REPUBLIC OF RWANDA

RWANDA POPULATION AND HOUSING CENSUS
16-30 AUGUST 2022
BE COUNTED BECAUSE YOU COUNT

NISR
NATIONAL INSTITUTE OF STATISTICS OF RWANDA

5th POPULATION AND HOUSING CENSUS

Rwanda, 2022

Thematic Report

FERTILITY

"Be counted because you count - Ibaruze kuko uri uw'agaciro"

REPUBLIC OF RWANDA

Ministry of Finance and Economic Planning

National Institute of Statistics of Rwanda

Fifth Rwanda Population and Housing Census, 2022

Thematic Report

FERTILITY

July 2023

The Fifth Rwanda Population and Housing Census, 2022 (RPHC 2022) was implemented by the National Institute of Statistics of Rwanda (NISR). Fieldwork was conducted from 16th to 30th August, 2022.

Additional information about the 2022 RPHC may be obtained from the NISR:
P.O. Box 6139, Kigali, Rwanda; Telephone: (+250) 788 383103/Hotline: 4321
E-mail: info@statistics.gov.rw; Website: www.statistics.gov.rw.

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LIST OF ABBREVIATIONS

ASFR	Age-Specific Fertility Rate
CBR	Crude Birth Rate
CEB	Children Ever Born
DHS	Demographic and Health Survey
EICV	Enquête Intégrale sur les Conditions de Vie des ménages (Integrated Household living conditions Survey)
GFR	General Fertility Rate
GRR	Gross Reproduction Rate
ICPD	International Conference on Population and Development
MAFB	Median Age at First Birth
LFOR	Late Fertility Onset Rate
LFR	Late Fertility Rate
MAWC	Mean Age of Women at Childbearing
MIC	Middle Income Country
NRR	Net Reproduction Rate
NISR	National Institute of Statistics of Rwanda
ONAPO	Office National de la Population (National Population Council)
PHC	Population and Housing Census
PPR	Parity Progression Ratio
RIDHS	Rwanda Interim Demographic and Health Survey
SBR	Standardized Birth Rate
TFR	Total Fertility Rate

FOREWORD

The Government of Rwanda, through the National Institute of Statistics of Rwanda (NISR), conducted the Fifth Rwanda Population and Housing Census in August 2022. The Census results provide updated demographic, social and economic indicators for policy formulation and planning to support the national development agenda. Census results will also help in tracking the implementation of national, regional, continental and global development goals, such as the National Strategy for Transformation (NST), the AU Agenda 2063, and the Sustainable Development Goals (SDGs).

The Population and Housing Census in Rwanda dates back to the year 1978 when the first ever-modern census was implemented. The second, third, and fourth censuses were carried out in 1991, 2002, and 2012 respectively. The 2022 Rwanda Population and Housing Census marks therefore the fifth in the series following the United Nations Recommendations to conduct a census every ten years.

Considering census' crucial importance for the planning process, the Government of Rwanda has made the Population and Housing Census a priority to be undertaken every 10 years and adopted the use of technologies for timely delivery of census results for use.

Results of the 2022 Population and Housing Census provide population numbers from national to the lowest administrative level, as well as demographic and socio-economic indicators at both national and district levels. The census remains the only national data collection exercise that can provide the lowest levels of disaggregation to support decentralised decision making across the country.

I would like, therefore, to take this opportunity to thank all stakeholders that contributed to the success of the 2022 Rwanda Population and Housing Census. They include Ministries and other Government institutions, international organizations such as the World Bank (WB), the European Union (EU), the United Nations Population Fund (UNFPA), One-UN, UN Women, UNICEF, UNECA, the United Kingdom AID (UKAID), ONS, the African Development Bank (AfDB), the USAID, ENABEL, PARIS 21 and others for their support in diverse ways.

My special thanks go to the local government leaders from the province to the village levels who contributed a lot to the success of the 2022 Rwanda Population and Housing Census. Exceptional gratitude goes also to all enumerators and all field personnel, who collected the information and all respondents for their cooperation and dedication. The National Institute of Statistics of Rwanda (NISR) deserves special appreciation for the excellent operational and coordination of all census activities.

I finally recommend that the invaluable information contained in the different thematic reports of the 5th Rwanda Population and Housing Census be used as updated evidence for all decision and policy making for the national, regional and global development programs.

Dr. Uzziel NDAGIJIMANA
Minister of Finance and Economic Planning

ACKNOWLEDGEMENTS

The National Institute of Statistics of Rwanda (NISR) is pleased to release the results of the Fifth Rwanda Population and Housing Census (RPHC5). The execution of different Census phases: preparatory works, data collection, data processing, tabulation and data analysis; spans for a period of about four years between 2020 and 2023.

NISR has produced several thematic reports to be of direct help to policy makers, planners, local authorities and other census users. The reports provide key information, mainly population size and distribution, education, settlement, population of particular interest (children, youth, women, elderly, etc.), and population projections to mention but a few. NISR expects that results from these reports supplemented by the district profile reports will meet the demand of census data users across board.

On this occasion, I would like to extend my sincere gratitude to the Government of Rwanda and development partners for availing financial, logistical and technical support to the 2022 RPHC. The NISR would like to appreciate all stakeholders who worked tirelessly with us to ensure that the 2022 Rwanda Population and Housing Census operation was successful.

Special recognition also goes to the Ministry of Finance and Economic Planning, Ministry of Defence, Ministry of Local Government, Ministry of Education, Ministry of Foreign Affairs, Ministry of ICT and Innovation, Ministry of Interior, Ministry of Health, Ministry in Charge of Emergency Management, the Rwanda National Police, Rwanda Correctional Services, Rwanda Biomedical Center (RBC), Rwanda Information Society Authority (RISA), Rwanda Utilities Regulatory Authority (RURA), Rwanda Public Procurement Authority (RPPA), Office of Government Spokesperson (OGS), and Rwanda Broadcasting Agency (RBA) for their direct involvement in awareness campaign, logistical and data collection operations.

I also wish to express my appreciation to the local government authorities and NISR staff for their excellent operational organization and to the tens of thousands of enumerators and supervisors for their painstaking efforts throughout the data collection phase.

Finally, to the people of Rwanda, residents, and visitors, your cooperation was crucial towards the success of the census.

Thank you.

MURANGWA Yusuf
Director General,
National Institute of Statistics of Rwanda

EXECUTIVE SUMMARY

This report presents estimates of the current and lifetime fertility levels, differentials in Rwanda based on the 2022 PHC. There three key findings of the analysis:

- Fertility has declined substantially since 1978 however, its level has not reached that of replacement (TFR of 2.1 births).

- Fertility levels by level of education have changed since 2012 census. Fertility level of women with secondary education or higher increased compared to the census of 2012 (2.6 children by woman in 2012 against 3.4 children by woman in 2022) while fertility level of those with primary education is now higher than those who have never been to school (3.6 and 3.9 children by woman respectively). Trend data on fertility levels for women with primary education may have stalled.

- Although adolescent fertility level in the country is lower than in most countries in Sub Saharan Africa, it is still important. About 25 births for every 1000 women aged 15-19 had a birth 12 months prior to census date. Adolescent fertility rate is highest in Eastern Province at 36 per 1000 and lowest in Kigali City at 19 per 1000.

Fertility Levels and trends

A woman residing in Rwanda would have on average 3.6 children at the end of her reproductive life. The level of fertility is lowest at 3.0 births per woman in Kigali City, and highest in Eastern Province at 4 births per woman on average. There has been a shift in the observed levels of fertility by province. In 2012 fertility level was highest in Eastern and Western provinces, however in 2022 highest level is only in Eastern Province.

Over the last four and half decades fertility has declined from a high of 8.6 births per woman in 1978 to 3.6 births per woman in 2022. This represents a decline of 5 births (about 58 percent). However, the declines in fertility was not uniform over time. It was slow at the beginning, followed by an increase then a fast decline from the year 2005. This roughly corresponds to four distinct periods: (i) the mid 70's to mid-90's when an explicit anti-natalist policy was implemented; (ii) the period from 1990 to 1994 which correspond to a civil unrest, (iii) the genocide against the Tutsi aftermath where families were being reunited and baby boom took place to replace the deceased as is classically observed after conflict with high death toll; and (iv) the period 2005 to present characterized by a strong population and development policy at harmonizing the availability of resources in the country with population growth.

Age patterns of fertility and its timing

The age pattern of fertility in Rwanda is similar to other developing countries notably sub-Saharan African countries. The country experiences low levels during the adolescent period (less than 0.03 child per woman between age 15 and 19 years). In the sub-sequent ages fertility increase to reach its maximum by age 25-29 years (0.176 child per woman). Thereafter it decreases continuously to reach 0.015 child per woman by age group 45-49 years. This age patterns of fertility varies by Province and place of residence. In the City of Kigali, the age group of maximum of the childbearing is in the age 30-34 years while in other provinces, it is 25-29years. This is consistent with the mean age at childbearing: it is lower as 29 years in the Eastern Province and higher as 30 years in the City of Kigali.

Fertility differentials by socio-economic characteristics

The level of fertility varies according to different attributes or characteristics of a population. Fertility is lowest among women with higher levels of education and highest among those with primary or post primary level. This observation is like the results from the 2020 RDHS. Trend data from RDHS shows that fertility has been increasing among those with secondary or higher education but stagnant among those with primary level while it continued to decline for women who have never been to school.

With reference to religion, fertility varies from a minimum of 3.0 children per woman among Jehovah Witness to a maximum of 3.8 children per woman among Protestants. TFR is 3.6 among Adventists. The low level of fertility among Catholics (TFR of 3.5) as compared to Protestants (3.8) is explained by the Catholic Church's program that promotes natural family planning only. Moreover, Catholic women are more likely to use modern contraception ceteris paribus as shown by UWAYEZU (2009) in a

multivariate analysis of the determinants of modern contraception use among Rwandan women.

Muslim's fertility is the second lowest one after the Jehovah witnesses (3.3 children per woman) may be explained in the case of Rwanda by the fact that Muslims reside mainly in urban areas. Muslim women have therefore more modern fertility behaviours than most of the other women.

Adolescent fertility

Adolescent fertility refers to births from women aged 10-19 years. It is generally measured through three indicators.i) adolescent fertility which is the number of births per 1000 women age 15-19; and ii) Early adolescent fertility which refer to births per 1000 or 10 000 to women in the age group 10-14; and the proportion of adolescent who have given birth by age. Data from census indicates that for every 1000 adolescents aged 15-19, nearly 25 had a live birth in the 12 months prior to census date. Adolescent birth rate was slightly higher in rural areas (28 births per 1000 women) compared with the urban areas (20 births per 1000 women). Adolescent birth rate is highest in Eastern Province at 36 births per 1000 women and lowest in Kigali City (19 births per 1000 women). Although adolescent birth rate is low when compared to other Sub-Saharan African countries, the risk of teenage motherhood still deserves utmost policy attention because of its socio-economic implications to both the adolescent mother and their children.

Fertility among adolescents is very low before age 17 but becomes substantial at age 18 and 19. In fact, the percentage of adolescent girls who gave birth is 2.6% at national level. It is stable around 1% up to age 16 from which it starts to increase quickly: 2.6% at age 17, 6.7% at age 18 and 13.4% at age 19.

This pattern does not vary much by area of residence but varies significantly by current school attendance. It is far higher among out of school adolescents(more than 20%) than among in-school adolescents(1.7%). In terms of provincial variations, adolescent fertility is close to the national level in the Southern and Western provinces, higher in the Eastern Province and lower in the City of Kigali and the Northern province .

Overtime, adolescent fertility has decreased between 2002 and 2022, from 3.6% to 2.6%. Though adolescent fertility is decreasing, its contribution to the Total Fertility Rate (TFR) has increased from 3% to 4% between 2002 and 2022.

Late childbearing

Starting childbearing at late age bears many risks to the health of mother. Age 35 is usually set as the lower age boundary for late childbearing onset. In Rwanda late childbearing onset is rare, as it represents only 1.2% totalizing 4,091 women. This frequency was 0.5% in 2012. Moreover, women who pursue childbearing until late ages are exposed to high risks for their own health and their children. In this analysis we define late childbearing as giving birth at 45 years or above. The 2022 Population and Housing Census recoded a frequency of late childbearing of 0.42%. The level of late fertility behaviour does not vary by women's characteristics such as province of residence, urban-rural residence, educational attainment.

Premarital fertility

At the national level 14% of never married women at the time of the census have already given birth. This percentage does not vary by area of residence and varies only slightly by province from 13.2% in the Western, 13.9% in the Northern Province, 14.7% in the City of Kigali and 15% in the Southern Province. It varies more importantly according to educational attainment level, religious affiliation. The prevalence of premarital fertility varies from 10.4% among women with secondary and above educational attainment level to 11% among those with primary level and 34% among non-educated women. By religious affiliation we distinguish three main groups: Women with no religious affiliation who have the highest prevalence of premarital fertility (23%), the Jehovah witness, Protestants and Adventists with a relatively lowest percentage of premarital fertility (11%, 13.5%, and 12.9% respectively), and the Catholics, Muslims and women with other religious affiliation who have prevalence of premarital fertility between 14 and 19 (14.4%, 17.9%, and 14.9% respectively).

Infertility and sterility

The percentage of childless women at the end of the reproductive span (50-54 years or 55-59 years) is an indirect measure of the prevalence of sterility or infertility in a population. About 3.7 % of women aged 50-54 were

reported as childless. Trend data shows that the proportion childless at age 50-54 have slightly increased since 2012.

General fertility indices

Overall, Rwandan women gave births to 364,549 babies during the 12 months preceding the census, equivalent to approximately 999 births per day. In other words, 41 babies are born in Rwanda every one hour. The corresponding Crude Birth Rate (CBR) is 27.8 births per thousand inhabitants per years and the General Fertility Rate (GFR) 105.5 births per thousand women aged 15-49 per year. Fertility has decreased a lot since 1978. The Standardized Birth Rate (SBR) was 54 children per 1,000 inhabitants per year in 1978, 46 in 1991, 41 in 2002 31 in 2012, and 27.4 in 2022. Fertility varies significantly across Provinces. The SBR varies from a minimum of 22children per one thousand inhabitants in the City of Kigali to a maximum of 30 in the Eastern Province.

Population Replacement

To ensure that the population will not decline over time, each woman in the reproductive age should be replaced at least by one daughter. There are three indicators to capture the likelihood of the population to be replaced. The first one is the TFR that should be greater or equal to 2.1 children to ensure the replacement of the population for the next generation. The two others are the Gross Reproduction Rate (GRR) and the Net Reproduction Rate (NRR) which are the number of daughters a woman would have at the end of her reproductive life under the current fertility conditions not taking into account female mortality (GRR) and taking it into account (NRR). Both GRR and NRR should be greater or equal to 1 to ensure that each female is replaced by a daughter.

According the 2022 PHC, the TFR is 3.6 children per woman, the Gross Reproduction Rate (GRR) is 1.8 daughters per women, and the Net Reproduction Rate (NRR) is 1.7 daughters per woman. All these indicators show that the replacement of the Rwandan population is guaranteed.

CHAPTER 1: OVERVIEW OF THE FIFTH RWANDA POPULATION AND HOUSING CENSUS

1.1. Context and justification

The history of the Population and Housing Census in Rwanda dates back in the 1970s. To date, five modern censuses have been successfully conducted in Rwanda: 1978, 1991, 2002, 2012 and 2022.
In line with the United Nations Decennial Census Programme, the 2022 Census is the Fifth Rwanda Population and Housing Census (RPHC5) in series.

Since 2000 and following the endorsement of recommendations from major international conferences held under the auspices of the United Nations, the Government of Rwanda (GoR) has been focusing on the long-term Vision 2020 that aims at transforming Rwanda into a middle-income country. Rwanda pursued the Millennium Development Goals (2000-2015) on the international scene and currently seeks to achieve the Sustainable Development Goals (SDGs) as well as Rwanda's Vision 2050. These goals have been implemented through the medium-term planning framework of the Economic Development and Poverty Reduction Strategy (EDPRS) and the National Strategy for Transformation (NST1). The measurement of progress in implementing national and international programmes in line with various AU and UN recommendations calls for availability of updated demographic and socio-economic statistical data to inform selected indicators at different levels.

The RPHC5 is a reliable and comprehensive source of such data. It was implemented in a way that allows the disaggregation of indicators at the lowest geographical level where it is applicable. The RPHC5 was undertaken to update the national mapping and demographic databases, to provide indicators for monitoring poverty reduction strategies and achievement of national, regional, and international development goals (NST1, Vision 2050, AU Agenda 2063, SDGs, etc.) and to strengthen the technical capacity of the National Institute of Statistics of Rwanda (NISR).

1.2. Legal and institutional frameworks

As an essential precondition for Census execution, the legislation of its operations was secured by the law No. 53bis/2013 of 28/06/2013 establishing the National Institute of Statistics of Rwanda and determining its mission, organization and functioning; and law No. 45/2013 of 16/06/2013 on the organization of statistical activities in Rwanda.
In order to ensure focused functioning during the whole period of Census execution, a Census Unit of NISR coordinated the overall implementation of the 2022 RPHC5 with support from other NISR units.

1.3. Objectives of the Census

The overall goal of the Fifth Rwanda Population and Housing Census (PHC5) is to contribute to the improvement of the quality of life of the Rwanda population by furnishing the Government and other stakeholders with relevant, reliable, and timely data and information for development planning, policy formulation and service delivery as well as for monitoring and evaluation of development programmes.
Specifically, the 2022 Rwanda Population and Housing Census has been implemented and is well placed to:

- Have increased availability and accessibility of accurate, timely and reliable data on demographic and socio-economic characteristics for evidence-based decisions, policy formulation and monitoring and evaluation of development frameworks at national, sub-national and sectoral levels;
- Have increased knowledge of stakeholders, at all levels, on population characteristics, patterns and trends;
- Have strengthened national capacities in data collection, processing, analysis, dissemination and

utilization, including geographic information system (GIS).

- Have increased utilization, at all levels, of data and information for designing, monitoring and evaluating development programmes.

1.4. Census phases and Methodology

1.4.1. Census phases

Following the preparatory phase of the Census, which consisted of the production of the project document detailing all activities, schedule and Census budget, the following technical activities were undertaken:

- Census mapping conducted between 18th October, 2020 to 15th July, 2021;
- A Pilot Census conducted between 16-30 September, 2021;
- Questionnaire and manual development;
- Census publicity and sensitization campaign;
- Recruitment and training of field staff;
- Census enumeration conducted between 16 - 30 August, 2022;
- Post Enumeration Survey conducted between 16-30 September, 2022; and
- Post-census activities, including analysis and dissemination of census results.

The success of the RPHC5 is widely attributable to the rigorous pre-census planning and robust census enumeration monitoring undertaken by the NISR as well as the remarkable support received from the Government, people of Rwanda and the generous technical and financial assistance from international development partners.

1.4.2. Census Methodology

Census mapping

Census mapping was a crucial phase of the 2022 RPHC. The purpose of the census mapping is to divide the whole country into well-delineated enumeration areas that constitute the smallest operational census units to be assigned to each enumerator during the enumeration period.

The mapping used the latest versions of technology including satellite imagery and ArcGIS software to collect and document detailed information about the administrative units of the country, including boundaries, and locations of major social GPS coordinates of housing units and economic infrastructure (schools, health centres, hospitals, markets, administrative offices, etc.). These activities were carried out together with the estimation of the population and were used for delimitation of enumeration areas (EAs) in all villages (Imidugudu) of the country.

The Census mapping operation lasted for about 9 months (from 18th October, 2020 to 15th July, 2021), which enabled the NISR to better estimate the number of staff to be recruited (e.g., enumerators, team leaders, supervisors, etc.) and all logistics for the main field data collection. Details from the Census mapping also provided guidance for adequate planning of the other census infrastructures and facilities required for field activities.

The outcomes of the Census mapping included the production of a new sampling frame for future surveys and an updated administrative area boundary map for Rwanda. In total, the country was delineated into 24,339 enumeration areas within the current boundaries of administrative units, consisting of five provinces, 30 districts, 416 sectors and 2,148 cells and 14, 436 villages. This allows for easy compilation of census results in these administrative entities.

Pilot Census

Prior to the RPHC5, a pilot census was designed for testing the census questionnaires, other census data-collection tools, enumeration time requirements and the state-of-preparedness of the entire field work organisation of the census.

The pilot census was conducted from 16th to 30th September, 2021 on a sample of 600 EAs, including 416

randomly selected EAs across all sectors and 184 purposively selected EAs in the areas bordering neighbouring countries to Rwanda and in remote rural areas in order to test the internet connectivity, data transmission, and the availability of electricity.

The pilot census was initially planned for 16th to 30th August, 2021 just to fall one year before the main census but was postponed for one month to ensure adequate preventive measures against the spread of Covid-19.

The pilot census was a rehearsal for the actual census enumeration during which the various methods and procedures for field organisation and operations as well as the census publicity/awareness campaign, census maps production, field remote monitoring, data transmission and storage, ICT infrastructure, and data analysis were tested.

The lessons learnt from the pilot census exercise were used to revise some census procedures and instruments to ensure a smooth/successful implementation of the actual census enumeration.

Questionnaires and manuals

The questionnaires' design for the 2022 RPHC consisted of updating the questionnaires used during the 2012 census coupled with consultations with stakeholders such as planners and policymakers from different sectors, ministries, other government institutions, private sector, and government's stakeholders,... in order to collect their needs in terms of statistical data. After the development of the questionnaires and the instruction manual, the team of analysts developed questionnaire specifications to support and ensure a smooth translation of the paper based
questionnaire into the CAPI questionnaire by the IT and data processing team.

The lessons learnt during the pilot census were used by the NISR to improve and finalise the census
questionnaires, containing 131 variables, as well as to revise the manuals of instructions for all the census functionaries.

The questionnaires used for data collection are presented in Annex of this report. Two different types of questionnaires were administered: one for private households and one for institutional households. The questionnaire for private households contained a person record, a household record and a mortality record. The questionnaire for institutional households contained only a person record with few questions.

Census publicity and sensitisation campaign

The success of the census is dependent upon the cooperation and participation of the entire populace. It therefore, becomes imperative to sensitize and educate the public on the importance of the census, an objective that was achieved through the implementation of the communication strategy developed for the census. A phased approach was assumed in implementing the communication strategy that includes awareness in different ways and dissemination mechanisms.

Some of the methods used for publicizing the 2022 RPHC are as below:

a. Digital Communication Programme through websites, social media, and mobile platforms;
b. Public Relations, events and mass communication;
c. Traditional Advertising through mass and outdoor media;
d. Community Mobilization (Umuganda).
e. Radios/TVs shows communication on the census calling for the public participation.

Prior to census enumeration, a national publicity and sensitisation campaign was implemented in order to inform the public about the importance and relevance of the census (RPHC5), as well as to seek the active participation, involvement and collaboration of administrative authorities during the census enumeration.

A subtle and targeted publicity and awareness campaign was conducted before the census, which was later intensified and expanded to cover all districts and villages across.

NISR was responsible for organizing and coordinating, as well as preparing and implementing appropriate communication strategies to all communities at both national and district levels. The materials were appropriately packaged and delivered to the districts for the implementation of communication activities. In addition, the NISR coordinated and implemented communication interventions as guided by the communication strategy, and where necessary, by the prevailing conditions at the district level. Census's tasks force at Province and District levels played an important role in the census public awareness.

The census results published including the population projections attest to the high level of cooperation of the political and administrative authorities and the effective participation of the general public in the entire census enumeration operation and processes.

Recruitment and training of field staff

The RPHC5 was conducted by personnel from various institutions: the NISR (the census executing agency), the Rwanda Defence Force through involvement of the Ministry of Defence, the Ministry of Emergency Management, the Rwanda National Police, the Rwanda Correctional Services and MINEDUC (Sector Inspectors of education and teachers).

The recruitment of Census functionaries was done by each institution according to the needs (i.e., number and categories of staff needed) of the NISR, except in the case of teachers whose recruitment was done by the NISR in collaboration with administrative authorities at the district and sector levels.

At each stage of census implementation, the necessary induction and mandatory training of NISR staff and census personnel took place. For example, the census mapping phase was preceded by the training of cartographers, while the pilot census and the actual census enumeration were preceded by the training of enumerators, data quality monitors and their supervisors.

About twelve weeks prior to the commencement of actual Census enumeration, cascaded trainings were organised for all categories of census functionaries, namely:

a. Core training for 59 people (exclusively NISR staff);
b. Master training for 200 master trainers (NISR staff expanded to the Data quality monitors/team leaders and special institutions national coordinators;
c. Training of trainers for 1,748 trainers organised in 30 training centres, one centre per district; and
d. Training of 26,536 enumerators in 445 training centres spread across all sectors of the country.

The census training sessions focused on understanding of census questionnaire content, census enumeration processes and the correct completion of census questionnaires, reading and interpretation of census maps, practical role plays, and field practice. All the trainers and trainees were subjected to mandatory qualifying tests which they had to pass before being appointed.

In order to mitigate the risk of declining quality of training at the various cascading trainings, the training content was recorded in audio-visual materials from the studio. The recorded materials were projected in each training centre and were registered in each trainee's telephone for use in case of electricity outage or at home.

Regarding the organization of the training in each centre, four trainers were in charge of the training centre. The training in each of the centres were coordinated at the central level by NISR trainers who moderated all training sessions using CISCO Webex to ensure that all contents were covered and timely management of the cessions.

Actual census enumeration

As planned, the actual census enumeration of the population in private and institutional households was conducted across the country from 16th to 30th August 2022, immediately after the Census reference night (the night of 15th to 16th August, 2022). Although data-collection activities were carried out by well-trained enumerators, quality assurance of the Census enumeration was ensured through close supervision at various levels.

The census personnel deployed for the RPHC5 comprised the following personnel:

a. Enumerators and support staff;
b. Sector supervisors;
c. Field monitors/data quality monitors and district team leaders;
d. Field analysts, data analysts; and
e. National coordinators.

In accordance with the instructions contained in the census manual, each personnel ensured the operations of daily census activities within their area of supervision. Enumerators were accountable for the work done on a daily basis to their sector supervisors, who monitored the progress using dashboards and field visits facilitated by two motorcycles hired to facilitate the transport of Sector Supervisors in their daily supervisory activities.

As the dashboard was accessible to all supervisors at different levels of supervision, each supervisor was expected to understand what was going on regarding the data collection and then provide explanations for any identified issues.

A team of 60 data monitors was working at NISR headquarters coordinated by 10 field analysts. They were responsible of the follow up on the progress of data collection through the dashboards in all enumeration areas. They interacted with sector supervisors on a daily basis by identifying the enumeration areas with low completion rates, and then suggesting possible solutions including redeployment of those who completed enumeration in EAs lagging behind. They were also reporting any issue that needed special attention of the coordination team.

The dashboards allowed coordination team to continually monitor the progress of census enumeration in all the 24,399 enumeration areas but also ensuring for quality of the census. The use of dashboards allowed the identification of the enumeration areas with risk of not completing the enumeration on time and where additional resources and support were needed (e.g. enumerators, means of transportation to ensure the completeness.

Post-enumeration activities

The post-enumeration activities include the Post-Enumeration Survey (PES), data processing, release of results, thematic analysis, and dissemination of census results. The use of technology at all stages of the census enabled the rapid and timely publication of the main indicators report, as well as the tabulations and summary results contained in the thematic reports and other census products.

The PES was conducted from 16th to 30th September 2022, just in one month after the main census enumeration. The aim of the PES was to assess the census coverage/completeness and quality of the census data.
A total of 180 enumeration areas were sampled from all districts of the country. To assess census coverage, PES and census records were matched, a task that was carried out using data science techniques and the Python programming language. Matching is the process of checking whether records from two different data sets relate to the same household and/or person match or not. In this work, both automatic and clerical matching methods were used.

The census dataset –stabilisation, data-processing, and data-editing processes were completed within two months, after which census data tables for all thematic reports were generated. The final results were subjected to an in-depth analysis across 18 generic themes (one of which is presented in this report) in accordance with the analysis plan developed for each theme. Census monographs for each of the 30 districts will also be produced.

Data quality assessment

An independent quality review (available as an internal report to NISR) was conducted in parallel with the thematic analysis. This investigated the work done prior, during, and after the census enumeration to maximise the level of data quality. The assessment confirmed strong planning and quality assurance throughout the enumeration. Assessment of the key demographic and socio-economic variables also confirmed the good quality of the RPHC5 data in terms of representation of the population.

The overall conclusion of the assessment is that the RPHC5 was implemented with strong quality controls and gives an excellent representation of the population of Rwanda with generally good measurement of its structure, both in terms of spread and demographic and socio-economic characteristics. The high quality of the data with respect to coverage and representation is confirmed by the results of the Post-Enumeration Survey, which measured the net coverage of the household population in the RPHC5 to be around 99% nationally with little variation across regions and by age and sex. Gross under-coverage was around 1.8% while gross over-coverage (erroneous inclusions) was around 0.2%.

The conclusion of excellent representation is also consistent with the plausible growth rate for the population over the intercensal period implied by the national results.

Some quality issues were identified on a few population characteristics. These include age heaping, particularly for ages with terminal digits 0 and 5. However, summary measures from Whipple's index, Myers' index and the UN

joint score indicate comparatively some improvement and a reduction in age heaping in the 2022 Census compared to the 2012 Census. There is also some evidence of under-reporting of infant deaths, and across other ages - hence the use of indirect methods is recommended for estimating mortality indicators.

In conclusion, there were no major quality issues identified in the 2022 Rwanda Population and Housing Census, except for some economic activity variables with low-quality reporting. The evaluation of key demographic and socio-economic variables as well as the triangulation of the data with other sources generally confirm the excellent quality of the RPHC5. Thus, the final database of the 2022 Rwanda Population and Housing Census is of high quality.

CHAPTER 2: CONTEXT AND OBJECTIVES OF THE ANALYSIS

Fertility is the most important component of the population change, so it remains a subject of active research. For more than four decades, Rwanda has been one of most of the countries that have regularly carried out operations to collect socio-demographics data enabling it to grasp the level and characteristics of the fertility of its population. To this asset we count the various PHCs respectively in 1978, 1991, 2002, 2012; the National Fertility Survey 1983, DHSs 1991, 2000, 2005, 2007-08, 2010, 2014-15, 2019-20, the Social Demographic Survey 1996, as well as the recent PHC 2022 whose data are subject of the current analysis. This section describes the general context of fertility in Rwanda and outlines the objectives of the analysis.

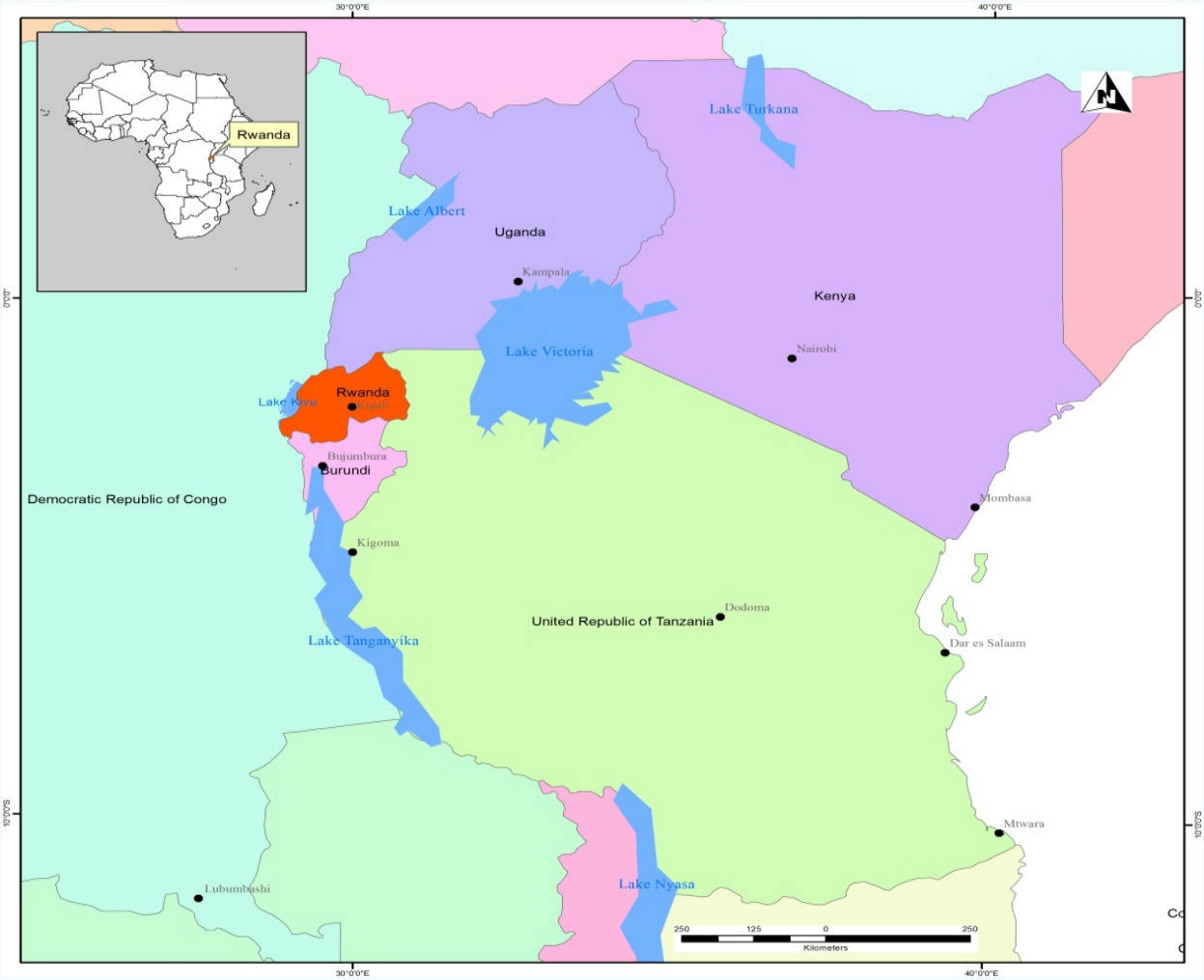
2.1. Context

Human reproduction is determined by both individual biological and behavioural characteristics, and wider socio-political, economic, cultural and spatial factors. For example, the probability of a woman having a birth is strongly influenced by her age. Human fertility is also determined by national and sub-national or regional population and sustainable development policies and related reproductive health and family planning interventions. The immediate social and cultural context where a woman or a couple lives is also critically important in determining the level of fertility. The analysis of fertility is critically important to understand population growth and its impact on society and to forecast future population development of a country.

2.1.1. Geographic context

The Republic of Rwanda is situated in Eastern Africa with a surface area of 26,338 square kilometres and is bordered by Uganda to the North, Tanzania to the East, the Democratic Republic of Congo to the West, and Burundi to the South (Figure 2.1). Landlocked, Rwanda lies 1,200 kilometres from the Indian Ocean and 2,000 kilometres from the Atlantic Ocean. Rwanda forms part of the highlands of Eastern and Central Africa, with mountainous relief and an average elevation of 1,700 meters.

Figure 2. 1 Geographic Location of Rwanda



2.1.2. Socio-cultural context

In Rwanda, as in most of African countries, children occupy a primordial place in society. This importance granted to the child and to procreation in general, finds its foundation especially in considerations anchored in the culture.

Apart from that culture, the Rwandan family that was formerly considered as a reliable value has been shaken to its depth by the Genocide against Tutsi in 1994. The entire rwandan society was profoundly affected by the war and genocide against the Tutsi in the early 1990s. Poverty and economic hardships increased the vulnerability of many families, particularly the internally displaced and returned refugees who left the country during the civil conflict, families of genocide against the Tutsi victims especially the widows and orphans and the perpetuators of genocide against the Tutsi related crimes.

In the aftermath of the 1994 genocide against the Tutsi, the country introduced political, economic and social reforms and managed to restore social harmony and to rebuild its physical and social infrastructure. The Government of Rwanda, since 1994 still prioritize its efforts on improving the health and education especially of young women. The focus of recent government policies has been on enhancing family values and wellbeing, and overcoming the social vulnerabilities associated with polygamy, widowhood, orphaned and street children, disabled and old people (Office of the Prime Minister, Republic of Rwanda, 2005). The National Strategy for Transformation (NST1) gives priority to gender and family promotion through a number of interventions such as facilitating women access to finance, mainstreaming gender in employment and job creation strategies, strengthening capacities of gender machinery and use of gender mainstreaming tools and disaggregated data to inform policy formulation and resource allocation; scaling

up ECDs at village level, continuing awareness and fight against gender based violence and human trafficking, and enhancing coordination among stakeholders to reintegrate street children and prevent delinquency1.

As seen elsewhere in Africa, childbearing is universal and a social norm in Rwanda. A union, formal or only consensual, without any children is often deemed precarious or socially unacceptable in many countries of Africa. Ilinigumugabo (1989, p. 40) argues that: "Like any African woman, the Rwandan woman is supposed to be as productive as possible; she has to produce so many children and descendants." In other words, it is considered as a sin for not having children when a woman is fertile. This ideology is deeply embedded in the sociocultural life and religious beliefs of Rwandan society where children are regarded as the foundation of family life.

Families in Rwanda are seen as 'core of life, cradle of the future and pillar of happiness' (Office of the Prime Minister, Republic of Rwanda, 2005, p.2).

Fertility is also linked to religion and religious beliefs in Rwanda. According to the 2022 Population and Housing Census data, the Rwandan population is predominantly Christian (approximately 92.38%): 40% Catholics, 21.3% ADPER, 14.6% Protestants, 12.2% Adventists, 4.2% other Christians, about 2% are Muslims, 0.7% are Jehovah witness; 0.02 % are followers of the traditional religion/animist, 2% follow other religions, 3% are with no religion; 0.02% didn't want to state their religious affiliation, while about 0.012% stated that they don't know their religious affiliation. All Christians religions are generally pro-natalist and reinforce the beliefs that children are a gift from God.

2.1.3. Economic and social context

Agriculture still the backbone of Rwanda's economy and the majority of households in Rwanda are engaged in farming, crop production or livestock activity. According to data from the 2017 EICV5 (national survey on the households living conditions), 70% of the active population works in the agricultural, fishing and forestry sector, with a higher representation of females (79.6%) than males (58.6%)2 .

The households engaged in agriculture tend to have usually high fertility rates. The agricultural sector in Rwanda is not modernised as in economically developed countries which trigger the demand for surplus people. This is perhaps one of the reasons for sustained high fertility rates in rural Rwanda. Yet another reason is the widespread poverty in Rwanda which is strongly associated with high fertility. The 2017 EICV5 data show that about 38.2% of the population was poor in 2016/17 compared to 39.1% as measured by the EICV4 in 2013/14. During the same period, the extreme poverty dropped from 16.3% to 16%3 (NISR, 2018b).

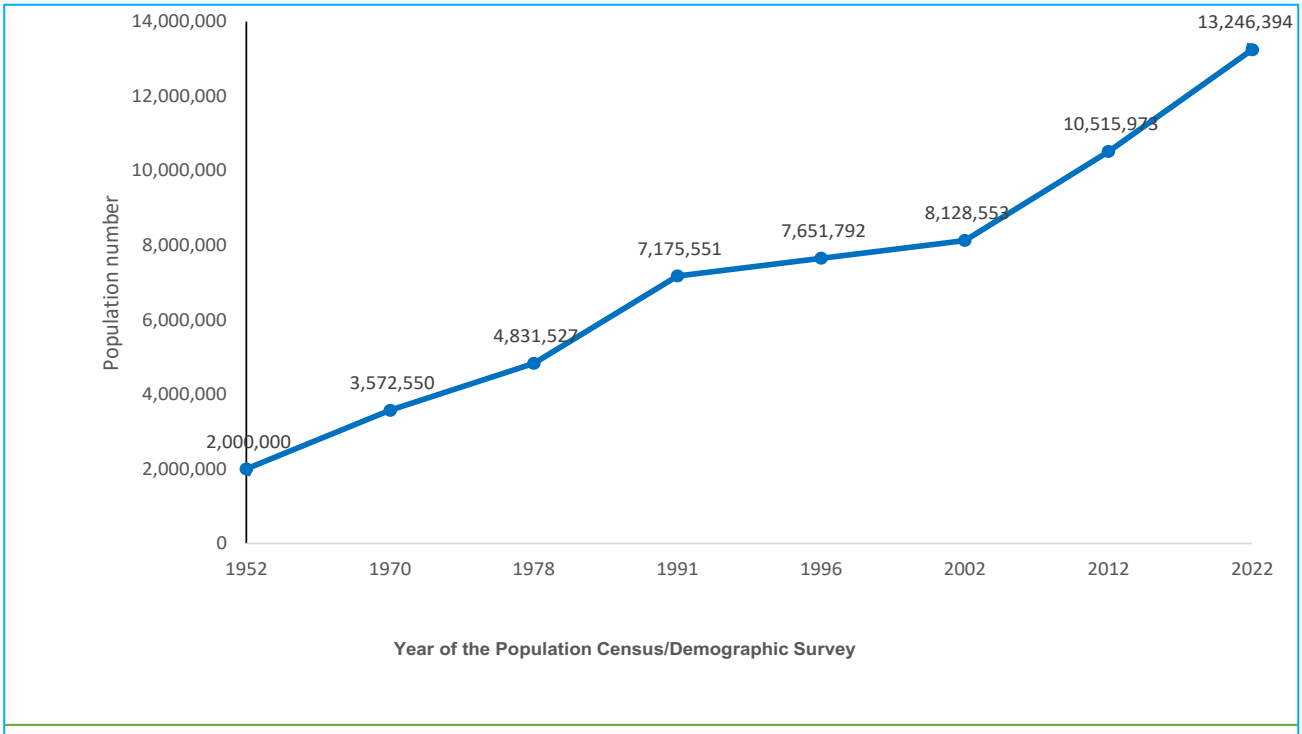
The third economic characteristic that is linked with fertility behaviour is education. Formal education provides new knowledge and skills for human development. Women with generally secondary or higher educational level have a relatively low fertility, while women with no education have high fertility. Until recently the majority of women in Rwanda had little or no formal education. However, in recent years there has been substantial progress in school enrolment and education attainment rates. According to the 2022 PHC data, about 16% of women aged 10 years and above have never attended school, 59% have attended the primary level and only 24% has a secondary or higher level of education.

[1] 7 Years Government Programme: National Strategy for Transformation (NST1) 2017-2024
[2] National Institute of Statistics for Rwanda, Economic activity report, December 2018, p35
[3] National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report, 2016/17, November 2018, p21

2.1.4. Demographic context

It took about 50 years between 1900 and 1950 for the Rwandan population to double its size from 1 million to nearly 2 million. The 2012 PHC estimated the Rwandan population at 10,515,973 million (Figure 2. 2) while the 2022 PHC recoded a population of 13,246,394 million persons. Population growth was very slow before 1950. Between 1978 and 1991, Rwandan population was growing annually at a rate of about 3% which then slowed down to 1.2% between 1991 and 2002 before increasing again at an annual rate of 2.6% between 2002 and 2012. The average annual growth rate between 2012 and 2022 is estimated as 2.3%. Population projections based on the current growth trends suggest that Rwandan population is likely to double within the next 30 years.

Figure 2. 2 Evolution of the Rwandan Population between 1952 and 2022



Source: Population and Housing Censuses (1978, 1991, 2002, 2012,2022), Demographic Survey (1952, 1970) and Socio Demographic Survey, 1996

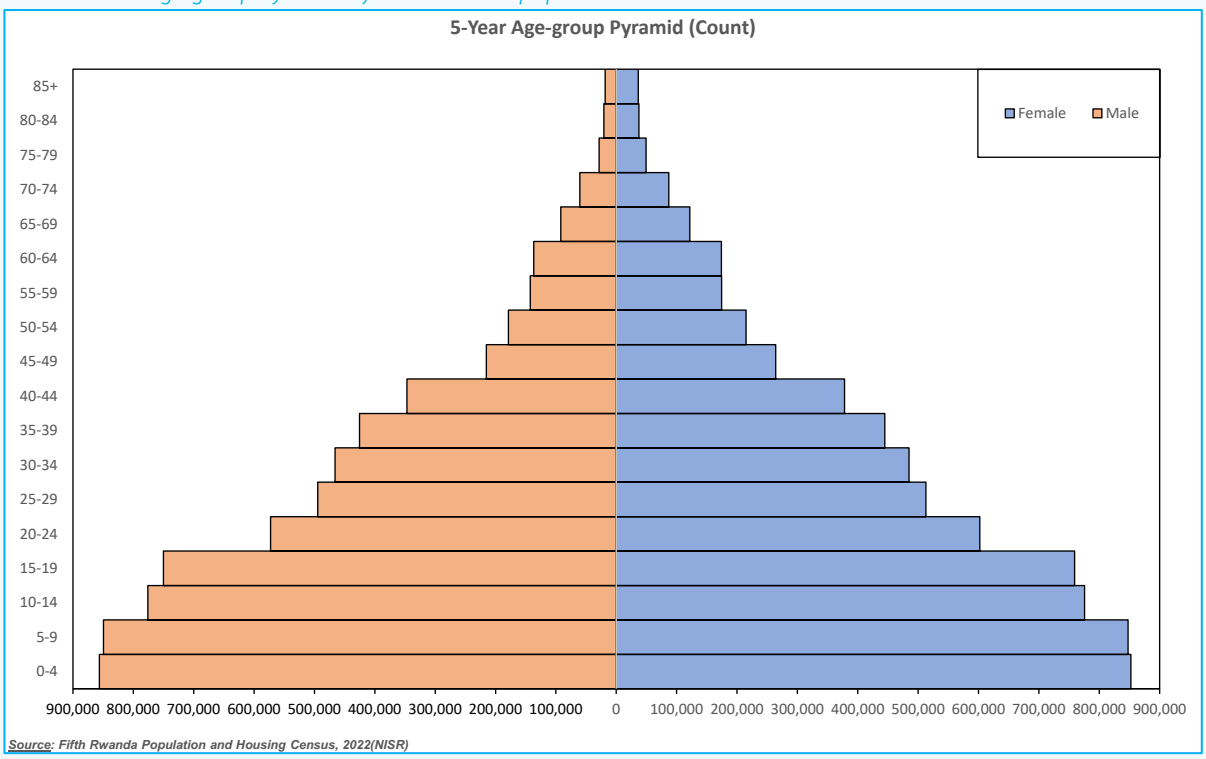
The population growth rate in the country is mainly driven by fertility levels. Even during the period 1991-2002 where the growth rate appears slow, fertility was high, because the slowdown of the population growth was due to the 1994 genocide against the Tutsi which claimed the life of more than one million people.

Before the genocide against the Tutsi, the total fertility rate was 6.2 births per woman in 1991 which then decreased to 5.8 in 2000 (NISR, MOH and ICF International, 2012). Fertility rates increased again in 2005 to 6.1 births per woman and then declined substantially to 4.6 in 2010, 4.2 in 2014/15 and 4.1 births in 2019/20 (NISR, MOH and ICF International, 2020).

The historical high fertility in Rwanda along with high mortality is clearly reflected in the age-sex structure of the population in 2022 (Figure 2.3). The population pyramid is characterized by a broadened base narrowing quickly with age. About 37.4% of the population is below 15 years and those in the working age 16 and above constitute to about 60.2% while those aged 65 years and above represent only 4.2% (PHC 2022). In addition, the Rwandan population is predominantly female (51.5% of the resident population). Among them, 62.9% are in the childbearing age (10-49 years). The vast majority of Rwandan population lives in rural areas (72.1%) where generally fertility is high since the population is less receptive to family planning campaigns and has relatively low access to reproductive health services. This high population share of young people and the predominance

of rural residence indicate that the future growth potential of the Rwandan population is still high.

Figure 2. 3. 5-Years age group Pyramid of the Rwandan population in 2022



2.1.5. Policy context

In Rwanda, issues related to population and development has long been a central concern for political authorities. In order to improve the standard of living of the population, the Government has developed a number of population programmes and policies to ensure balanced population growth and distribution of available resources. Concrete actions to reduce the level of fertility were taken through different strategies. Four stages of policy interventions and responses can be identified:

a) Anti-natalist policy in the period 1974–1990

An explicit anti-natalist policy was implemented during the period 1974-1990 based on fertility reduction through the promotion of use of modern contraception. In 1974, a Scientific Advisory Board for socio-demographic issues was established. Its mission was to identify and analyse all issues related to population growth and to propose relevant solutions (ONAPO, 1991 pp. 38-39). However, as the name suggests, the purpose of the board was only consultative for a term of six years. Therefore, in order to promote a much more dynamic population policy to serve as a framework for the proposed solutions, the board proposed the creation of an independent institution in charge of studying constantly all population issues.

This recommendation was quickly accepted by the President of the Republic who announced in his speech of January 8, 1979, the creation of the National Office of Population (ONAPO) replacing the Scientific Advisory Board as follows:

> *"... what should concern all leaders and all our managers is the fact that Rwanda should be able to feed all Rwandans. Our planning services must ensure to restore and maintain a balance between consumers and what we are capable to produce. Thus, in demographic terms, I felt it necessary to strengthen the "Scientific Advisory Council for the socio-demographic problems" which now is an*

independent service under the Ministry of Social Affairs and the Cooperative Movement." (ONAPO, 1991, pp. 38-39).

Thus, the National Office of Population (ONAPO) was created in 1981. The objectives assigned to this office were, among others:

- Analyse all the aspects related to population growth and its impact on the socio-economic development.
- Propose solutions that achieve a balance between increasing population and production;
- Study the process of integration of family planning services in public health and propose to health officials the best way of this integration;
- Manage the family planning services;
- Participate in the development of school curricula at all levels in terms of population (ONAPO 1985 quoted by Ilinigumugabo, 1989).

In the same line, the first program of family planning was launched in 1982. Its activities included staff training, improving access to services, and increasing awareness about family planning through Health workers ("Abakangurambaga").

Eight years later, the first national population policy was adopted. It was designed to slow down population growth mainly by reducing fertility through family planning. The main demographic objectives were, among others, to reduce population growth from 3.6% in 1990 to 2.0% in 2000, by increasing the use of moderns Family Planning methods from 12% in 1990 to 45.7% in 2000, which would decrease the number of children per woman from 8.5 in 1990 to 4.0 in 2000.

b) Civil unrest (1990–1994)

This 1990-1994 period corresponds to the civil unrest years which impeded the implementation of population policies adopted earlier. The population policy adopted in 1990 was not implemented nor extended as originally planned due to political upheaval following the 1990 war and 1994 genocide against the Tutsi.

c) Genocide against the Tutsi aftermath and recovery (1994–2003)

The genocide against the Tutsi aftermath and recovery (reconstruction period) was characterized by a baby boom. Rwandans, who were traditionally pro-natalist, sought to compensate for loss of human lives occurred during the 1994 genocide against the Tutsi where an estimated one million people or more died. Therefore, after the 1994 genocide against the Tutsi, population issues had taken a new dimension, both in terms of the quality of life and reducing population growth.

d) Population and socio-economic sustainable development (2003– to present)

The post 2003 years witnessed the introduction of various population and sustainable development policies and programmes to address diverse population issues including fertility reduction through increasing access to reproductive health services. The objective was to transform Rwanda to a Middle-Income Country (MIC) by 2020.Virtually all sectors were targeted: education for all, universal access to health care, women empowerment and gender equity promotion, to quote a few.

In 2003 a new population policy was adopted in a different international context. Indeed, at the Cairo 1994 International Conference on Population and Development (ICPD), participating countries, including Rwanda, adopted resolutions recommending to focus on the quality of life than the population size control.The Rwandan population policy was formulated based on this vision. In addition to reduce high population growth rate, the policy also aimed at achieving sustainable economic growth, food security, health, education, human resources development and management, environmental management and good governance (ONAPO, 2003a). However, ONAPO heading the National Population Policy was dissolved and the different population problems were mainstreamed in different government ministries.

A National Policy for Reproductive Health policy was adopted in July 2003, with the primary objective of improving the overall health of the population, with a specific focus on reducing maternal and infant mortality.

Other policies and programs directly impacting fertility were also adopted during this period. The country adopted a National Education Policy and a Girls Education Program to promote, among others, mass education

enrolment of girls and to reduce female school drop-out. This coincided with the implementation of a dynamic gender equity policy focused on promoting women's empowerment, strengthening strategies to improve inter-spousal communication and encouraging wider participation of men in reproductive health and family planning.

In the same line, the EDPRS-I (2008-2012) included among its priorities the improvement of health and slowing down the population growth. In that perspective the EDPRS-I targeted a TFR of 4.5 by 2012-2013 and a modern contraceptive prevalence rate of 70% among females aged 15-49. The National Strategy for Transformation (NST1 2017-2024) states that the contraceptive prevalence will move from 48% to 60%. This will be achieved through ensuring universal access to contraceptive information and services to avoid unplanned pregnancies and prevention of sexually transmitted diseases with a particular focus on the youth.

2.2. Justification and relevance of fertility analysis based on census data

Fertility analysis is of central importance in demographic analysis because it is a fundamental engine of population growth. Fertility is also indispensable for determining a country's future population growth and evaluating the effectiveness of family planning and other population and social programmes. Knowledge of fertility levels and trends helps the government and policy makers formulate and evaluate policies relates to populations changes. Furthermore, analysis of fertility trends helps to predict demand for public services such as health and education facilities among others.

Depending on data availability, fertility can be measured directly from vital registration systems, birth history data from demographic and health surveys and population censuses. Census is unique source to analyse fertility at different geographic levels and across different socioeconomic strata in countries such as Rwanda where the civil registration system coverage is not yet universal. Survey data such as DHSs, though collect more information than censuses, are limited by their sample size and cannot be disaggregated at lower administrative units.

2.3. Objectives of the analysis

The overall objective of the analysis is to generate the current levels of fertility, its trends and its variation by geographical and socio-economic characteristics.

The specific objectives are to:

- Provide the levels, trends and differentials of natality;
- Provide the levels, trends, age patterns and differentials of current fertility;
- Provide the levels and trends in infertility;
- Provide the levels and trends of high-risk reproductive behaviour
- Suggest policy and program implications of the findings.

CHAPTER 3: METHODOLOGY

This section presents the definitions of the main concepts and key indicators utilized in the report. It also presents the methodology used to collect data and to evaluate the quality of fertility data reported.

3.1. Definition of the main Concepts and key indicators

The term fertility refers to the number of births a woman has had whereas fecundity is the biological ability of women to reproduce. Infertility is the biological inability of women to conceive. The key indicators of period and cohort fertility and their measurement are discussed below.

Fertility: The reproductive performance of an individual, a couple, a group, or a population. Sometimes a distinction is made by age of the woman or birth order of the index child such as first-birth fertility, second-birth fertility, and so on.

Natality: The term natality expresses the frequency of births in a population.

Fecundity: The biological capacity, of a woman, a man or a couple, to produce a live birth. Fecundity varies widely from one individual or from one couple to another.

Infertility: The biological inability of a man, a woman or a couple to conceive.

Infecundity: The biological inability of a man, a woman or a couple to produce a live birth. Its synonym is sterility.

Childlessness: is the condition of living up to age without ever having a live birth. The condition can either be voluntary or involuntary and often taken as a proxy measure of infertility.

Crude Birth Rate (CBR): Crude Birth Rate (CBR) is the most basic form of fertility measure. It is defined as the total number of births during a calendar year divided by the corresponding mid-year population. CBR is usually expressed per 1000 population. The indicator is crude because it relates births to both men and women, heavily confounded with the age distribution of the population. However, the indicator is widely used to indicate the overall effect of fertility and that it could be estimated easily with minimum data requirements.

$$\text{CBR} = \frac{\text{Number of Births in a year}}{\text{mid} - \text{year population}} \text{x}1000$$

Age-Specific Fertility Rate (ASFR): Age Specific Fertility Rate (ASFR) is the number of births in a year to women in a specific age group divided by the mid-year population of women in that specific age group.

$$\text{ASFR} = \frac{\text{Number of Births in a year to women aged x to x} + \text{n}}{\text{mid} - \text{year population of women aged x to x} + \text{n}} \text{x}1000$$

where n is the width of the age interval.

General Fertility Rate (GFR): General Fertility Rate (GFR) is similar to CBR except that the GFR measures the number of births in a given year divided by the corresponding mid-year population of women in the childbearing years (15-49).

$$\text{GFR} = \frac{\text{Number of Births in a year}}{\text{mid} - \text{year population of women aged } 15 - 49 \text{ years}} \text{x}1000$$

Mean Age at Childbearing: The Mean Age of Childbearing is another fertility measure that determines the average age at which women experienced childbearing. It is a summary of the timing of fertility within a population or a group of women.

Total Fertility Rate (TFR): Total Fertility Rate (TFR) is the average number of children a hypothetical cohort of women would have at the end of their reproductive period during their lifetime if they were subject to experiencing the ASFRs of a given period. It is calculated by summing the ASFRs and multiplying the sum by the width of the age interval.

$$\text{TFR} = \frac{(\text{Sum of ASFRs to women aged } x \text{ to } x+n)xn}{1000}$$

Parity: The number of children born alive to a woman.

Reproduction rates: The indicator that measures in which conditions generations are replaced. If calculated not taking into account women's mortality it is called Gross Reproduction Rate (GRR). The GRR is exactly like TFR, except that it counts only daughters and literally measures "reproduction"– a woman reproducing herself in the next generation by having a daughter. The GRR is estimated by multiplying the TFR by the percentage of female at birth. The GRR, like TFR, assumes that the hypothetical cohort of women pass from birth through their reproductive life without experiencing mortality. This assumption is satisfactory when one wants to compare levels of fertility and/or gross reproduction across populations and over time. For a more realistic assessment of the reproductive potential of a population, taking into account mortality, one needs to calculate the Net Reproduction Rate (NRR). The NRR is obtained by multiplying the ASFR by the Survivorship rate of corresponding age-group from the women life table and summing up all these values. When NRR equals 1, then each generation of women is exactly reproducing itself. When it is larger than 1, the next generation will have more women. When it is smaller than 1, the next generation will have less women.

$$\text{GRR} = \frac{(\text{Sum of ASFRs to women aged } x \text{ to } x+n \text{ for female births})xn}{1000}$$

$$\text{NRR} = \frac{\text{GRRx Proportion of women surviving in each age group})xn}{1000}$$

Parity progression Ratios (PPR): Parity is the number of children born alive to a woman at a given age. Zero parity women are those with no live births and single parity refers to those women who have one child and so on. Parity Progression Ratio (PPR) is the probability of having another child given that the mother has reached certain parity. PPRs are usually represented as a0, a1, a2 and so on. The term a0 at the end of reproductive period is a measure of infertility. Women progressing to higher parities usually have high fertility rates.

3.2. Method of data collection

For more than 40 years, Rwanda has collected socio-demographic data to evaluate fertility levels and other general characteristics of the population. These efforts include the following censuses and surveys: the 1978 Rwanda General Population and Housing Census, the 1983 National Fertility Survey, the 1991 Rwanda General Population and Housing Census, the 1992 Rwanda Demographic and Health Survey, the 1996 Socio-demographic Survey, the 2000, Rwanda Demographic and Health Survey, the 2002 Rwanda General Population and Housing Census, the 2005 Rwanda Demographic and Health Survey, the 2007-08 Rwanda Interim Demographic and Health Survey (RIDHS), the 2010 Rwanda Demographic and Health Survey, 2012 General Population and Housing Census, the 2014-15 Rwanda Demographic and Healy Survey, the 2019-20 Rwanda Demographic and Health Survey and now the 2022 Rwanda Population and Housing Census which is presented in this report.

In the absence of data from civil registration system for the estimation of fertility measures, the alternative approach has always been to analyse the data collected from censuses and sample surveys. The 2022 Rwandan fifth PHC provides an opportunity to analyse relevant data

on births from which the most indicators on fertility can be obtained.

Fertility data collected in censuses seeks information about recent births (live births occurred in households during the 12 months preceding the census), and about lifetime fertility (live children ever born during women's reproductive life).

During the 2022 Rwanda Population and Housing Census, the following questions related to births were asked :

A. Lifetime fertility (Children ever born):

- Have {Name} ever given a live birth?
- If yes: - How many live boy births {Name} has ever had?
- How many live girl births {Name} has ever had?
- Among those boys, how many are still alive?
- Among those girls, how many are still alive?

B. Recent fertility (births from the 12 months prior to the Census night)

- During the 12 months prior to the census night {from 16/08/2021 – 15/08/2022} Did {Name} give a live birth?
- If yes: - How many live boys did {name}have gave during the 12 months prior to the census night {From 16/08/2021-15/08/2022} ?
- How many live girls did {name} have gave during the 12 months prior to the census night {From 16/08/2021-15/08/2022} ?
- Among those boys how many are still alive?
- Among those girls how many are still alive?

Questions on live births in the last 12 months allow to measure fertility at the census date. Information on all live births (ever born children) is used to determine the past fertility of women of childbearing age.

As all retrospective questions, answers on these questions suffer from different errors as it is presented in the next section.

3.3. Evaluation of data collected

The questions on fertility that are usually asked in population censuses provide data on both recent births and lifetime fertility. In the 1960s, William Brass and colleagues observed that each of the recent birth and lifetime fertility data collected by the census were subject to systematic underreporting. For recent births in the year preceding the census, both under and over-enumeration is likely due to misunderstanding of the reference period used and shifting recent births into the reference period (Moultrie et al. 2013). On the other hand, data on lifetime fertility are also subject to reporting errors with increasing age of the mother. There is a tendency among mothers not to report information on children who have died or those older children who have left home for a long period.

This section will examine the potential bias associated with data on recent births and children ever-born from the 2022 PHC and will further assess the severity of the bias they introduce in the data. In doing so, the analysis will specifically focus on the completeness of birth reporting and its variations by mother's age and sex of children, the plausibility and consistency of reported parities including the percentage of women with unknown parity. Where possible, appropriate corrections will be made.

3.3.1. Completeness of the reporting of births in the 12 months preceding the census

The completeness of the reporting of births in the 12 months preceding the census were assessed using different steps. First, the number of births reported was compared to the number of children aged 0 at the time of the census. It is expected that for the whole country, the number of births in the 12 months preceding the census would be greater or equal to the number of children aged 0, assuming there is no loss of information due to international migration of children aged 0. Second, the age-specific fertility rates (ASFRs) were graphically plotted to check if they follow the expected pattern for countries with high fertility. Third, the total fertility rates (TFRs) are estimated which will be compared against those from the RDHS for consistency and plausibility.

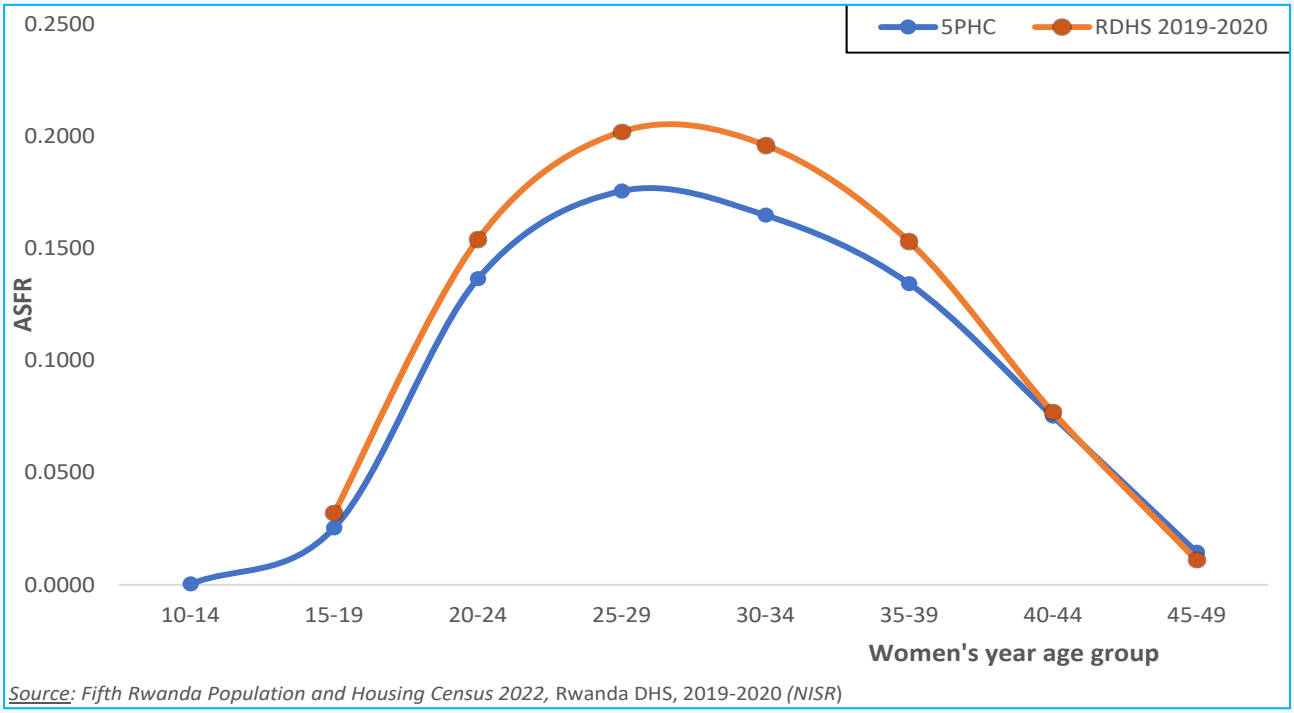
Overall, 364,549 births were reported by 3,312,743 private households whereas the number of children aged 0 in the household enumeration was 339,900. This clearly shows that there was no inconsistency and underreporting of births in the year preceding the census, since the reported

Figure 3. 1). Regarding the age-group 10-14, only 311 births were reported corresponding to a total of 775,575 women

recent births are greater than the population aged less than one year. The curve of the ASFRs below follows the expected pattern, the same as the 2019-20 RDHS, between age 15 and age 49 (

in that age group, suggesting either severe underreporting of births or very low fertility level in that age group.

Figure 3. 1Age-specific Fertility Rates (ASFRs) from the 2019-20 DHS and the 2022 PHC



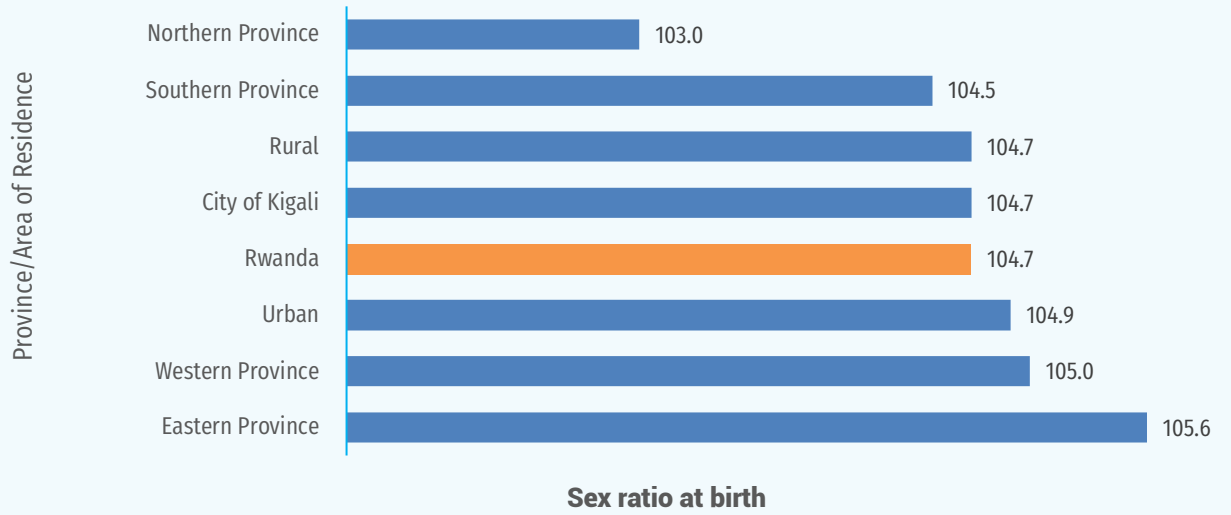
Source: Fifth Rwanda Population and Housing Census 2022, Rwanda DHS, 2019-2020 *(NISR)*

The final step in the evaluation of the completeness of the reporting of the births in the last 12 months is to be compare with the TFR calculated from the PHC data with the 2019-20 DHS, the most recent one in Rwanda. The DHSs are a good source of reference in measuring fertility. To allow comparison between the two sources, we have excluded the age-group 10-14 and considered only the age-group 15-49. The estimated TFR based on the 2022 census data is 3.6 children per woman which is not significantly different from the 2019-20 RDHS estimate of 4.1.

This confirms that there was no underreporting of births in the 12 months preceding the census. 3.3.2 Completeness of the reporting of births in the 12 months preceding the census by sex Globally, sex ratios at birth range between 102 and 107 except for countries which are known to have selective abortions. For sub- Saharan Africa the average of sex ratios at birth is about 103 male births per 100 female births4. The sex ratio based on the births in the 12 months preceding the PHC from women aged 15-49 was 105 males per 100 females. There are small variations (see Table 3.2 below) ranging from 103 in Northern Province to 106 in the Eastern Province

[4] Fengqing Chao, P Gerrland, A R Cook, and L Alkema 2019 Systematic assessment of the sex ratios at birth for all countries and estimation of national imbalances and regional reference levels proceedings of national academic sciences U.S.A 116, 9303-9311.

Figure 3. 2 Sex Ratio at birth by province and residence area



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

3.3.2. Completeness of the reporting of children ever born (the Brass and Rachad test)

An analytical way to evaluate the completeness of the reporting of children ever born is to calculate the modified General Fertility Rate (GFR) by Coale and Demeny (GFR1) and the modified GFR by Brass and Rachad (GFR2) and to compare these with the mean parity at 45-49 years (P7).

If Min(GFR1, GRF2)>P7, then there is underreporting of live births (Brass et Rachad, 1979; ONU, 1967).

GFR_1 (Coale et Demeny)	$=(P3)^2/P2$
GFR_2 (Brass et Rachad)	$=(P2)*(P4/P3)^4$
P2 :	Mean Parity at 20-24 years
P3 :	Mean parity at 25-29 years
P4 :	Mean parity at 30-34 years

For the 2022 PHC, GFR1=3.3, GFR2=4.2 and P7=4.5. Therefore Min(GFR1, GFR2)=3.3 is not greater than P7 (4.5).

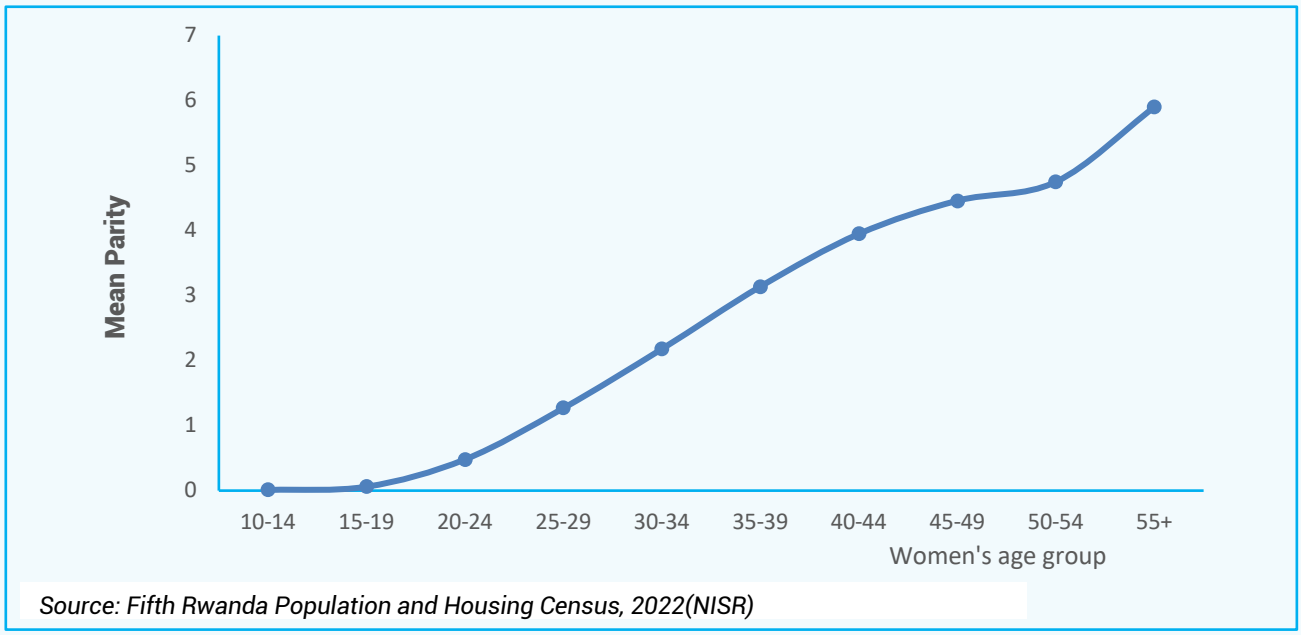
Based on the Brass and Rachad test, we can conclude that there is no evidence of underreporting of children ever-born in the 2022 PHC.

3.3.3. Completeness of the reporting of children ever born by women's age-group

If the quality of the lifetime fertility reporting varies significantly according to the women's age, this will appear in the curve of the number of children ever born per woman (mean parity) by women's Age-group. It is expected that the mean parity increases with women's age-group. A moderate increase is expected at the early and late stages of reproductive life and faster in between.

The curve of the mean parity by women's age-group follows more or less the expected pattern except that the increase is sustained up to age 55 years and above due to the late childbearing practice in Rwanda (Figure 3.3). Therefore, there is no evidence to suggest that births are more underreported for one age-group compared to the other.

Figure 3. 3 Women's mean parity by Age-group



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

3.3.4. Completeness of the reporting of children ever born by sex

If there is no sex selectivity in the reporting of children ever born, the sex ratio at birth should be closed to what is expected for Rwanda. In this case the sex ratio from the 2019-20 RDHS is considered as a reference though the DHS does not capture births of all women but only women aged 15-49 years. However, there is no reason to believe that the sex ratio at birth should vary significantly by age of women.

The sex ratios based on the reported children ever born for women aged 15-49 is 102.8 which is less than 103.5 estimated by the 2019-2020 RDHS. This gives an indication that male children ever born are underreported by the 2022 PHC compared to their female counterparts.

3.4. Method of analysis

The analysis is essentially descriptive, consisting of computing all indicators at the national and provincial levels, disaggregated by background characteristics known to be associated with fertility behaviour: age, education, religious affiliation, and disability status. The analysis also distinguishes groups of women with higher In the section on fertility data evaluation, we have found that the quality of data for women aged 10-14 years was poor. Instead of adjusting these data, we took a decision to exclude them from the computation of indicators, because they may biasedly affect indicators. We believe risk fertility behaviour from other women. A separate analysis is conducted for each of the high-risky fertility behaviour.

Fertility data for women aged 10-14 years

that the exclusion of that age group will have an insignificant effect on the computed fertility indicators, given the very small births concerned. However, for policy context, such women need to be identified because of health and other consequences of early adolescent birth.

CHAPTER 4: FINDINGS

This section presents the main findings of the analysis in four different sections. First, it presents the levels of lifetime fertility, infertility, and infecundity in the country. Second, the level, age patterns, trends, geographical variations, and other differentials of current fertility are presented. The third section presents information on high-risk fertility behaviours and premarital fertility. The final section presents information on natality.

4.1. Lifetime fertility

For each resident woman aged 10 and above the 2022 PHC collected data on the total number of her children ever-born alive as well as the births that occurred in the 12 months preceding the census date.

Four aspects of lifetime fertility were analysed in this section:

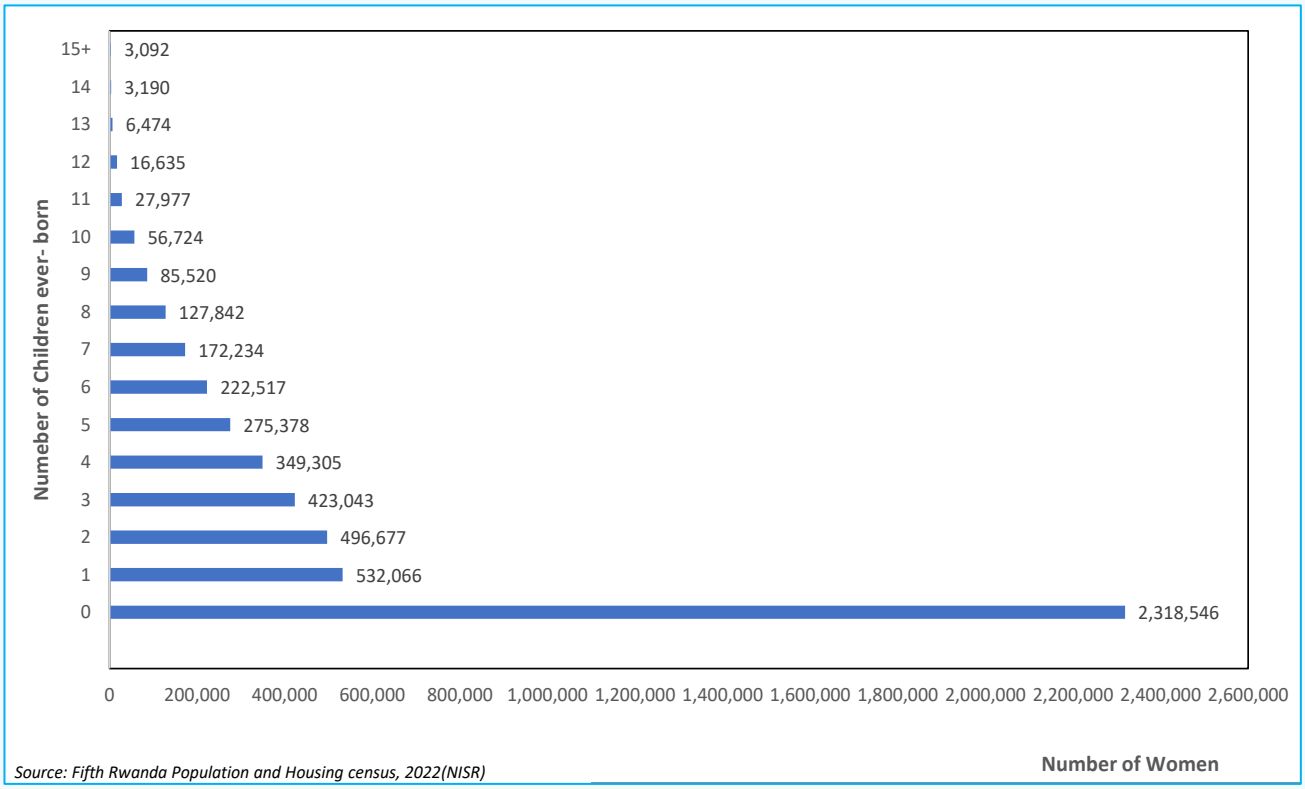
- current fertility, determined by the total number of children ever-born to women aged 10 years and above;
- past fertility, measured through parity reached by women at the at the end of their reproductive life;
- process of family formation by analysing the Parity Progression Ratios;
- and infertility through the analysis of the percentage of childless women at the end of the reproductive span and probability of not having an additional child among women who already gave birth.

4.1.1. Children ever-born per woman (parity)

Overall, 5,117,220 women were aged 10 years and above at the time of the census and all provided information on their parity. The total number of children ever-born for these women varies from 0 to 20 births per woman (Figure 4. 1). The number of women decreases as parity increases.

About 45% of women have no children at the time of census, 10% have one child, 10 % two children and less than 14% have 6 or more children. The 5,117,220 women gave to a total of 11,154,247children, equivalent to a mean parity of 2.2 children per woman

Figure 4. 1 Distribution of the women aged 10 years and above by number of the number of their children ever-born (parity)



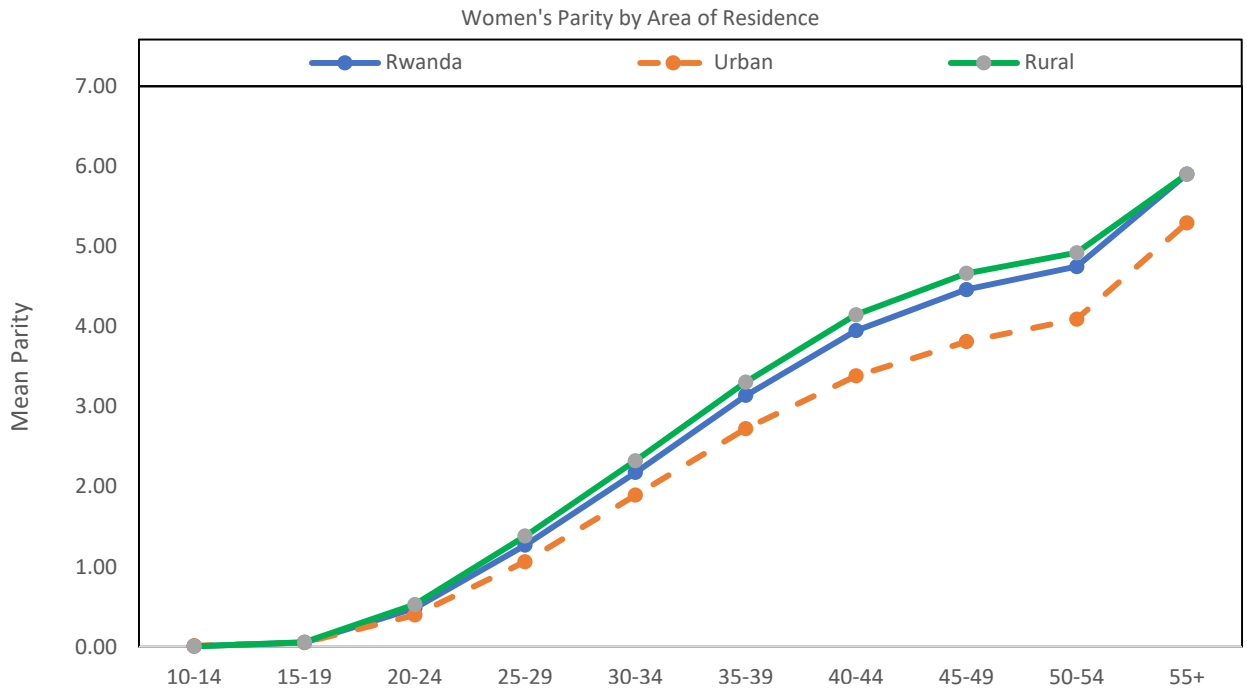
Source: Fifth Rwanda Population and Housing census, 2022(NISR)

However, the interpretation of mean parity for all women aged 10 years and above is meaningless, since these include women of different ages who are at the start or end of their reproductive period. This limitation is overcome by computing the parity by women's age. Figure 4.2 the parity distribution by women's age group and residence area.

Since the number of children per woman increases with mother's age, the expected pattern of the mean parity curve is a slow increase at the early stage of the reproductive life, followed by a steady increase. By the end of the reproductive period, women no longer have additional children resulting in the curve no longer increasing. The results presented in Figure 4.2 confirm this pattern, although the mean parity shows an increase well beyond 50 years which is indicative of late childbearing in Rwanda. The mean parity remains close to zero up to age 20. This confirms previous findings censuses and DHSs that childbearing starts relatively late in Rwanda as compared to other African countries.

The results also suggest that the mean parity varies significantly by area of residence though the general pattern described above holds in both urban and rural areas. Women in urban area have in average less children ever-born than women in rural area at all ages beyond 24, the gap increases with age. The observed differences reflect the relatively lower fertility in urban area but also the fact that the female population is younger in in urban area with an average age of 29 years than in rural area with an average age of 33 years

Figure 4. 2 Women's mean parity by age-group and area of residence



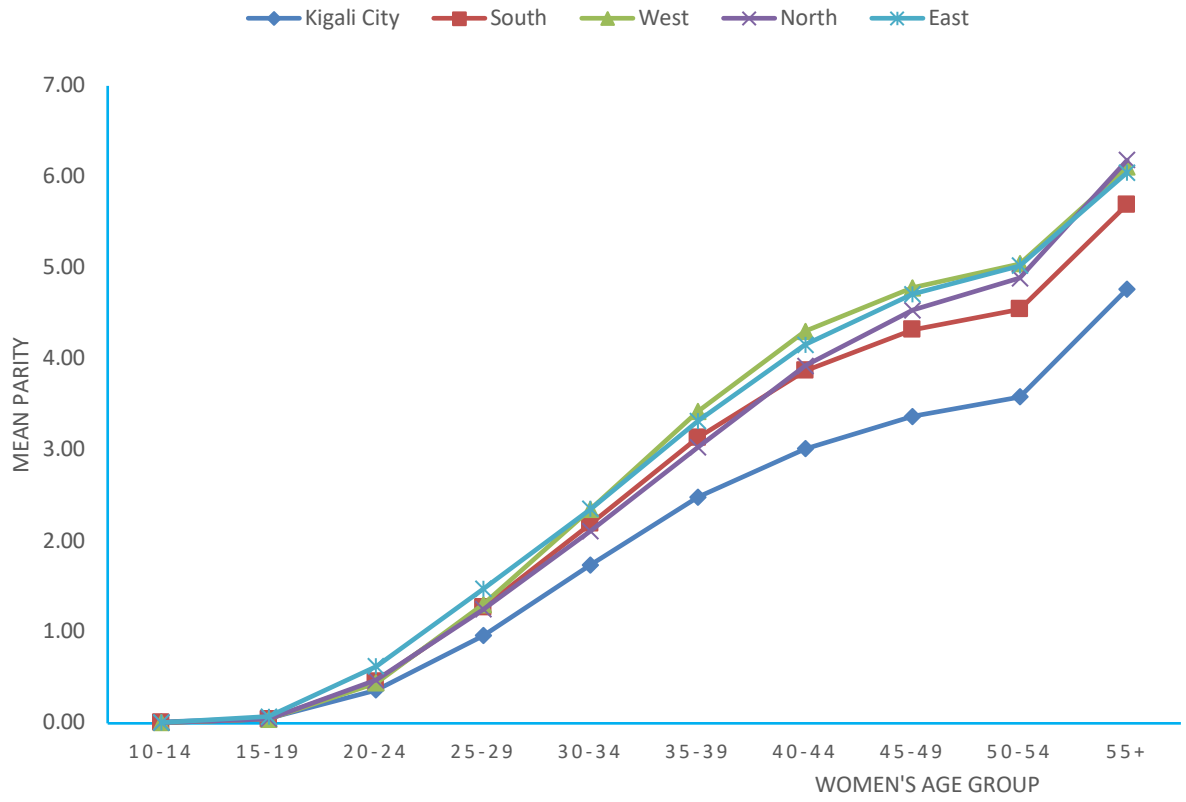
Source: Fifth Rwanda Population and Housing Census, 2022, (NISR)

The mean parity by women's age-group also varies by Province, as shown in Figure 4. 3 although the general pattern is similar to the national one. However, three sub-patterns can be distinguished: (i) the Eastern, Western and Northern Provinces with the highest mean parities; (ii) Kigali City with the lowest mean parity; (iii) and the Southern Province with mean parities between the two extremes.

Mean parity in Kigali City is different from those in other provinces from age 24 while parities in the Southern Province tend to be lower than those from other provinces but only after age 40.

The lower mean parity in Kigali reflects the influence of urbanisation on fertility but also the fact that its female population is younger as reflected in the mean age of 23 years in Kigali City as compared to 26.7 and 26.1 in the Southern and Northern Provinces respectively and 25 years in the Western Province. In contrast, the low mean parity in the Southern Province seems to reflect a true lower fertility rather than the effect of the age-structure.

Figure 4. 3 Women's mean parity by age-group and by province



Source:Fifth Rwanda Population and Hosing Census, 2022(NISR)

4.1.2. Total number of children ever-born at the end of reproductive life

The total number of children a woman has under the past conditions of fertility is usually measured by mean parity at 50 years of age (D50). This is based on the assumption that women no longer have children after age 49. However, in Rwanda, a reasonable number of women continue their childbearing beyond age 49, and hence a more relevant indicator would be the mean parity at age 55 (D55). Thus, both indicators were used to assess the distribution of mean parities at the end of the childbearing age. The indicator D50 was used for comparison with previous censuses and D55 for a more accurate measure of the level of past fertility. The results are presented in Table 4.1a for 2012 and table 4.1b for the 2022PHC.

The findings confirm that fertility was high in the past in Rwanda. Women aged 55 years and above have on average 5.9 children in 2022 compared with 6.8 in 2012. It was relatively much higher in three provinces: West and North (7.1 children) and lower in Kigali City (in 5.8 children in 2012). In 2022 we observe the same pattern of mean parity at 55 years and above among provinces: the Western, the Northern provinces have the highest mean (6.1 children), the Eastern province and the city of Kigali have 4.1 and 4.8 children respectively. while the Southern province have a mean parity of 5.7 children for female aged 55 and above Generally in urban areas for both periods, fertility is 5.9 children in 2012 and 5.3 children in 2022.

The mean parity among women aged 50 years and above is systematically lower than the one among women aged 55 years in all provinces except the East province. It may be the case that age 50 may not be the termination age of childbearing in Rwanda since few women still give birth after age 50. The average parity for women aged 50 and over declined for every group. At national level, the mean number of children declined by about 6.7 percent with no differences by rural urban residence. However, the largest decline in mean number of children was in Eastern province where the decline was about 35 % followed by City of Kigali at 10 %. The least decline was in South where the decline was marginal at 1 %.

Table 4. 1a: Mean parity of women aged 50 and above and women aged 55 and above by area of residence and province, 2012

Area of residence and Province	Number of women aged 50 years and above	Mean parity at age 50 and above (D_{50})	Number of women aged 55 years and above	Mean parity at age 55 and above (D_{55})
Rwanda	620,411	6.0	435,499	6.8
Area of residence				
Urban	59,293	5.2	40,898	5.9
Rural	561,118	6.1	394,601	6.9
Province				
Kigali City	35,656	4.9	24,261	5.8
South	180,602	5.5	127,274	6.4
West	150,298	6.4	104,579	7.1
North	112,081	6.3	81,147	7.1
East	141,774	6.3	98,238	6.9

Source: Rwanda 4th Population and Housing Census, 2012 (NISR)

Table 4 1b Mean parity of women aged 50 and above and women aged 55 and above by area of residence and province, 2022

Area of residence and Province	Number of women aged 50 years and above	Mean parity at age 50 and above (D50)	Number of women aged 55 years and above	Mean parity at age 55 and above (D55)
Rwanda	895,980	5.6	680,862	5.92
Area of residence				
Urban	164,473	4.96	119,384	5.29
Rural	731,507	5.77	561,478	5.90
Province				
City of Kigali	63,551	4.40	43,974	4.77
South	181,752	5.43	194,321	5.70
West	201,026	5.87	155,969	6.11
North	150,473	5.89	116,546	6.18
East	228,027	4.05	170,052	4.05

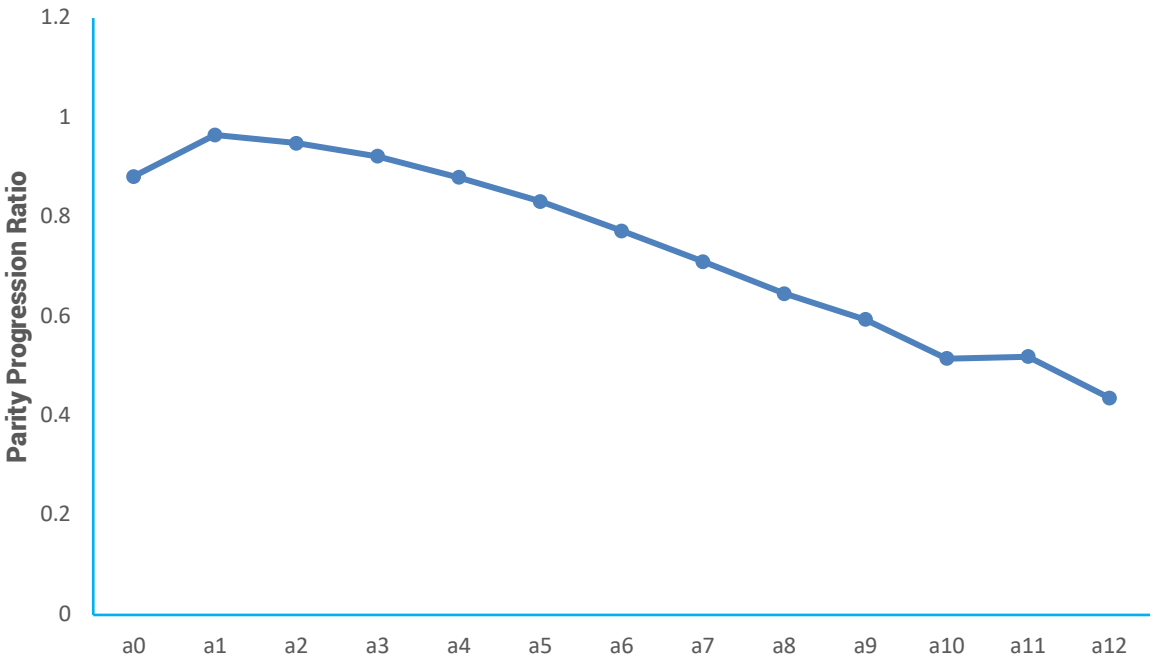
Source: Fifth Rwanda Population and Housing Census, 2022 (NISR)

4.1.3. Family formation and rate of childbearing

One interesting aspect of the study of fertility in a population is the rate at which families are growing and the likelihood for a woman with n number of children to proceed to a (n+1)th child. This is analysed using Parity Progression Ratios (PPR) which measures the proportion of women of a specific parity who progress to the next parity. For instance, the PPR an is the proportion of women who have n+1 children among women who already have n children. It is related to the quantity or quantum of fertility. PPRs are used to evaluate changes in fertility in terms of births spacing. However, it is only useful when age is also controlled for, since there are those who may have completed childbearing (voluntarily or involuntarily) and those who wish to continue. PPR can be viewed from two different perspectives: a purely demographic one (described above) and a public health one to study infecundity (or primary sterility or secondary sterility) among a population. This latter perspective is adopted in section 4.1.4.

The PPR from 0 to 1 is not analysed since the estimate is influenced by potential period effects. Figure 4.4 presents the PPRs for parity higher than 0 for women aged 50years and above. The findings indicate that the probability of having an additional child is high and stable between 96% and 88% up to the fourth child just almost the TFR of 3.6 children per woman. The PPRs range between 83 % and above 50% after the 11th child, suggesting that the majority of women who have already reached higher parities are likely to pursue their childbearing.

Figure 4. 4 Parity Progression Ratio for women aged 50 years and above



Source: Fifth Rwanda Population and Housing Censu, 2022(NISR)

4.1.4. Infertility and Sterility

The sequence of PPRs along with the percentage of childless women at age 55 years give an estimate of the level of different types of infertility and sterility in a population.

The percentage of childless women at the end of the reproductive span (50-54 years or 55-59 years) is an indirect measure of the prevalence of sterility in a population. This measure, however, overestimates the true prevalence of sterility because some of the childless women aged 50-54 or 55-59 years may have not had children for reasons not related to their physiological ability to become pregnant or to give birth. For example, women who are never married may have less exposure to the risk of pregnancy or those married may voluntarily decide not to have any children as well as those with physical or mental disability might be reluctant to give births.

The proportion of women who already have n children and who will not have an additional child (1-an) is an indirect measure of secondary sterility. The reasons for secondary infertility may be biological, or may be a consequence of a previous obstetrical complication or a consequence of untreated sexually transmitted diseases, etc. However, 1-an overestimates the true medical prevalence of secondary infertility because many other reasons might explain why a woman has not an additional child: fulfilment of fertility desire, insufficient exposure to the risk of pregnancy (divorced and separated women who are no longer sexually active) and so on.

The results for both infertility Indices and percentage of childless women at ages 50-54 and 55-59 years from the 2022 PHC are presented in Table 4.2.

The results presented in Table 4.2 show that about 3% of women in Rwanda are childless at the end of their reproductive span, giving an estimation of the prevalence of sterility among women, with the limitations discussed above. This value is similar to the estimate from the 2012 PHC. This suggests that the prevalence of sterility among women in Rwanda has not changed over the past decade.

Table 4. 2 : Infertility indices and Percentage of Childless Women at age 50-54 and 55-59 by area of residence and province

Infertility Indices ($1-a_n$) and Percentage of Childless Women	Rwanda	Area of Residence		Province				
		Urban	Rural	Kigali City	South	West	North	East
PPR (a_n)								
$1-a_1$	0.190	0.242	0.173	0.270	0.171	0.169	0.196	0.187
$1-a_2$	0.219	0.293	0.197	0.333	0.201	0.188	0.223	0.215
$1-a_3$	0.239	0.313	0.219	0.363	0.233	0.208	0.233	0.234
$1-a_4$	0.259	0.326	0.244	0.385	0.264	0.235	0.243	0.253
$1-a_5$	0.276	0.321	0.267	0.371	0.291	0.257	0.255	0.271
$1-a_6$	0.308	0.341	0.302	0.381	0.331	0.290	0.285	0.305
$1-a_7$	0.345	0.360	0.342	0.387	0.371	0.332	0.320	0.342
$1-a_8$	0.390	0.400	0.389	0.416	0.414	0.382	0.372	0.386
$1-a_9$	0.428	0.427	0.429	0.424	0.451	0.424	0.417	0.423
$1-a_{10}$	0.497	0.496	0.497	0.495	0.520	0.494	0.485	0.491
$1-a_{11}$	0.488	0.476	0.490	0.450	0.503	0.500	0.487	0.472
$1-a_{12}$	0.566	0.560	0.567	0.541	0.583	0.575	0.567	0.550
% Childless Women								
At age 50-54 years	3.7	2.7	4.1	2.5	4.4	3.6	3.7	3.8
At age 55-59 years	3.0	2.0	3.4	1.7	3.9	3.0	3.1	3.0

Source: Rwanda Fifth Population and Housing Census, 2022(NISR)

4.2. Current fertility: Levels, Pattern, Trends and Differentials

Current fertility reflects recent childbearing experiences among women aged 15-49 years. This age-group is traditionally considered as the reproductive span though some women start childbearing before 15 and others continue giving birth after 49 years. Fertility below 15 and above 49 is usually rare and not accurately reported. Moreover, for comparison over time and across countries, fertility indicators are computed for the age-group 15-49 years. The rest of the analysis will consider only women aged 15-49 years.

This section presents the: (i) levels, pattern and trends of current fertility at the national level; (ii) geographic variations; and (iii) selected differentials of current fertility.

4.2.1. Levels, pattern and trends of current fertility at the national level

Current Fertility Level

The widely used indicator to measure current fertility is the Total Fertility Rate (TFR), which is defined as the total number of children a woman would have at the end of her reproductive life if she would experience the current conditions of fertility throughout her all-reproductive life. The age patterns of current level of fertility are usually presented by the Age-Specific Fertility Rates (ASFRs) in 5-year age interval.

Table 4.3. presents the TFR and the ASFRs measured based on the 2012 and 2022 respectively. The findings show that under the current fertility conditions, a woman residing in Rwanda would have 3.6 children at the end of her reproductive life which is a decline of about 10 percent in 10 years period.

Table 4. 3: Age-Specific Fertility Rates (ASFRs) and Total Fertility Rate (TFR) in 2012 and 2022

Indicators	Rwanda	
ASFR	2012	2022
15-19	0.027	0.025
20-24	0.150	0.137
25-29	0.202	0.176
30-34	0.185	0.165
35-39	0.142	0.134
40-44	0.079	0.075
45-49	0.019	0.015
TFR	4.02	3.63

Source: Rwanda 4th Population and Housing Census, 2012 (NISR); Rwanda 5th Population and Housing Census, 2022(NISR)

Age Pattern of fertility

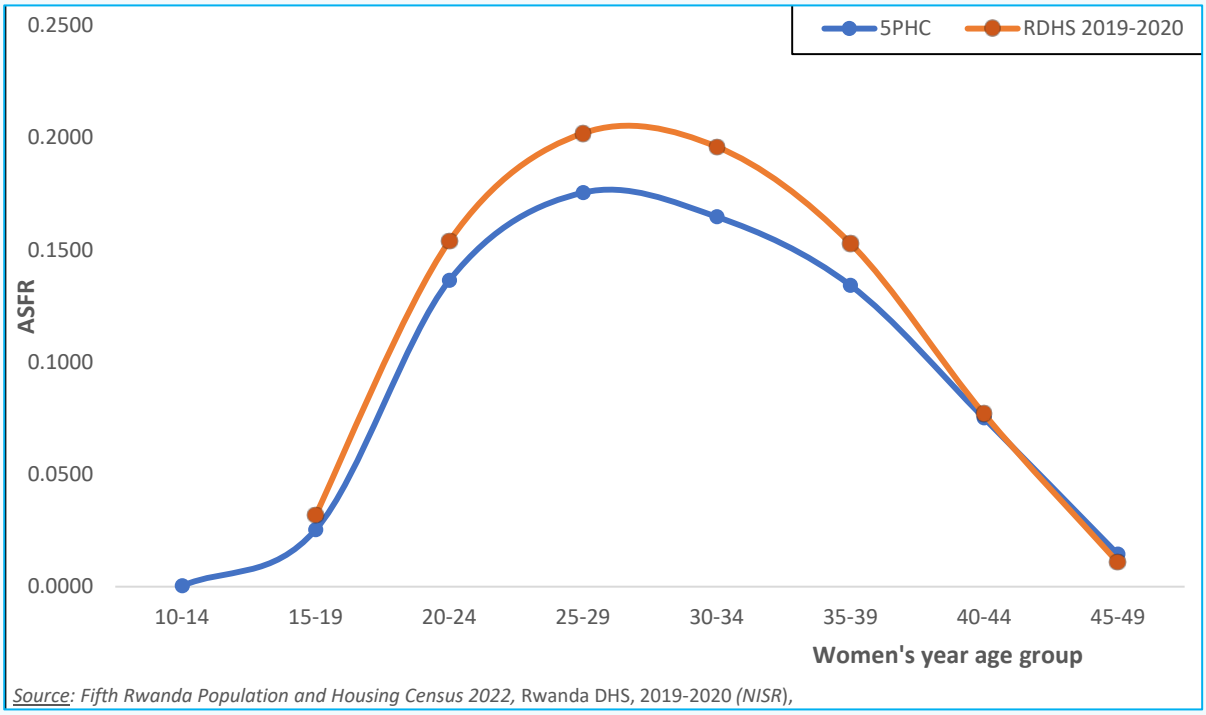
Table 4.3 along with Figure 4.5 also illustrate that the pattern of fertility in Rwanda is similar to the one found in the developing countries where fertility is high. Women give births mostly during their 20 to 34 years of age. Fertility is low during adolescence (less than 0.03 child per woman between 15 and 19 years) followed by a steady increase to reach its maximum by aged 25-29 years (0.2 child per woman). Then fertility decreases continuously to reach 0.02 children per woman by age 49. The age pattern of fertility has declined at every age group. The largest decline occurred in the age group 45-49 at 21 % followed by the age group 25-29 at 13 % and 30-34 at 11 % respectively. The lowest decline was among women aged 40-44 at only 5 %. The age patterns of fertility change in the country conforms to Caldwell and Oruboloye 19925 hypothesis that fertility transition in Africa may be different from other regions in that the transition occurs across all age groups.

Overall MAWC is 30 years in 2022, the MAWC has continuously decreased from 32 years in 1978 to 31.3 in 1991, 31.0 in 2002 and 29.2 in 2012, but it has increased a little bit in 2022 where it is 30years.

The 2022 fertility age pattern is also like that estimated by the 2019-20 DHS (Figure 4.5). The comparison between the 2022 PHC and the 2019-20 DHS ASFRS reveals that the decline in fertility may have occurred in the age group 20-34. However, tracking decline based on census data shows that the highest decline was in the age group 45-49 followed by the middle age groups.

[5] Caldwell J C, I Oruboloye and P Caldwell 1992. Fertility Transition in Africa: a new type of transition? Population and Development Review 18(2): 211-242.

Figure 4. 5 Age-Specific Fertility Rates (ASFRs) from the 2022 PHC as compared to the ones from the 2019-2020 DHS



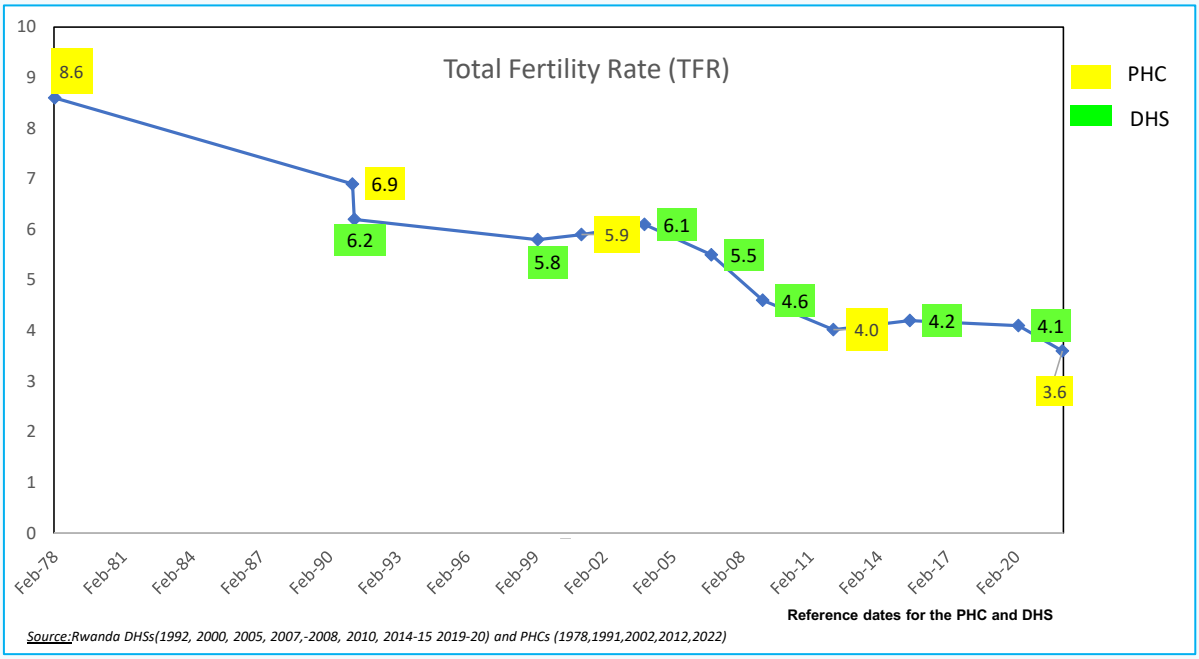
Source: Fifth Rwanda Population and Housing Census 2022, Rwanda DHS, 2019-2020 *(NISR),*

Recent Trends in Current Fertility

The observed decline in fertility by considering 2019-20 DHS and the 2022 PHC is generally confirmed by the past trends since 1978 (Figure 4. 6). The decline, however, was not homogeneous over time and could be split into four distinct periods:

- The 1974 – 1990 period during which an explicit anti-natalist policy based on fertility reduction through promotion of the use of modern contraception were implemented. This period was characterised by an important decline of fertility, with the TFR decreasing from 8.6 to 6.2 children per woman.
- The 1990–1994 period corresponding to the civil unrest years during which the implementation of the population policy adopted earlier was impeded;
- The 1994 – 2003 period corresponding to the genocide against the Tutsi aftermath and recovery ("reconstruction period") marked by a baby boom which translated in an increase of fertility from 5.8 to 6.1 births per woman; and
- The 2003 to present period where various policies and programs were established and implemented to address diverse population issues with the objective of transforming Rwanda into a Middle-Income Country (MIC) by 2020. This period is characterized by a baby bust with a TFR dropping from 6.1 to 3.6 births per woman.

Figure 4. 6 Evolution of the TFR between 1978 and 2022



4.2.2. *Provincial variations of the current fertility6*

Current Fertility Level

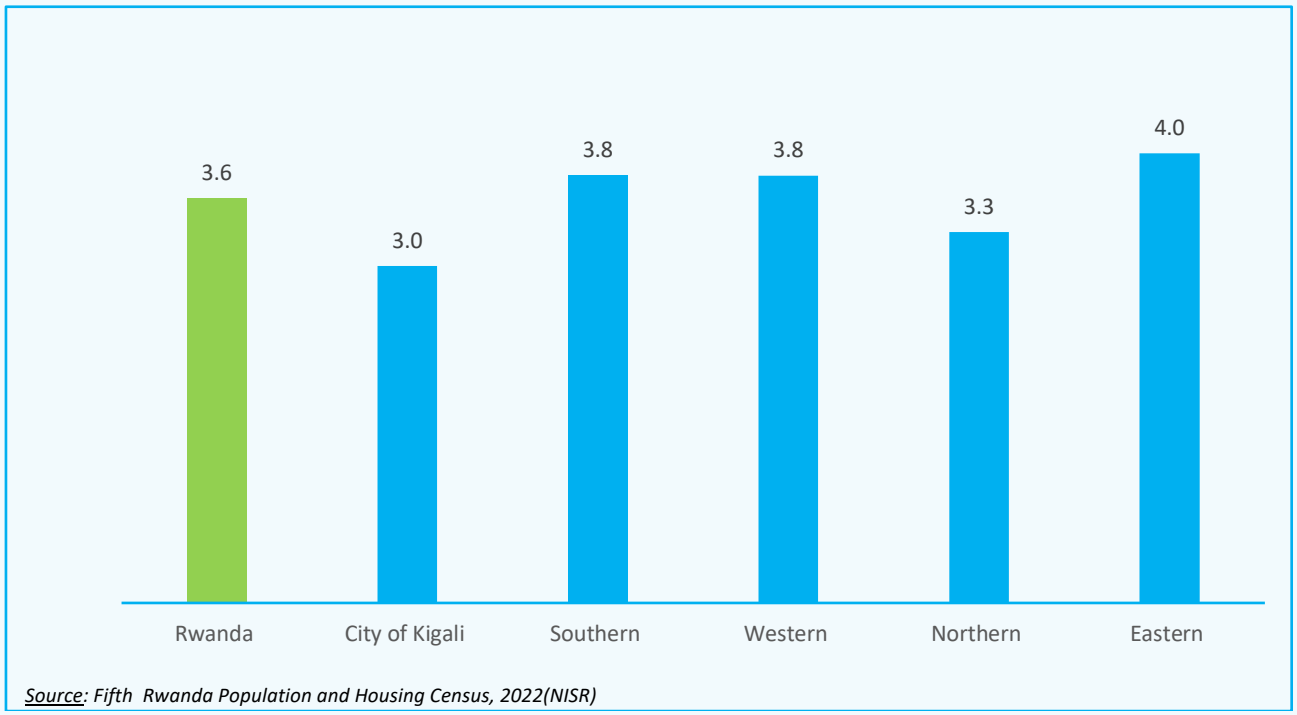
As expected, current fertility varies across Provinces. The total fertility rates (TFR) vary between 3.0 births per woman in the City of Kigali and 4.0 in the Eastern Province (Figure 4.7) It is also low in the Northern Province(TFR of 3.3 births) where it is below the national level of 3.6 births per woman.

There are several explanations for these spatial variations. For example, in the City of Kigali, women have relatively better education and better access to modern contraception than their counterparts in other Provinces which are rural predominated.

In contrast the high fertility level in the Eastern Province is recent and seems to be linked to internal migration. One of the main pull factors of migration to the Eastern Province is the availability of arable land which attracts young migrants in the childbearing ages from other areas, particularly from the Northern Province where agricultural land is scarce (cf. The 2022 PHC Thematic report on Migration). In fact, the outmigration of young people from the North partly explains the decreasing trends in fertility in the Northern Province.

[6] The TFR at District level are presented in the annex C

Figure 4. 7 Total Fertility Rate (TFR) by Province

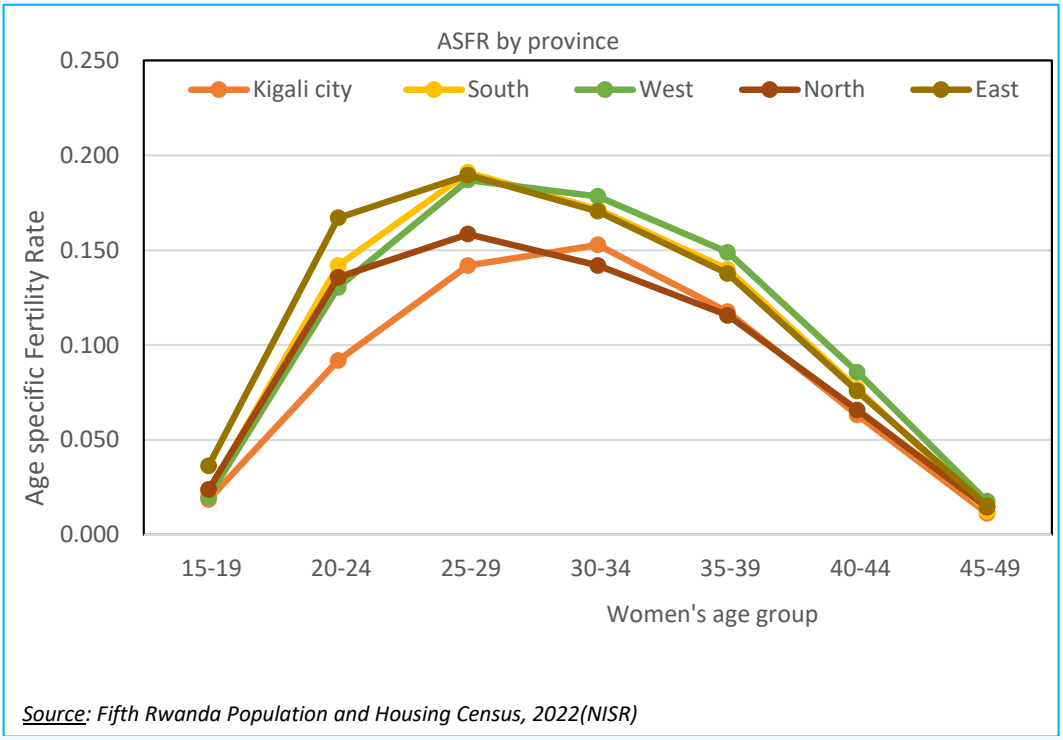


Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Age Patterns and Timing of fertility

The general fertility pattern in the five Provinces is the same as the one described at the national level, with some differences in the timing of fertility (Figure 4.8). In the City of Kigali, childbearing is more intense in the 25-29 and 30-34 age groups and peaks in the age group 30-34 while it tends to concentrate mostly in the 25-29 age group in the other Provinces. The provincial differences in the timing of fertility are reflected in the mean age of women at childbearing (MAWC): 30.0 in The City of Kigali, 30.3 in Southern Province, 30.5 in the Western Province, 29.6 in Northern Province, and 29.4 in Eastern Province.

Figure 4. 8 Age-Specific Fertility Rates (ASFRs) by Province



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Recent trend in Current Fertility Level

The recent rapid decline in fertility observed at the national level is also reflected at the provincial level. The largest decline in fertility between the 2012 and 2022 censuses occurred in the western province at nearly 14 percent. This was followed by Eastern and Northern provinces at 9 and 8 % respectively. The lowest decline is recorded in the City of Kigali where the fertility transition began earlier than in the other Provinces.

Table 4. 4 :Percentage decrease in fertility between 2019-20 DHS and 2022 PHC by Province

Province	DHS 2019-20	PHC 2022	Relative decline
Rwanda	4.1	3.63	-12.20
Kigali City	3.6	3.00	-16.67
Southern Province	4.1	3.80	-7.32
Western Province	4.5	3.80	-15.56
Northern Province	4.0	3.30	-17.50
Eastern Province	4.2	4.00	-4.76

Source:Fifth Rwanda Population and Housing Censuses, 2022(NISR), RDHS 2019-202(NISR)

Table 4. 5:Percentage decrease in fertility between the 2010 DHS and the 2012 PHC by Province

Province	DHS 2010	PHC 2012	Relative decline
Rwanda	4.6	4	-13
City of Kigali	3.5	3.1	-11
Southern Province	4.6	4	-12.2
Western Province	5	4.4	-12.7
Northern Province	4.1	3.6	-12.5
Eastern Province	4.9	4.4	-10

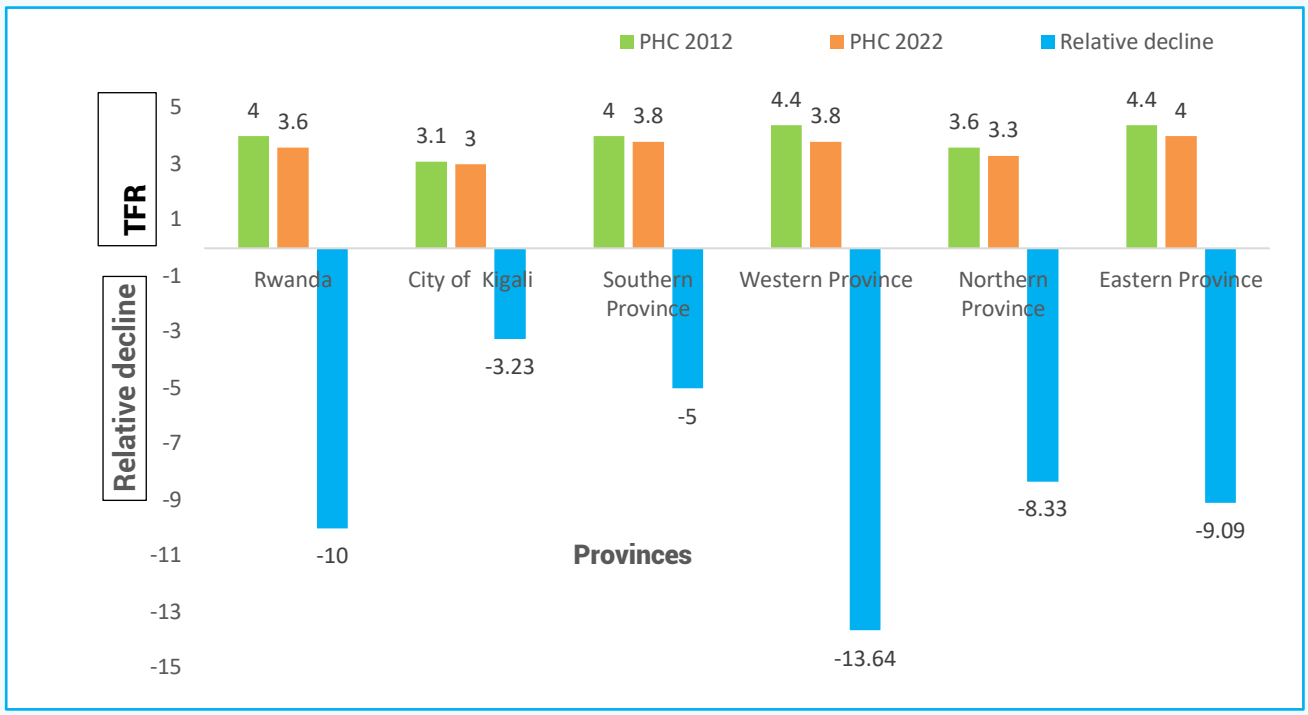
Source: Fourth Rwanda Population and Housing Census, 2012(NISR)

Table 4. 6: Percent change between the 2012 census and 2022 census

Province	PHC 2012	PHC 2022	Relative decline
Rwanda	4.0	3.60	-10.00
City of Kigali	3.1	3.00	-3.23
Southern Province	4.0	3.80	-5.00
Western Province	4.4	3.80	-13.64
Northern Province	3.6	3.30	-8.33
Eastern Province	4.4	4.00	-9.09

Source: Rwanda Population and Housing Censuses, 2012, 2022 (NISR)

Figure 1:Percent change between the 2012 census and 2022 census



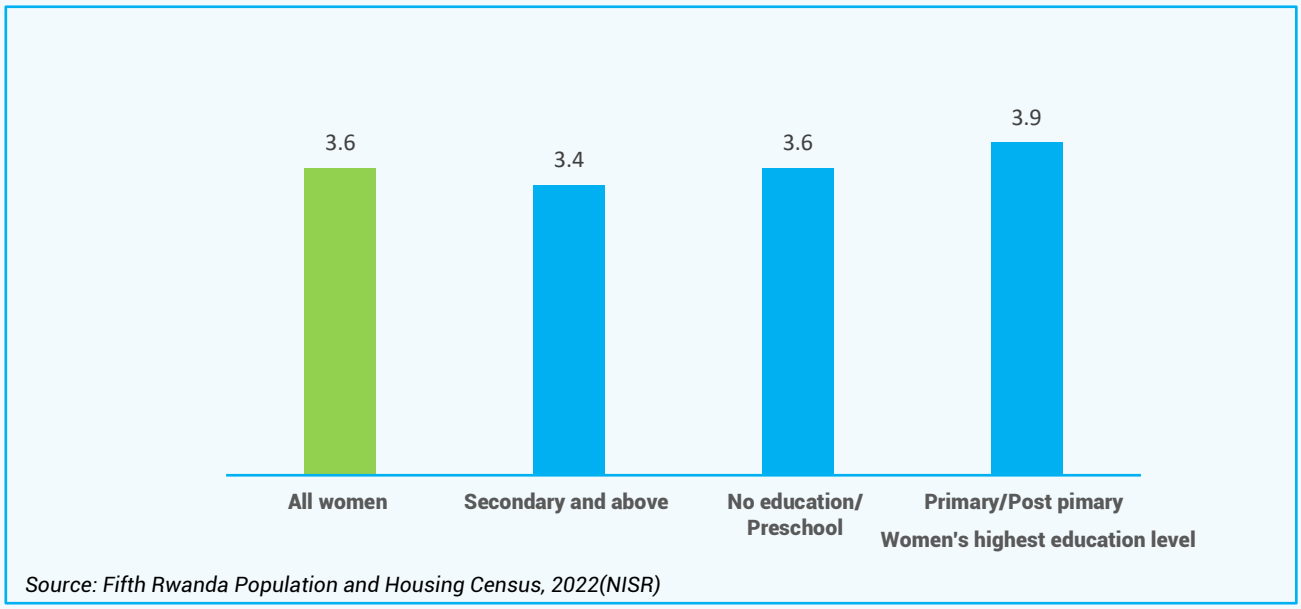
4.2.3. *Fertility differentials by Socio-Economic status*

This section describes the variation in fertility by the level of women's education and religious affiliation.

Fertility and women's education

Education is known to have a significant impact on reproductive behaviours. The higher the level of education, the fewer the children a woman has. Women with a secondary level of education or above have a TFR of 3.4 births compared to 3.9 amongst those with primary education. Those with no education have an intermediate TFR of 3.6 births.

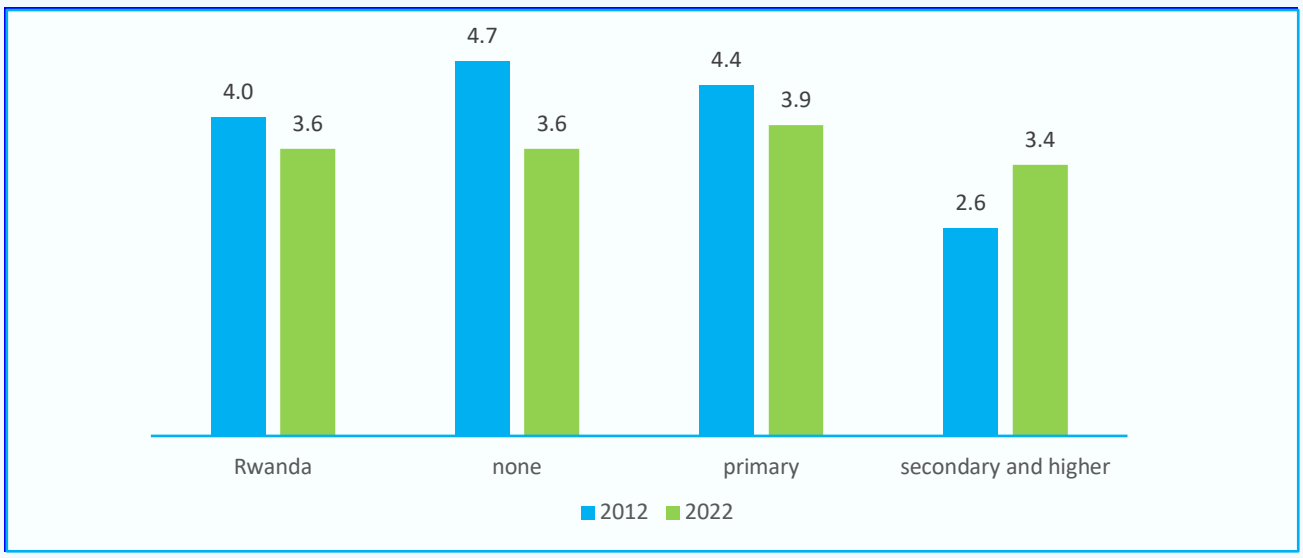
Figure 4. 9 TFR by Educational level



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

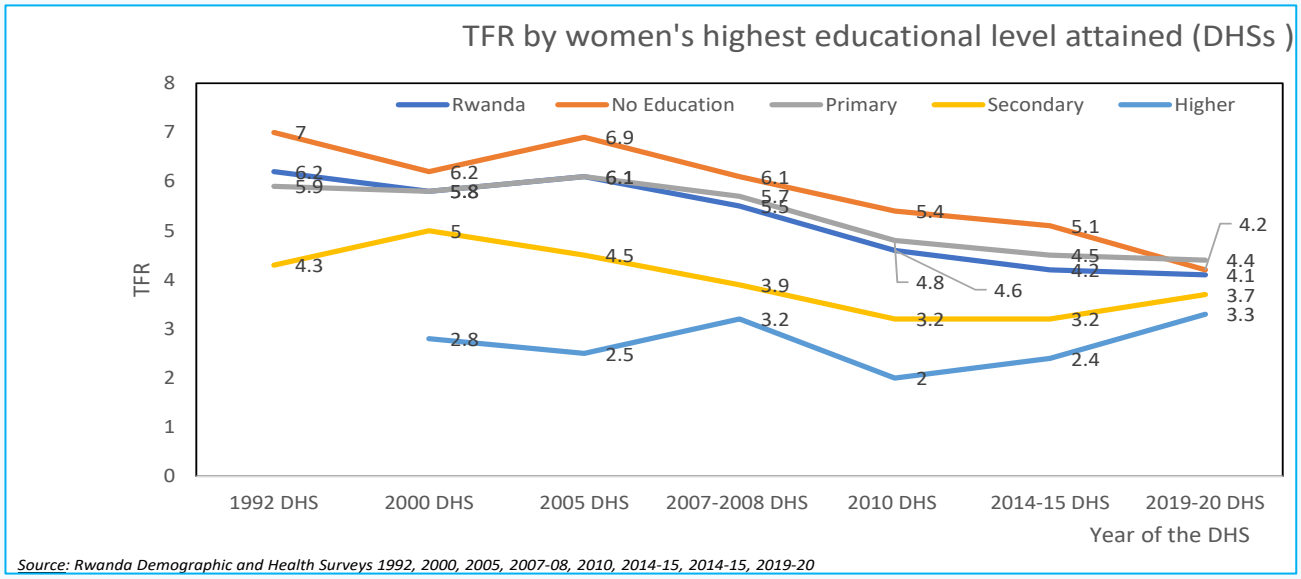
Figure 4.10 below shows trends in fertility by level of education. Unexpectedly, while fertility has declined among women with no education and those with primary, it increased among those with secondary education or higher. The trends in fertility by education is further illustrated using data from the RDHSs for several years (Figure 4.11). TFR for women with higher education have been increasing while that of women with primary education was almost stagnant. In centrally, among women who have never been at school, fertility have been declining. Furthermore, the comparative figure shows the beginning of convergence of fertility level across various levels of education.

Figure 4. 10 Total Fertility rate 2012 and 2022



Source: Rwanda Population and Housing Censuses, 2012, 2022(NISR)

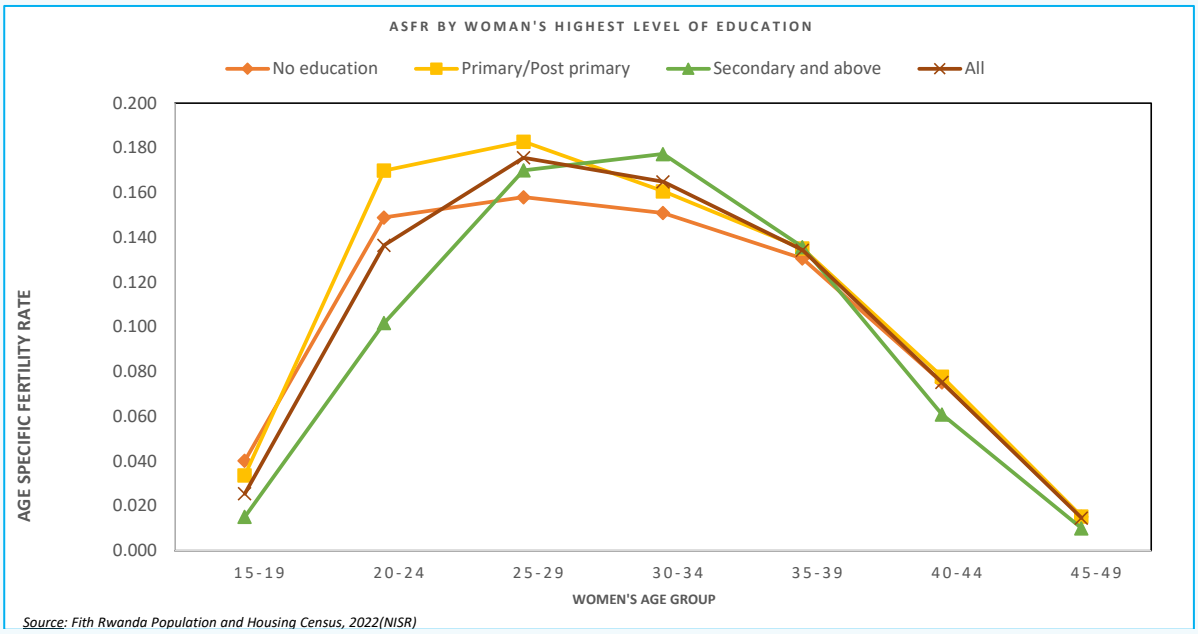
Figure 4. 11 TFR by Women's highest educational level attained (DHSs)



Source: Rwanda Demographic and Health Surveys 1992, 2000, 2005, 2007-08, 2010, 2014-15, 2014-15, 2019-20

Women's level of education has also an impact on the age pattern of fertility as shown in Figure 4.12. Less educated women enter childbearing relatively earlier than those with a secondary level of education or above. While women with secondary education reach their peak of fertility in the age group age 30-34 years, those with no education or with a primary level peak in the age group of 25 and 29 years.

Figure 4. 12 Age-Specific Fertility Rate by



Source: Fith Rwanda Population and Housing Census, 2022(NISR)

Fertility levels by religious affiliation

The main religious groups captured in the 2022 Population and Housing Census in Rwanda, are: Catholics (39.9% of the resident population), ADEPR (21.3%), Protestants (14.6 %), Adventists (12.2%), other Christians (4.2%), Muslims (2.0%). The Jehovah witness account for 0.7% of the resident population, the traditional religions followers, and other religious affiliations 2.0%, about 0.1% of the resident population didn't state their religious affiliation. Overall, 3% of the resident population have no religious affiliation. Virtually all the religious groups have their own

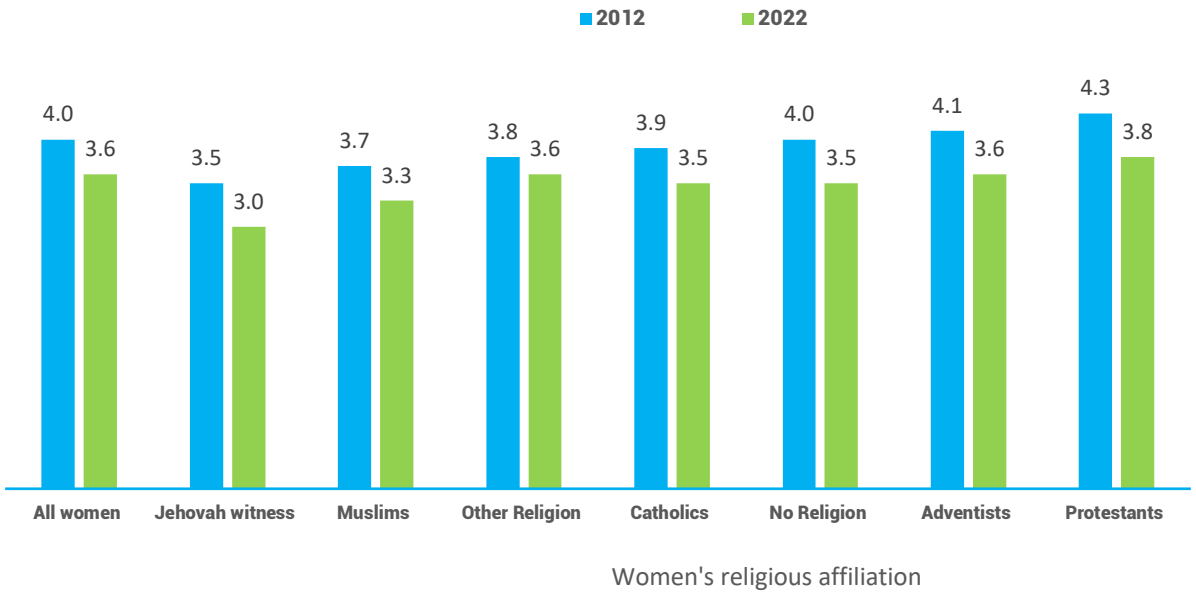
and different guidelines in terms of fertility behaviours. However, depending on how their followers stick to these guidelines, religious affiliation has an impact on the timing and intensity of women's fertility.

In 2012, the lowest TFR was among Jehovah Witnesses at 3.5 children per woman and highest at 4.3 children per woman among Protestants. Also, in 2022, the lowest TFR was among Jehovah witness (at 3 births per woman) and the highest among Protestant (3.8 per woman). The trend data indicate that patterns of fertility differentials by religious affiliation have changed from that observed in the data from 2012 PHC.

The second main finding from Figure 4.13 is the lower fertility of Catholics (3.5 children per woman) as compared to Protestants (3.8 children per woman) though both are Christians. This was not expected according to the literature but is explained for the specific case of Rwanda by the fact that Catholic women are more likely than protestants to use modern contraception ceteris paribus as shown by UWAYEZU (2009), despite the Catholic Church implements a program that promotes natural family planning methods.

Muslims' fertility is the second lowest one after the Jehovah witnesses (3.3 children per woman). Existing studies indicate that Muslim women tend to have fewer children than women from other religions because of higher prevalence of polygyny witch shorten exposure to the risk of pregnancy. But in the case of Rwanda the relatively lower fertility rate amongst Muslim women has more to do with two facts. In effect, most of them reside in urban areas (64% vs. 27.9% of the total population). Muslim women have therefore more modern fertility behaviours than most of the other Rwandan women.

Figure 4. 13 TFR by Women's Religious affiliation 7

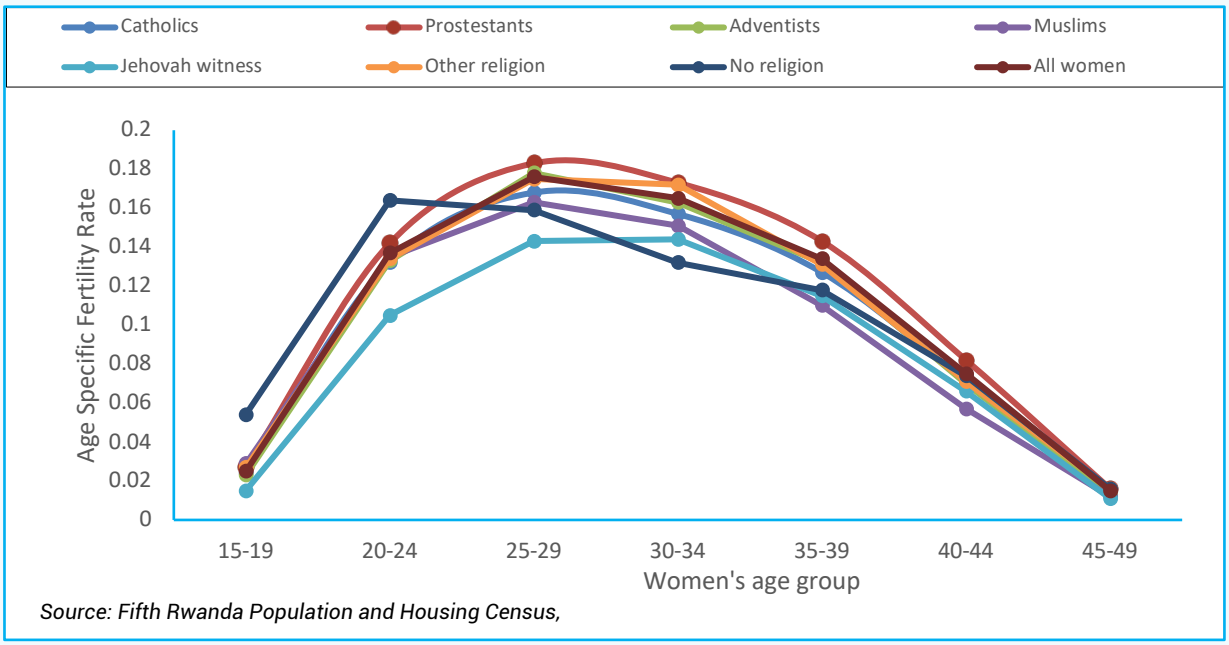


Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

The age pattern of fertility by women's religious affiliation is shown in Figure 4.14. Women affiliated to Jehovah Witness have a distinct pattern from the rest of the groups having lower fertility at younger ages and peak fertility occurring in the age group 30-34. Their current age patterns are similar to those observed in 2012 census data reports.

[7] The objective of analyzing fertility by religious affiliation is that the religion has an impact on fertility behaviors. Different religions have different understanding on fertility, and they adopt various rules that will guide their respective followers. Followers of ADEPR, Protestant and Other Christians, have almost same behaviors, and followers of the traditional religion and other religion have almost same understanding. For a better comparison with data from the 2012 PHC, we grouped together ADEPR, Protestant and other Christian together and traditional together with Other religion.

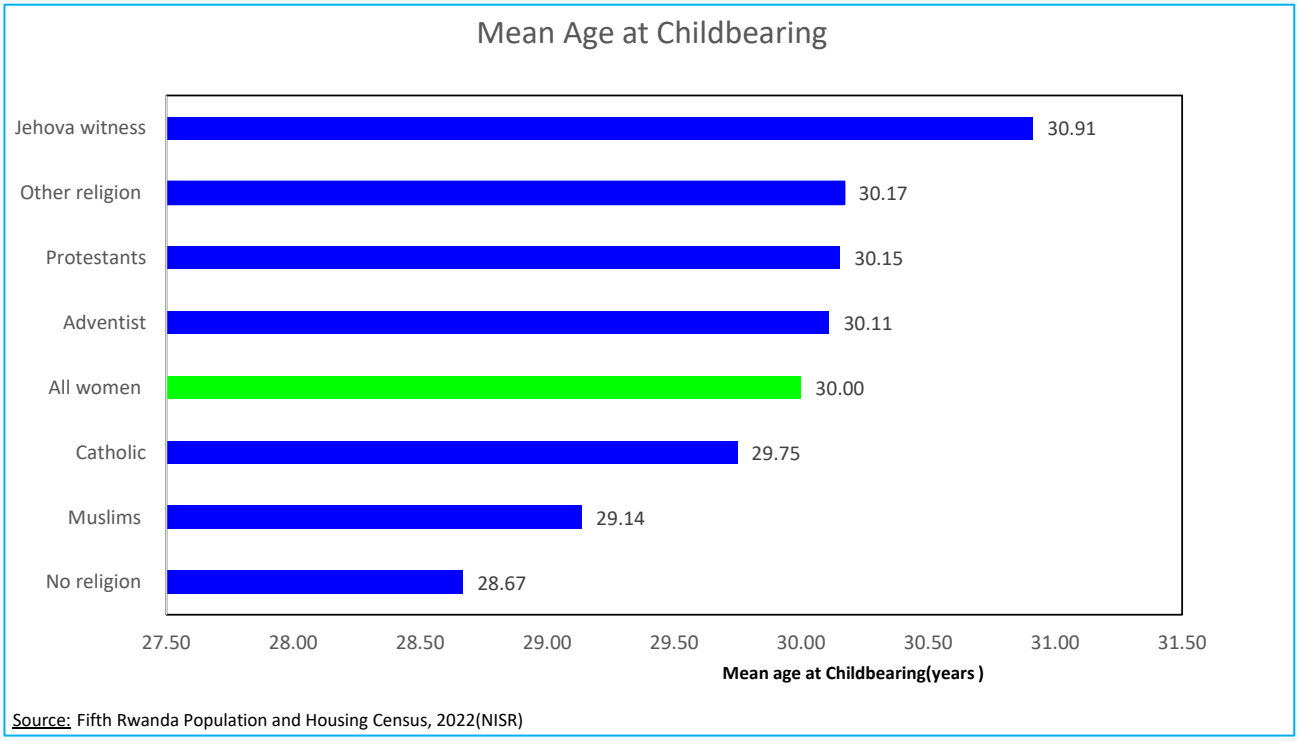
Figure 4. 14 Age Specific Fertility rates by Women's Religious affiliation



Source: Fifth Rwanda Population and Housing Census,

The differences in age pattern of fertility are further reflected in the mean age at childbearing. The value ranges from a high of 30.9 years among Jehovah witnesses, to low of 28.7 years among women with no religious affiliation. For all groups the mean age at childbearing has increased since 2012 in tandem with decline in fertility rates. In addition, differences between the groups narrowed from 3 years to about 2.2 years.

Figure 4. 15 Mean Age at Childbearing by women's religious affiliation



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

4.3. High-risk fertility behaviours/Unsafe motherhood and premarital fertility

4.3.1. High risk fertility behaviours: Adolescents' fertility

Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19. Adolescent childbearing is of concern from several perspectives: potential health harm young women face such as incidence of obstetric fistula; children of adolescent mothers are at higher risk not celebrating their first birthday; adolescents' potential loss of educational opportunities and risk of not participating in labour force leading to higher risk of falling into poverty. As a result, the program of Action of the 1994 International Conference on Population and Development (ICPD) highlighted the importance of reducing adolescent fertility. The SDG indicator 3.7.2 on adolescents includes two indicators: births among women aged 10-14 years (early adolescence) of age and births among women aged 15-19 years. Monitoring adolescent childbearing is therefore crucial for social welfare and health interventions.

For the above reasons, it is crucial for decision-makers and all actors in the public health sectors to be provided with accurate and up-to-date information on adolescents' fertility. The 5th PHC is the unique source to analyse the adolescents' fertility up to the lowest administrative entity level. Such analysis is not possible with the Demographic and Health Surveys due to few numbers of adolescents included in the samples. This section presents the results of analysis of different indicators of adolescent fertility. The indicators used to summarize adolescent fertility, namely:

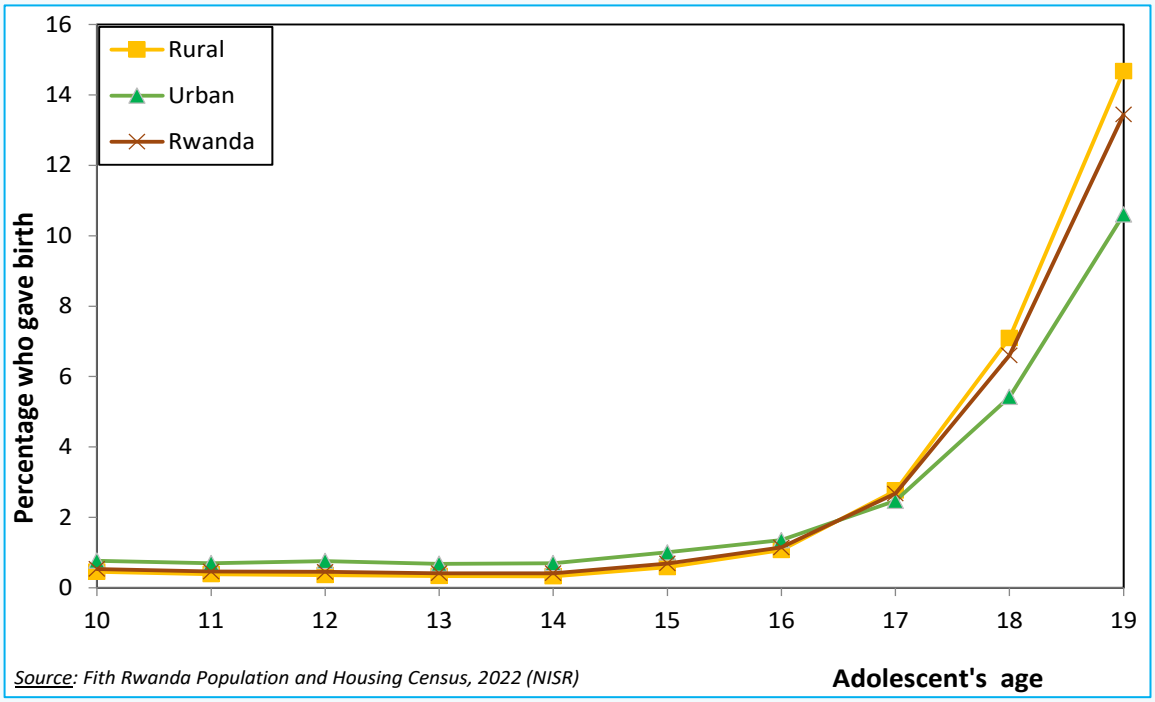
1. proportion of adolescents who have begun childbearing;
2. adolescent fertility rate.

Prevalence of adolescent fertility and its variation by area of residence and school attendance

The percentage of adolescent girls who already gave birth is 2.6% at the national level. This general fertility masks however important variations by age and other background characteristics. The frequency varies from a low level of nearly 0% at age 12 to 14% at age 19 years. This pattern does not much change by area of residence, as shown in Figure 4.16. The prevalence of childbearing among adolescents is almost the same in urban and in rural areas at each age. Despite this this similarity, the factors behind these behaviours are however be different.

Early childbearing in rural areas is usually related to early marriage and/or non-use of modern contraception during premarital sexual intercourse. In contrary, early childbearing in urban area generally occurs outside marriage and is influenced by modern social norms that promote sexual freedom channelled by the media. This premarital sex combined with non-use or ineffective use of contraceptive methods explain the risk for pregnancy among urban adolescents.

Figure 4. 16 Percentage of adolescent women who gave birth by single year of age by area of residence.



Source: Fith Rwanda Population and Housing Census, 2022 (NISR)

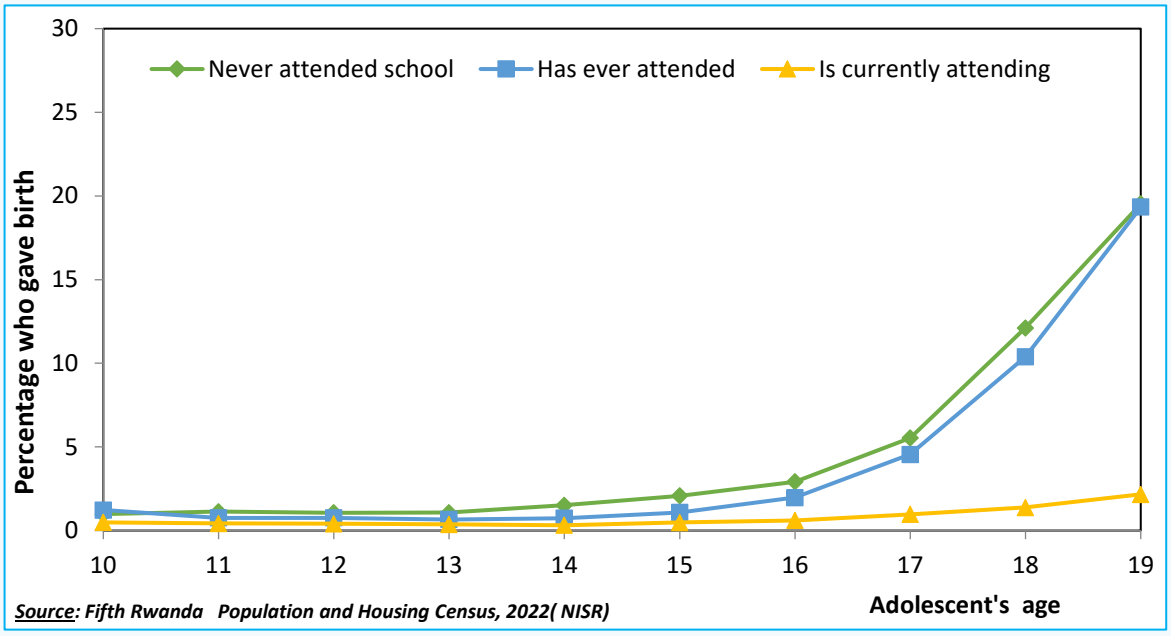
Table 4. 7: Distribution (counts) of adolescents by age and by residence area

Adolescent's age	Number of adolescents			Number of Adolescents who already gave birth		
	Rwanda	Urban	Rural	Rwanda	Urban	Rural
10	154,451	37,093	117,358	824	286	538
11	146,071	34,296	111,775	674	240	434
12	155,954	36,214	119,740	710	275	435
13	153,455	35,257	118,198	637	240	397
14	165,644	39,215	126,429	686	274	412
15	156,867	39,334	117,533	1,084	396	688
16	161,666	41,860	119,806	1,853	567	1,286
17	152,675	42,659	110,016	4,094	1,055	3,039
18	146,185	43,044	103,141	9,653	2,334	7,319
19	141,785	42,889	98,896	19,058	4,546	14,512
Total	1,534,753	391,861	1,142,892	39,273	10,213	29,060

Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Adolescent fertility varies however considerably by current school attendance. It is far higher among adolescents who have dropped out-of school or never attended. The percentage of adolescents (aged 10-19 years) who already gave birth is 5.2 % among adolescents who never attended school, 7.8% among those who dropped out and 0.6% among those who are currently attending school. This difference holds at each age as shown in Figure 4.17. Childbearing is a rare event among in-school adolescents (2.2% at age 19 and less than 1% before) and more common among out-of-school adolescents, i.e. the drop-outs and the never-attended adolescents, just above 5% before age 17 and almost 20% by age 19.

Figure 4. 17 Percentage of adolescent women who gave birth by single year of age by school attendance

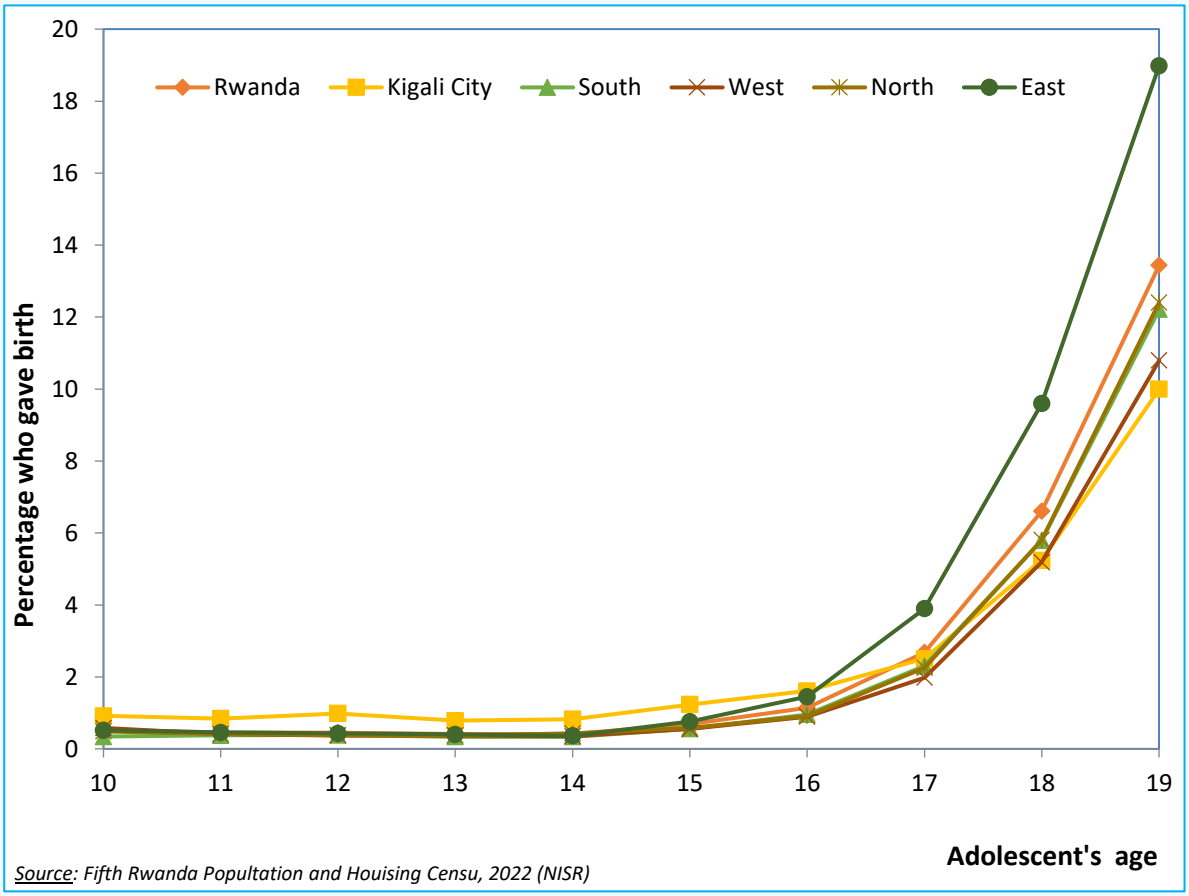


Provincial variations of adolescents' fertility

The pattern of childbearing during adolescence does not vary a lot by Province and is similar to the national one. The percentage of adolescents mothers is stable at a low(less than 2%) and stable up to age 16, and increase dramatically at ages 18 and 19 years (Figure 4.18) Considering the province level, we can distinguish two groups:

- The Eastern Province with the highest prevalence of adolescent fertility: 19% at age 19 years, and stands uniquely among all other provinces with slightly over 18 % who have given birth by age 19 years.
- All other Provinces (South, West, North and the City of Kigali) that have similar patterns with small variation. It may be the case that adolescent fertility in the Eastern province drives adolescent fertility in the country a pattern which has not changed since the 2012 census.

Figure 4. 18 Percentage of adolescents who already gave birth by single year of age by Province



Source: Fifth Rwanda Popultation and Housing Censu, 2022 (NISR)

Given that the variations in adolescent fertility by current school attendance status are more important than variation by area of residence, the regional analysis will be disaggregated by Province and school attendance. The findings are presented in Table 4.8 below. They confirm the findings at the national level. In each of the Province's adolescents' fertility varies tremendously by school attendance. Childbearing is much more frequent among out-of-school and never attended adolescents than among adolescents attending school.

Table 4. 8 Percentage of adolescents who already gave birth, by Province, according to the age-group and school attendance

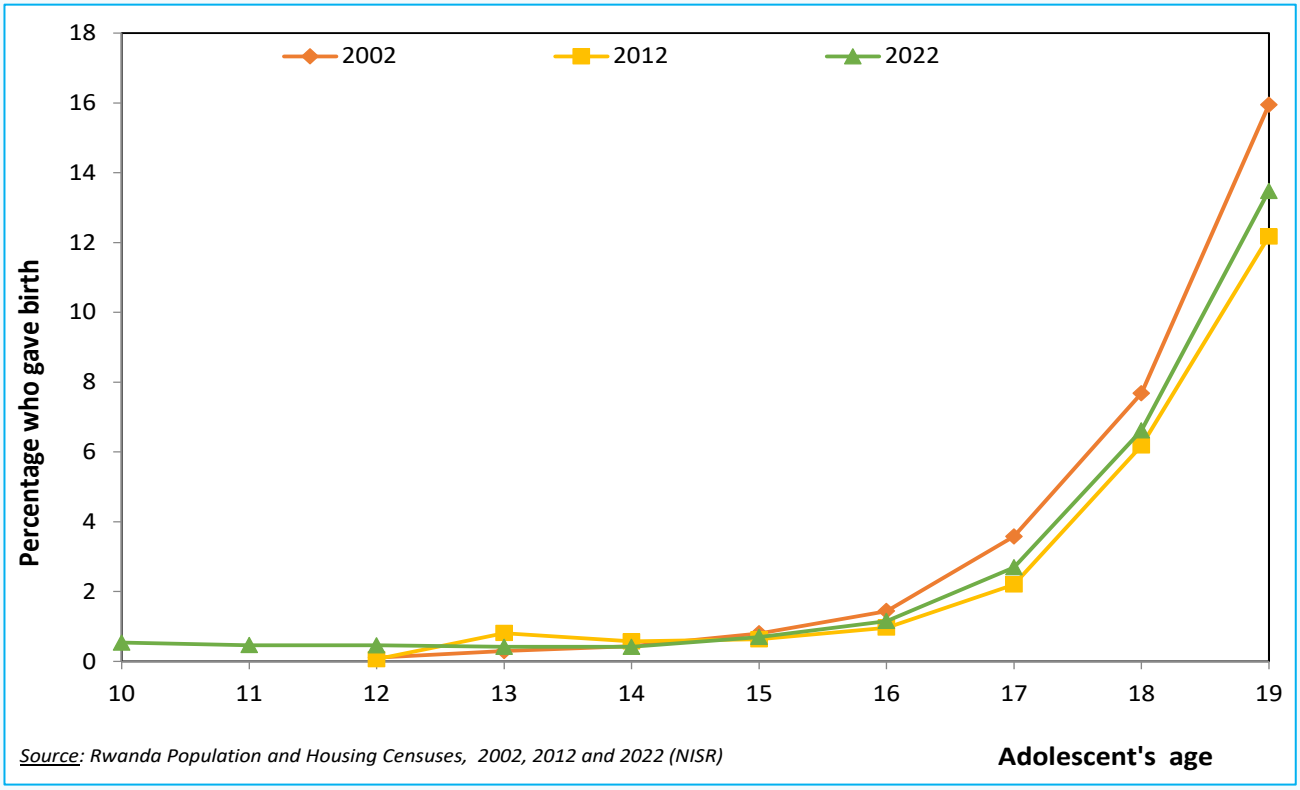
Province	10-14			15-19		
	Out of school	Currently attending	Never attended	Out of school	Currently attending	Never attended
Rwanda	0.77	0.41	1.15	9.04	0.96	8.72
Kigali	1.51	0.80	2.17	7.80	1.41	6.37
Southern	0.69	0.32	1.07	8.35	0.81	7.38
Western	0.59	0.39	1.02	6.99	0.75	7.47
Northern	0.87	0.38	1.07	7.90	0.82	8.06
Eastern	0.71	0.39	1.09	12.34	1.13	11.73

Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Evolution of adolescent fertility between 2002 and 2022

Adolescents' fertility has decreased between 2002 and 2022 but the pattern in 2022 has not changed from that of 2012. From age 16, the percentages of adolescents having had a child was higher in 2022 compared with 2012. However, the age patterns of childbearing during adolescence have not changed a lot between 2002 and 2022. The percentage of adolescents who gave birth is stable at a low level up to age 17 (less than 2%) before increasing dramatically at ages 18 and 19 (more than 12%).

Figure 2 Evolution of percentage of adolescent who have already gave birth from 2002 to 2022



Source: Rwanda Population and Housing Censuses, 2002, 2012 and 2022 (NISR)

Current adolescent fertility

The indicator of adolescent fertility using births in the 12 months prior to census date is age specific fertility rate for women in the age group 15-19. It is 25 per 1000 at national level and has only declined by about 7.4 % since the 2012 PHC. Adolescent fertility rate ranges between 19 per 1000 women in the City of Kigali to 36 per 1000 women in Eastern Province. Adolescent fertility rate is higher in rural areas (28 per 1000) than in urban (20 per 1000).

Table 4. 9: Adolescent's Age Specific Fertility birth rates

	Adolescent birth rate		Count of cases
	10-14	15-19	
Rwanda	0.0004	0.02546	1,534,753
Urban	0.0006	0.01980	391,861
Rural	0.0003	0.02762	1,142,892
Province			
Kigali City	0.0007	0.01856	172,080
North	0.0003	0.0225	349,276
South	0.0004	0.01998	351,173
West	0.0003	0.0239	237,471
East	0.0004	0.0364	424,753
Education			
None	0.0011	0.040	45,121
Primary	0.0004	0.034	1,092,759
Secondary and above	0.00023	0.015	399,857

Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Adolescent birth rate in Rwanda is lowest when compared to most sub-Saharan African countries (early and late fertility rates). However, as is indicated in the SDG program of action there is need for policy focus because women in this age group having children experience negative socio-economic outcomes.

Table 4.10 shows the early births rates by country in selected African countries-based data from DHS. The columns are countries arranged by the birth rate per 1000 among women in age group 10-14 while rows are birth rate among women in the age group 15-19. Only Rwanda has birth rate among women age 15-19 below 50 per 1000 and also birth rate among women age 10-14 below 1 per 1000. Burundi, South Africa and Senegal the birth rate for women age 15-19 lies between 50-74 per 1000 and in the same countries the birth rate for women in the age group 10-14 is less than 1 per 1000. However, in the same row, in Comoros have has birth rate among women age 10-14 to lie between 2 to 3 per 1000. Countries with high birth rate among women age 15-19 (over 100 per 1000) and also high birth rate among women age 10-14 (over 4 pr 1000) are Congo, Cote d'Ivoire, Liberia DRC, Guinea, Chad, Niger, Mozambique, Sierra Leone, Mali Angola Madagascar.

Table 4. 10:Adolescents (10-14 years, and 15-19) births rates by different countries

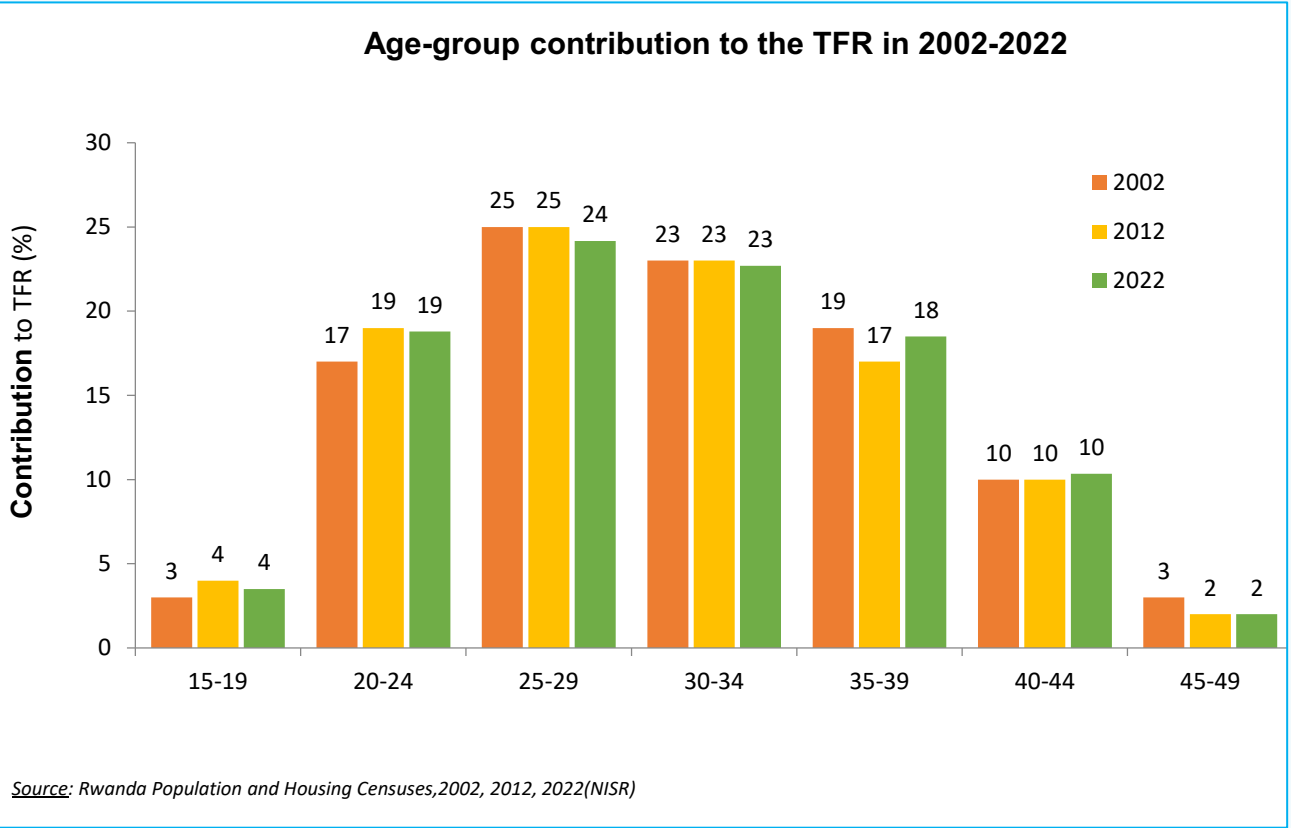
		Births per 1000 in age group 10-14		
		0-1	2-3	4+
Births per 1000 women in age -group 15-19	< 50	Rwanda		
	50-74	Burundi, South Africa, Senegal,	Comoros	
	75-99	Ethiopia, Ghana, Lesotho	Gambia, Kenya	Namibia
	100+	Burkina Faso, Tanzania	Cameroon, Togo, Benin, Zimbabwe, Uganda, Malawi, Zambia	Congo, Cote d'I viore, Liberia DRC, Guinea, Chad, Niger, Mozambique, Sierra Leone, Mali Angola Madagascar

Source: compiled from ICF Macro stat compiler

Evolution of the contribution of different age groups of women to the national TFR

Figure 4.19 shows that adolescents' contribution to the Total Fertility Rate (TFR) has slightly increased from 3% to 4% between 2002 and 2022 for the age group 15-19. This is the case for other age groups; the contribution of the age-group 20-24 increased from 17 to 19%. For the age group 25-29 the contribution to the TFR slightly declined while the age group 30-34 has remained the same since 2002. The contribution to the TFR for the 35-39 age group had slightly increased (17% to 18%) between 2012 and 2022.

Figure 4. 19 Age group contribution to the national TFR and its evolution 2002 to 2022



Source: Rwanda Population and Housing Censuses,2002, 2012, 2022(NISR)

4.3.2. High risk fertility behaviours: Late childbearing onset and late fertility

Late onset of childbearing

Starting childbearing at a late age bears many risks to mother's health. Age 35 is usually set as the lower age boundary for late onset of childbearing. Therefore, in this analysis we will capture late fertility onset by the Late Fertility Onset Rate (LFOR) that we define as the percentage of women who gave their first birth at age 35 and above among women who gave birth during the last 12 months preceding the PHC.

$$\text{LFOR} = \frac{\sum \text{Women who gave their first birth in the last 12 months at age 35 or above}}{\sum \text{Women who gave birth during the last 12 months}} \text{X100}$$

In 2022, the 5th PHC recoded a late fertility onset rate of 1.2%. This prevalence indicates that in Rwanda late onset of childbearing is rare. This percentage has however is increased as compared to 2002 and 2012 (0.2% and 0.5% respectively). The percentage of women who start late their childbearing varies slightly by Province. The LFOR is 0.9% in the Eastern Province, around 1 % in the Northern, Western and Southern Provinces and 2% in the City of Kigali.

Taking into account the highest level of education attained by women, the LFOR is slightly higher among women with less education. This seems to be not aligned with the literature which says women with higher education level tend to get married later and start their childbearing later. The LFOR is around 2% among women with no education and it is around 1% among other women (women with primary/post primary and women with secondary and above).

Late fertility

Women who keep on giving birth until late ages are exposed to high risk for their own health and that of their children's health. In this analysis we define late childbearing as giving birth at 45 or above. We will measure it by the Late Fertility Rate (LFR) which is the percentage of women who gave birth during the last 12 months among women aged 45 years and above.

$$\text{LFR} = \frac{\sum_{45+} \text{women who gave birth in the last 12 months}}{\sum_{45+} \text{women}} \textbf{x100}$$

The LFR in 2022 is 0.4%, it has decreased from 1.2% since 2012. Overall, 4,363 women aged 45 and above have given birth during the year preceding the census, meaning that a non-negligible of Rwandan women continue to give birth till late ages. Yet the LFR underestimates the true level of late childbearing in Rwanda because it is based on births occurred in the 12 months preceding the census while women aged 45 and above who still give birth do not deliver every single year. Women who gave birth two years or more before the census while aged 45 years and above are not captured by the LFR.

The variations in LFR by Province, area of residence, educational attainment and current economic activity status are trivial (Table 4.11). This finding suggests that there is still a culture of extending childbearing at late ages in Rwanda, regardless of other social and economic influences.

Table 4. 11: Late Fertility Rate (LFR) by some women's background characteristics

Women's background variables	Number of women aged 45 and above who had given birth	Number of women aged 45 and above who gave birth during the preceding year	Late Fertility Rate (%)
Area of Residence			
Urban	190,578	911	0.48
Rural	830,774	3,452	0.42
Province			
City of Kigali	74,757	389	0.52
Southern Province	285,966	938	0.33
Western Province	227,163	1,134	0.50
Northern Province	169,842	662	0.39
Eastern Province	263,624	1,240	0.47
Marital status			
Never married	29,966	123	0.41
Married	644,411	3,910	0.61
Separated/ Divorced	34,966	106	0.30
Widowed	312,009	224	0.07
Religious affiliation			
Catholic	477,286	1,584	0.33
Protestant	368,728	1,971	0.53
Adventist	124,035	531	0.43
Muslim	13,718	61	0.44
Jehovah Witness	7,310	36	0.49
No Religion	10,690	61	0.57
Other	19,585	119	0.61
Educational attainment			
No Education	440,832	1196	0.27
Primary/Post Primary	515,756	2802	0.54
Secondary and above	64764	365	0.56
Not Stated	-	-	-

Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

4.3.3. Premarital fertility

The analysis of premarital fertility is justified by the fact that in many settings, including Rwandan society, women who give births prior to marriage face several difficulties:

- Thy are stigmatized by their family members and the rest of the society, lacks social support and care usually provided by the family or family-in-law and needed by inexperienced young mothers
- They tend to experience higher maternal and infant mortality and morbidity; are tempted to resort to unsafe abortion;
- They have less means to take care of the child because of lack of support of a husband;
- they jeopardize their future (school drop-out, loose of their job if in the informal sector) and may easily fall into the poverty trap; and
- they have less chance to get married later on or are more likely to be involved in unwanted marriage (with the father of the baby) which will be more subject to dissolution than otherwise.

In this analysis, premarital fertility is measured by the percentage of never married women who already gave birth.

Current premarital fertility by background characteristics

The analysis is done by area of residence, Province, religious affiliation and level of educational attainment. The findings are presented in Table 4.12 below. At the national level, 14% of never married women have already given birth at the time of the census. This percentage had increased from 12 in 2012 and does not vary by area of residence. It varies only slightly by Province where premarital fertility ranges between 16% in the Southern province and 13% in Western, and Northern Provinces.

The prevalence of premarital fertility varies more importantly according to the level of educational and religious practised. It diminishes from 35% among non-educated women to 15% among those with a primary level and 10% among those with a secondary education or above. By religion we distinguish three groups: women with no religious and Muslims affiliation who have the highest prevalence of premarital fertility (23% and 18% respectively), the Christians who have the medium prevalence of premarital fertility (between 13 and 14%), and the Jehovah witness who have the lowest prevalence of premarital fertility between the two extremes, 11%/

Table 4. 12:Percentage of never married women who already gave birth by women's background

Women's background variables	Number of never married women whose parity is reported	number of never married women who gave birth	Percentage of never married women who already gave birth
All single women	1,946,827	274,537	14.1
Residence area			
Urban	590,917	82,896	14.0
Rural	1,355,910	191,641	14.1
Province			
City of Kigali	290,822	42,983	14.8
Southern Province	440,469	69,532	15.8
Western Province	432,120	55,044	12.7
Northern Province	300,501	39,730	13.2
Eastern Province	482,915	67,248	13.9
Religious affiliation			
Catholic	780,596	112,815	14.4
Protestant	802,020	108,705	13.5
Adventist	239,707	31,005	12.9
Muslim	34,876	6,232	17.9
Jehovah Witness	14,201	1,633	11.5
No Religion	33,648	7,885	23.4
Other	41,779	6,262	15.0
Educational level			
No Education	100,485	34,992	34.8
Primary/Post Primary	1,110,746	163,347	14.7
Secondary and above	735,501	76,198	10.36
Not stated	95	-	-

Source: Fifth Rwanda Population and Housing Census, 2022 (NISR)

Provincial and age variations of premarital fertility

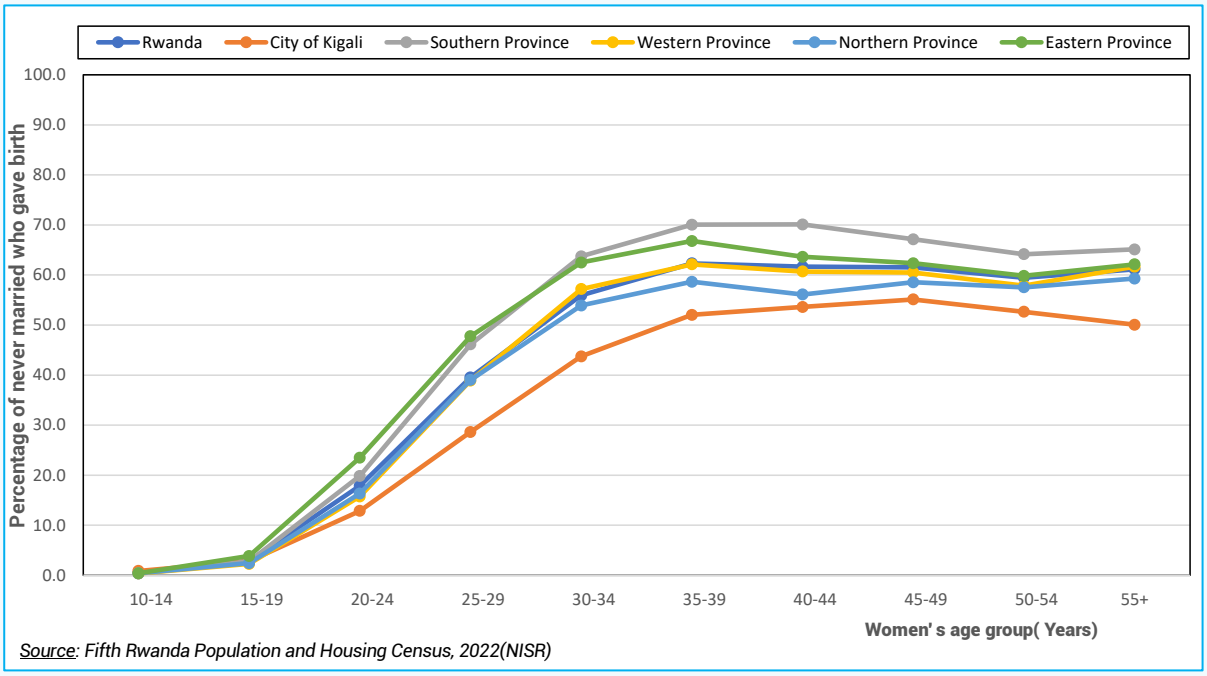
Since the risk of premarital fertility depends on the length of exposure and woman's age, it is important to compute the prevalence of premarital fertility by age-group similar to the ASFRs.

The prevalence of premarital fertility increases rapidly with women's age (Figure 4.20). It is low during adolescence (less than 3%) but becomes greater than 39% in the age-group 25-29 and thereafter increases till it reaches its maximum at age 50-54 (just above 60%). This pattern is probably explained by the duration of exposure to premarital fertility that increases with age.

Premarital fertility follows the same pattern in the five provinces as the national one described above. However, there are marked variations in terms of level after age 20 by Province:

- The Southern Province has the highest premarital fertility prevalence from ages 30 and above;
- Kigali City has the lowest premarital fertility prevalence at all ages above 15;
- The Eastern Province has premarital fertility prevalence higher than the national level at all ages;
- The Western Province has the same premarital fertility prevalence as the national level at all ages;
- Finally the Northern Provinces has the premarital fertility prevalence more or less equal to the national ones at all age-groups

Figure 4. 20 Percentage of never married women who gave birth by age group and by Province

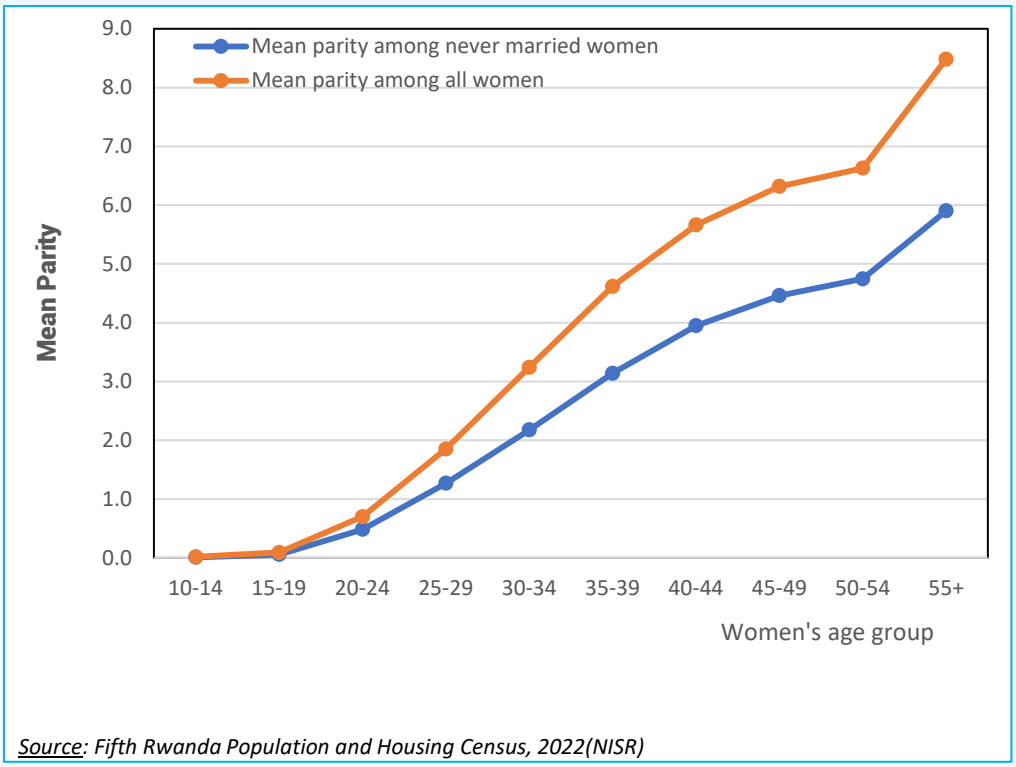


Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

Mean parity of never married women vs. mean parity of all women

As it would be expected, never married women have a mean parity which is lower than the mean parity among ever married women at any age group (Figure 4,21). This finding confirms the accuracy of the data on the children ever born as it has been found in the chapter on data quality evaluation chapter.

Figure 4. 21 Comparison of mean parity of never married women with parity of all women's at the time of the census



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

4.4. Other fertility indices

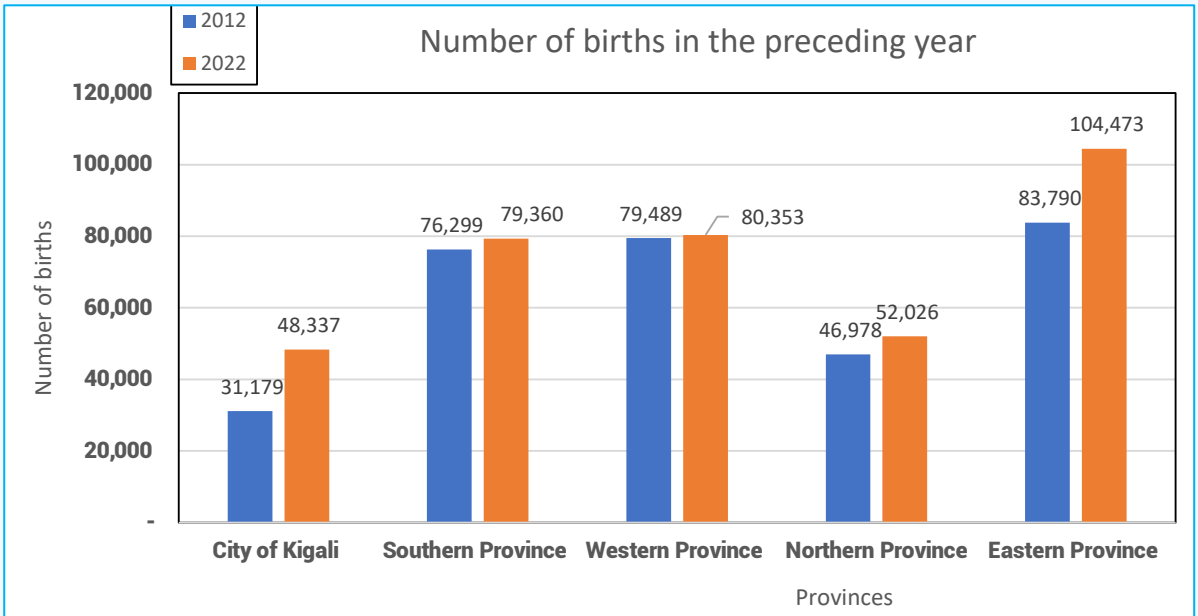
In this section we will analyse: (i) the number and frequency of births in the Rwandan population; (ii) its geographical variations; and (iii) the likelihood that the Rwandan population be replaced during the next generation. The indicators to measure natality that we will use in this analysis are: the number of births occurred in the population during the year preceding the census, the Crude Birth Rate (CBR) that refers to the number of births per 1000 inhabitants per year and the General Fertility Rate (GFR) which is the number of births among 1000 women in the reproductive age (15-49 years) per year.

4.4.1. Number and frequency of births in the population

The 5th PHC showed that, overall, Rwandan women gave births to 364,549 babies during the 12 months preceding the census, equivalent to approximately 999 births per day. In other words, 41 babies are born every one hour in Rwanda.

The distribution of births by province is shown in Figure 3below. As expected the highest number of births occurred in the three most populated provinces: East (29% of all births), South and West (22% each). The City of Kigali and the Northern Province have the lowest share of the number of births (13% and 14% respectively).

Figure 3: Number of births in preceding year



Source: Fifth Rwanda Population and Housing Census, 2022(NISR)

The number of children born in a year depends on the total population and more specifically on the number of women in the standard reproductive age group (15-49). To take into account this, the number of births is divided by the total population to obtain the Crude Birth Rate (CBR) and by the number of women aged 15-49 to obtain the General Fertility Rate (GFR). The two indicators measure more accurately the frequency of births in a population than the total number of births. Table 4.13 below shows the values of both indicators at the national and provincial levels.

At the national level, there are 28 births per thousand inhabitants per year and 107 births per thousand women aged 15-49 per year (GFR). The CBR varies from 26 births per thousand inhabitants per year in the Northern

Province to 30 births per thousand inhabitants per year in the Eastern Province. The GFR also varies by provinces from 94 births per thousand women aged 15-49 per year in the City of Kigali to 115 births per thousand women aged 15-49 per year in the Eastern Province.

Table 4. 13 Crude birth Rate and General Fertility Rates by Province

Province	Crude Birth Rate, CBR (‰)		General Fertility Rate, GFR (‰)	
	2012	2022	2012	2022
Rwanda	30.9	27.8	122.2	105.5
City of Kigali City	28.1	28.0	98.9	94.1
South	29.8	26.7	119.9	106.1
West	32.5	28.0	130.6	108.1
North	27.3	25.8	108.6	95.4
East	32.9	29.7	134.3	115.2

Source: Rwanda 4th Population and Housing Census, 2012 (NISR); 5h Population and Housing Census, 2022 (NISR)

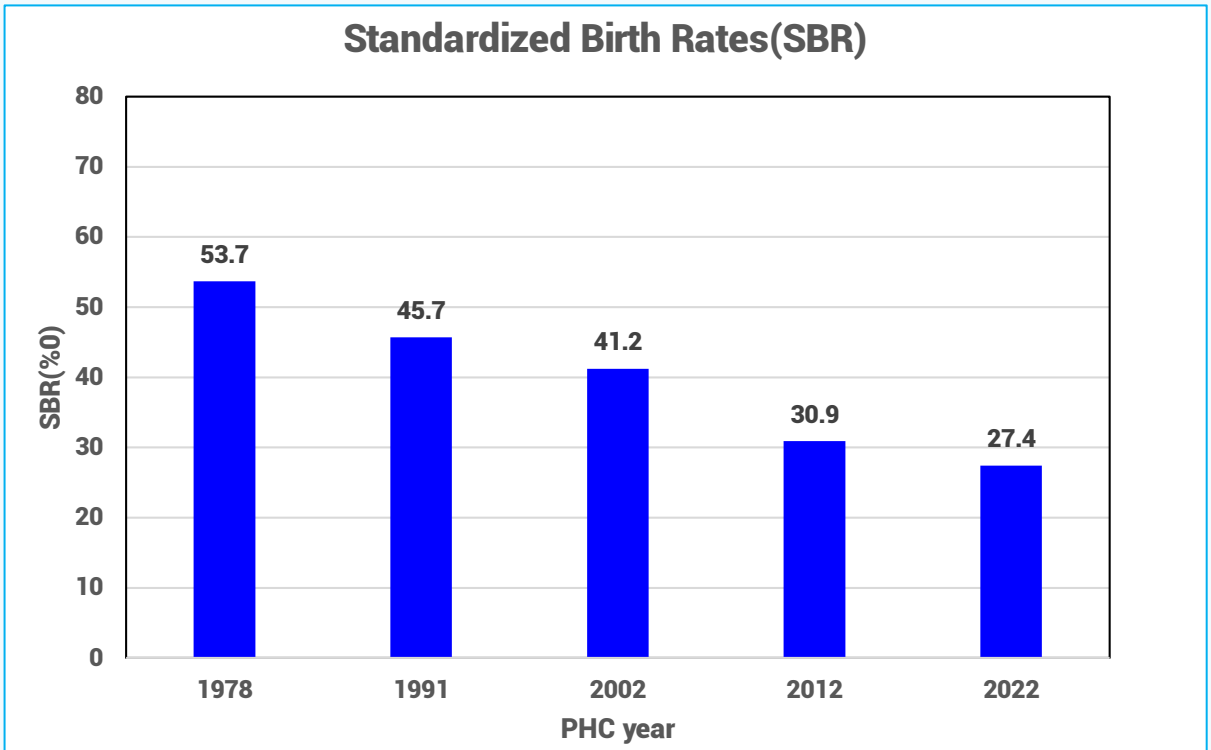
4.4.2. Trends and provincial variations of natality

To compare natality across different populations at a given time and within the same population at different points of time we will use the Standardized (SBR) rather than the Crude Birth Rate (CBR). The CBR is affected by the age-sex structure of the population. Two populations may have the same CBR but quite different levels of natality due to difference in the number and age distribution of the women in the two populations. The GFR, though more accurate than the CBR, does not fully fixed this limitation. To address this, we resort to SBR that eliminates the effect of age-sex structure by applying the ASFRs of the two populations to the age-sex distribution of a same population. This makes the SBR comparable across different populations at a given time and over time for the same population.

For comparability over time the SBR is computed using only women aged 15-49. Births from women out of this age-group are not available in all censuses (1978, 1991, 2002 ,2012 and 2022) used in the present trends analysis. The findings are displayed in the Figure 4.

It reveals that natality has decreased considerably since 1978, especially between 2002 and 2012. The SBR was 54 children per 1,000 inhabitants in 1978, 46 in 1991, 41 in 2002 31 in 2012 and 27 in 2022.

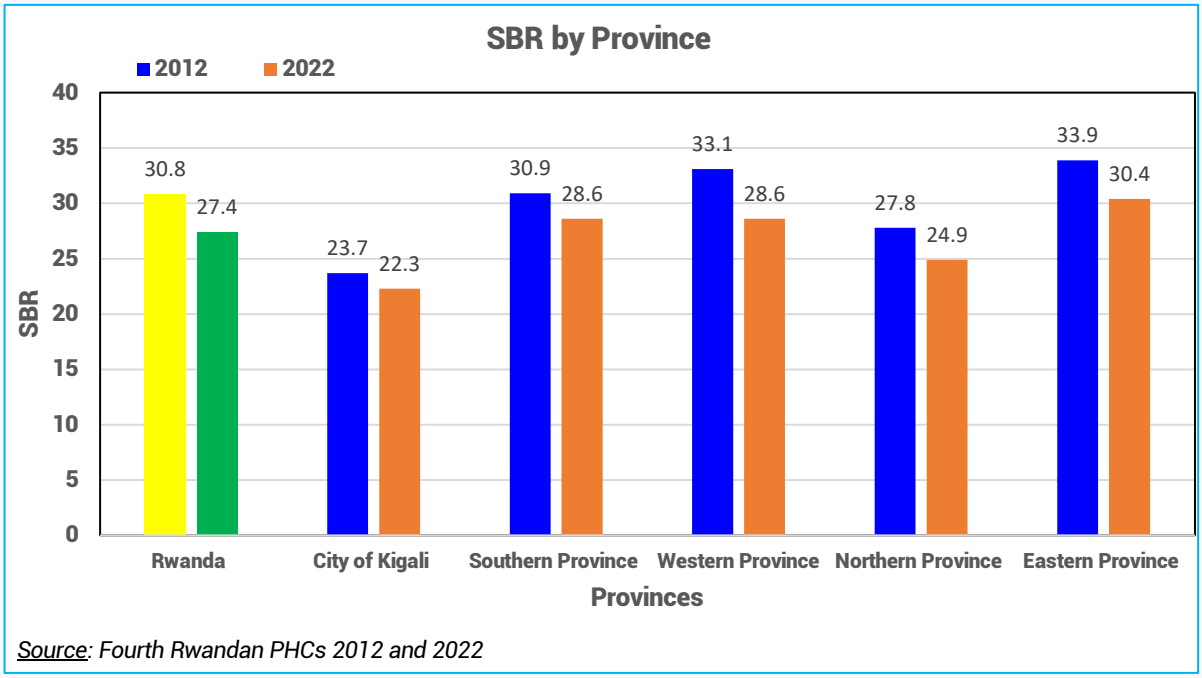
Figure 4. 22 Evolution of Standardized Birth rates from 1978 to 2022



Source: Rwandan 1978,1991,2002,2012 and 2022 PHCs

The SBR varies considerably across provinces (Figure 4.23) from a minimum of 22 children per one thousand inhabitants in Kigali City to a maximum of 30 in the Eastern Province. This pattern is the same as it was in 2012 PHC. Thus, the Eastern province appears to be the most fecund, followed by the Western and Southern. On the other side, the Northern Province appears to be the second less fecund province after Kigali City with an SBR as low as 25 children per one thousand inhabitants.

Figure 4. 23 Standardized Birth Rate by Province (2012-2022)



Source: Fourth Rwandan PHCs 2012 and 2022

4.4.3. Replacement of the population

To ensure that the population will not decline over time, each woman in the reproductive age should be replaced at least by one daughter. There are three indicators to capture the likelihood of the population to be replaced.

The first one is the TFR that should be greater or equal to 2.1 children to ensure the replacement of the population for the next generation. The second indicator is the Gross Reproduction Rate (GRR) that is the number of daughters a woman would have at the end of her reproductive life under the current fertility conditions. It is obtained by multiplying the TFR by the percentage of girls among the births as shown in the formula below.

$$GRR = \frac{\text{Number of female births in the last 12 months}}{\text{Total number of births in the last 12 months}} \text{x TFR}$$

The last indicator to measure the replacement of the population is the Net Reproduction Rate (NRR) that is the number of daughters a woman would have at the end of her reproductive life under the current fertility conditions while taking into account current level of female mortality at each five year age-group. The NRR is calculated by adding the survivorship rates at the different 5-year age group multiplied by the corresponding ASFR as shown in the formula below:

$$NRR = \frac{\text{Number of female births in the last 12 months}}{\text{Total number of births in the last 12 months}} \text{x} \sum_{k=15}^{44} S(k, k+4) \text{x} ASFR(k, k+4)$$

Where:

- S(k, k+4) is the female survivorship rate after age k+4 among women aged k to k+4 from the female life table;
- ASFR(k, k+4) is the Age-Specific Fertility Rate between age k, k+4.

If the NRR is equal 1, each generation of women is exactly reproducing itself. If it is larger than 1, the next generation will have more women. If it is smaller than 1, the next generation will have less women.

According the 2022 PHC, the TFR is 3.6 children per woman, the GRR is 1.8 daughters per women, and the NRR is 1.7 daughters per woman. All these indicators show that the replacement of the Rwandan population is guaranteed.

CONCLUSION

Census is a unique source of data to analyse fertility and natality through different angles and at different disaggregated level. Census data also forms an important benchmark for all other data sources.

The methodology used only by direct methods backed by a thorough evaluation of the quality of the data. The main findings are as follow:

- Fertility has declined substantially since 2002 census although it has not reached replacement level,
- Although fertility and natality vary according to Provinces and other socio-economic characteristics of women of childbearing age, the differences are narrowing. However, a noticeable fact is that fertility levels among women with secondary education or higher education increased between 2012 and 2022, remained nearly the same for women with primary education and continued to decline among those who have never attended school. Of these different categories of women, those, those with primary education have the highest fertility.
- Non-negligible proportions of women in Rwanda have high-risky fertility behaviours (childbearing at adolescence and at late ages) that compromise their health and that of their children.

The analysis reveals that the general picture of fertility in Rwanda focussing mainly on the success story of the important decrease observed in the past decades hides many other stories that call for specific interventions towards specific target groups. For instance, interventions to reduce adolescents fertility and its diverse health and socioeconomic impacts should target in priority out-of-school girls. The analysis also shows that the continuing migration to the Eastern Province brings with it high fertility. This means that land management policies and programs aimed at relaxing the land pressure in the other Provinces should also pay special attention to fertility. Otherwise, when people migrate for instance from the Northern to the Eastern Province, the land pressure will not be solved but only moved from the North to the East and postponed from nowadays to sometime in the future.

Policy implications and recommendations based on the census findings

This paragraph summarizes the policy implications based on the preceding analysis. From key findings presented following recommendation can be

The population growth rate of 2.3 percent registered during the intercensal period 2012 to 2022 is among the highest in the world. Such a high population growth rate has many implications on the demand for social services and places a huge burden on the already limited resources of the country and the budget allocated to the social sector. Given that this will not change quickly due to the demographic momentum, all policies and programs implemented in the country should integrate the population growth as a constraint to be managed rather than ignoring it.

Though there is a significant decline in fertility, at the same time, the contribution of the adolescent and young people to fertility is increasing. There should be specific family planning programs oriented to these groups of population, and in priority to those who are already mothers or those out-of-school.

The analysis has shown that the Eastern province which used to have lower fertility level is for nowadays the one which has the highest levels of fertility and natality. This is linked to the important migration flows of people in the reproductive age to that Province. Therefore, the migration policy should have a strong fertility component, otherwise, there will be a kind of shift of high fertility levels from the Northern to the Eastern and land pressure affecting currently the North will be shifted to the Eastern Province in the future.

The percentage of childless women at the end of their reproductive age (an indirect measure of the prevalence

of sterility) has remained stable over time though low. Further studies are needed to understand if that percentage is a threshold that cannot be lowered or not. In that latter case specific programs to address that issue are needed.

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ANNEXES

Annex A: Census Questionnaire

This annex provides the full questionnaire of the Census questionnaires.

As mentioned above, two different types of questionnaires were administered, one for private households and one for institutional households. The questionnaire for private households contained a population record, a household record and a mortality record. The questionnaire for institutional households contained only a population record.

a) Private households: person record

REPUBLIC OF RWANDA

MINISTRY OF FINANCE AND ECONOMIC PLANNING

NATIONAL INSTITUTE OF STATISTICS OF RWANDA

P.O. Box 6139 Kigali *Tel: +250-788383103*
Hotline: 4321 *E-mail: info@statistics.gov.rw*

GENERAL POPULATION AND HOUSING CENSUS
16 – 30 AUGUST 2022

Legal Basis: **Law n° 45/2013 of 16/06/2013 on the organisation of statistical activities in Rwanda.**

CENSUS QUESTIONNAIRE (PRIVATE HOUSEHOLD)

SECTION ML: LOCALISATION AND IDENTIFICATION OF HOUSEHOLD

ML01.	PROVINCE/KIGALI CITY:	|__|
ML02.	DISTRICT:	|__|__|
ML03.	SECTOR:	|__|__|
ML04.	CELL:	|__|__|
ML05.	VILLAGE:	|__|__|
ML06.	ENUMERATION AREA (N0 EA):	|__|__|
ML07.	AREA OF RESIDENCE (1.URBAN 2.RURAL) :.....	|__|
ML08.	BUILDING NUMBER:	|__|__|__|
ML09.	HOUSEHOLD NUMBER:	|__|__|__|
ML10.	FOOT PRINT NUMBER (as it is shown on the map) :.....	|__|__|__|
ML11.	GPS COORDINATES:	Latitude: |__|__|__|__|__|__|__|__| Longitude: |__|__|__|__|__|__|__|__|
ML12.	DISTANCE:	|__|__|__|
ML13.	HOUSEHOLD TYPE: 1. Private HH 2. Institutional HH |____|	

My names is ....., I work for the National Institute of Statistics of Rwanda as the enumerator of the General Population and housing census. The objective of the general population census is to have the full enumeration of all Rwandan residents as well as their key characteristics; for the planning of the well-being of Rwandan residents. I wish to talk with the head of the household. In general, the interview will last 30 min. All provided answers will be kept confidential. I hope that you accept the interview, as your responses are very important for the country.

ML14	CONSENT:	1. Interview accepted => **P01A (Start by making a list of HH members)** 2. Interview is not done |____|
ML15.	THE REASON OF NO INTERVIEW:	1.Uninhabited dwelling 2. Dwelling turned into business building |____| 3.Dwelling destroyed 4.Refused 5.All residents are absents during the whole period of enumeration 6. The house is still inhabited by some members of HH

HOUSEHOLD SCHEDULE (List of household members and visitors)	
N°	**Name(s) of household members and visitors**
Serial Number	**1. Resident household members** **INSTRUCTION:** WRITE THE NAMES OF ALL RESIDENT MEMBERS WHO WERE PRESENT OR ABSENT IN THE REFERENCE CENSUS NIGHT: (15-16/08/2022) ACCORDING TO THE FOLLOWING ORDER: 1.Household head 2.Spouse 3.Household head son or daughter 4.Household adoptive child 5.Father/ Mother 6.Father-in-law/Mother-in-law 7.Brother-in-law/Sister-in-law 8.Brother/Sister 9.Grand Child 10. Son/Daughter-in-law 11.Other relative 12.House help 13.Non- relative 14.Unknown relationship to household head **2. Visitors** RECORD THE NAMES OF ALL VISITORS WHO SPENT THE CENSUS NIGHT WITHIN THE HOUSEHOLD (IF ANY). (Please remember that visitors should be recorded after recording resident members)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
17	
19	
20	

SECTION P: CHARACTERISTICS OF THE POPULATION

FOR ALL MEMBERS OF HOUSEHOLD

P01A: Serial Number of the person

P01B: Surname of the person:.....

P01C: Other names of the person.....

P02: What is [NAME]'s relationship to the Head of Household?

01.Household head
02.Spouse
03.Son or daughter
04.Adoptive child
05.Father/ Mother
06.Father-in-law/Mother-in-law
07.Bother-in-law/Sister-in-law
08. Brother/Sister
09. Grand Child
10. Son/Daughter-in-law
11. Other relative
12. House help
13. Non-relative
14. Unknown relationship

P03: What is [NAME]'s Sex? 1.Male 2.Female

P04: How old was [NAME] at his/her Last Birthday?
NOTE: RECORD AGE IN COMPLETED YEARS

P05A: In which month was [NAME] born?

P05B: In which year was [NAME] born?
NOTE: RECORD 9999, IF THE YEAR IS UNKNOWN

P06: What is [NAME]'s marital status?
ALL PERSONS AGED 12 YEARS AND ABOVE
1.Married to one wife/husband officially
2.Married to one wife/husband not officially
3.Live in a polygamous union
4.Divorced
5. Separated
6. Never married
7. Widowed

P07A: Is [NAME] usual resident or was a visitor on census night?
1. Usual resident
2. Visitor => GO TO THE NEXT PERSON

P07B: Did [NAME] sleep in this household on census night?
1. Yes, slept in this HH (PR)
2. No, did not sleep in this HH (AR)

SECTION S: HOUSEHOLD SUMMARY TABLE

Residence status	*Both sexes*	*Male*	*Female*
Present Resident (PR)			
Absent Resident (AR)			
Total Resident (PR+AR)			
Visitors(VIS)			
Total Enumerated			

ALL RESIDENT(P07A=1) AGED 12 YEARS AND ABOVE

P08A: How many spouses does [NAME] have? => P08C
(FOR MEN IN POLYGAMOUS UNION ONLY)
IF THE NUMBER OF SPOUSES IS 8 OR ABOVE, WRITE 8
IF THE NUMBER OF SPOUSES IS UKNOWN WRITE 9

P08B: What is the rank of [NAME] to His Husband?
(FOR FEMALE IN POLYGAMOUS UNION ONLY)
IF THE RANK IS 8 OR ABOVE, WRITE 8. IF THE RANK IS UNKOWN WRITE 9

P08C: How old was [NAME] when he/she first got married or lived together with his/her partner (AGE AT FIRST MARRIAGE)?
RESERVED FOR ALL PERSONS WHO RESPOND 1,2,3,4,5, AND 7 ON QUESTION P06 IF THE AGE AT THE FIRST MARRIAGE IS NOT KNOWN, WRITE 99

FOR RESIDENTS ONLY (P07=1)

P09A: was [NAME] born in Rwanda or abroad?
1.In Rwanda
2. Abroad =>P09C

P09E: In which District was [NAME] born? =>P10A

SELECT ONE DISTRICT FROM THE LIST OF ALL DISTRICTS

P09C: In which Country was [NAME] born?
(SELECT THE COUNTRY FROM WORLD COUNTRIES LIST)

P10A: How many years has [NAME] been living continuously in [District]?
- Record 000 if less than 1 year
- Record 888 if the residence has not changed since birth
- If the residence has not changed since birth =>P12A

P10E: Prior to come living in [district], was [NAME] residing in Rwanda or abroad
1.In Rwanda
2.Abroad =>P11B

P11A: In which District was [NAME] residing previously?
(SELECT THE DISTRICT FROM THE LIST OF ALL DISTRICTS)
=>P12A

P11B: In which Country was [NAME] residing previously?
(Select the country among the world countries List)

P12A: Is there any member of this household who does not have Rwandan Nationality?
1.Yes (Choose all non-Rwandans from the list of Household members
2.No (Make all Rwandans) => P13

P12B: What is [NAME]'s nationality?
CHOOSE THE NATIONALITY FROM WORLD COUNTRIES LIST

P13: What is [NAME's] Religious affiliation?
01.Catholic
02.ADEPR
03.Protestant
04.Adventist
05.Other Christians
06.Muslim
07. Jehovah witness
08.Traditional/Animist
09. Other religion
10. No Religion
11. Not stated
99. Do not Know

P14: What is [NAME]'s Medical insurance?
1.Mutuelle
2.RSSB (former RAMA)
3.MMI
4.Schools
5. Employer
6. Private insurance companies
7. NGOs
8. None
9. Do not know

DISABILITY: FOR RESIDENT AGED 5 YEARS AND ABOVE

P15: In this household, does any member have difficulty seeing?
1.Yes
2.None of the Household members has the difficulty =>P16

P15A: Who has difficulty seeing?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P15AA: Does [NAME] wear glasses?
1. Yes 2. No =>P15B

P15AB: Does [NAME] continue to have difficulties even when wearing glasses?
1. Yes 2. No =>P16

P15B: Would you say [NAME] has Some difficulty seeing, a lot of difficulty or cannot do at all?
0. No difficulty (To be filled by CAPI if P15AA==2 OR P15AB==2)
1.Some difficulty 2.A lot of difficulty 3.Cannot see at all

SECTION P: CHARACTERISTICS OF THE POPULATION

DISABILITY: FOR RESIDENT AGED 5 YEARS AND ABOVE

P16: In this household, does any member have difficulty hearing?
1.Yes
2.None of Household member has the difficulty **=>P17**

P16A: Who has difficulty hearing?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P16AA: Does [NAME] use hearing aid?
1. Yes 2. No **=>P16B**

P16AB: Does [NAME] continue to have hearing difficulties even if using hearing aid?
1. Yes
2. No **=>P17 (After the automatic fill in of modality "No difficulty" by CAPI on P16B)**

P16B: Would you say [NAME] has Some hearing difficulty, a lot of difficulty or cannot do at all
0. No difficulty 1.Some difficulty
2.A lot of difficulty 3.Cannot hear at all

P17: In this household, does any member have difficulty walking or Climbing steps?
1.Yes 2.None of Household member has the difficulty **=>P18**

P17A: Who has difficulty walking or climbing steps?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P17B: Would you say Some difficulty, a lot of difficulty or cannot do at all?
0. No difficulty 1.Some difficulty
2. A lot of difficulty 3. Cannot walk or climbing steps at all

P18: In this household, does any member has difficulty communicating, for example being understood by others?
1.Yes
2.None of Household member has the difficulty **=>P19**

P18A: Who has difficulty communicating, for example being understood?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P18B: Would you say Some difficulty, a lot of difficulty or Cannot do at all?
0. No difficulty 1.Some difficulty
2.A lot of difficulty 3.Cannot communicate at all

P19: In this household, does any member have difficulty remembering or concentrating?
1.Yes
2.None of Household member has the difficulty **=>P20**

P19A: Who has difficulty remembering or concentrating?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P19B: Would you say Some difficulty, a lot of difficulty or Cannot do at all?
0. No difficulty
1.Some difficulty
2.A lot of difficulty
3.Cannot remember or concentrate at all

P20: In this household, does any member have difficulty with self-care such as washing all over or dressing?
1.Yes
2.None of Household member has the difficulty **=>P21**

P20A: Who has difficulty with self-care such as washing all over or dressing?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P20B: Would you say Some difficulty, a lot of difficulty or cannot do at all
0. No difficulty
1. Some difficulty
2. A lot of difficulty
3. Cannot do at all

P21: In this household, Does any member have short stature?
1.Yes
2.None of Household member has the difficulty **=>P22**

P21A: Who has a problem of short stature?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

P22: In this household, does any member have albinism?
1.Yes 2.None of Household member has the difficulty **=>P23A**

P22A: Who has a difficulty with albinism?
CHOOSE FROM THE LIST OF HOUSEHOLD MEMBERS

ALL RESIDENT AGED LESS THAN 18 YEAS OLD

P23A: Is [NAME]'s biological mother alive?
1.Yes
2.No
9.Don't know **=>P23C**

P23B: Does [NAME]'s biological mother live in this household?
1.Yes 2.No **=> P23C**

P23BB: Who is **[NAME]'s biological mother?**

FROM THE LIST OF ALL FEMALES AGED [THE AGE OF CHILD +10] YRS OR ABOVE CHOOSE THE MOTHER

P23C: Is [NAME]'s biological father alive?
1.Yes
2.No
9.Don't know **=>P24**

P23D: Does [NAME]'s biological father live in this household?
1.Yes 2.No **=>P24**

P23DD: Who is **[NAME]'s biological father?**

FROM THE LIST OF ALL MALES AGED [THE AGE OF CHILD +15] YRS OR ABOVE CHOOSE THE FATHER

P24: Was [NAME]'s birth registered in the Civil Registration books?
1.Yes **=> P29**
2.No
9.Don't know

QUESTION P25 IS FOR THOSE WHO HAVE 18 YEARS OLD AND ABOVE AND THOSE WITH LESS THAN 18 YEARS BUT RESPONDED 2 AND 9 IN QUESTION P24

P25: What is the type of official identification document does [NAME] have?
01.Rwandan Identity Card 09. Refugee ID
02.Foreign Identity Card 10. Rwanda Birth Certificate
03.Rwandan Passport 11. Foreign Birth Certificate
04.Foreign Passport 12. Embassy/ Consular issued Documents
05.Rwandan Nationality Certificate 13. No document
06.Foreign Nationality Certificate 14. Other (specify)
07.Refugee travel document 99. Don't know
08. Proof of registration for refugees

QUESTION P25A-P28 ARE FOR THOSE WHO ANSWERED 13 ON P25

P25A: Why does [NAME] not have any official identification document?
1. In process looking for it 4. Personal reasons
2. The request got rejected 5. Other reason(specify)
3. Under required age 9. Do not know

P26: What is the Nationality of [NAME]'s Parents?
1. Both are Rwandan
2. One is Rwandan
3. Both are non-Rwandan
9. Don't know
IF P25A=1 or 3 AND P26=1 =>P29

P27: Are [NAME]'s Parents still alive?
FOR RESIDENT AGED 18 YEAS OLD OR MORE
1. Yes Both 3. No
2. Yes, one of them 9. Don't know

SECTION P: CHARACTERISTICS OF THE POPULATION

P28: Do Parents of [NAME] have or had legal Residence in Rwanda?
1. Yes Both 3. No
2. Yes, one of them 9. Don't know

EDUCATION: ALL HOUSEHOLD RESIDENTS

P29: Has [NAME], previously attended or is currently attending school / ECD?
1.Has previously attended
2.Is currently attending
3.Has never attended =>P32

P30A: What is the highest level of education did [NAME] attend or is currently attending?
1.ECD =>P32
2.Nursery
3.Primary
4.INGOBOKA /Vocational training
5. Lower secondary 6. Upper secondary 7. Tertiary

P30B: How many years of school did [NAME] complete successfully at that level? YEARS

WRITE 99 IF THE NUMBER OF COMLETED YEAR IS UNKOWN

P31: What is the highest certificate/degree [NAME] obtained?

THE QUESTION IS ASKED IF P30A IS 3,4,5,6 ,7

1. Primary school certificate
2. Post primary certificate (CE/FM/TVET I/TVET II)
3. EMA/ENTA
4. O' level Certificate
5. A3/D4/D5
6. A2/D6/D7
7. TVET certificate III
8. TVET certificate IV
9. TVET certificate V
10. TVET advanced diploma (A1)
11. Diploma(A1): D6+2-3yrs
12. Bachelor(A0): D6+3-6yrs
13. Post Graduate Diploma
14. Masters: Bachelor+1-2yrs
15. Doctorate(PhD)
16. None 99. Do not know

QUESTIONS P32 -P36 ARE RESERVED FOR PERSONS AGED 10 YEARS OLD AND ABOVE

P32: Can [NAME] read, write and understand the following languages? MORE THAN ONE LANGUAGE IS ALLOWED
READ MODALITIES STARTING BY KINYARWANDA
1. Kinyarwanda 8. Swahili
2. English 16. Other
4. French 0. None

P33: Has [NAME] ever attended or currently attending Informal adult literacy Program?
(RESERVED FOR THOSE WHO ANSWERED P29=3 OR P30A<4 AND P30B<4)
1.Yes, Still Attending
2.Yes, Completed
3.Never attended

INTERNET ACCESS

P34: Did [NAME] use internet in the last 12 months?
1. Yes
2. No =>P36A
9. Don't know =>P36A

P35: Where does [NAME] often access Internet?
1.From Home
2.From work place
3.From School/Place of Education
4.From Another Person's home
5.From Community Internet access facility
6.From cyber café/From Commercial Internet Access facility
7.Other

MOBILE PHONE OWNERSHIP

P36A: Does any member of this household own the mobile phone?
1.Yes 2. =>P37

P36B: Who own the mobile phone among members of the household? CHOOSE FROM THE LIST OF HH MEMBERS

P36C: What type of mobile phone does [NAME] have?
1.Smart phone
2.Ordinary phone with radio
3.Ordinary phone without radio

IF ONE HAS BOTH TYPE, CHOOSE SMART PHONE

EMPLOYMENT: FOR RESIDENTS AGED 16 YEARS OLD AND ABOVE

P37: During the last 7 days, did [NAME] do at least one of the following even if only for one hour?
-Work for wage or salary, commission or tips
-Work for pay in kind
-Work in own business
-Helped unpaid in a family business or a job of a family member
-Farming for pay in cash or in Kind
-Self-employed in farming/fishing/forestry mainly for market
-As paid internees
1.Yes =>P46 2. No

P38: During the last 7 days, did [NAME] have a paid job or a business from which he/she was temporarily absent and for which he/she expects to return?
1.Yes 2.No =>P42

P39: What was the main reason for which [NAME] was absent from work during the last 7 days?
1.Sick leave due to own illness or injury } =>P46
2.Annual leave/ maternity leave
3.Seasonal worker =>P42
4.Business closed due to COVID-19
5.Self or Family in Quarantine
6.Laid off because of COVID-19 while business continued
7.Not able to go to work due to COVID-19 movement restrictions
8.Other

P40: Does [NAME] continue receiving an income from his/her job during absence?
1.Yes =>P46
2.No 9. Don't know

P41: Was [NAME] planning to go to work for a period less than 3 months?
1.Yes =>P46
2. No
9.Don't know

P42: During the last four weeks did [NAME] work in farming, fishing or hunting mainly for own consumption
1.Yes
2.No

SECTION P: CHARACTERISTICS OF THE POPULATION

ONLY FOR THOSE AGED 16 YEARS AND ABOVE

P43: During the last four weeks did [NAME] look for a paid job or tried to start a profit job?
1.Yes =>P45
2.No

P44: In the last 4 weeks, did [NAME] find a profit job or was planning to start his/her own business?
1. Yes
2. No

P45: If a paid job or business opportunity become available, could [NAME] have started work during the last 7 days or within the next two weeks?
1.Yes
2.No } =>P50A

P46: What is [NAME]'s institutional sector of employment?
READ ANSWERS FOR RESPONDENT
1.Public institution/enterprise
2.Mixed public and private enterprise
3.Private in non-agriculture activities
4.Private in agriculture activities
5.VUP
6.International NGO/International organization"
7.Local NGO/Religious organization
8.Cooperative
9.Household(Domestic workers)

P47: What is the main product, service or activity of [NAME]' place of work? (Explain):
.....
P47A. ISIC

P48: What was [NAME]'s main occupation (main duty) during the last 7 days?
Main occupation:.....
Example: Teacher in primary school, Vegetable seller, House help, Taxi Driver **P48A. ISCO**

P49: In this job, is [NAME]' working as…?
(What is [NAME]'s status in employment?)
READ ANSWERS FOR RESPONDENT
1.Employee
2.Paid apprentice/Internee
3.Employer (with regular employees)
4.Own account worker (without regular employees)
5.Member of cooperative
6.Contributing family worker
7.Other

FOR RESIDENT WOMEN AGED 10 YEARS AND ABOVE

P50A: Has [NAME] ever given a live birth?
1.Yes
2.No =>Next Person

P50B_Boys: How many live boys has [NAME] ever had?

P50B_Girls: How many live girls has [NAME] ever had?

P50C_Boys: Among those boys how many are still alive?
TO BE ASKED IF P50B_BOYS>0

P50C_Girls: Among those girls how many are still alive?
TO BE ASKED IF P50B_GIRLS>0

P51A: During the 12 months prior to the census night (From 16/08/2021-15/08/2022) Did [NAME] give a live birth?
1.Yes
2.No =>Next Person

P51B_Boys: How many live boys did [NAME] have during the 12 Months prior to the census night (From 16/08/2021-15/08/202

P51B_Girls: How many live girls did [NAME] have during the 12 Months prior to the census night (From 16/08/2021-15/08/2022)?

P51C_Boys: Among those boys how many are still alive?
TO BE ASKED IF P51B_BOYS>0

P51C_Girls: Among those girls how many are still alive?
TO BE ASKED IF P51B_GIRLS>0

=>GO TO NEXT PERSON/SECTION H

b) *Private households: household record and mortality record*

SECTION H: HOUSING CHARACTERISTICS

TYPE OF HABITAT

H01: What the type of Habitat?

1.Planned rural settlement
2.Integrated Model Village
3.Old settlement
4.Unplanned clustered rural housing (Dispersed/Isolated housing)"
5.Modern planned urban area
6.Spontaneous/Squatter housing
6.Spontaneous/Squatter housing in Rural area
8.Other type of housing

TYPE OF BUILDING

H02: What is the Type of Building?

1.House occupied by one household
2.House occupied by several households
3.Storey building occupied by one household
4.Storey building occupied by many households
5.Several buildings in a compound occupied by one household
6.Several buildings in a compound occupied by several households"
7.Other

TENURE STATUS

H03: What is the tenure status of the housing Unit?

1.Owner (Even when he/she is still paying the bank loan) => H05
2.Tenant
3.Hire purchase(Having payment contract with the owner) => H05
4.Free lodging
5.Staff housing
6.Temporary camp or settlement
7.Other

H04: Is this Household has its own housing unit in this village or elsewhere?

1.Yes 2.No

MAIN MATERIAL OF THE ROOF

H05: What is the main material used for the roof?
(In case of a store building, consider the roof of the last floor)

1.Iron Sheets
2.Local tiles
3.Industrial tiles
4.Asbestos
5.Concrete
6.Cartoons/Sheeting/ all non-durable roofing materials
7.Grass
8. Other

MAIN MATERIAL OF THE WALLS

H06: What is the main material used for the exterior walls?

1.Wood with mud and cement
2.Wood with mud without cement
3.Sun dried bricks with cement
4.Sun dried bricks without cement
5. All non-durable wall materials (Cartoons/Sheathing)
6.Cement blocks
7.Concrete
8.Stones with cement
9.Stones without cement
10.Timber
11.Burnt bricks with cement
12.Burnt bricks without cement
13.Other

MAIN MATERIAL OF THE FLOOR

H07: What is the main material used for the floor?

1. Earth
2. Dung hardened
3. Concrete
4. Stones
5. Burnt bricks
6. Wooden floor
7. Ceramic/clays/Granite tiles
8. Cement
9. Other

NUMBER OF ROOMS

H08: How many rooms do the housing units have, including bathrooms, toilets, kitchen, store rooms?

NUMBER OF ROOMS FOR SLEEPING

H09: How many rooms are used for sleeping?

H10: Are Sleeping rooms for Boys separated from those for Girls?

1.Yes
2.No
3.NA

MAIN SOURCE OF WATER

H11: What is the main source of water used by your household for general purposes such as cooking and handwashing?

1.Internal pipe-born water
2.Pipe-born water in the compound
3.Pipe-born water from the neighbor HH
4.Public tap out of the compound
5.Tube Well /Borehole
6.Protected Spring/Well
7.Unprotected Spring/Well
8.Rain water
9.Tanker Truck
10.River/Lake/Pond/Stream/Irrigation Channel "
11.Lake/Stream/Pond/Surface water
12.Other

SOURCE OF DRINKING WATER

H12: What is the main source of drinking water for members of your household?

1. Internal pipe-born water
2. Pipe-born water in the compound
3. Pipe-born water from the neighbor HH
4. Public tap out of the compound
5. Tube Well /Borehole
6. Protected Spring/Well
7. Unprotected Spring/Well
8. Rain water
9. Tanker Truck
10. River/Lake/Pond/Stream/Irrigation Channel
11. Lake/Stream/Pond/Surface water
12. Mineral water
13. Other

SECTION H: HOUSING CHARACTERISTICS

TYPE OF TOILET FACILITY

H13: "What is the main type of toilet facility used by the members of the household?"

1.Flush toilet used by one Household
2.Flush toilet used by several Households
3. Pit Latrine with constructed floor slab used by one HH
4. Pit Latrine with constructed floor slab used by several HH
5.Pit Latrine without constructed floor slab used by one HH
6.Pit Latrine without constructed floor slab used by several HH
7. Bush
8. Other

MAIN SOURCE OF ENERGY FOR LIGHTING

H14: Is this HH connected to the REG grid line or to other electric lines?

1.Yes 2.No

H15: What is the main source of energy that the household uses for lighting?

01. Electricity from REG
02. Private Hydro Mini grid
03. Standalone solar system
04. Private Solar Mini Grid
05. Generator
06. Kerosene/ Paraffin lamp
07. Biogas
08. Candles
09. Firewood
10. Batteries
11. flashlight /phone flashlight
12. Rechargeable battery
13. Lantern
14. Other

ENERGY FOR COOKING

H16 "What is the main source of energy the household uses for cooking?"

01. Firewood
02. Charcoal
03. Gas
04. Electricity
05. Kerosene/Parafine
06. Biogas
07.Solar power
8. Crop waste
09. Animal dung
10. Briquette
11. Peat
12. sawdust
13. Straw/shrub/grass
14. Other(specify)
15. Do not cook **=>H19**

H17: "Is there any additional source of energy the household uses for cooking?" If Yes; which?

01. Firewood
02. Charcoal
03. Gas
04. Electricity
05. Kerosene/Parafine
06. Biogas
07.Solar power
8. Crop waste
09. Animal dung
10. Briquette
11. Peat
12. sawdust
13. Straw/shrub/grass
14. Other(specify)
15. None

ENERGY SAVING STOVE

H18: Does your HH use a cooking energy saving stove? (Do not ask if H16 and H17 responded 3,4,5,6,7)

1. Yes
2. No

MODE OF WASTE DISPOSAL

H19: "What is the main mode of household waste disposal used?"

1.Public Composit dumping
2.Household ompost dumping
3.Waste collection companies
4.Thrown in the household's fields or bushes "
5.Burnt
6. In a River/Stream/Drain/Gutter/lacs
7. Other

MODE OF SEWAGE DISPOSAL

H20: What is the main mode of sewage disposal used by the household?

1.Sump
2.In the courtyard
3.Rivulet/Trench/Channels
4.In the street
5. Main sewer
6. Cesspool
7. Bush
8. Other

HH ASSETS

H21: Does your household has the following assets in functioning

Condition ?	1. Yes	2. No	
1. Radio		9. Bed	
2.Television		10. Tables	
3. Refrigerator/ Freezer for HH use only		11. Sofa	
		12. Computers	
4.Gas/Electrical Cooker		13. Vehicles for household use only	
5. Washing machine		14. Motorcycles for household use only	
6.Microwave		15. Bicycles for household use only	
7. Mattress		16. Electrical/Charcoal Iron	
8. Bench/Chair			

LIVESTOCK

H22: Does your household has any big /small livestock, beehive or dog?

1.Yes 2.No **=>H23**

H22A: What type of livestock do you have?

Livestock type	SELECT
01. Local breed cows	
02. Exotic breed cows	
03. Cross breed cows	
04. Local goats	
05.Exotic goats	
06.Cross goats	
07. Local sheep	
08. Exotic sheep	
09. Local pigs	
10. Exotic pig	
11. Cross pig	
12. Rabbits	
13. Broiler chicken	
14. Layers chicken	
15. Dual purpose chicken	
16. Local chicken	
17.Duck	
18.Turkey	
19.Other poultry	
20.Camel	
21.Bees hive	
22.Dogs	
23.Others	

SECTION H: HOUSING CHARACTERISTICS

H22B: "How many (Type of livestock) do you have now and in which district are they located?"

Livestock type	Number	Location/District
01. Local breed cows		
02. Exotic breed cows		
03. Cross breed cows		
04. Local goats		
05.Exotic goats		
06.Cross goats		
07. Local sheep		
08. Exotic sheep		
09. Local pigs		
10. Exotic pig		
11. Cross pig		
12. Rabbits		
13. Broiler chicken		
14. Layers chicken		
15. Dual purpose chicken		
16. Local chicken		
17.Duck		
18.Turkey		
19.Other poultry		
20.Camel		
21.Bees hive		
22.Dogs		
23.Others		

AGRICULTURAL ACTIVITIES

H23: During the last 12 months did any member of this household grow crop?
(DO NOT INCLUDE AGRICULTURAL ACTIVITIES DONE IN KITCHEN GARDEN)

1. Yes
2. NO →H28A

H23A: Where were agricultural activities done?

1.In household owned land
2.In rented land (in cash or in kind payment or for free)
3.In both households owned land and in rented land

H24: " What types of crops did your household grow in last 12 months?

01.Maize		12. Yams& Taro	
02.Rice		13. Cooking Banana	
03.Sorghum		14. Dessert Banana	
04.Wheat		15. Banana for Beer	
05.Bean		16. Vegetables	
06.Pea		17. Tea	
07.Groundnut		18. Coffee	
08.Soybean		19. Sugarcane	
09.Cassava		20. Pyrethrum	
10.Sweet potato		21. Flowers	
11.Irish potato		22. Others, specify...	

H25: What type of vegetables that household grew in last 12 months? Ask this question if on question H24 vegetables is in selected crops"

ASK THIS QUESTION IF H24=16

01.Amaranths		13.Garlic	
02.Tomato		14.Lettuce	
03.Cabbage		15.Broccoli	
04.Onion		16.Spinach	
05.Carrot		17.Celery	
06.Eggplant		18.Leeks	
07.Black eggplant		19.Pumpkin	
08.Sweet pepper		20.Cocumber	
09.Pepper		21.Mushroom	
10.Cauliflower		22.Chayote	
11.French beans		23. Cassava Leaves	
12.beetroot		24.Other vegetables	

H26: "How many tea trees does your households has? Ask this question if on question H24 tea tree is in selected crops

H27: How many coffee trees does your households has? Ask this question if on question H24 Coffee tree is in selected crops

H28A: Does your household has any fruit tree?
1.Yes 2.No **=> Go to Section M**

H28B: What Type and How many (fruit trees) does your household grow?

	28BA: Type	28BB: How many trees do you have?
1.Avocado		
2.Orange		
3.Papaya		
4.Guava		
5.Lemon		
6.Mango		
7.Mandarin		
8.Jack fruits		
9.Beefheart		
10.Passion fruits		
11.Pineapple		
12.Tree tomato		
13.Watermelon		
14.Strawberry		
15.Other fruit		

SECTION M: MORTALITY

M1: Is there any member of the household who died 12 months prior to the census night (16/08/2021-15/08/2022)?
1.Yes 2.No => End of the interview

If there was a death in the HH during the 12 months prior to the census night ,Write their Names and ask the following questions

S/N	M2: Names Write the names of those who died during the last 12 months	M3: SEX 1.Male 2.Female	M4: AGE at Death How old was [NAME] when (he/she) died? IF THE AGE IS 1 YEAR OR ABOVE => M5 (Record 000 if less than 1 year)	M4A:Age at death for infants How many months or days [NAME] had before dying? RECORD THE ANSWER IN MONTHS IF THE AGE WAS FROM 1 TO 11 MONTHS. RECORD THE ANSWER IN DAYS IF THE AGE WAS FROM 0 TO 29 DAYS	M5: Place of death where the death for the [NAME] took place? 1. At community 2. At health facilities	M6: Manner of Death "What is the manner of death of [NAME]? 1.Natural cause/disease 2.Accident 3.Suicide 4. Homicide 9. Don't know IF THE ANSWER IS 2-9 =>Next Person End if no other died person	If the Deceased Person was a female aged 10-49 years, we ask the following questions:		
							M7: "Did [NAME] death occur while Pregnant? 1.Yes => Next Person 2.No	M8: "Did the death Occur during the childbirth? 1.Yes =>Next Person 2.No	M9: "Did the death occur during the 6 weeks' period following the termination of pregnancy? 1: Yes =>Next Person 2: No=>Next Person =>Next Person End if no other died person
1	.....			1:days 2:months					
2	.....			1:days 2:months					
3	.....			1:days 2:months					

Annex B: Glossary of key terms and definitions

This Glossary provides definitions of key concepts and indicators used in the thematic reports of the Fifth Rwanda Population and Housing Census (RPHC5). Readers are referred to the methodological sections of the respective reports for a more detailed technical explanations of indicators.

B.1. Population and demographic characteristics

Resident status: People with resident status are persons who have been living in a place for more than six months where they were enumerated or who have the intention to stay there for more than six months. These individuals represent the population usually living in such places.

Present residents: individuals present in their place of usual residence on the reference night, or

Absent residents: individuals not present in their place of usual residence on the reference night. The person must be absent for a period shorter than or equal to six months.

Visitors: Persons who were not usual residents of the household. They might be absent residents in another place in Rwanda, or non-residents of the country, for example, tourists present at the time of the Census from other countries.

De facto population: A concept that defines enumerated persons on the basis of their actual location at the time of the census (present residents + visitors): Includes all persons physically present in the country or given area at the reference date.

De jure population: A concept that defines enumerated persons on the basis of their usual place of residence at the time of the census. (Present residents + absent residents):

The de jure population includes all usual residents of a given country or area, whether they were physically present in the area at the reference date or not. It also refers to the resident population. Most of the analyses presented in the thematic reports are based on the de jure population.

Demographic dependency ratio: is measured as the ratio between those typically not in the labour force and the age group typically in the labour force. Using the national definition of working age, it is defined as the sum of persons aged 0 to 15 and elderly people aged 60 and above, divided by the population in the 16 to 59 age group, multiplied by 100. For international comparisons, age groups 0 to 14 and 65 and above are used to identify dependents.

Median age of a population: the median age is the age at which exactly half the population is older and half is younger.

Mean age of a population: the mathematical average age of all the members of a population.

Population growth rate: the increase (or decrease) in the number of persons in the population during a certain period of time, expressed as a percentage of the population at the beginning of the time period. The average annual growth rates for all ages as well as for particular age groups are calculated on the assumption that growth is continuous.

Population pyramid: graphically displays a population's age and sex composition. Horizontal bars present the numbers (or percentages) of males and females in each age group or at each individual age. The sum of all the age/sex groups in the population pyramid equals the total population.

Sex ratio: The ratio of males to the number of females in a population, usually computed for age group and expressed per 100 females. A sex ratio of 100 would imply that there are as many males as females.

Age structure: The proportion of the total population in each age group.

Age-sex structure: the composition of a population as determined by the proportion of males and females in each age category.

Area of residence refers to a place of Urban or Rural area: The urban and rural are two different physical, socio and economic environment. Urban area is in most of the cases characterized by high concentration of population, diversified economic activities, many and better

infrastructures. This lead to different needs for population living in the two different environments and policy makers have to take note for that in all socio-economic development programs. The 2022 census consider only 5 which are classified as urban:

- Capital City (Kigali)
- Satellite cities
- Secondary Cities
- District Towns
- and Emerging centers

Since 2020, a campaign of census mapping collected different information aiming at the delineation of enumeration area. Different locations of services were collected (offices, shops, education, health religious, entertainment facilities, etc.). Using the locations, a service concentration layer was created showing the hot spot concentration area considered as core urban centers Each urban area among the retained one, has at least one or more hotspot zone of services concentration which can be considered as a core urban center.

B.2 Housing and household characteristics

Housing unit: a separate and independent place of abode intended for habitation by a single household, or one not intended for habitation but occupied by a household at the time of the Census. The essential features of households are separateness and independence.

Household: the concept of the household is based on the arrangements in regard to food or other essentials for living. It consists of one or several persons who live in the same dwelling and share meals.

Private household: consists of one or more persons living together and sharing at least one daily meal. Persons in a private household may or may not be related or may constitute a combination of persons both related and unrelated. In order to facilitate analysis of the de jure population (usual residents) across thematic reports, private households were further categorised as follows:

a) Households where there is at least one usual resident in the household (present or absent resident); and

b) Households consisting only of visitors (e.g.: Households found during the Census in their holiday homes, etc.)

Subsequently, and across all thematic reports, any analysis of the characteristics of the private households will refer to the definition in (a) above.

Types of private households:

- One-person household: consists only of the head of the household.
- Nuclear household: refers to a household consisting entirely of a single family nucleus. It may be classified into married or unmarried couple, family with children or without children or single parent with children only.
- Extended household: people related to each other and living together but who do not form a nuclear family.
- Composite household: people not related to each other living together; extended or nuclear family living with non-relatives.

Institutional household: It comprises a group of persons who are being provided with institutionalised care, and includes educational institutions, health care institutions, military institutions, religious institutions, or institutions for the elderly or persons with disabilities. In the RPHC5, persons who were homeless on the night of the Census were also classified as belonging to an institutional household.

Head of household: S/he refers to a person recognised as such by other members of the household. Every private household has one and only one household head.

Structure: According to census purposes, a structure constitutes a building used for residence purposes. A structure can contain one or more dwelling units.

Types of habitat: there are six types of habitat for private households: clustered rural settlement (umudugudu)/old settlement, Integrated model villages, dispersed/isolated habitat, planned urban housing (cadastre), and spontaneous or squatter habitat (Akajagari).

Improved source of water: According to the latest definitions from the WHO/UNICEF Joint Monitoring Programme for water supply, sanitation and hygiene (JMP, 2017), improved sources of drinking water include: piped water (into dwelling, compound, yard or plot, to neighbour), public tap/standpipe, tube well/borehole, protected well, protected spring, rainwater collection, and packaged or delivered water. Contrary to the previous definition of MDGs, packaged water (bottled water and sachet water) and delivered water (tanker truck and cart with small drum/tank) are treated as improved water sources according to SDGs definition.

Unimproved source of water: Any other source of drinking water which does not belong to the types of water defined above as improved is classified as unimproved source. This includes the following: unprotected well, Unprotected spring, surface water (river, lake, dam, pond, stream, irrigation channel, etc.).

Housing tenure: refers to legal occupation of the dwelling. Usually, occupancy here is defined as owner, tenant, hire purchase, free lodging, staff housing or refugee/temporary camp settlement.

B.3. Migration and spatial mobility

Migration: Geographic and spatial mobility involving a relatively permanent change in usual residence between clearly defined political or statistical units. It has associated dimensions of time and space.

Internal Migration: Refers to migration across regional administrative boundaries within a country. Internal migration can be categorized by type (in-migration and out-migration) and directional flow (rural-urban, rural-rural, urban-rural, and urban-urban).

An in-migrant: Is a person who enters a migration-defining area by crossing its boundary from some point outside the area, but within the same country.

An out-migrant: Is a person who departs from a migration-defining area by crossing its boundary to a point outside it, but within the same country.

Lifetime Migration: Is the migration that occurs between birth and the time of the census. Thus, a lifetime migrant is one whose current district of residence is different from his or her district/country of birth, regardless of intervening migration.

Lifetime migrants: As defined in the UN's Manual VI (1970), lifetime migrants are those whose place of birth is not the same as the current place of residence. The number stated in this case is, however, an underestimation of both the number of migrations that the population has experienced and the number of migrants that have occurred during the lifetime of the living population. People who moved from the place of birth to a given place of destination and then returned before the Census date, as well as people who moved but died before the Census date, will not be counted.

Place of birth: According to the RPHC5 enumerator's manual, the place of birth is the usual place of residence of the mother at the time of the respondent's birth. This question is meant to establish persons who are not enumerated in their places of birth and hence have migrated. Sometimes expectant mothers move from rural areas to urban areas for the delivery since maternity services are better in the towns. This kind of movement is short-lived and must not be confused with a migratory one.

Even though the district boundaries have changed over time, the objective is to relate a person's place of birth to the district as now constituted. For districts which have been split by administrative reform, enumerators were asked to find the actual district of birth and give its current name.

Recent Migration: Is the movement in the recent past of persons enumerated during the census, relative to their previous place of residence (5 years or less) prior to census. A recent migrant is one whose current district of residence is different from his or her previous place/district of residence, five years ago or less. Note that if the person was still living in the district, then he/she was not considered as a migrant

Previous place of residence: In the RPHC5 enumerator's manual, the previous place of residence is related to the name of the district in Rwanda in which respondents were living before August 2022. A person who may have been absent from home temporarily for some reason, such as visiting relatives or because of a stay in hospital, or who

may have been overseas on a visit of less than six months, was shown where he or she normally lived before August 2022 (i.e. ignoring the temporary absence). If the person was living in another country before August 2022, the name pertaining to the specific country was used.

Duration of residence: The duration of residence is the length of time an individual has resided in the current district of residence up to the date of the Census. The duration of residence concerns the time lived in a given place/district of residence and not in a particular housing unit. In the enumerator's manual, the instructions are that if the duration is less than one year, it is to be recorded as zero, and if the respondent has lived in the current place of residence since his or her birth then the respondent's age is the duration of residence. In the case of a period which is over one year then the period is recorded in years.

Migration effectiveness: This is the ratio of net migration to gross migration. It is meant to display the magnitude of the effective addition (or loss) through migration to the overall gross movement. The Migration Effectiveness Index "measures the degree of (a)symmetry or (dis)equilibrium in the network interregional migration flows". It is the indicator commonly used to measure net migration as a proportion of gross migration turnover for any territorial/administrative unit. An index of migration effectiveness or effectiveness index is calculated as the ratio of net migration to total in- and out-migration. The range of the index is from zero, when arrivals and departures are equal in number, to one, when migration is entirely one way. A nation's population is redistributed through migration flows and counterflows between its constituent subnational areas, resulting in a geographical pattern of net migration gains or loses which may change from one time period to another.

Migratory efficiency index (MEI): Migration efficiency ratio is simply defined as the ratio of the net number of moves of individuals between areas to the gross number of moves that take place. It is suggested that the ratio of net to gross migration measures the efficiency of migration, such that a low ratio indicates a low efficiency and a high ratio indicates a high efficiency.

The MEI, which ranges from 1 to 100, quantifies the balance between regional flows and counterflows, with low values indicating largely reciprocal exchanges between regions, and high values suggesting strongly directional flows. A number between 0 and 100 where the higher number shows an efficient mechanism of population redistribution. Measured at multiple geographical scales, MEI values are remarkably stable with scale when computed for 20 regions or more (Rees et al, 2017).

Gross migration: Gross migration is the total flow of migrants across an administrative border, i.e. in-migrants + out-migrants, or in the case of international migration, immigrants + emigrants. Net migration is the difference between the inward and outward flows of migration, i.e. in-migrants – out-migrants or immigrants – emigrants.

Net-Migration: This is the balance between in-migration and out-migration. According to direction of the balance, it may be characterized as net in-migration or net out-migration. Thus, net flow in or out is indicated by a plus (+) or minus (-) sign.

International migration: This is the process by which one changes his place of usual residence by crossing international boundaries into another country.

An emigrant: This is an international migrant, departing to another country by crossing an international boundary

An immigrant: This is an international migrant entering an area from a place outside the country. Immigrants cross national borders during their migration from the perspective of the country in which they enter.

Return Migration: This type of migration occurs when a return migrant (person) moves back to the area where he or she formerly resided.

Migration stocks and flows: The stock of internal/international migrants is the total number of internal/international migrants living in a district/country at a particular point in time, while the flow of internal/international migrants is the number of migrants entering or leaving a district/country over the course of a specific time period (e.g.. one year). District/country of birth and citizenship are the main criteria used for categorizing different types of population stocks and flows, with duration of stay providing a further element for statistics on migration flows.

B.4. Education

Early childhood development (ECD): is defined as a comprehensive approach to policies and programs for children from birth to eight years of age, their parents, and caregivers, aimed at protecting the child's rights to develop his or her full cognitive, emotional, social, and physical potential. In Rwanda, this usually refers to the age group 0–6 years.

School attendance and attendance rates: School attendance is defined as regular attendance at any regular accredited educational institution or program, public or private.
There is a difference between 'attending school' and being 'enrolled in school'; thus results from censuses and administrative data may differ.
School attendance is complementary to but must be distinguished from 'school enrolment', which typically is obtained from administrative data. A child can be enrolled in school but not necessarily be attending. It is recommended that these concepts be clearly defined so that countries can determine which variable they wish to collect via the census.

Net Attendance Ratio (NAR): attendance of the official age group for a given level of education expressed as a percentage of the corresponding school-age population. The NAR for primary school is the percentage of the primary school-age population (6–11) attending primary school. The NAR for secondary school is the percentage of the secondary school-age population (12–17) that is attending secondary school. By definition, the NAR cannot exceed 100%.

Gross Attendance Ratio (GAR): total attendance in a specific level of education, regardless of age, expressed as a percentage of the corresponding school-age population. The GAR for primary schools is the total number of primary school students, expressed as a percentage of the official primary school-age population. The GAR for secondary schools is the total number of secondary school students, expressed as a percentage of the official secondary school-age population. If there are significant numbers of overage and underage students at a given level of schooling, the GAR can exceed 100%.

Gender Parity Index (GPI): ratio of the number or proportion of the female population to the male population for a given indicator. It measures gender equality between girls' and boys' performance in school.

Educational attainment: Educational attainment is defined as the highest grade completed within the most advanced level attended in the education system of the country where the education was received.

Educational qualifications (level of education): Qualifications are the degrees, diplomas, certificates, professional titles, and so forth that an individual has acquired, whether by full-time study, part-time study, or private study, whether conferred in the home country or abroad, and whether conferred by educational authorities, special examining bodies or professional bodies. The acquisition of an educational qualification, therefore, implies the successful completion of a course of study or training program.
According to national needs, information on qualifications may be collected from persons who have reached a certain minimum age or level of educational attainment. Such information should refer to the title of the highest certificate, diploma, or degree received.

Academic degree obtained: An academic degree is a college or university diploma, often associated with a title and sometimes associated with an academic position, which is usually awarded in recognition of the recipient having either satisfactorily completed a prescribed course of study or having conducted a scholarly endeavor deemed worthy of his or her admission to the degree. The most common degrees awarded today are Diploma, Advanced Diploma, Bachelor's, Master's, and doctoral (PhD) degrees. Most higher education institutions generally offer certificates and several programs leading to the awarding of a Master of Advanced Studies, which is predominantly known as a Diplôme d'études supérieures specialises under its original French designation. The certificates listed below are some of the certificates currently or previously awarded by the Rwandan education system:

Primary Leaving Certificate: a certificate awarded upon successful completion of six years of primary school. This certificate provides access to lower secondary education.

Ordinary 'O' Level Certificate: a certificate awarded upon successful completion of three years of lower secondary

school. This certificate provides access to senior secondary education.

TVET Certificate I: the duration to get the certificate is 3 to 9 months. There is no further educational prerequisite for enrollment to study at this level other than having reached the age of 16 years. Graduates at this level will have the basic practical skills and competencies required to carry out a specific task in the labor market.

TVET Certificate II: the duration to get the certificate is 1 year. The minimum age to study at this level is 16 Years and one has completed at least primary six. Graduates at this level will have practical skills and a set of competencies required to carry out different tasks in the labor market or to pursue further learning.

TVET Certificate III: the duration to get the certificate is 1 year. To study at this level you must have completed 9Years Basic Education or have an equivalent qualification. At the completion of this level, students will have practical skills and knowledge enabling them to proceed to TVET Level 4. This certificate is given to people who completed 1 year of technical secondary education and who decided to enter the labor market.

TVET Certificate IV: the duration to get the certificate is 1 year. The minimum requirement to study at this level is to have completed Level III. At the completion of this level, students will have practical skills and knowledge enabling them to proceed to TVET Level 4. This certificate is given to people who completed 2 years of technical secondary education and who decided to enter the labor market.

TVET Certificate V/ Professional Certificate of Secondary Education A2 (Technical secondary education): a certificate awarded upon successful completion of three years of senior secondary school in technical secondary education. The minimum requirement to study at this level is to have completed Level IV. Graduates at this level will have advanced practical skills and knowledge enabling them to join the labor market or proceed to higher Education.

Advanced General Certificate of Secondary Education A2 (general secondary education): a certificate awarded upon successful completion of three years of senior secondary school in general secondary education.

NB: The Advanced General Certificate of Secondary Education and Professional Certificate of Secondary Education A2 grant access to higher education.

- **ENTA (Ecole Normale Technique Auxilliaire)** – a certificate awarded upon successful completion of five years of secondary school. This type of certificate is no longer available;

- **A3/D4/D5** – certificates awarded upon successful completion of three, four, or five years of secondary school. This type of certificate is no longer available.

- **A2/D6/D7** – certificates awarded upon successful completion of six or seven years of secondary school.
- **Post-primary education:** In the past, this level of education targeted technical skills and allowed students, after successfully completing three years of study to enter the labor market. Some disaggregations by highest level attended may group post-primary and secondary education. The following certificates and/or diplomas were awarded at this level of education:

- **EMA (Ecole des Moniteurs Auxilliaire) –** a certificate awarded upon successful completion of two years of post-primary education, when this level existed in the education system.

- **CE/FM (Certificat d'Edute Familiale)** – a certificate awarded upon completion of three years of post-primary education. The courses associated with these certificates were exclusive to the female population.

- **CERAI (Centre d'Enseignement Rural Artisanal Integré)** – a certificate awarded upon successful completion of three years of post-primary education.

Tertiary Education: The duration of tertiary education varies between three and six years according to the institution and the field of study. The following certificates and/or diplomas were or are currently awarded at this level of education:

A diploma and an Advanced Diploma program: are between two and three years in length. Admission requires an upper-secondary qualification like the

Certificate of Technical Secondary Education A2. In addition, the HEC defines certificate and diploma qualifications as exit qualifications in incomplete bachelor's programs rather than distinct study programs. Students who complete one year of study (120 credits) before dropping out may receive a Certificate of Higher Education, whereas students who complete 2 years of studies and obtainment of at least 240 credits may be awarded a Diploma and students who completed 2,5 years of studies and obtainment of at least 300 credits may be awarded an Advanced Diploma in Higher Education in Higher Education.

Bacc/diploma: a degree previously awarded upon successful completion of two years of university. It is no longer available.

Bachelor's: a degree awarded upon successful completion of four years of university. In Rwanda, the Bachelor's programs are offered for three-five years and each year is split into semesters or trimesters depending on the specifications of the programs.

Master's: a degree awarded to a university graduate upon his/her successful completion of at least one year of post-graduate studies. In Rwanda, the duration of Masters's Programs varies between eighteen (18) and twenty-four (24) months, except in Medicine, where they last for four years. They are offered by coursework or purely by research.

PhD: a degree awarded to a university graduate upon his/her successful completion of a doctoral program, usually lasting between three and four years.

School Life Expectancy (primary to tertiary education): SLE is the total number of years of schooling (primary to tertiary) that a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrolment ratio at that age. Caution must be maintained when utilizing this indicator in international comparisons. For example, a year or grade completed in one country is not necessarily the same in terms of educational content or quality as a year or grade completed in another country. SLE represents the expected number of years of schooling that will be completed, including years spent repeating one or more grades.

Literacy: Literacy is the ability to both read and write with understanding. A literate person is one who can both read and write a short, simple statement about his or her everyday life. An illiterate person is one who cannot, with understanding, both read and write such a statement. Hence, a person capable of reading and writing only figures and his or her own name should be considered illiterate, as should a person who can read but not write as well as one who can read and write only a stock phrase that has been memorized. In the 2022 Census, literacy is recorded in the following languages: Kinyarwanda, English, French, Swahili and Other.

B.5. Employment/economic activity

The main concepts and definitions used in the census are in line with the international standards on statistics of work, employment, and labour underutilization adopted by the 19th International Conference of Labour Statisticians (Geneva, 2013).8 They are briefly described below.

Work: work is defined as:

- "Any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use" in line with the General production boundary defined in the System of National Accounts 2008.
- Work is defined "irrespective of its formal or informal character or the legality of the activity."
- It excludes "activities not involving production of goods or services (begging, stealing), self-care (personal grooming, hygiene) and activities that cannot be performed by another person on one's own behalf (sleeping, learning, own recreation)."

The international standards recognize different forms of work: Own-use production work (production of goods and services for own final use); employment (work performed for others in exchange for pay or profit); unpaid trainee work (work performed for others without pay to acquire workplace experience or skills); volunteer work (non-compulsory work performed for others without pay); and other forms of work (not defined at this time by the international standards).

[8]ILO, Resolution concerning statistics of work, employment and labour underutilization, 19th International Conference of Labour Statisticians, Geneva, October 2013.

Working age population: The working age population in Rwanda is defined as all persons 16 years old and over.

Employment: Employment is a particular form of work. Persons in employment are defined as all those above a specified age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. It excludes persons engaged wholly in activities to produce goods or services for own final use such as producing agricultural, fishing and gathering products for own-consumption or cleaning, decorating, gardening and maintaining one's own dwelling or premises, durables and other goods. Persons in employment comprise: (a) employed persons "at work," i.e., who worked in a job for at least one hour; and (b) employed persons "not at work" due to temporary absence from a job, or to working-time arrangements (such as shift work, flexi-time and compensatory leave for overtime).

Status in employment: Status in employment classifies jobs held by persons at a given point of time with respect to the type of explicit or implicit contract of employment of the person with other persons or organizations. The International Standard Classification of Status in Employment (ICSE-1993) identifies five main categories of persons with respect to their status in employment.9 : Employee, paid apprentice/Intern; employer; Own-account worker; Member of cooperative; Contributing family worker

Branches of economic activity: Branch of economic activity refers to the activity of the establishment in which an employed person worked during the reference period. An establishment may be a farm, a mine, a factory, a workshop, a store, an office or a similar type of economic unit. It is important to distinguish enterprises from establishments. "Enterprise" is a broader concept than "establishment". An enterprise is a legal entity (or group of legal entities) and may have a number of establishments with different economic activities and different locations.

Occupation: Occupation refers to the kind of work done by a person irrespective of the branch of economic activity or the status in employment of the person.

Occupational segregation index: It is an indicator that measures the extent to which labour markets are separated into "male" and "female" occupations. The occupational segregation index (D) is commonly used as a proxy indicator for equality of opportunity in employment and occupation.10 It is defined by

$$D = \frac{1}{2}\sum_i \left| \frac{n_{Ai}}{n_A} - \frac{n_{Bi}}{n_B} \right|$$

Where nAi and nBi are, respectively, the number of men and women in a given occupational i and nA and nB are, respectively, the total number of men and women in all occupations. The value of the index ranges from zero to one, zero indicating no segregation and one indicating complete segregation. The index may be interpreted as the fraction of persons that need to change occupations to achieve zero segregation.

B.6. Socio-cultural characteristics

Religion: Religion originates in an attempt to represent and order beliefs, feelings, imaginings and actions that arise in response to direct experience of the sacred and the spiritual (Connelly, 1996). Affiliation to a religion entails adherence to its fundamental beliefs and the frequenting of liturgical services and other duties expected of an active member (Ellway, 2005). Religions commonly are taken to provide general orientation in regard to the way one lives one's life (Fasching et al., 2001). The main religions existing in Rwanda and taken into account during the RPHC5 are the following:

The Catholic Church: The Christian Catholic Church is characterised by an Episcopal hierarchy with the Pope at its head and belief in seven sacraments and the authority of tradition. The authority of the church lies within the hierarchy of the church and the truth is found in the Bible.

ADEPR (Associations des Eglises Pentecostes au Rwanda): ADEPR is the first pentecostal church established in Rwanda. It has born in 1983 as a result of the association of different pentecostal denominations that had been originaly established by Swidish missionaries since 1920 and progressivey expended in diffent parts of Rwanda. ADEPR share the same beliefs as

[9]ILO, International Classification of Status in Employment, ICSE-93, Fifteenth International Conference of Labour Statisticians, Geneva, http://laborsta.ilo.org.

[10]ILO, Decent Work Indicators Concepts and definitions, ILO Manual (First version), May 2012, pp. 127-130.

most of protestant churches and its main mission is the expension of Christ centered evanglism.

Islam: Islam was founded in 622 CE by the Prophet Muhammad, in Makkah (also spelled 'Mecca'). The two sacred texts of Islam are the Qur'an, which are the words of Allah 'the One True God' as given to Muhammad, and the Hadith, which is a collection of Muhammad's sayings.

Protestantism: The term Protestant was not initially applied to reformers in the sixteenth century but came to be used to describe all groups protesting against the Roman Catholic orthodoxy. Thus, the term Protestant is often used as a general term merely to signify Christians who belong to none of the churches of the Catholic tradition. Most Protestants believe Baptism that is an outward testimony of a prior inward regeneration, usually done after a person confesses Jesus Christ as their saviour and obtains an understanding of the significance of Baptism. Here, there are the churches that are in CEPR(Conseil Protestant du Rwanda)

Seventh-Day Adventist Church: The Seventh-Day Adventist Church is a Protestant Christian denomination originating in the mid-nineteenth century in the northeast United States. The Adventist Church among Protestant Christian denominations is the observance of the Sabbath on Saturday, the seventh day.

Other Christian churches: Other Christian churches are Protestant churches that were established in Rwanda after 1994 and do not belong to the CPR(Conseil Protestant du Rwanda).

Jehovah's Witnesses: The **religious beliefs** of Jehovah's Witnesses are in many ways similar to those of mainstream Christians but but they believe that after the resurrection they will live in this world but renewed. Moreover, Jehovah's Witnesses are permitted most forms of medical treatment, but under no circumstances must they ever have a blood transfusion.

Traditionalist/Animist Religion: The term 'animism' is usually applied to any religious belief that recognises spirits or a spirit world as inherent and controlling within the physical world. Some spirits are the souls of deceased ancestors, while others are beings inherent in nature and the spirit realm. For some people the spirits are intermediaries between humans and a higher god.

Other religion: these are religions which are not Christian and which are not Christian and which do not belong to the other religions mentioned above.

Nationality: Under the idea of 'nationality', people construct symbolically a referent of their identity (Brubaker, 1992), which entails a place or territory seen and understood geographically as a space wherein people have something in common.
Nationality means the state of being legally a citizen of a particular country or the legal right to belong to a particular nation whether by birth or naturalisation. Types of nationality are identified as single and dual nationality, the latter of which refers to the state of being a citizen of two countries.

Nationality and citizenship are two terms that are sometimes used interchangeably (Lynn, 2007) and some people even use the two words – 'citizenship and nationality' – as synonyms. However, they differ in many aspects. Simply put, nationality can be applied to the country where an individual was born while citizenship is a legal status, which means that an individual has been registered with the government in a particular country.

B.7. Mortality

Death (Mortality): Mortality refers to the occurrence of deaths in a population. A death is a complete absence of any signs of life at any time after a live birth has occurred.

Infant Mortality Rate (IMR): Is the probability for a new-born to die before his/her first birthday. It is expressed per 1,000 live births occurring during a specified reference period. In this case of the present census it is the preceding year. It is usually denoted IMR or by the life table notation (1q0).

Child Mortality Rate (CMR): Is the probability for a child aged 1 year to die before reaching exact year 5. It is expressed per 1,000 live births and covers a specified reference period, in this case taken to be one year prior to the census. It is usually denoted by CMR or the life table notation (4q1).

Under-Five Mortality Rate (U5MR): Is the probability for a new-born to die before his/her fifth birthday It is expressed per 1,000 live births occurring during a specified reference period, in this case taken to be one

year prior to the census. It is usually denoted U5MR or by the life table notation (5q0).

Crude Death Rate (CDR): The total number of deaths in a given year among a population divided by the mid-year population, expressed per 1,000 inhabitants.

Age-Specific Death Rate (ASDR): The number of deaths in a population of a given age (or age-group) in a given year divided by the estimated mid-year population in that age (age-group), expressed per 1,000 inhabitants.

Life Expectancy at Birth (e0): Average number of years a hypothetical cohort of people born in a specific year could expect to live if they were subject to the current mortality level at each age throughout their life. Life expectancy at a specific age is the number of additional years a person could expect to live if he was subject to the current mortality at each age for the rest of his life.

B.8. Fertility

Fertility: The reproductive performance of an individual, a couple, a group, or a population. When a distinction is made by birth order, the terms first-birth fertility, second-birth fertility, etc. are used.

Natality: The Natality expresses the frequency of births in a population.

Fecundity: The biological capacity, of a woman, a man or a couple, to produce a live birth. Fecundity varies widely from one individual and from one couple to another.

Infertility: The biological inability of a man, a woman or a couple to conceive.

Infecundity: The biological inability of a man, a woman or a couple to produce a live birth. Its synonym is sterility.

Childlessness: is the condition of living up to age without ever having a live birth. The condition can either be voluntary or involuntary and often taken as a proxy measure of infertility.

Crude Birth Rate (CBR): Crude Birth Rate (CBR) is the most basic form of fertility measure. It is defined as the total number of births during a calendar year divided by the corresponding mid-year population. CBR is usually expressed per 1000 population. The indicator is crude because it relates births to both men and women, heavily confounded with the age distribution of the population. However, the indicator is widely used to indicate the overall effect of fertility and that it could be estimated easily with minimum data requirements. The number of births is corrected for possible underreporting. It has been estimated through multiplying corrected ASFR by the number of woman classified by age and 6 months before the census.

Rate (ASFR) is the number of births in a year to women in a specific age group divided by the mid-year population of women in that specific age group.

General Fertility Rate (GFR): General Fertility Rate (GFR) is similar to the CBR except that the GFR measures the number of births in a given year divided by the corresponding mid-year population of women in the childbearing years (15-49).

Mean Age at Childbearing: The Mean Age of Childbearing is another fertility measure that determines the average age at which women experienced childbearing. It is a summary of the timing of fertility within a population or a group of women.

Total Fertility Rate (TFR): Total Fertility Rate (TFR) is the average number of children a hypothetical cohort of women would have at the end of their reproductive period during their lifetime if they were subject to experiencing the ASFRs of a given period. It is calculated by summing the ASFRs and multiplying the sum by the width of the age interval.

Parity: The number of children born alive to a woman.

Reproduction rate: The indicator that measures in which conditions generations are replaced. If calculated not taking into account women's mortality It is called **Gross Reproduction Rate (GRR).** The GRR is exactly like TFR, except that it counts only daughters and literally measures "reproduction"– a woman reproducing herself in the next generation by having a daughter. The GRR is estimated by multiplying the TFR by the percentage of female at birth. The GRR, like TFR, assumes that the hypothetical cohort of women pass from birth through their reproductive life without experiencing mortality. This assumption is satisfactory when one wants to

compare levels of fertility and/or gross reproduction across populations and over time. But, for a more realistic assessment of the reproductive potential of a population, taking into account mortality, one needs to calculate the **Net Reproduction Rate (NRR).**

The NRR is obtained by multiplying the ASFR by the Survivorship rate of corresponding age-group from the women life table and summing up all this values. When NRR equals 1, then each generation of women is exactly reproducing itself. When it is larger than 1, the next generation will have more women. When it is smaller than 1, the next generation will have less women.

Parity progression Ratios (PPR): Parity is the number of children born alive to a woman. Zero parity women are those with no live births and single parity refers to those women who have one child and so on. Parity Progression Ratio (PPR) is the probability of having another child given that the mother has reached certain parity. PPRs are usually represented as a0, a1, a2 and so on. The term a0 is a measure of infertility. Women progressing to higher parities usually have high fertility rates.

B.9. Gender

Sex: refers to the classification of people as male or female, based on biological and physiological characteristics such as chromosomes, hormones, and reproductive organs.

Gender: a social and cultural construct, which values men's and women's (and girls' and boys') attributes differently. Accordingly, it assigns socially acceptable and often stereotypical roles and responsibilities to men and women. Gender-based roles and other attributes, therefore, change over time and vary with different cultural contexts. The concept of gender includes the expectations held about the characteristics, aptitudes and likely behaviours of both women and men (femininity and masculinity). This concept is also useful in analysing how commonly shared practices legitimise discrepancies between sexes.

Gender analysis: is a critical examination of how differences in gender roles, activities, needs, opportunities and rights/entitlements affect men, women, girls and boys in certain situations or contexts. Gender analysis examines the relationships between females and males and their access to, and control of resources, and the constraints they face relative to each other.

4.4.4. B.10 Disability

Disability prevalence: This is defined as the percentage of all the people age 5 years and above reported having at least one disability divided by the entire population of persons age 5 years and above.

Disability status: differentiates the population into those with and those without a disability. Persons with disabilities include those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers or environments may hinder their full and effective participation in society on an equal basis with others.

The following limitations in activity functioning are considered in the RPHC5: seeing, hearing, mobility, cognitive, communication and self-care using Washington Group on Disability Statistics Short Set of questions. In addition, questions of albinism and short stature were added to the questionnaire.

Seeing difficulty
Seeing difficulty describes the various degrees of vision loss. A person is considered to have eyesight or vision disability if he/she has difficulty seeing even if he/she wears eyeglasses or contact lenses.

Hearing difficulty
Hearing difficulty refers to complete deafness or partial hearing in one or both ears, hard of hearing. Those with hearing difficulty can also use a hearing aid.

Mobility difficulty
Physical or mobility difficulty refers to difficulties in moving, i.e. walking, climbing stairs, using hand, sitting upright, or standing. This disability restricts one's physical movement, say body movement or paralysis of legs, hands, or the whole body. Persons with this type of disability can use assistive equipment and supportive devices that assist them to move around. For example, those who use wheelchairs, crutches among other mobility aids.

Cognitive difficulty
Cognitive difficulty affects people's ability to perform activities like other people of similar age groups. They may have difficulty remembering things or concentrating on what he/she is performing. It includes many different functions such as the ability to pay attention, learn and retain information, solve problems, and use language to express thoughts. This disability hampers clear thoughts in the mind. It also exhibits problems in comprehending any new ideas or opinions or finding solutions and therefore restrains a person from learning or even coordinating functions/activities.

Self-care difficulty
This refers to difficulties in dressing, bathing, eating, grooming and hygiene, toileting or getting around the home or inside the home. The difficulties may have arisen as a result of other disabilities or impairments. These types of difficulties may be present in most disabilities. It may be more pronounced in mental disabilities and severe physical disabilities.

Communication difficulty

Speech and language disorders refer to problems in communication or difficulties in producing oral speech sounds or problems with voice quality. They might be characterized by an interruption in the flow or rhythm of speech, such as stammering. These delays and disorders range from simple sound substitutions to the inability to understand or use language. Some causes of speech and language disorders include hearing loss, brain injury, learning disability, substance abuse, physical impairments such as cleft lip, deformed lip or palate, and vocal abuse or misuse. Persons with speech disabilities are often not able to communicate well with others.

Short stature: Short stature is a general term used to describe a condition in which a person's height is well below the average height of his or her peers. Short stature typically means that a person's height is below that of the shortest 3 percent to 5 percent of people of the same age and sex.

Albinism: Albinism is a rare, non-contagious, genetically inherited condition occurring in both genders regardless of ethnicity, in all countries of the world. The condition results in a lack of pigmentation in the skin, hair and eyes, causing vulnerability to sun exposure and bright light. Almost all persons with albinism are visually impaired, with the majority being classified as "legally blind. Skin cancer is common amongst a majority of PWA living in the region of Sub Saharan Africa.

B. 11 Youth

According to the UN, Youth is best understood as a period of transition from dependence of childhood to adulthood independence. That's why, as a category, youth is more fluid than other fixed age groups. Yet, age is the easiest way to define this group, particularly in relation to education and employment, because 'youth' is often referred to a person between the ages of leaving compulsory education and finding their first job.

The United Nations, for statistical purposes, defines 'youth', as those persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States.

Considering the current priorities and trends of Rwanda's Development, the definition of Youth in terms of age has been revised in this policy. It was brought from 14–35 years to 16–30 years due to a number of factors including among others:

(i) The need to keep in close conformity with regional and international bodies that Rwanda subscribes to such as:
a. The African Youth Charter adopted by the seventh ordinary session of the African Union Assembly held in Banjul - Gambia on the 2nd July 2006, ratified by Rwanda on 7th August 2007, defines youth or young people as a category of people between the ages of 15 and 35 years;
b. The United Nations General Assembly, by its resolution 50/81 in 1995, adopted the World Programme of Action for Youth to the Year 2000 and beyond and reiterated Page 6 of 43 that the United Nations defines "youth", as those persons between the ages of 15 and 24 years, without prejudice to other definitions by member states;
c. For the Commonwealth, which Rwanda joined in November 2009 and becoming the association's 54th member, youth are defined as people between 15-29 years.

(ii) With a need to harmonize the definition of youth and youth programmes taking into account the current local policies and legal frameworks, this Policy shall also complement related policies such as:
a. The Integrated Child Policy of Rwanda that defines a child as persons below 18 years (taken care from the time before their birth until they complete the age of 18 years), the age for consent and voting rights among others. It also prohibits from employing any person under 18 years old into employment that is deemed hazardous and worst forms of labour.
b. The National and Vocational Education and Training (TVET) Policy (2008) that aims to guarantee that all TVET measures achieve the maximum economic impact through providing all sectors with appropriately qualified workforce in the needed number in accordance to the different qualification levels.
c. The Education Sector Policy (2003) with a direction clearly defined: involve vocational standards and national needs and reach a sufficient number of graduates who are well-trained and therefore able to meet the development needs of Rwanda.
d. The National Policy for Family Promotion (2005) that has among its actions to protect youth against the evils of society and to educate them to positive family values.
e. The Employment Policy (2006) that promotes the employment of youth, women, persons with disability, the marginalized and increasing their contribution to economic production.
f. The National Gender Policy (2010) that seeks to eradicate the imbalance between young man and young girls' rights among others.
g. The Rwanda Sports Development Policy (2012) that promotes youth clubs. h. The National Culture Heritage Policy (2014), which promotes the education of culture values to the youth.
For the case of Rwanda, law N°54/2011 of 14/12/2011 related to child rights and protection states that 18 years should be the starting point for differentiating „child" and „youth". However, the national youth policy points out that in Rwanda young people are those between 16 and 30. In this report we will adhere to this definition and the term „youth" is used to mean the 16–30 age groups. This choice also allows for a comparison and contextualization of results with findings based on reports on youth to discern differences within this large and heterogeneous age group, findings are also presented for the following four sub-groups:

- 16–20 years;
- 21–25 years;
- 26–30 years.

Disaggregation by these sub-groups should help reveal different demographic processes, such as the end of school attendance, marriage, fertility, labour force participation and migration. The age categories reflect transitional periods from school to the labour market, single status to marriage and the beginning of

childbearing. Exceptions to these age groups are noted in the text.

B.12. Children

Child: According to the UN Convention on the Rights of the Child (1989), a child is defined as every human being under 18 unless, under the law applicable to the child, majority is attained earlier. It is relevant to underline here that this period coincides with Rwanda's, as stipulated in Article 3 of the National Law nº 54/2011 of 14 December 2011 relating to the rights and the protection of the child, which stipulates that a child is any person under the age of 18. The age range (0–17) adopted for this report reflects this definition.

Adolescent: The word 'adolescent' comes from the concept of adolescence, which means the transitional development period from childhood to early adulthood, starting approximately at 10–12 and ending at 18–22 (Santrock, 2000).

Orphan: According to the national policy for orphans and other vulnerable children (MINALOC, 2003), an orphan is a child who has lost one or both parents. In the subsequent analysis, children are also considered orphans if the survivorship of the parent is unknown.

vulnerable Children: A vulnerable child is a person under 18 exposed to conditions which do not permit him/her to fulfil her/his fundamental right to her/his harmonious development (MINALOC, 2003).

B.13. Elderly

The Elder population: The elderly population is defined as people aged 65 and over in Rwanda.

Old age: is the last period of life, associated with the decline of mental and physical capacities. The term is also used to refer to the population group known as the elderly. The precise onset of old age varies culturally and historically, as it is a social construct rather than a biological stage.

The elderly dependency rate: The elderly dependency rate is defined as the ratio between the elderly population and the working age (15-64 years) population.

B.14. Non-monetary poverty

Poverty: The poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households, and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation.

Multidimensional poverty: a measure of nonmonetary poverty which considers and combines deprivations in three dimensions: education, health and living standards. Each dimension is measured using specific indicators and cut-off points to determine whether people are deprived in each indicator, and people's deprivations are then summed up to reveal the overall level of joint deprivation. A person is considered poor if deprived in at least one-third of the weighted indicators, which also means that deprivations most often occur across at least two dimensions.

Multidimensional Poverty Index (MPI): The MPI reflects both the incidence of multidimensional deprivation (the percentage of poor) and its intensity (the average deprivations people experience at the same time). It is the most comprehensive measure of multidimensional poverty which considers changes in both the incidence and the intensity of poverty

Incidence of Poverty: After the poverty identification step through deprivation, Incidence is an aggregation across individuals to obtain headcount ratio (H) which represents the percentage of poor people in the population. It shows how the overall number of multidimensionally poor people in a country has changed and reflects both demographic change and population growth.

Intensity of Poverty: The intensity of poverty (A), representing the average percentage of weighted deprivations experienced by the poor people.

Absolute change (annualized): The difference in a poverty measure between two years, divided by the number of years between surveys.

Relative change (annualized): The compound rate of change per year.1 It shows the percentage by which the previous year's poverty has changed.

Vulnerable people in poverty: Estimating headcount ratio using two other poverty cut-offs, individuals are identified as vulnerable to poverty if they are close to the one-third threshold, that is, if they are deprived in 20 to 33.33 percent of weighted indicators.

Severally poor people: Those are individuals with a higher poverty cut-offs , meaning those deprived in 50 percent or more of the dimensions.

B.15. Marital status and nuptiality

Information on marital status was collected on the resident population aged 12 and above. The question was formulated as 'what is [name] marital status?' and, responses were recorded as provided. Seven categories constituted the question on marital status:

Married to one wife/husband officially: an individual who was in legally accepted marital union with one partner at the moment of the Census.

Married to one wife/husband officially: an individual who was in marital union with one partner, but that was not legally officiated at the moment of the Census.

Live in a polygamous union: An individual is said to be in polygamous union when he is married with more than one spouse. People living in polygamous union in the context of this census were men having more than one wife or wife living in a marital union with such men. A polygamous man may be simultaneously in legal union with one of his wives and in consensual union with another wife or other wives.

Divorced: an individual who has been separated from his or her spouse through a court decision, according to the legislation.

Separated: an individual who has separated temporarily from his/her spouse with or without intention to be back in marital union with him/her but without any court decision on the case.

Never married: an individual who has never been in a marital union.

Widowed: a man or a woman who has lost his or her spouse by death, not yet remarried.
The distinction between consensual union and monogamous union does not cover all types of unions. Moreover, the concept of monogamy is applicable in regard to legal unions as well as consensual ones.

Unofficial monogamy: An individual is said to be monogamous when he or she is married with one spouse and polygamous in the contrary situation (Louis Henry, 1981). In the context of this census, unofficial monogamy refers to the marital union where a man or woman is married unofficially to one spouse.

B.16. Agriculture

Agriculture household: Agriculture households refer to households that have at least one person engaged in agricultural activities; that is either in crop or animal husbandry.

Crops Farming: Crop farming is the cultivation of plants for food, animal foodstuffs, or other commercial uses. A variety of techniques including organic production methods can be used to manage crops by private households. Private household livelihoods and management of natural resources are addressed not separately but as one, whereby the private actors are actively engaged to participate in shaping and working towards achieving development solutions. Towards that goal, in Rwanda, private households cultivate different types of crops such as maize, rice, sorghum, wheat, beans,

soybeans, cassava, sweet potato, Irish potato, yams and taro, bananas, vegetables, and fruits.

Livestock Rearing: Livestock rearing is analogous to animal husbandry; that is, the rearing and management of animals/livestock. In Rwanda, private households practice farming systems to mainly, produce milk and meat for human consumption. They rear a variety of livestock types, namely: cows, goats, sheep, pigs, rabbits, and chickens among others.

Beekeeping: The science and art of managing honey bees called apiculture or beekeeping is a centuries-old tradition. The first beekeepers were hunters, seeking out wild nests of honey bees, which often were destroyed to obtain the sweet reward, called honey, for which these insects are named.

Rearing dogs and/or puppies: Hand rearing a dog and/or a litter of puppies can be very rewarding, but is a big commitment. Hand rearing involves keeping your puppies warm, regular feeding, toileting, cleaning, health monitoring and socialization. They can be reared either for socialization, security or commercial purposes.

Cereals: are crops grown to produce grains used by man or animal. In this group there is maize, sorghum, wheat, rice, and other cereals.

Legumes: are crops that produce pods that bear seeds in rows. In this group there is bean, soybean, pea, groundnut and so on.

Tubers: Tubers are plants whose harvested and edible part is the root of a crop or stem. In this group, there is cassava, sweet potato, Irish potato, and yam.

Vegetables: are crops whose harvested and edible part is either roots, stem, leaves, flower, or fruits. They can be edible raw or cooked.

Fruits: are crops whose harvested and edible part is fruit. They can be edible raw.

Beverage crops: are crops that are grown for the purpose of producing food drinks as their end-product. In this group there is tea and coffee.

Spices crops: are crops grown for the purpose of producing stimulants. Examples of spices are ginger, pepper and so on.

Sugar crops: are crops grown for the purpose of producing sweet tasting liquids or sugar.
Examples are sugarcane and sugar beet(beetroot)

Annex C: persons and institutions that contributed to the Fifth Rwanda Population and Housing Census, 2022

A. National Census Task Force

Institutions

Office of the President of the Republic of Rwanda
Office of the Prime Minister
Ministry of Finance and Economic Planning
Ministry of Local Government
Ministry of Defence
Ministry of Interior
Ministry of Health
Ministry in Charge of Emergency Management
Ministry of Foreign Affairs and Cooperation
Ministry of Education
Ministry of ICT & Innovation
Ministry of Public Service and Labour
Ministry of Infrastructure
Rwanda Information Society Authority
Office of Government Spokesperson
Rwanda National Police
Rwanda Correctional Service
Rwanda Public Procurement Authority
Rwanda Utilities Regulatory Authority
Rwanda Broadcasting Agency
Rwanda Education Board
National Examination and School Inspection Authority
Rwanda Biomedical Centre
Representatives of all Religious Confessions

Branches of the National Census Task Force

Members of the task Force at Province and the City of Kigali

Office of the Lord Mayor, City of Kigali
Office of the Governor, Southern Province
Office of the Governor, Western Province
Office of the Governor, Northern Province
Office of the Governor, Eastern Province
Representatives of all Religious Confessions

Members of the Branches of the Census Task Force at District Level

Office of the District of Nyarugenge
Office of the District of Gasabo
Office of the District of Kicukiro
Office of the District of Nyanza
Office of the District of Gisagara
Office of the District of Nyaruguru
Office of the District of Huye
Office of the District of Nyamagabe
Office of the District of Ruhango
Office of the District of Muhanga
Office of the District of Kamonyi
Office of the District of Karongi
Office of the District of Rutsiro
Office of the District of Rubavu
Office of the District of Nyabihu
Office of the District of Ngororero
Office of the District of Rusizi
Office of the District of Nyamasheke
Office of the District of Rulindo
Office of the District of Gakenke
Office of the District of Musanze
Office of the District of Burera
Office of the District of Gicumbi
Office of the District of Rwamagana
Office of the District of Nyagatare
Office of the District of Gatsibo
Office of the District of Kayonza
District of Office of the Ngoma
Office of the District of Bugesera

B. Census Technical Team

National Directors
Murangwa Yusuf, Director General of NISR
Murenzi Ivan, Deputy Director General of NISR

National Census Technical Director
Habarugira Venant, Director of Census Unit, NISR

Census National Coordinators
Habarugira Venant
Byiringiro James
Mutijima Prosper
Bigirimana Florent
Ndakize Michel
Munyarugerero Juvenal

Census National Field Coordinators

Habarugira Venant	NISR	Lt Col Rusizana Deo	RDF
Byiringiro James	NISR	CSP Rubayiza Venant	RNP
Mutijima Prosper	NISR	SP Habinshuti Emmanuel	RCS
Bigirimana Florent	NISR	Karagire Gonzague	MINEMA
Ndakize Michel	NISR		
Munyarugerero Juvenal	NISR		
Lt Col Ndikuriyo Jean Paul	RDF	CIP Habineza Hamiss	RCS
Maj Rugema Ntazinda	RDF	CIP B Karemera	RCS
Capt Mugemanyi Faustin	RDF	CIP Mukambarushimana Irene	RCS
Lt Muteteri Sophie	RDF	IP Karugaba Donath	RCS
SP Ndayisenga Alex	RNP	S/SGT Gatete Edison	RCS
SP Nzabonimpa Joseph	RNP	Mukansonera Pascasie	MINEMA
CIP Nzeyimana Florent	RNP	Murangasabwe Emma Marie	MINEMA
CIP Nayihiki Elam	RNP	Mbabazi Emmanuel	MINEMA
AIP Tuyishime Emmanuel	RNP	Uwamurera Odette	MINEMA
		Musoni Jean Damascene	MINEMA

Field Analysts
Mazimpaka Jean Claude
Karera Albert
Hakizimana Celestin
Habimana Norbert
Ngabo Muhire Olympe
Kabera Jean Luc
Segahwege Astrid
Ndizeye Job
Ntawiha Athanasie
Munderere Theophile
Nshimiyimana Patrick
Uwimbabazi Denyse

Post Enumeration Survey

Nyirimanzi Jean Claude	Gaga Rukorera Didier
Uwimana Therese	Mugenzi Gilbert
Muhoza Didier	Nahimana Samuel
Uwimbabazi Denise	Akingeneye Seraphine
Harerimana Massoud	Ntambara Juvenal
Nshimiyimana Clement	Kambogo Francois
Uwamahoro Sandrine	Ayingeneye Seraphine
Iranzi Orodha	Bosco Ndayiragije
Hagenimana Jean damascene	Patrick Niyongira
Ntagengerwa Bonus	

Census District Team Leaders: 30 (1 per District)
District Data Quality Monitors: 60 (2 per District)
Sector Data Quality Monitors: 1,277 (416 Sector Education Inspectors, 416 primary school teachers, and 445 youths)
Enumerators: 26,437 (Primary School Teachers + Youth)

Special Groups Supervisors: 32
Special Groups Enumerators: 289
Data Processing, Cartography and ICT Infrastructures

Programmer:
Mukasa Jimmy, Director of ICT

Assistant Programmers:
Nkundimana Donath
Mukanshimiye Peruth
Ndayishimiye Bosco
Niyongira Patrick
Twibaze Joel
Nkurunziza JMV

Cartography:
Bigirimana Florent
Bizimungu Clement
Mbangutse Olivier
Karera Albert
Niyitegeka Beatha
Ntawiha Athanasie
Kiconco Jovia
Ngabo Muhire Olympe
Ndazigaruye Alfred
Munderere Théophile
Irambona Eddy Mercus

Archiving:
Kabandana Pierre Claver

ICT Infrastructures :
Sharangabo Jean Jacques
Ndayiragije Bosco
Muvara Joseph
Nkamicaniye Gaetan
Niyonshuti Levi
Nshimiyimana Clement

Census Data Analysis
National Data Analysts

Imanishimwe Valentine	Population size, structure& spatial distribution
Nilingiyimana Faustin	Marital status & nuptiality
Uwayezu Beatrice	Fertility
Kanyonga Ingabire Evelyne	Mortality
Mukazitoni Madeleine	Social cultural characteristics of the population
Serugendo Jean Baptiste	Migration and spatial mobility
Nzabonimpa Jean Claude	Characteristics of housing and households
Uwamahoro Pacifique	Economic Activity
Abalikumwe Francois	Measurement& mapping of non-monetary poverty
Uwitonze Martin	Educational characteristics
Tuyisenge Methode	Gender status
Rukundo Ephrem	Socio-economic status of persons with disabilities
Bizimana Venuste	Socio-economic status of children
Ngomituje Xavier	Socio-economic status of youth
Didas Uwamahoro	Socio-economic status of aged people
Buramba Eric	Agriculture
Habarugira Venant	Population Projections
Nyabyenda Emmanuel Christian &Tuyisenge Methode	Compilation of the Main Indicators

Technical Support

International Consultants for Data processing
Juste Nitiema, Data Processing Expert
Peter WEKESA NYONGESA, Data processing expert
Arij Decker, Data processing expert
Enkhbayar, Data processing expert

United Nations Population Fund (UNFPA):
Mungai Mercy
Kantengwa Kathy
Harindimana Florien

International Consultants for thematic analysis

Dr. Macoumba Thiam
Dr. Sunday Adedini Adepoju
Dr. Ghislain Mbep Fomekong
Dr. Anne Akoya Khasakhala
Mr. Ben Obonyo Jarabi
Dr. George Odipo
Mr. Robert C.B. Buluma
Dr. Alfred Agwanda Otieno

Census Communication Team

Habarugira Venant
Nyirimanzi Jean Claude
Tugirimana Jean Paul
Segahwege Astride
Serugendo Jean Baptiste
Mutijima Prosper
Munyarugerero Juvenal
Niyomugabo Pierre Celestin
Umuhoza Wa Shema Daniella
Neza Nadege

Corporate Services

Nkusi David	Head of Corporate Services	Gasana Patrick	Logistics Officer
Ingabire Alice	Ag. Director of HR and Admin.	Nzayisenga Cyrile	Logistics Officer
Museruka David	SPIU coordinator	Nshimiyumukiza Steven	Accountant
Munyemana Silas	Director of Finance	Muhima Jadot	Accountant
Nshimiyumukiza Steven	Accountant	Sibomana Diane	Accountant
Uwizeye Richard	Financial specialist	Dusenge Elias	Office Messenger
Munezero Nadia	Planning office	Uwamahoro Console	Secretary/Finance Unit
Mupende Emmanuel	M& E specialist	Shumbusho Alphonse	Procurement Specialist
Tuyisenge Alice	HR Officer	Nkurunziza Godfrey	Procurement Officer
Ntwali Abdul	HR Officer	Nshuti Henry	Procurement Support Staff
Kazimbaya Sita	Office Messenger	Umuhoza Nahayo Anaise	Procurement Support Staff
Ndungutse Emmanuel	Printing and Distribution Officer	Tuyisenge Yasin	Logistics Support Staff
Babyeyi Nadine	Ag. Head of Central Secretariat	Riziki Emma	Finance Support Staff
Uwimpuhwe Claire	SPIU Secretary	Iradukunda Pascasie	Finance Support Staff
Rutijanwa Felecite	Administrative Assistant/DG Office	Uwimana Thacienne	HR Support Staff
Umwari Angelique	Administrative Assistant/DDG Office	Musonerwa Claver	HR Support Staff
Murebwayire Theodette	Logistics Officer	Umutoni Alice	Secretary Census Unit

Proofreading of thematic reports

Name	Institution	Name	Institution
Rugarama Nsengiyumva Jean	MoH	Nyampundu Benita	MINEDUC
Habimana Jean Pierre	MINIYOUTH	Ndaruhutse Jean Bosco	MINICOFIN
Munana Jean de Dieu	MINIYOUTH	Ntirampeba Sylvere	MIFOTRA
Nyabanimba Emmanuel	DGIE	Prof. Muhoza Diedonne	UR-CBE
Kyazze Edward	MININFRA	Mr Rizinde Theogene	UR-CBE
Ngayaboshya Silas	MIGEPROF	Dr Ndemezo Ethienne	UR-CBE
Muhire Jean Baptiste	MIGEPROF	Dr Ngaruye Innocent	UR-CST
Umutoni Glorieuse	NCPD	Dr Rizinjirabake Fabien	UR-CST
Cyemezo Henry	NCDA	Dr Mugemangango Cyprien	UR-CST
Dushimeyezu Bertrand	MINAGRI	Ms Uwihangana Consolee	UR-CASS
Uwamahoro Didas	BRD	Mr Habineza Jean Paul	UR-CASS
Hategekimana Samson	WASAC	Prof. Twarabamenye Emmanuel	Independent
Rugira Esdras	EDCL	Munyemana Emmanuel	UNICEF
Murindwa Prosper	MINALOC	Dr Kantengwa Kathy	UNFPA

Annex D: Total Fertility Rate by District

	District	TFR
1	Nyarugenge	3.0
2	Gasabo	3.1
3	Kicukiro	2.8
4	Nyanza	4.0
5	Gisagara	4.4
6	Nyaruguru	4.2
7	Huye	3.9
8	Nyamagabe	3.5
9	Ruhango	3.6
10	Muhanga	3.3
11	Kamonyi	3.6
12	Karongi	3.5
13	Rutsiro	3.7
14	Rubavu	3.8
15	Nyabihu	3.7
16	Ngororero	3.4
17	Rusizi	4.5
18	Nyamasheke	4.1
19	Rulindo	3.1
20	Gakenke	3.2
21	Musanze	3.3
22	Burera	3.3
23	Gicumbi	3.5
24	Rwamagana	3.7
25	Nyagatare	4.2
26	Gatsibo	3.9
27	Kayonza	3.9
28	Kirehe	3.9
29	Ngoma	3.9
30	Bugesera	4.0