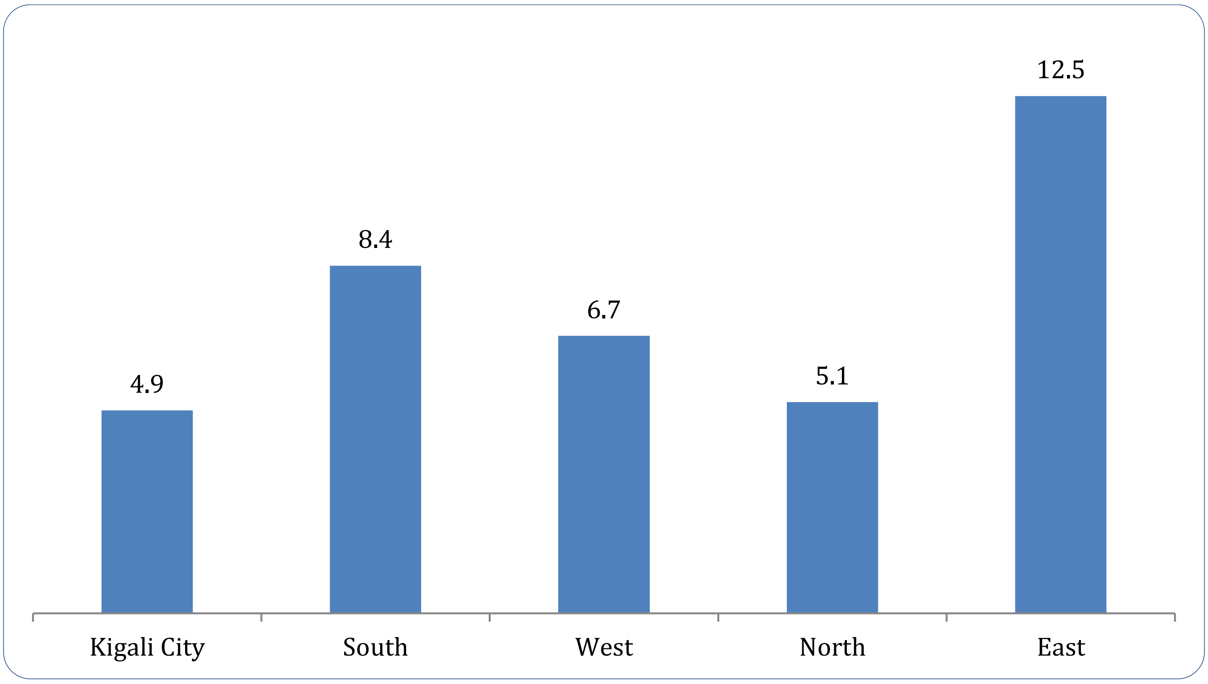


Source: Mortality Assessment Survey, 2015 (NISR)

4.6.3. Child Mortality rate by Province

Figure 23 shows provincial differential of child mortality in the most recent two years. Expectedly, the City of Kigali has the lowest level of Child Mortality Rate with 4.9 child deaths per 1000 children who reached age one. Child mortality rate is more than twice higher in East province (12.5). The West, South, and North Provinces occupy the middle position with child mortality rate reaches 8.4, 6.7 and 5.1 child deaths per 1000 children of exact age one respectively.

Figure 23: Child Mortality rate by Province



Source: Mortality Assessment Survey, 2015 (NISR)

CHAPTER FIVE: MATERNAL MORTALITY RATIO (MMR)

Maternal health has occupied prime position amongst the UN Millennium Development Goals (MDGs). It continues to occupy the same importance in the UN Sustainable Development Goals (SDGs). For this reason monitoring maternal deaths in a regular basis is crucial to assess availability and accessibility as well as the quality of health services directed to woman. Along this line, the MAS has collected information about maternal deaths occurred in the two years reference period (December, 2013 to November, 2015).

The information obtained was used to produce the Maternal Mortality Ratio, defined as the number of woman deaths due to maternal causes (while pregnant, delivering or in post- partum period) among women aged 12-52 during the period of the study per 100,000 live births in the same period.

The MAS has exhibited that the Maternal Mortality Ratio (MMR) at national level in the reference period under study (December, 2013 until November, 2015) is 64.5 maternal deaths per 100, 000 live births in the same period.

5.1. Consistency of DHS results with the corresponding results of MAS regarding MMR

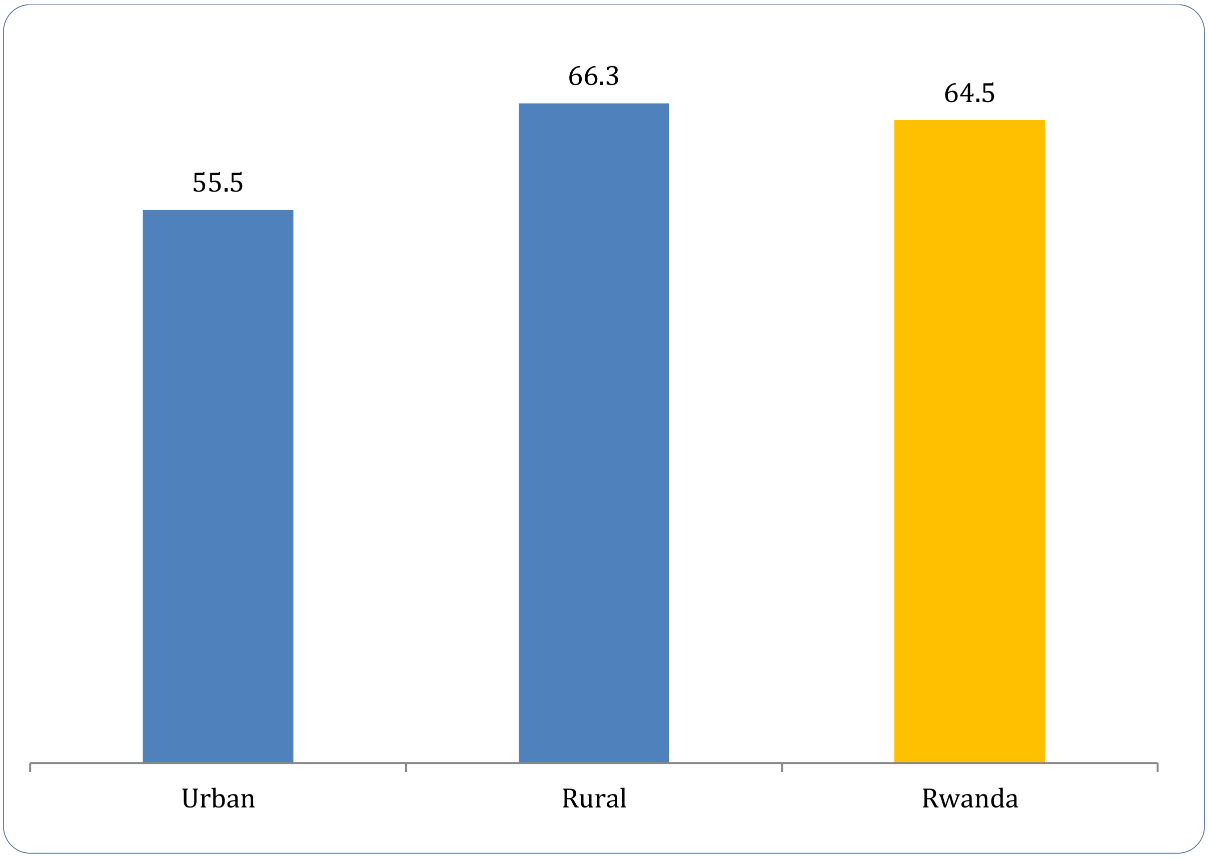
MMR measured in the last two DHS (DHS 2010 and DHS 2014-15) have been examined to quantify how much decline has occurred in MMR in the above inter-survey period. It has been found that DHS-MMR has declined in the five years preceding the survey from 476 per 100, 000 in the first to 210 per 100,000 live births in the second survey.
It is worth mentioning that the reference period of DHS-MMR is the five years preceding the survey date. Above mentioned DHS results have been used to extrapolate DHS-MMR to the mid-reference period of MAS (01/12/2014). The linearly extrapolated DHS-MMR is found to be 66 maternal deaths per 100,000 live births.

With regard to the MAS, the 95% confidence interval of MMR is between 35.63 and 93.462. Evidently, the extrapolated RDHS MMR falls in the 95% confidence interval of the MAS-MMR. Since, the MAS confidence interval, encompasses the extrapolated DHS-MMR, there is no significant difference between DHS extrapolated MMR estimate and MAS-MMR estimate. This means that the null hypothesis of the same MMR value of extrapolated DHS and MAS-MMR cannot be rejected. In other words, there is no significant difference between DHS and MAS results as far as MMR is concerned.

5.2. Maternal Mortality Ratio by residence type

As expected, as shown in the Figure 24, the MMR is higher in rural area (66.3) than in urban area (55.5 maternal deaths per 100,000 live births). In fact the urban area has better living conditions, better heath infrastructures and personnel.

Figure 24: Maternal Mortality Ratio by Area of Residence



Source: Mortality Assessment Survey, 2015 (NISR)

CHAPTER SIX: SEX-AGE PATTERNS OF MORTALITY

This chapter deals with age-specific death rate (ASDR) for each sex individually and for both sexes combined. ASDR is the most refined death rate in comparison with the death rate analyzed in Chapter Three.

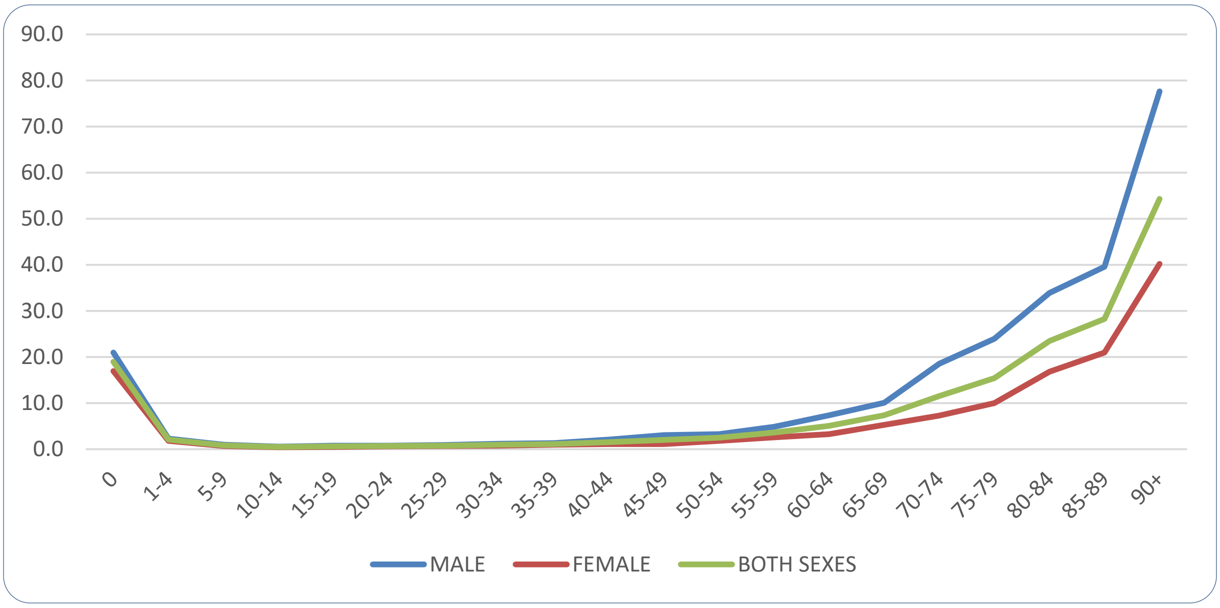
Age-specific Death Rate is defined as the number of deaths in a specific age group per 1000 person-years in this age group. It is estimated independently for each sex and for both sexes combined. Annexes 1.10, 1.11 and 1.12 include ASDR for each sex and for total population. Also included is the same tabulation for urban and rural populations (Annex 1.13), Figure 25 exhibits the graphic representation of sex-age pattern of mortality for the whole country. The figure shows the well-known U-shape of ASDR when plotted against age.

Incidence of mortality begins higher in early years of life; decline rapidly with age and finally resumes its upward trend in older ages. Although the pattern is the same for males and females, Male mortality is higher in early ages; almost no difference due to sex in middle ages, starting from age 50 years onward male mortality is notably higher. It is worth noting that the observed sex-age mortality pattern of Rwanda is typical for all human populations.

In some developing countries, however, female mortality in childbearing ages (15-49) may exceed that of males due to the exposure of women to several risks associated with pregnancy and delivery. This phenomenon does not exist in Rwanda as the availability and accessibility of health care services exist equally for men and women: Almost all Rwandans are covered by some sort of health insurance.

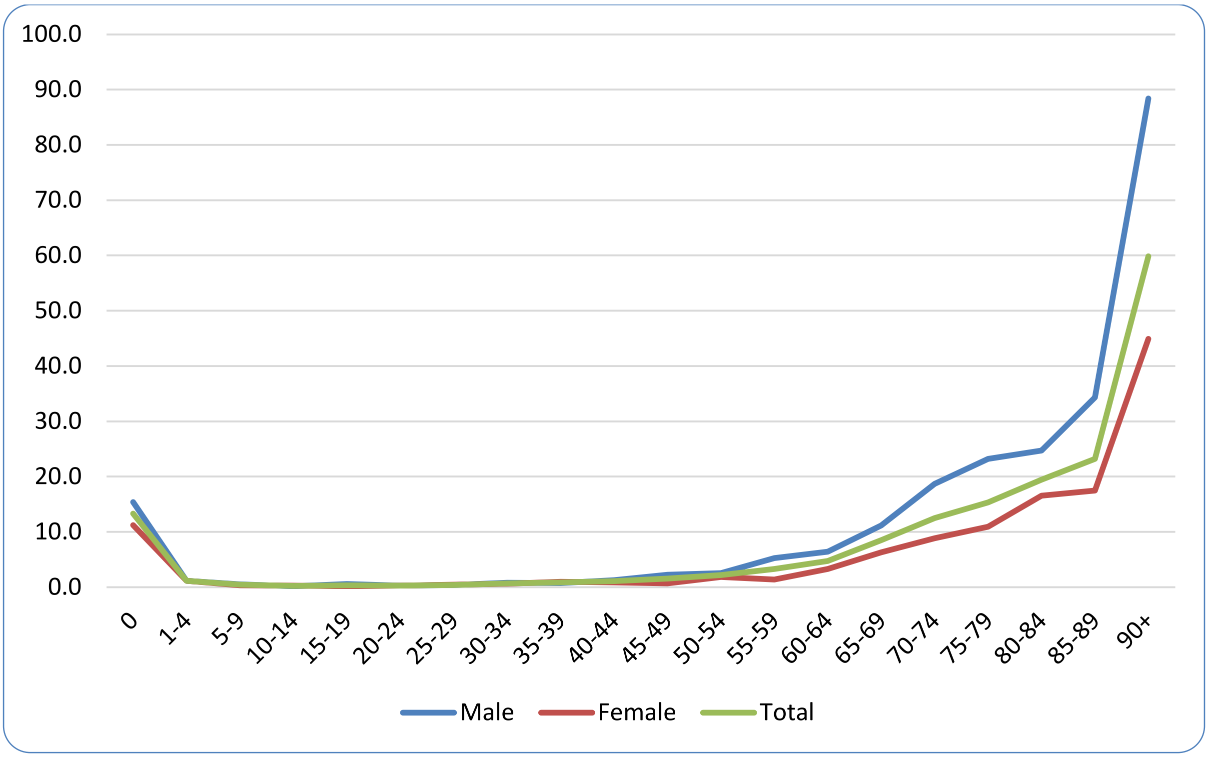
The sex-age pattern of mortality for urban and rural populations are analogous to that of the whole country; see Figures 26 and 27.

Figure 25: Age-specific Death Rate by sex-Total population



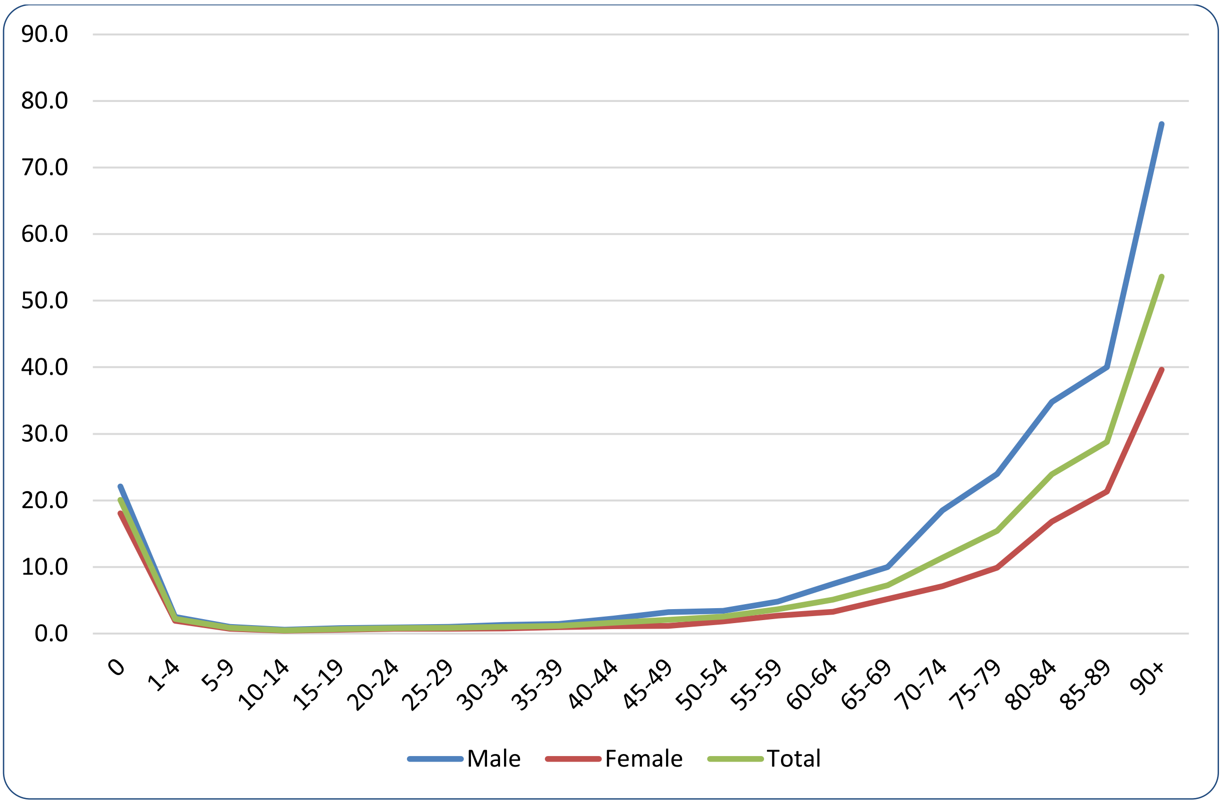
Source: Mortality Assessment Survey, 2015 (NISR)

Figure 26: Age-specific Death Rate by sex-Urban population



Source: Mortality Assessment Survey, 2015 (NISR)

Figure 27: Age-specific Death Rate by sex-Rural population



Source: Mortality Assessment Survey, 2015 (NISR)

CHAPTER SEVEN: LIFE TABLE

Life Table is a statistical Model that summarizes mortality experience of a certain population in a specified period of time. In our situation, the time period is 01/12/ 2013 to 30/11/2015. The sex-age pattern of mortality presented in Chapter Six has enabled constructing life tables following a direct approach that should have been used had the vital registration system is complete. The direct approach of Life Table construction is applied for the first time in Rwanda and probably in other countries lacking complete vital registration systems.

Customarily, Life Table is a sex specific. Yet, the U.S. Census Bureau developed a spreadsheet: population analysis system (PASX) that provides for life table construction for either sex and for both sexes combined. The functional relationship between the function "ex" for both sexes combined and "ex" for each sex has been verified and proven to be valid. Tables from 4 to 6 display Life tables for both sexes' combined, male and female populations.

The Life Tables presented in this chapter has 10 columns: the definition of each is briefly given in the following:

The first column (x) is age defined in an exact sense; the second column is the observed ASDR (nMx) as presented in Chapter Six; the third column (nax) is the average number of years lived in the age interval by those who died in the interval that correspond to the observed nMx. This value is taken from the north regional Model Life Table. Previous studies have shown that the North Model Life Table is combatable to mortality experience in Rwanda. It is worth noting that all model life tables vary only in the first two entries of the function nax.

The fourth column (nqx) is the probability of dying between exact age x and exact age x+n for survivors at exact age x. The nqx function is estimated based on the corresponding values of the previous two functions. The nqx is also defined as age-specific mortality rate. The function (lx) is the Life Table population at exact age x; the function (ndx) is the number of deaths in the Life Table population between exact age x and exact age x+n. The function (nLx) is defined as the number of years lived by the life table population between exact age x and exact age x+n.

The function (Tx) is defined as the total number of years lived by life table population beyond exact age x. The last function (ex) is really our intended final destination from the outset. It measures life expectancy at exact age x. The first entry of this column occupies prime importance as it measures life expectancy at birth.

In Rwanda, the average number of years expected to be lived by a new born baby is **72.24** years pending upon that that new born baby will experience throughout his/her life the same mortality level and pattern prevailed in Rwanda in the period of 1/12/2013 to 30/11/2015.

The Life Table for both sexes combined is exhibited in table 4. Life Tables for males and females are presented in tables 5 and 6.

On the basis of sex-specific life tables, Male and Female life expectancy at birth is respectively 69.27 and 75.85 years.

Unprecedentedly, Life Table has been constructed for Urban and Rural Populations in Rwanda.

Tables 7 and 10 Table 7.9 indicate that urban life expectancy at birth for both sexes combined is 73.76 compared with 71. 95 years for rural population.

The 95% confidence interval estimates of age specific death rates has triggered interest in constructing life tables corresponding to the upper and lower limits of confidence interval of ASDR. The results presented in Annex 2.3 show that for both sexes combined the life expectancy at birth ranges from **70.05** (Annex 2.3) to **74.67** (Annex 2.2); for males it ranges from **66.64** (Annex 2.4.b) to **72.37** (Annex 2.4.a) and for females it ranges from **72.91** (Annex 2.5.b) to **79.82** (Annex 2.5.a).

Table 4: Life Table (both sexes Combined)

Abridged Life Table:				Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01951	0.098	0.01917	100,000	1,917	98,270	7,223,919	72.24
1	4	0.00206	1.800	0.00821	98,083	805	390,559	7,125,649	72.65
5	5	0.00082	2.500	0.00407	97,277	396	485,395	6,735,090	69.24
10	5	0.00046	2.500	0.00232	96,881	225	483,842	6,249,695	64.51
15	5	0.00063	2.500	0.00314	96,656	303	482,521	5,765,853	59.65
20	5	0.00069	2.500	0.00344	96,353	331	480,935	5,283,331	54.83
25	5	0.00077	2.500	0.00383	96,022	368	479,187	4,802,396	50.01
30	5	0.00095	2.500	0.00476	95,653	455	477,129	4,323,208	45.20
35	5	0.00112	2.500	0.00556	95,198	530	474,666	3,846,080	40.40
40	5	0.00152	2.500	0.00759	94,668	719	471,545	3,371,414	35.61
45	5	0.00201	2.500	0.01000	93,950	940	467,399	2,899,868	30.87
50	5	0.00249	2.500	0.01237	93,010	1,151	462,173	2,432,469	26.15
55	5	0.00361	2.500	0.01787	91,859	1,641	455,192	1,970,297	21.45
60	5	0.00506	2.500	0.02499	90,218	2,255	445,453	1,515,104	16.79
65	5	0.00738	2.500	0.03623	87,963	3,186	431,850	1,069,652	12.16
70	+	0.13292	7.523	1.00000	84,777	84,777	637,802	637,802	7.52

Source: Mortality Assessment Survey, 2015 (NISR)

Table 5: Male Life Table

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02123	0.102	0.02084	100,000	2,084	98,130	6,927,283	69.27
1	4	0.00231	1.796	0.00918	97,916	899	389,685	6,829,154	69.74
5	5	0.00093	2.500	0.00465	97,018	452	483,960	6,439,469	66.37
10	5	0.00053	2.500	0.00264	96,566	255	482,193	5,955,509	61.67
15	5	0.00076	2.500	0.00379	96,311	365	480,644	5,473,316	56.83
20	5	0.00077	2.500	0.00383	95,946	368	478,812	4,992,672	52.04
25	5	0.00087	2.500	0.00436	95,579	417	476,851	4,513,860	47.23
30	5	0.00117	2.500	0.00582	95,162	554	474,425	4,037,009	42.42
35	5	0.00130	2.500	0.00646	94,608	611	471,513	3,562,585	37.66
40	5	0.00205	2.500	0.01021	93,997	959	467,588	3,091,071	32.88
45	5	0.00304	2.500	0.01508	93,038	1,403	461,682	2,623,484	28.20
50	5	0.00329	2.500	0.01632	91,635	1,496	454,435	2,161,802	23.59
55	5	0.00486	2.500	0.02403	90,139	2,166	445,282	1,707,367	18.94
60	5	0.00736	2.500	0.03613	87,974	3,179	431,922	1,262,085	14.35
65	5	0.01009	2.500	0.04922	84,795	4,173	413,542	830,163	9.79
70	+	0.19351	5.168	1.00000	80,622	80,622	416,621	416,621	5.17

Source: Mortality Assessment Survey, 2015 (NISR)

Table 6: FEMALE LIFE TABLE

Abridged Life Table:				Female					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01767	0.102	0.01739	100,000	1,739	98,439	7,584,642	75.85
1	4	0.00181	1.705	0.00721	98,261	708	391,419	7,486,204	76.19
5	5	0.00070	2.500	0.00348	97,553	339	486,916	7,094,785	72.73
10	5	0.00040	2.500	0.00200	97,214	195	485,581	6,607,869	67.97
15	5	0.00050	2.500	0.00250	97,019	243	484,488	6,122,287	63.10
20	5	0.00061	2.500	0.00307	96,776	297	483,139	5,637,799	58.26
25	5	0.00067	2.500	0.00332	96,479	320	481,596	5,154,660	53.43
30	5	0.00075	2.500	0.00373	96,159	359	479,897	4,673,065	48.60
35	5	0.00096	2.500	0.00477	95,800	457	477,858	4,193,168	43.77
40	5	0.00108	2.500	0.00539	95,343	514	475,432	3,715,310	38.97
45	5	0.00112	2.500	0.00560	94,830	531	472,821	3,239,878	34.17
50	5	0.00183	2.500	0.00912	94,299	860	469,343	2,767,057	29.34
55	5	0.00258	2.500	0.01282	93,439	1,198	464,197	2,297,713	24.59
60	5	0.00327	2.500	0.01623	92,240	1,497	457,458	1,833,516	19.88
65	5	0.00528	2.500	0.02604	90,743	2,363	447,807	1,376,058	15.16
70	+	0.09521	10.503	1.00000	88,380	88,380	928,252	928,252	10.50

Source: Mortality Assessment Survey, 2015 (NISR)

Table 7: Urban Life Table (Both sexes combined)

Abridged Life Table:				Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01381	0.086	0.01364	100,000	1,364	98,754	7,375,884	73.76
1	4	0.00115	1.766	0.00457	98,636	451	393,536	7,277,130	73.78
5	5	0.00043	2.500	0.00216	98,185	212	490,394	6,883,594	70.11
10	5	0.00024	2.500	0.00120	97,973	117	489,570	6,393,200	65.25
15	5	0.00033	2.500	0.00166	97,855	163	488,870	5,903,629	60.33
20	5	0.00028	2.500	0.00142	97,693	139	488,117	5,414,760	55.43
25	5	0.00042	2.500	0.00210	97,554	205	487,257	4,926,643	50.50
30	5	0.00071	2.500	0.00354	97,349	345	485,882	4,439,386	45.60
35	5	0.00087	2.500	0.00433	97,004	420	483,971	3,953,503	40.76
40	5	0.00107	2.500	0.00533	96,584	515	481,634	3,469,533	35.92
45	5	0.00154	2.500	0.00765	96,069	735	478,510	2,987,898	31.10
50	5	0.00220	2.500	0.01095	95,335	1,044	474,065	2,509,388	26.32
55	5	0.00330	2.500	0.01635	94,291	1,542	467,602	2,035,323	21.59
60	5	0.00475	2.500	0.02346	92,749	2,176	458,306	1,567,721	16.90
65	5	0.00848	2.500	0.04152	90,573	3,760	443,464	1,109,415	12.25
70	+	0.13036	7.671	1.00000	86,813	86,813	665,950	665,950	7.67

Source: Mortality Assessment Survey, 2015 (NISR)

Table 8: MALE LIFE TABLE URBAN

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01537	0.086	0.01515	100,000	1,515	98,615	7,102,928	71.03
1	4	0.00113	1.813	0.00452	98,485	445	392,965	7,004,313	71.12
5	5	0.00051	2.500	0.00256	98,039	251	489,571	6,611,348	67.44
10	5	0.00019	2.500	0.00093	97,789	91	488,716	6,121,777	62.60
15	5	0.00055	2.500	0.00273	97,698	266	487,822	5,633,060	57.66
20	5	0.00029	2.500	0.00144	97,431	140	486,805	5,145,238	52.81
25	5	0.00041	2.500	0.00206	97,291	200	485,954	4,658,433	47.88
30	5	0.00078	2.500	0.00388	97,091	377	484,512	4,172,479	42.98
35	5	0.00075	2.500	0.00375	96,714	363	482,662	3,687,967	38.13
40	5	0.00126	2.500	0.00629	96,351	606	480,239	3,205,305	33.27
45	5	0.00223	2.500	0.01107	95,745	1,060	476,073	2,725,066	28.46
50	5	0.00254	2.500	0.01262	94,684	1,195	470,434	2,248,993	23.75
55	5	0.00529	2.500	0.02610	93,489	2,440	461,345	1,778,559	19.02
60	5	0.00645	2.500	0.03172	91,049	2,888	448,023	1,317,214	14.47
65	5	0.01116	2.500	0.05429	88,161	4,787	428,836	869,191	9.86
70	+	0.18933	5.282	1.00000	83,374	83,374	440,354	440,354	5.28

Source: Mortality Assessment Survey, 2015 (NISR)

Table 9: FEMALE LIFE TABLE URBAN

Abridged Life Table:				Female					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01215	0.086	0.01201	100,000	1,201	98,902	7,670,707	76.71
1	4	0.00116	1.713	0.00463	98,799	458	394,148	7,571,805	76.64
5	5	0.00035	2.500	0.00175	98,341	172	491,275	7,177,657	72.99
10	5	0.00029	2.500	0.00145	98,169	143	490,487	6,686,383	68.11
15	5	0.00015	2.500	0.00076	98,026	74	489,945	6,195,896	63.21
20	5	0.00028	2.500	0.00140	97,952	137	489,416	5,705,951	58.25
25	5	0.00043	2.500	0.00215	97,815	210	488,548	5,216,535	53.33
30	5	0.00063	2.500	0.00314	97,604	306	487,257	4,727,987	48.44
35	5	0.00100	2.500	0.00498	97,298	485	485,280	4,240,730	43.58
40	5	0.00085	2.500	0.00423	96,813	410	483,043	3,755,450	38.79
45	5	0.00071	2.500	0.00356	96,404	344	481,161	3,272,407	33.94
50	5	0.00185	2.500	0.00920	96,060	884	478,093	2,791,246	29.06
55	5	0.00139	2.500	0.00691	95,177	658	474,239	2,313,153	24.30
60	5	0.00331	2.500	0.01642	94,519	1,552	468,713	1,838,915	19.46
65	5	0.00628	2.500	0.03089	92,966	2,872	457,652	1,370,202	14.74
70	+	0.09873	10.129	1.00000	90,094	90,094	912,550	912,550	10.13

Source: Mortality Assessment Survey, 2015 (NISR)

Table 10: LIFE TABLE RURAL (Both sexes combined)

Abridged Life table:				Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02059	0.105	0.02022	100,000	2,022	98,191	7,195,363	71.95
1	4	0.00222	1.751	0.00886	97,978	868	389,961	7,097,171	72.44
5	5	0.00088	2.500	0.00437	97,110	425	484,491	6,707,211	69.07
10	5	0.00050	2.500	0.00250	96,686	241	482,826	6,222,720	64.36
15	5	0.00069	2.500	0.00345	96,445	333	481,390	5,739,894	59.51
20	5	0.00080	2.500	0.00399	96,112	384	479,599	5,258,504	54.71
25	5	0.00087	2.500	0.00435	95,728	417	477,598	4,778,905	49.92
30	5	0.00102	2.500	0.00507	95,311	483	475,349	4,301,307	45.13
35	5	0.00118	2.500	0.00586	94,828	556	472,751	3,825,958	40.35
40	5	0.00162	2.500	0.00805	94,272	759	469,465	3,353,207	35.57
45	5	0.00209	2.500	0.01041	93,514	974	465,134	2,883,742	30.84
50	5	0.00253	2.500	0.01257	92,540	1,163	459,792	2,418,608	26.14
55	5	0.00364	2.500	0.01804	91,377	1,649	452,763	1,958,816	21.44
60	5	0.00509	2.500	0.02515	89,728	2,257	442,999	1,506,053	16.78
65	5	0.00727	2.500	0.03569	87,471	3,122	429,552	1,063,054	12.15
70	+	0.13315	7.510	1.00000	84,349	84,349	633,502	633,502	7.51

Source: Mortality Assessment Survey, 2015 (NISR)

Table 11: MALE LIFE TABLE RURAL

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02237	0.106	0.02193	100,000	2,193	98,039	6,891,979	68.92
1	4	0.00252	1.793	0.01001	97,807	979	389,069	6,793,940	69.46
5	5	0.00100	2.500	0.00499	96,828	483	482,936	6,404,871	66.15
10	5	0.00058	2.500	0.00290	96,346	279	481,030	5,921,936	61.47
15	5	0.00080	2.500	0.00399	96,066	384	479,372	5,440,905	56.64
20	5	0.00090	2.500	0.00450	95,683	431	477,336	4,961,533	51.85
25	5	0.00102	2.500	0.00510	95,252	486	475,044	4,484,197	47.08
30	5	0.00128	2.500	0.00639	94,766	605	472,316	4,009,152	42.31
35	5	0.00145	2.500	0.00721	94,161	679	469,105	3,536,836	37.56
40	5	0.00225	2.500	0.01117	93,482	1,044	464,798	3,067,731	32.82
45	5	0.00321	2.500	0.01592	92,438	1,471	458,510	2,602,933	28.16
50	5	0.00341	2.500	0.01691	90,966	1,538	450,986	2,144,424	23.57
55	5	0.00481	2.500	0.02376	89,428	2,125	441,828	1,693,438	18.94
60	5	0.00746	2.500	0.03662	87,303	3,197	428,523	1,251,610	14.34
65	5	0.00998	2.500	0.04869	84,106	4,095	410,294	823,086	9.79
70	+	0.19383	5.159	1.00000	80,011	80,011	412,792	412,792	5.16

Source: Mortality Assessment Survey, 2015 (NISR)

Table 12: FEMALE LIFE TABLE RURAL

Abridged Life Table:				Female					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01872	0.105	0.01841	100,000	1,841	98,353	7,565,977	75.66
1	4	0.00192	1.703	0.00766	98,159	752	390,910	7,467,624	76.08
5	5	0.00075	2.500	0.00375	97,407	365	486,124	7,076,715	72.65
10	5	0.00042	2.500	0.00209	97,042	203	484,705	6,590,591	67.91
15	5	0.00058	2.500	0.00290	96,840	281	483,495	6,105,886	63.05
20	5	0.00071	2.500	0.00352	96,558	340	481,942	5,622,390	58.23
25	5	0.00073	2.500	0.00364	96,218	351	480,215	5,140,448	53.42
30	5	0.00077	2.500	0.00387	95,868	371	478,412	4,660,233	48.61
35	5	0.00095	2.500	0.00472	95,497	451	476,358	4,181,821	43.79
40	5	0.00112	2.500	0.00558	95,046	531	473,904	3,705,463	38.99
45	5	0.00118	2.500	0.00589	94,516	557	471,186	3,231,559	34.19
50	5	0.00183	2.500	0.00911	93,959	856	467,653	2,760,373	29.38
55	5	0.00271	2.500	0.01345	93,103	1,252	462,383	2,292,720	24.63
60	5	0.00327	2.500	0.01621	91,851	1,489	455,530	1,830,337	19.93
65	5	0.00518	2.500	0.02557	90,361	2,310	446,031	1,374,806	15.21
70	+	0.09480	10.548	1.00000	88,051	88,051	928,775	928,775	10.55

Source: Mortality Assessment Survey, 2015 (NISR)

ANNEX 1. PRECISION ESTIMATES

Annex 1.1. Precision estimates CDR by sex, urban rural residence and Province

Characteristics	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Rwanda	**2.2**	0.063	1.379	2.967	0.029	7.931
Sex						
Male	**2.6**	0.083	1.530	3.645	0.032	5.748
Female	**1.8**	0.045	1.207	2.351	0.025	2.576
Residence						
Urban	**1.4**	0.105	0.020	2.699	0.078	5.924
Rural	**2.3**	0.028	1.982	2.683	0.012	1.204
Province						
City of Kigali	**1.2**	0.105	-0.182	2.488	0.091	4.777
South	**2.5**	0.000	2.533	2.533	0.000	0.000
West	**2.1**	0.000	2.050	2.050	0.000	0.000
North	**1.9**	0.000	1.921	1.921	0.000	0.000
East	**2.6**	0.000	2.559	2.559	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.2. Precision estimates CDR by District

District	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	**Upper**		
Nyarugenge	**1.6**	0	1.582	1.582	0	0
Gasabo	**1.1**	0.125	-0.532	2.633	0.119	3.538
Kicukiro	**1.0**	0	0.951	0.951	0.000	0.000
Nyanza	**3.1**	0	3.087	3.087	0.000	0.000
Gisagara	**2.3**	0	2.319	2.319	0.000	0.000
Nyaruguru	**2.4**	0	2.374	2.374	0.000	0.000
Huye	**2.4**	0	2.436	2.436	0.000	0.000
Nyamagabe	**2.2**	0	2.23	2.23	0.000	0.000
Ruhango	**3.1**	0	3.113	3.113	0.000	0.000
Muhanga	**2.2**	0	2.229	2.229	0.000	0.000
Kamonyi	**2.5**	0	2.487	2.487	0.000	0.000
Karongi	**2.5**	0	2.459	2.459	0.000	0.000
Rutsiro	**1.6**	0	1.577	1.577	0.000	0.000
Rubavu	**1.8**	0	1.763	1.763	0.000	0.000
Nyabihu	**2.1**	0	2.136	2.136	0.000	0.000
Ngororero	**2.4**	0	2.363	2.363	0.000	0.000
Rusizi	**2.4**	0	2.35	2.35	0.000	0.000
Nyamasheke	**1.8**	0	1.769	1.769	0.000	0.000
Rulindo	**2.1**	0	2.09	2.09	0.000	0.000
Gakenke	**2.0**	0	2.007	2.007	0.000	0.000
Musanze	**1.8**	0	1.821	1.821	0.000	0.000

District	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Burera	**2.0**	0	1.997	1.997	0.000	0.000
Gicumbi	**1.8**	0	1.754	1.754	0.000	0.000
Rwamagana	**2.2**	0	2.182	2.182	0.000	0.000
Nyagatare	**2.4**	0	2.39	2.39	0.000	0.000
Gatsibo	**2.2**	0	2.171	2.171	0.000	0.000
Kayonza	**2.1**	0	2.104	2.104	0.000	0.000
Kirehe	**3.2**	0	3.171	3.171	0.000	0.000
Ngoma	**3.2**	0	3.213	3.213	0.000	0.000
Bugesera	**2.9**	0	2.864	2.864	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.3. Precision estimates of IMR by sex, urban rural residence and Province

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Rwanda	**19.174**	.502	12.796	25.552	.026	1.645
Sex of child						
Male	**20.842**	.544	13.935	27.748	.026	.916
Female	**17.401**	.462	11.534	23.269	.027	.743
Area of residence						
Urban	**13.645**	.692	4.853	22.437	.051	.699
Rural	**20.227**	.297	16.450	24.004	.015	.460
Province						
City of Kigali	**11.644**	1.064	-1.871	25.159	.091	1.374
South	**19.555**	0.000	19.555	19.555	0.000	0.000
West	**17.785**	0.000	17.785	17.785	0.000	0.000
North	**20.598**	0.000	20.598	20.598	0.000	0.000
East	**22.396**	0.000	22.396	22.396	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.4.Precision estimates of Infant Mortality Rate BY Birth Order

BIRTH ODER	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
1	**19.027**	.374	14.275	23.779	.020	.257
2	**15.044**	.392	10.060	20.028	.026	.296
3	**17.351**	.492	11.097	23.604	.028	.290
4	**21.510**	.596	13.933	29.088	.028	.231
5+	**24.113**	.589	16.628	31.598	.024	.382

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.5. Precision estimates of Infant Mortality Rate by Level of Education of the Mother

EDUCATION LEVEL	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
NO LEVEL	**22.005**	.326	17.864	26.147	.015	.329
PRIMARY	**16.953**	.508	10.495	23.412	.030	.637
SECONDARY	**14.137**	.517	7.568	20.706	.037	.234
HIGHER	**6.252**	.026	5.924	6.580	.004	.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.6. Precision estimates of IMR by District

District	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Nyarugenge	**14.790**	0.000	14.790	14.790	0.000	0.000
Gasabo	**11.139**	1.684	-10.255	32.534	.151	1.792
Kicukiro	**9.630**	0.000	9.630	9.630	0.000	0.000
Nyanza	**17.007**	0.000	17.007	17.007	0.000	0.000
Gisagara	**27.302**	0.000	27.302	27.302	0.000	0.000
Nyaruguru	**17.746**	0.000	17.746	17.746	0.000	0.000
Huye	**22.093**	0.000	22.093	22.093	0.000	0.000
Nyamagabe	**15.410**	0.000	15.410	15.410	0.000	0.000
Ruhango	**25.241**	0.000	25.241	25.241	0.000	0.000
Muhanga	**14.474**	0.000	14.474	14.474	0.000	0.000
Kamonyi	**15.939**	0.000	15.939	15.939	0.000	0.000
Karongi	**18.604**	0.000	18.604	18.604	0.000	0.000
Rutsiro	**14.355**	0.000	14.355	14.355	0.000	0.000
Rubavu	**17.630**	0.000	17.630	17.630	0.000	0.000
Nyabihu	**21.984**	0.000	21.984	21.984	0.000	0.000
Ngororero	**21.858**	0.000	21.858	21.858	0.000	0.000
Rusizi	**19.263**	0.000	19.263	19.263	0.000	0.000
Nyamasheke	**11.664**	0.000	11.664	11.664	0.000	0.000
Rulindo	**21.089**	0.000	21.089	21.089	0.000	0.000
Gakenke	**27.481**	0.000	27.481	27.481	0.000	0.000
Musanze	**19.001**	0.000	19.001	19.001	0.000	0.000
Burera	**20.314**	0.000	20.314	20.314	0.000	0.000
Gicumbi	**16.868**	0.000	16.868	16.868	0.000	0.000
Rwamagana	**16.598**	0.000	16.598	16.598	0.000	0.000
Nyagatare	**23.655**	0.000	23.655	23.655	0.000	0.000
Gatsibo	**19.279**	0.000	19.279	19.279	0.000	0.000
Kayonza	**17.705**	0.000	17.705	17.705	0.000	0.000
Kirehe	**28.525**	0.000	28.525	28.525	0.000	0.000
Ngoma	**28.775**	0.000	28.775	28.775	0.000	0.000
Bugesera	**22.650**	0.000	22.650	22.650	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.7. Precision estimates of Neonatal Mortality Rate by sex, urban rural residence, and province

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Rwanda	**11.141**	.261	7.825	14.457	.023	.760
Sex of child						
Male	**12.620**	.261	9.309	15.931	.021	.345
Female	**9.570**	.265	6.204	12.935	.028	.441
Area of residence						
Urban	**8.399**	.185	6.051	10.747	.022	.081
Rural	**11.664**	.192	9.226	14.102	.016	.330
Province						
City of Kigali	**7.453**	.654	-.851	15.757	.088	.807
South	**11.002**	0.000	11.002	11.002	0.000	0.000
West	**10.229**	0.000	10.229	10.229	0.000	0.000
North	**13.849**	0.000	13.849	13.849	0.000	0.000
East	**12.004**	0.000	12.004	12.004	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.8. Precision estimates of Post-Neonatal Mortality Rate by sex, urban rural residence, Province

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Rwanda	**8.032**	.241	4.970	11.095	.030	.896
Sex of child						
Male	**8.221**	.283	4.626	11.817	.034	.622
Female	**7.832**	.197	5.330	10.333	.025	.297
Area of residence						
Urban	**5.246**	.507	-1.198	11.690	.097	.970
Rural	**8.563**	.105	7.224	9.902	.012	.135
Province						
City of Kigali	**4.191**	.410	-1.019	9.402	.098	.564
South	**8.553**	0.000	8.553	8.553	0.000	0.000
West	**7.556**	0.000	7.556	7.556	0.000	0.000
North	**6.749**	0.000	6.749	6.749	0.000	0.000
East	**10.392**	0.000	10.392	10.392	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.9. Precision estimates of Maternal Mortality Ratio by urban rural residence, province

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
Rwanda	**64.546**	2.276	35.631	93.462	0.035	0.109
Area of residence						
Urban	**55.549**	4.071	3.827	107.270	.073	.065
Rural	**66.268**	1.657	45.212	87.324	.025	.047
Province						
City of Kigali	**75.644**	24.879	-240.479	391.768	.329	1.269
South	**76.927**	0.000	76.927	76.927	0.000	0.000
West	**33.824**	0.000	33.824	33.824	0.000	0.000
North	**36.406**	0.000	36.406	36.406	0.000	0.000
East	**93.424**	0.000	93.424	93.424	0.000	0.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.10. Precision estimates of Sex Age specific death rates (Male)

AGE_GROUP	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	**20.989**	.547	14.045	27.934	.026	.895
1-4	**2.306**	.059	1.560	3.052	.025	.371
5-9	**.933**	.013	.763	1.103	.014	.060
10-14	**.529**	.018	.306	.752	.033	.169
15-19	**.759**	.033	.335	1.184	.044	.350
20-24	**.768**	.043	.222	1.314	.056	.466
25-29	**.874**	.041	.356	1.392	.047	.344
30-34	**1.167**	.078	.175	2.160	.067	.855
35-39	**1.295**	.074	.358	2.233	.057	.471
40-44	**2.052**	.082	1.012	3.092	.040	.267
45-49	**3.039**	.102	1.746	4.332	.033	.222
50-54	**3.291**	.091	2.132	4.450	.028	.145
55-59	**4.864**	.027	4.516	5.211	.006	.008
60-64	**7.359**	.162	5.303	9.416	.022	.125
65-69	**10.092**	.067	9.239	10.944	.007	.010
70-74	**18.540**	.413	13.287	23.792	.022	.119
75-79	**23.918**	.323	19.816	28.020	.013	.043
80-84	**33.887**	.884	22.660	45.114	.026	.142
85-89	**39.553**	.557	32.477	46.629	.014	.028
90+	**77.616**	.590	70.113	85.119	.008	.010

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.11.precision estimates of Sex Age specific death rates (Female)

AGE_GROUP	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	**16.918**	.504	10.512	23.324	.030	.928
1-4	**1.809**	.060	1.050	2.568	.033	.471
5-9	**.697**	.009	.581	.813	.013	.036
10-14	**.401**	.012	.247	.554	.030	.106
15-19	**.501**	.020	.247	.755	.040	.194
20-24	**.614**	.006	.534	.695	.010	.014
25-29	**.665**	.022	.388	.943	.033	.133
30-34	**.748**	.006	.674	.822	.008	.008
35-39	**.956**	.019	.713	1.198	.020	.048
40-44	**1.080**	.025	.757	1.404	.024	.058
45-49	**1.123**	.038	.635	1.611	.034	.100
50-54	**1.833**	.029	1.470	2.195	.016	.031
55-59	**2.582**	.070	1.695	3.468	.027	.115
60-64	**3.273**	.071	2.369	4.178	.022	.070
65-69	**5.277**	.088	4.162	6.392	.017	.042
70-74	**7.264**	.083	6.207	8.322	.011	.021
75-79	**10.004**	.278	6.468	13.540	.028	.123
80-84	**16.793**	.276	13.280	20.305	.016	.045
85-89	**20.967**	.351	16.504	25.431	.017	.033
90+	**40.183**	.588	32.717	47.648	.015	.036

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.12. Precision estimates of Sex Age specific death rates (both sexes combined)

AGE_GROUP	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	**18.980**	.526	12.294	25.666	.028	1.819
1-4	**2.062**	.059	1.311	2.813	.029	.825
5-9	**.816**	.002	.787	.846	.003	.004
10-14	**.465**	.015	.277	.653	.032	.273
15-19	**.629**	.027	.287	.971	.043	.555
20-24	**.688**	.024	.385	.992	.035	.334
25-29	**.768**	.031	.381	1.156	.040	.444
30-34	**.954**	.039	.454	1.455	.041	.541
35-39	**1.116**	.043	.566	1.666	.039	.399
40-44	**1.524**	.048	.920	2.128	.031	.266
45-49	**2.011**	.061	1.235	2.787	.030	.262
50-54	**2.490**	.054	1.808	3.172	.022	.148
55-59	**3.606**	.046	3.027	4.184	.013	.063
60-64	**5.062**	.104	3.736	6.387	.021	.173
65-69	**7.379**	.012	7.227	7.531	.002	.001
70-74	**11.503**	.214	8.787	14.220	.019	.138
75-79	**15.404**	.301	11.581	19.226	.020	.151
80-84	**23.494**	.528	16.784	30.204	.022	.190
85-89	**28.255**	.046	27.667	28.843	.002	.001
90+	**54.262**	.026	53.930	54.593	.000	.000

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.13. Precision estimates of Age specific death rates by place of residence (Urban, Rural)

Area of residence	Age group	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
				Lower	Upper		
Urban	0	13.321	.725	4.105	22.538	.054	.823
	1-4	1.147	.082	.103	2.190	.072	.434
	5-9	.433	.045	-.144	1.009	.105	.396
	10-14	.240	.021	-.029	.509	.088	.146
	15-19	.333	.048	-.278	.944	.145	.585
	20-24	.284	.002	.253	.315	.009	.002
	25-29	.421	.037	-.043	.885	.087	.268
	30-34	.710	.081	-.319	1.739	.114	.626
	35-39	.867	.051	.216	1.518	.059	.139
	40-44	1.069	.081	.044	2.094	.075	.184
	45-49	1.535	.253	-1.676	4.746	.165	.868
	50-54	2.201	.072	1.284	3.119	.033	.037
	55-59	3.297	.063	2.492	4.103	.019	.014
	60-64	4.749	.289	1.078	8.419	.061	.134
	65-69	8.480	.116	7.006	9.953	.014	.007
	70-74	12.512	.666	4.050	20.973	.053	.118
	75-79	15.332	.448	9.636	21.028	.029	.028
	80-84	19.460	2.865	-16.947	55.866	.147	.676
	85-89	23.223	.242	20.144	26.302	.010	.002
	90+	59.833	3.880	10.532	109.135	.065	.163
Rural	0	20.101	.309	16.178	24.025	.015	.493
	1-4	2.225	.029	1.859	2.591	.013	.154
	5-9	.876	.019	.637	1.115	.021	.215
	10-14	.500	.009	.385	.615	.018	.082
	15-19	.692	.013	.531	.853	.018	.092
	20-24	.800	.009	.683	.917	.011	.033
	25-29	.872	.008	.768	.976	.009	.022
	30-34	1.017	.017	.796	1.237	.017	.079
	35-39	1.175	.031	.780	1.570	.026	.158
	40-44	1.616	.025	1.293	1.939	.016	.060
	45-49	2.093	.014	1.910	2.277	.007	.012
	50-54	2.530	.045	1.961	3.098	.018	.089
	55-59	3.641	.039	3.151	4.131	.011	.040
	60-64	5.095	.081	4.068	6.121	.016	.093
	65-69	7.268	.015	7.077	7.460	.002	.001
	70-74	11.396	.179	9.123	13.669	.016	.088
	75-79	15.411	.286	11.770	19.051	.019	.125
	80-84	23.938	.212	21.238	26.637	.009	.027
	85-89	28.769	.054	28.086	29.453	.002	.001
	90+	53.634	.300	49.828	57.440	.006	.010

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.14. Precision estimates of Male Age specific death rates (Urban)

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	15.407	.797	5.282	25.532	.052	.430
1-4	1.133	.101	-.150	2.416	.089	.340
5-9	.512	.032	.111	.912	.062	.082
10-14	.187	.015	-.003	.377	.080	.046
15-19	.546	.097	-.686	1.778	.178	.665
20-24	.288	.029	-.079	.656	.100	.123
25-29	.412	.084	-.658	1.483	.204	.761
30-34	.777	.129	-.860	2.414	.166	.794
35-39	.752	.080	-.267	1.772	.107	.210
40-44	1.262	.159	-.756	3.280	.126	.323
45-49	2.227	.398	-2.825	7.280	.179	.803
50-54	2.540	.128	.909	4.172	.051	.051
55-59	5.290	.026	4.965	5.615	.005	.001
60-64	6.447	.328	2.281	10.612	.051	.058
65-69	11.162	.161	9.120	13.204	.014	.005
70-74	18.696	1.406	.831	36.562	.075	.130
75-79	23.234	1.005	10.460	36.008	.043	.033
80-84	24.723	3.153	-15.335	64.780	.128	.228
85-89	34.294	.473	28.290	40.299	.014	.002
90+	88.387	2.393	57.978	118.795	.027	.014

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.15. Precision estimates of Female Age specific death rates (Urban)

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	11.215	.680	2.580	19.851	.061	.429
1-4	1.161	.062	.369	1.953	.054	.120
5-9	.350	.060	-.413	1.113	.171	.420
10-14	.291	.027	-.051	.633	.092	.098
15-19	.152	.005	.083	.220	.036	.009
20-24	.280	.023	-.007	.567	.081	.082
25-29	.430	.016	.227	.634	.037	.024
30-34	.628	.025	.310	.946	.040	.030
35-39	.999	.015	.803	1.195	.015	.005
40-44	.848	.004	.793	.903	.005	.000
45-49	.714	.094	-.480	1.908	.132	.118
50-54	1.848	.018	1.618	2.078	.010	.001
55-59	1.388	.187	-.982	3.757	.134	.146
60-64	3.312	.303	-.544	7.168	.092	.115
65-69	6.275	.401	1.176	11.374	.064	.065
70-74	8.839	.082	7.803	9.875	.009	.002
75-79	10.932	1.292	-5.482	27.346	.118	.214
80-84	16.537	2.616	-16.702	49.777	.158	.428
85-89	17.488	.272	14.034	20.941	.016	.002
90+	44.932	5.951	-30.686	120.551	.132	.345

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.16. Precision estimates of Male Age specific death rates (Rural)

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	22.084	.315	18.079	26.090	.014	.236
1-4	2.516	.017	2.295	2.737	.007	.025
5-9	1.000	.031	.612	1.387	.031	.250
10-14	.581	.011	.445	.717	.018	.050
15-19	.800	.015	.612	.989	.019	.055
20-24	.903	.022	.623	1.182	.024	.081
25-29	1.023	.004	.970	1.076	.004	.002
30-34	1.282	.041	.757	1.806	.032	.168
35-39	1.447	.045	.875	2.020	.031	.123
40-44	2.246	.029	1.878	2.614	.013	.024
45-49	3.209	.012	3.062	3.355	.004	.002
50-54	3.411	.066	2.576	4.246	.019	.063
55-59	4.810	.036	4.348	5.271	.008	.012
60-64	7.460	.129	5.820	9.100	.017	.070
65-69	9.980	.042	9.442	10.518	.004	.004
70-74	18.523	.310	14.582	22.464	.017	.061
75-79	23.976	.429	18.529	29.423	.018	.069
80-84	34.796	.557	27.715	41.876	.016	.050
85-89	40.014	.593	32.476	47.552	.015	.028
90+	76.521	1.032	63.409	89.633	.013	.030

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 1.17. Precision estimates of Female Age specific death rates (Rural)

	Ratio Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect
			Lower	Upper		
0	18.059	.297	14.289	21.829	.016	.250
1-4	1.923	.041	1.404	2.443	.021	.177
5-9	.751	.007	.665	.837	.009	.016
10-14	.418	.007	.324	.513	.018	.033
15-19	.582	.011	.448	.715	.018	.038
20-24	.706	.003	.674	.738	.004	.001
25-29	.730	.020	.473	.988	.028	.082
30-34	.775	.003	.738	.812	.004	.002
35-39	.947	.021	.676	1.217	.023	.050
40-44	1.120	.024	.811	1.428	.022	.044
45-49	1.182	.021	.912	1.451	.018	.025
50-54	1.831	.030	1.449	2.213	.016	.031
55-59	2.707	.042	2.168	3.247	.016	.037
60-64	3.269	.048	2.657	3.882	.015	.029
65-69	5.180	.068	4.314	6.045	.013	.023
70-74	7.095	.107	5.737	8.453	.015	.032
75-79	9.914	.189	7.515	12.313	.019	.052
80-84	16.822	.002	16.802	16.843	.000	.000
85-89	21.356	.489	15.141	27.571	.023	.057
90+	39.616	1.256	23.651	55.580	.032	.147

Source: Mortality Assessment Survey, 2015 (NISR)

ANNEX 2. LIFE TABLES

For the sake of comparison of life tables corresponding to the point estimates of ASDR and upper and lower confidence limits are presented in Annex 2

Annex 2.1. Life Table of both sexes Combined-point estimate

Abridged Life Table:				Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01951	0.098	0.01917	100,000	1,917	98,270	7,223,919	72.24
1	4	0.00206	1.800	0.00821	98,083	805	390,559	7,125,649	72.65
5	5	0.00082	2.500	0.00407	97,277	396	485,395	6,735,090	69.24
10	5	0.00046	2.500	0.00232	96,881	225	483,842	6,249,695	64.51
15	5	0.00063	2.500	0.00314	96,656	303	482,521	5,765,853	59.65
20	5	0.00069	2.500	0.00344	96,353	331	480,935	5,283,331	54.83
25	5	0.00077	2.500	0.00383	96,022	368	479,187	4,802,396	50.01
30	5	0.00095	2.500	0.00476	95,653	455	477,129	4,323,208	45.20
35	5	0.00112	2.500	0.00556	95,198	530	474,666	3,846,080	40.40
40	5	0.00152	2.500	0.00759	94,668	719	471,545	3,371,414	35.61
45	5	0.00201	2.500	0.01000	93,950	940	467,399	2,899,868	30.87
50	5	0.00249	2.500	0.01237	93,010	1,151	462,173	2,432,469	26.15
55	5	0.00361	2.500	0.01787	91,859	1,641	455,192	1,970,297	21.45
60	5	0.00506	2.500	0.02499	90,218	2,255	445,453	1,515,104	16.79
65	5	0.00738	2.500	0.03623	87,963	3,186	431,850	1,069,652	12.16
70	+	0.13292	7.523	1.00000	84,777	84,777	637,802	637,802	7.52

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.2. Life Table of both sexes Combined using lower limit

Abridged Life Table:				Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01294	0.079	0.01279	100,000	1,279	98,823	7,467,474	74.67
1	4	0.00131	1.819	0.00523	98,721	516	393,759	7,368,652	74.64
5	5	0.00079	2.500	0.00393	98,205	386	490,060	6,974,893	71.02
10	5	0.00028	2.500	0.00138	97,819	135	488,757	6,484,833	66.29
15	5	0.00029	2.500	0.00143	97,684	140	488,069	5,996,076	61.38
20	5	0.00038	2.500	0.00192	97,544	188	487,251	5,508,007	56.47
25	5	0.00038	2.500	0.00190	97,356	185	486,319	5,020,756	51.57
30	5	0.00045	2.500	0.00227	97,171	220	485,306	4,534,437	46.66
35	5	0.00057	2.500	0.00283	96,951	274	484,070	4,049,131	41.76
40	5	0.00092	2.500	0.00459	96,677	444	482,276	3,565,061	36.88
45	5	0.00123	2.500	0.00616	96,233	592	479,686	3,082,785	32.03
50	5	0.00181	2.500	0.00900	95,641	861	476,053	2,603,099	27.22
55	5	0.00303	2.500	0.01502	94,780	1,424	470,342	2,127,046	22.44
60	5	0.00374	2.500	0.01851	93,357	1,728	462,464	1,656,704	17.75
65	5	0.00723	2.500	0.03549	91,629	3,252	450,014	1,194,240	13.03
70	+	0.11875	8.421	1.00000	88,377	88,377	744,226	744,226	8.42

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.3. Life Table of both sexes Combined using upper limit

		Abridged Life Table:		Both sexes					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02613	0.116	0.02554	100,000	2,554	97,742	7,005,224	70.05
1	4	0.00281	1.781	0.01118	97,446	1,090	387,365	6,907,482	70.89
5	5	0.00085	2.500	0.00422	96,356	407	480,764	6,520,116	67.67
10	5	0.00065	2.500	0.00326	95,949	313	478,966	6,039,352	62.94
15	5	0.00097	2.500	0.00484	95,637	463	477,026	5,560,386	58.14
20	5	0.00099	2.500	0.00495	95,174	471	474,691	5,083,360	53.41
25	5	0.00116	2.500	0.00576	94,703	546	472,150	4,608,670	48.66
30	5	0.00145	2.500	0.00725	94,157	682	469,079	4,136,520	43.93
35	5	0.00167	2.500	0.00830	93,475	775	465,435	3,667,441	39.23
40	5	0.00213	2.500	0.01058	92,699	981	461,043	3,202,006	34.54
45	5	0.00279	2.500	0.01384	91,718	1,269	455,418	2,740,963	29.88
50	5	0.00317	2.500	0.01573	90,449	1,423	448,687	2,285,545	25.27
55	5	0.00418	2.500	0.02071	89,026	1,843	440,521	1,836,858	20.63
60	5	0.00639	2.500	0.03143	87,183	2,741	429,061	1,396,336	16.02
65	5	0.00753	2.500	0.03696	84,442	3,121	414,408	967,275	11.45
70	+	0.14709	6.799	1.00000	81,321	81,321	552,867	552,867	6.80

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.4. Male Life Table –point estimate

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02123	0.102	0.02084	100,000	2,084	98,130	6,927,283	69.27
1	4	0.00231	1.796	0.00918	97,916	899	389,685	6,829,154	69.74
5	5	0.00093	2.500	0.00465	97,018	452	483,960	6,439,469	66.37
10	5	0.00053	2.500	0.00264	96,566	255	482,193	5,955,509	61.67
15	5	0.00076	2.500	0.00379	96,311	365	480,644	5,473,316	56.83
20	5	0.00077	2.500	0.00383	95,946	368	478,812	4,992,672	52.04
25	5	0.00087	2.500	0.00436	95,579	417	476,851	4,513,860	47.23
30	5	0.00117	2.500	0.00582	95,162	554	474,425	4,037,009	42.42
35	5	0.00130	2.500	0.00646	94,608	611	471,513	3,562,585	37.66
40	5	0.00205	2.500	0.01021	93,997	959	467,588	3,091,071	32.88
45	5	0.00304	2.500	0.01508	93,038	1,403	461,682	2,623,484	28.20
50	5	0.00329	2.500	0.01632	91,635	1,496	454,435	2,161,802	23.59
55	5	0.00486	2.500	0.02403	90,139	2,166	445,282	1,707,367	18.94
60	5	0.00736	2.500	0.03613	87,974	3,179	431,922	1,262,085	14.35
65	5	0.01009	2.500	0.04922	84,795	4,173	413,542	830,163	9.79
70	+	0.19351	5.168	1.00000	80,622	80,622	416,621	416,621	5.17

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.4.a. Male Life Table lower limit

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01411	0.083	0.01393	100,000	1,393	98,722	7,237,184	72.37
1	4	0.00156	1.817	0.00622	98,607	613	393,088	7,138,462	72.39
5	5	0.00076	2.500	0.00381	97,993	373	489,035	6,745,374	68.83
10	5	0.00031	2.500	0.00153	97,620	149	487,728	6,256,340	64.09
15	5	0.00033	2.500	0.00167	97,471	163	486,948	5,768,611	59.18
20	5	0.00022	2.500	0.00111	97,308	108	486,270	5,281,663	54.28
25	5	0.00036	2.500	0.00178	97,200	173	485,568	4,795,393	49.34
30	5	0.00017	2.500	0.00087	97,027	85	484,925	4,309,824	44.42
35	5	0.00036	2.500	0.00179	96,943	173	484,279	3,824,900	39.46
40	5	0.00101	2.500	0.00505	96,769	488	482,625	3,340,620	34.52
45	5	0.00175	2.500	0.00869	96,281	837	479,312	2,857,995	29.68
50	5	0.00213	2.500	0.01060	95,444	1,012	474,690	2,378,683	24.92
55	5	0.00452	2.500	0.02233	94,432	2,108	466,889	1,903,993	20.16
60	5	0.00530	2.500	0.02617	92,324	2,416	455,579	1,437,103	15.57
65	5	0.00924	2.500	0.04515	89,908	4,060	439,391	981,524	10.92
70	+	0.15835	6.315	1.00000	85,848	85,848	542,133	542,133	6.32

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.4.b. Male Life Table upper limit

Abridged Life Table:				Male					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02843	0.122	0.02774	100,000	2,774	97,565	6,663,919	66.64
1	4	0.00305	1.775	0.01213	97,226	1,179	386,283	6,566,354	67.54
5	5	0.00110	2.500	0.00550	96,047	528	478,917	6,180,071	64.34
10	5	0.00075	2.500	0.00375	95,519	358	476,700	5,701,155	59.69
15	5	0.00118	2.500	0.00590	95,161	561	474,400	5,224,454	54.90
20	5	0.00131	2.500	0.00655	94,599	619	471,448	4,750,054	50.21
25	5	0.00139	2.500	0.00694	93,980	652	468,270	4,278,606	45.53
30	5	0.00216	2.500	0.01074	93,328	1,002	464,134	3,810,335	40.83
35	5	0.00223	2.500	0.01110	92,326	1,025	459,066	3,346,201	36.24
40	5	0.00309	2.500	0.01534	91,301	1,401	453,002	2,887,135	31.62
45	5	0.00433	2.500	0.02143	89,900	1,926	444,684	2,434,133	27.08
50	5	0.00445	2.500	0.02201	87,974	1,936	435,029	1,989,449	22.61
55	5	0.00521	2.500	0.02572	86,038	2,213	424,656	1,554,420	18.07
60	5	0.00942	2.500	0.04600	83,825	3,856	409,485	1,129,764	13.48
65	5	0.01094	2.500	0.05326	79,969	4,259	389,198	720,279	9.01
70	+	0.22867	4.373	1.00000	75,710	75,710	331,082	331,082	4.37

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.5. FEMALE LIFE TABLE-point estimate

Abridged Life Table:				**Female**					
Age,	**Width,**								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01767	0.102	0.01739	100,000	1,739	98,439	7,584,642	75.85
1	4	0.00181	1.705	0.00721	98,261	708	391,419	7,486,204	76.19
5	5	0.00070	2.500	0.00348	97,553	339	486,916	7,094,785	72.73
10	5	0.00040	2.500	0.00200	97,214	195	485,581	6,607,869	67.97
15	5	0.00050	2.500	0.00250	97,019	243	484,488	6,122,287	63.10
20	5	0.00061	2.500	0.00307	96,776	297	483,139	5,637,799	58.26
25	5	0.00067	2.500	0.00332	96,479	320	481,596	5,154,660	53.43
30	5	0.00075	2.500	0.00373	96,159	359	479,897	4,673,065	48.60
35	5	0.00096	2.500	0.00477	95,800	457	477,858	4,193,168	43.77
40	5	0.00108	2.500	0.00539	95,343	514	475,432	3,715,310	38.97
45	5	0.00112	2.500	0.00560	94,830	531	472,821	3,239,878	34.17

Abridged Life Table:				**Female**					
Age,	**Width,**								
50	5	0.00183	2.500	0.00912	94,299	860	469,343	2,767,057	29.34
55	5	0.00258	2.500	0.01282	93,439	1,198	464,197	2,297,713	24.59
60	5	0.00327	2.500	0.01623	92,240	1,497	457,458	1,833,516	19.88
65	5	0.00528	2.500	0.02604	90,743	2,363	447,807	1,376,058	15.16
70	+	0.09521	10.503	1.00000	88,380	88,380	928,252	928,252	10.50

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.5.a. FEMALE LIFE TABLE LOWER LIMIT

Abridged Life Table:				Female					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.01165	0.085	0.01152	100,000	1,152	98,945	7,981,930	79.82
1	4	0.00105	1.714	0.00419	98,848	414	394,444	7,882,984	79.75
5	5	0.00058	2.500	0.00290	98,434	285	491,455	7,488,540	76.08
10	5	0.00025	2.500	0.00124	98,148	121	490,438	6,997,085	71.29
15	5	0.00025	2.500	0.00123	98,027	121	489,833	6,506,647	66.38
20	5	0.00053	2.500	0.00267	97,906	261	488,877	6,016,814	61.45
25	5	0.00039	2.500	0.00194	97,645	189	487,752	5,527,937	56.61
30	5	0.00067	2.500	0.00337	97,456	328	486,460	5,040,185	51.72
35	5	0.00071	2.500	0.00356	97,128	346	484,775	4,553,725	46.88
40	5	0.00076	2.500	0.00378	96,782	366	482,996	4,068,950	42.04
45	5	0.00063	2.500	0.00317	96,416	306	481,318	3,585,954	37.19
50	5	0.00147	2.500	0.00732	96,111	704	478,794	3,104,636	32.30
55	5	0.00170	2.500	0.00844	95,407	805	475,021	2,625,842	27.52
60	5	0.00237	2.500	0.01177	94,602	1,114	470,223	2,150,820	22.74
65	5	0.00416	2.500	0.02060	93,488	1,926	462,624	1,680,597	17.98
70	+	0.07518	13.302	1.00000	91,562	91,562	1,217,973	1,217,973	13.30

Source: Mortality Assessment Survey, 2015 (NISR)

Annex 2.5.b. FEMALE LIFE TABLE UPPER LIMIT

Abridged Life Table:				Female					
Age,	Width,								
x	n	nMx	nax	nqx	lx	ndx	nLx	Tx	ex
0	1	0.02375	0.120	0.02326	100,000	2,326	97,953	7,290,829	72.91
1	4	0.00257	1.695	0.01021	97,674	997	388,397	7,192,877	73.64
5	5	0.00081	2.500	0.00406	96,676	392	482,402	6,804,480	70.38
10	5	0.00055	2.500	0.00277	96,284	266	480,755	6,322,078	65.66
15	5	0.00076	2.500	0.00377	96,018	362	479,184	5,841,324	60.84
20	5	0.00069	2.500	0.00347	95,656	332	477,450	5,362,140	56.06
25	5	0.00094	2.500	0.00470	95,324	448	475,499	4,884,690	51.24
30	5	0.00082	2.500	0.00410	94,876	389	473,405	4,409,191	46.47
35	5	0.00120	2.500	0.00597	94,486	564	471,022	3,935,786	41.65
40	5	0.00140	2.500	0.00699	93,922	657	467,969	3,464,764	36.89
45	5	0.00161	2.500	0.00802	93,265	748	464,457	2,996,795	32.13
50	5	0.00220	2.500	0.01092	92,517	1,010	460,062	2,532,338	27.37
55	5	0.00347	2.500	0.01719	91,507	1,573	453,605	2,072,276	22.65
60	5	0.00418	2.500	0.02067	89,934	1,859	445,025	1,618,671	18.00
65	5	0.00639	2.500	0.03146	88,075	2,770	433,451	1,173,647	13.33
70	+	0.11525	8.677	1.00000	85,305	85,305	740,196	740,196	8.68

Source: Mortality Assessment Survey, 2015 (NISR)

ANNEX 3. QUESTIONNAIRE

MORTALITY ASSESSMENT SURVEY 2015

NATIONAL INSTITUTE OF STATISTICS OF RWANDA

IDENTIFICATION

PROVINCE: ______ DISTRICT: ______ SECTOR: ______

CELL ______ VILLAGE ______

HOUSEHOLD STRUCTURE NUMBER . . . .

HOUSEHOLD NUMBER . . . .

AREA OF RESIDENCE URBAN..................1 RURAL.....................2

NAME OF HOUSEHOLD HEAD ______ TEL. ______

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE INTERVIEWER'S NAME RESULT*				DAY MONTH YEAR INT. NUMBER RESULT
NEXT VISIT: DATE TIME				TOTAL NUMBER OF VISITS

*RESULT CODES:
1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3 ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4 POSTPONED
5 REFUSED
9 OTHER ______ (SPECIFY)

TOTAL PERSONS IN HOUSEHOLD

LINE NO. OF RESPONDENT

TEAM LEADER

NAME ______

KEYED BY

NAME ______

INTRODUCTION AND CONSENT

Hello. My name is ______. I am working with National Institute of Statistics of Rwanda. We are conducting a survey on survival status of the population of Rwanda. The information we collect will help the government to plan health services. All Households in this village are included for the survey. I would like to ask you some questions about your household. The questions usually take about 5 to 10 minutes. All of your answers will be confidential and will not be shared with anyone other than members of our survey team. We hope you will agree to answer the questions since your participation is important.

Do you have any questions?
May I begin the interview now?

SIGNATURE OF INTERVIEWER: ______ DATE: ______

RESPONDENT AGREES TO BE INTERVIEWED . . . 1 RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . . . 2 → END

Section 1 HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	AGE	RESIDENCE STATUS	NATIONALITY	IF AGE 3 OR OLDER: LITERACY	IF AGE 3 OR OLDER: SCHOOL ATTENDENCE
11	12	13	14	15	16	17	18	19
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here in the night of 30/11/2015, starting with the head of the household. AFTER LISTING THE NAMES, RECORD THE RELATIONSHIP AND SEX FOR EACH ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 15 to 19 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	How old is (NAME)? IF 95 OR MORE, RECORD 95'.	What is the residence status of (NAME) PRESENT RESIDENT……..1 ABSENT RESIDENT……..2 VISITOR……………3	What is (NAME) nationality? RWANDAN……………….1 OTHER EAST AFRICAN……2 OTHER AFRICAN…………3 REST OF THE WORLD……..4	Can (NAME) read and write with understanding any language (KINYARWANDA, ENGLISH, FRENCH…)? YES READ AND WRITE……..1 NO………………………2	What is the highest level of education has (NAME) attended? NEVER ATTENDED……..0 PRESCHOOL…………..1 PRIMARY……………..2 POST PRIMARY………..3 SECONDARY…………..4 UNIVERSITY……………5
			M F	IN YEARS	PR AR V			
01			1 2		1 2 3			
02			1 2		1 2 3			
03			1 2		1 2 3			
04			1 2		1 2 3			
05			1 2		1 2 3			
06			1 2		1 2 3			
07			1 2		1 2 3			
08			1 2		1 2 3			
09			1 2		1 2 3			
10			1 2		1 2 3			
11			1 2		1 2 3			
12			1 2		1 2 3			
13			1 2		1 2 3			
14			1 2		1 2 3			
15			1 2		1 2 3			
16			1 2		1 2 3			
17			1 2		1 2 3			
18			1 2		1 2 3			
19			1 2		1 2 3			
20			1 2		1 2 3			

TICK HERE IF CONTINUATION SHEET USED ☐

2A) Just to make sure that you have a complete listing. Are there any other persons such as small children or infants that we have not listed?	YES ☐ →	ADD TO TABLE	NO ☐
2B) Are there any other people who may not be members of your family, such as domestic servants, lodgers, or friends who usually live here?	YES ☐ →	ADD TO TABLE	NO ☐
2C) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed?	YES ☐ →	ADD TO TABLE	NO ☐

CODES FOR Q. 13: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD	08 = BROTHER OR SISTER
02 = WIFE OR HUSBAND	09 = OTHER RELATIVE
03 = SON OR DAUGHTER	10 = ADOPTED/FOSTER/ STEPCHILD
04 = SON-IN-LAW OR DAUGHTER-IN-LAW	11 = NOT RELATED
05 = GRANDCHILD	12 = DOMESTIC WORKER
06 = PARENT	98 = DON'T KNOW
07 = PARENT-IN-LAW	

THE FOLLOWING 3 SECTIONS (2,3 AND 4) ARE ONLY RELATED TO HOUSEHOLD RESIDENTS, PRESENT OR ABSENT

Section 2. LIVE BIRTHS AND SURVIVAL STATUS

2.1. Has the household had any live birth during the period 01/12/2013 until 30/11/2015?

YES.. 1
NO.. 2

2.2. If 1"YES" ASK: How many? [ ]
If 2"NO" GO TO QUESTION 3.1

		1rst CHILD	2nd CHILD	3rd CHILD	4th CHILD	5th CHILD	6th CHILD	7th CHILD
		NAME	NAME	NAME	NAME	NAME	NAME	NAME
2.3	Was (NAME) born single or multiple?	SING...................... 1 MULT.................... 2	SING...................... 1 MULT.................... 2	SING...................... 1 MULT.................... 2	SING...................... 1 MULT.................... 2	SING...................... 1 MULT.................... 2	SING...................... 1 1 MULT.................... 2 2	SING...................... 1 MULT.................... 2
2.4	Is (NAME) a boy or a girl?	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2	BOY...................... 1 GIRL...................... 2
2.5	On which day, month and year was (NAME) born? PROBE When is his/her birthday?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR
2.6	What is (NAME)'s birth order?							
2.7	ASK IF THE MOTHER LIVES IN THE HOUSEHOLD. IF "YES" ASK HER NAME THEN RECORD HER LINE NUMBER FROM Q.1.1	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"
2.8	What is the (NAME)'s Parents' nationality?	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN.....4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN...4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN...4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN...4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN...4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN..4	BOTH PARENTS RWANDAN..........1 MOTHER ONLY RWANDAN..........2 FATHER ONLY RWANDAN..........3 BOTH PARENTS NON RWANDAN..4
2.9	Is (NAME)'s mother able to read and write with understanding any language?	YES READ AND WRITE......1 NO..............................2	YES READ AND WRITE......1 NO..............................2	YES READ AND WRITE......1 NO..............................2	YES READ AND WRITE..........1 NO..............................2	YES READ AND WRITE..........1 NO..............................2	YES READ AND WRITE..........1 NO..............................2	YES READ AND WRITE..........1 NO..............................2
2.10	What is the (NAME)'s mother's highest level of education attended?	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5	NEVER ATTENDED..............0 PRESCHOOL......................1 PRIMARY..........................2 POST PRIMARY..................3 SECONDARY......................4 UNIVERSITY......................5
2.11	Is (NAME) still alive?	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2	YES.................................1 IF YES LINE NUMBER (SEE Q1.1) THEN GO TO (NEXT BIRTH) If 'NONE ELSE" GO TO Q.3.1 NO.................................2
2.12	IF DEAD How old was (NAME) when he/she died? IF '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN "1" MONTH; MONTHS IF "1" MONTH TO"2" YEARS	DAYS . . . . 1 MONTHS 2	DAYS . . . . 1 MONTHS...... 2	DAYS . . . . 1 MONTHS....... 2	DAYS . . . . 1 MONTHS....... 2	DAYS . . . . 1 MONTHS....... 2	DAYS . . 1 MONTHS 2	DAYS . . . . 1 MONTHS 2
2.13	On which day, month and year was (NAME) died?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR

Section 3. INFANT DEATHS (Infant deaths born in 12 months before 1/12/2013)

3.1. Has the household experienced any infant death in the period from 01/12/2013 until 30/11/2014 that was born before 01/12/2013?

YES………………………………………… 1 — **3.2** If 1"YES" ASK: How many? ☐

NO………………………………………… 2 — If 2"NO" GO TO Q.4.1

		1rst CHILD DIED	2nd CHILD DIED	3rd CHILD DIED	4th CHILD DIED	5th CHILD DIED	6th CHILD DIED	7th CHILD DIED
		NAME	NAME	NAME	NAME	NAME	NAME	NAME
3.3	Is (NAME) a boy or a girl?	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2	BOY…………………. 1 GIRL…………………. 2
3.4	How old was (NAME) when he/she died? **PROBE:** How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH	DAYS . . . . 1 MONTHS 2	DAYS . . . 1 MONTHS 2	DAYS . . . . 1 MONTHS 2	DAYS . . . . 1 MONTHS 2	DAYS . . . . 1 MONTHS 2	DAYS . . 1 MONTHS 2	DAYS . . . . 1 MONTHS 2
3.5	On which day, month and year was (NAME) born?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR
3.6	On which day, month and year was (NAME) died?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR
3.7	What is (NAME)'s birth order?	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"	IF DON'T KNOW RECORD"98"
3.8	ASK IF THE MOTHER LIVES IN THE HOUSEHOLD. IF "YES" ASK HER NAME THEN RECORD HER LINE NUMBER FROM Q.1.1	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"	LINE NUMBER IF THE MOTHER DOESN'T LIVE IN THE HOUSEHOLD RECORD "00"
3.9	What is the (NAME)'s Parents' nationality?	BOTH PARENTS RWANDAN………1 MOTHER ONLY RWANDAN………………… FATHER ONLY RWANDAN………………3 BOTH PARENTS NON RWANDAN…..4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN……………2 FATHER ONLY RWANDAN…………..3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN……………2 FATHER ONLY RWANDAN…………..3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN……………2 FATHER ONLY RWANDAN…………..3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN……………2 FATHER ONLY RWANDAN…………..3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN………….2 FATHER ONLY RWANDAN………….3 BOTH PARENTS NON RWANDAN..4	BOTH PARENTS RWANDAN…….1 MOTHER ONLY RWANDAN………….2 FATHER ONLY RWANDAN………….3 BOTH PARENTS NON RWANDAN..4
3.10	Is(NAME)'s mother able to read and write with understanding any language?	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2	YES READ AND WRITE……1 NO……………………………2
3.11	What is the (NAME)'s mother's highest level of education attended?	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5	NEVER ATTENDED……………0 PRESCHOOL……………………1 PRIMARY………………………2 POST PRIMARY………………3 SECONDARY…………………4 UNIVERSITY……………………5

Section 4: DEATHS (1 year and above)

4.1. Has the household experienced in the period from 01/12/2013 until 30/11/2015 any death of at least one year of age who were born before 01/12/2013?

YES……………………………………… 1
NO……………………………………… 2

4.2 If 1"YES" ASK: How many? [ ]
If 2"NO" END INTERVIEW

		1rst DEATH	2nd DEATH	3rd DEATH	4th DEATH	5th DEATH	6th DEATH	7th DEATH
		NAME ____	NAME ____	NAME ____	NAME ____	NAME ____	NAME ____	NAME ____
4.3	Was (NAME) a Male or a female?	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2	MALE…………… 1 FEMALE……… 2
4.4	How old was (NAME) when he/she died? IF 95 OR MORE RECORD 95	Months (if 1 year and less than 2 years) 1 YEARS (if 2 years and above). ……… 2	Months (if 1 year and less than 2 years)……… 1 YEARS (if 2 years and above). ……… 2	Months (if 1 year and less than 2 years)……… 1 YEARS (if 2 years and above). ……… 2	Months (if 1 year and less than 2 years)……… 1 YEARS (if 2 years and above). ……… 2	Months (if 1 year and less than 2 1 YEARS (if 2 years and above). ……… 2	Months (if 1 year and less than 2 years)……… 1 YEARS (if 2 years and above). ……… 2	less than 2 years)……… 1 YEARS (if 2 years and above). ……… 2
4.5	On which day, month and year was (NAME) born?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR
4.6	On which day, month and year was (NAME) died?	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR	DAY MONTH YEAR
CHECK Q.4.4: IF LESS THAN 5 YEARS OLD(1-4); ASK QUESTIONS 4.7--4.10.								
4.7	What is (NAME)'s birth order?							
4.8	What is the (NAME)'s Parents' nationality?	BOTH PARENTS RWANDAN………1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN…..4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN…4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN..4	BOTH PARENTS RWANDAN……1 MOTHER ONLY RWANDAN………2 FATHER ONLY RWANDAN………3 BOTH PARENTS NON RWANDAN..4
4.9	Is (NAME) mother able to read and write with understanding any language?	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2	YES READ AND WRITE……1 NO……………………2
4.10	What is the (NAME)'s mother highest level of education attended?	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5
IF 5 YEARS AND ABOVE ASK Qs.4.11-- Q4.13								
4.11	What was (NAME)'s nationality?	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4	RWANDAN…………………1 OTHER EAST AFRICAN………2 OTHER AFRICAN……………3 REST OF THE WORLD………4
4.12	Was (NAME) able to read and write any language?	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON	YES READ AND WRITE……1 NO……………………2 LESS THAN 12 YEARS……3 IF 3 GO TO THE NEXT PERSON
4.13	What was the (NAME)'s highest level of education attended?	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5	NEVER ATTENDED…………0 PRESCHOOL……………1 PRIMARY………………2 POST PRIMARY…………3 SECONDARY……………4 UNIVERSITY……………5
CHECK Q.4.4: IF FEMALE AGED 12 TO 52 .								
4.14	FOR FEMALE DEATH AGED FROM 12 -52 YEARS What was the cause of death?	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5	ACCIDENT…………… 1 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 2 DURING LABOUR……… 3 3 DURING 42 DAYS AFTER DELIVERY……… 4 4 OTHER CAUSES……… 5 5	ACCIDENT…………… 1 **MATERNAL CAUSES** DURING PREGNANCY……… 2 DURING LABOUR……… 3 DURING 42 DAYS AFTER DELIVERY……… 4 OTHER CAUSES……… 5

Annex 4: Persons who contributed to the 2015 Mortality Assessment Survey

National Director
Yusuf MURANGWA, Director General of NISR

National technical Coordinators
Venant HABARUGIRA, Director of Census
Michel NDAKIZE Director of Demographic and Social Statistics

National data collection Coordinators

Michel NDAKIZE
Venant HABARUGIRA
Apolline MUKANYONGA

Field work supervisors

James BYIRINGIRO
Dominique KANOBANA
François ABALIKUMWE
Astrid SEGAHWEGE
Venuste BIZIMANA
Ephrem RUKUNDO
Jean Baptiste SERUGENDO
Faustin NILINGIYIMNA
Venuste NKURUNZIZA
Roger KAMANA

Data Processing

Massoud HARERIMANA
Jean Marie Vianey NKURUNZIZA

Sampling

Dr. Mohamed ABULATA
James BYIRINGIRO
Roger KAMANA

Data Analysis and report writing

Dr. Mohamed ABULATA
Venant HABARUGIRA
Michel NDAKIZE
James BYIRINGIRO
Dominique KANOBANA
Apolline MUKANYONGA

REFERENCES

1- Abulata, M. F. "*Report of the sample design of the 2002 Yemeni Household Health and Maternal Mortality Survey",* PAPFAM *Project*, League of Arab States.

2- Abulata, M. F. "*Report of the sample design of the 2006 Sudani Household Health and Maternal Mortality Survey",* PAPFAM *Project*, League of Arab States.

3- Turner, A. "*Sampling Manual of PAPCHILD survey Project, 1988",* PAPFAM/PAPCHILD Project, League of Arab States.

4- Jacob S. Siegel, David A.Swanson. "*The Methods and Material of Demography"*, Second edition, Elsevier, Academic Press, 2004.

5- NISR, "*Rwanda Demographic and Health Survey 2014-15*", March 2016.

6- NISR, "*4th PHC, Population size, structure and distribution*", January, 2014.