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Rwanda Vital Statistics Report 2022

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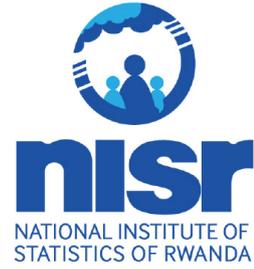
Rwanda Vital Statistics Report 2022

June 2023

National Institute of Statistics of Rwanda

Preface

This report is produced based on data collected in 2022 to showcase the progress made by Rwanda in improving civil registration and vital statistics system and to assess how far we are toward attaining the targets set under the Civil Registration and Vital Statistics (CRVS) strategic plan elaborated in 2017. It will therefore be a useful tool to inform related policies and decisions and guide strategic interventions aimed at improving the CRVS system in Rwanda. Ideally, vital statistics are used to derive the fundamental demographic and epidemiological measures that are needed in national planning across multiple sectors such as education, labour and health. They are also critical for a wide range of government activities (e.g. population registers and other administrative registers) and commercial enterprises (e.g. life insurance, marketing of products).

The data used in this report were mainly generated by the National Centralized and Integrated Civil Registration and Vital Statistics System (NCI-CRVS System), a digitized system launched in August 2020 for official registration of all vital events. At the beginning, NCI-CRVS started with official registration of births and deaths occurring at health facilities and thereafter, the system operationalization was extended to capture births and deaths occurring out of health facilities and other civil events as well. By end of 2022, NCI-CRVS system was capturing detailed information on the seven events, namely: Births, Deaths, Marriages, Divorces, Adoptions, child recognitions and annulment of marriages. However, as registration of marriages through NCI-CRVS system started in the mid of 2022, some marriages have been registered in paper-based registers and recorded in CRVS web-based system, an online platform initiated in 2015 to ease the collection of civil registration data and facilitate the timely production of vital statistics reports.

NCI-CRVS system's generated data were therefore merged with CRVS web-based system generated data to obtain   exhaustive dataset to be used for analysis. To pinpoint the level of reliability of the results obtained, the outputs were compared with census and survey-based data including data from Rwanda demographic and health survey (RDHS) and Rwanda population and housing Census (RPHC).

The report compilation was mainly performed by National Institute of Statistics of Rwanda (NISR) staffs in charge of regular monitoring of CRVS data collection who provided the first draft, under the direction of NISR leadership. The draft was thereafter technically reviewed and validated in collaboration with CRVS key stakeholders.

The 2022 Vital Statistics report extends to births, deaths and causes of deaths and, marriages registered countrywide. It is the Rwanda's fourth vital statistics report, which is expected to be a resourceful provider of information on the status of vital events registration in Rwanda and a reference source for future publications within the same scope.

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Acronyms and abbreviations

ANACONDA	Analysis of National Causes of Death for Action
APAI-CRVS	Africa Programme For Accelerated Improvement of Civil Registration and Vital Statistics
ASBR	Age-Specific Birth Rate
ASFR	Age-Specific Fertility Rate
ASMR	Age-Specific Mortality Rate
CBR	Crude Birth Rate
CDR	Crude Death Rate
CoD	Cause of Death
CR	Civil Registrar
CRO	Civil Registration Officer
CRVS	Civil Registration and Vital Statistics
D4H	Data for Health
DHIS2	District Health Information Software 2
ENMR	Early Neonatal Mortality Rate
GFR	General Fertility Rate
HBCP	Home-Based Care Practitioner
HMIS	Health Management Information System
ICD-10	International Classification of Causes of Deaths, Version 10
IECMS	Integrated Electronic Case Management System
LNMR	Late Neonatal Mortality Rate
MAS2	Second Mortality Assessment Survey
MCCoD	Medical Certification of Cause of Death
MIGEPROF	Ministère du Gerne at de la Promotion de la Famille (Ministry of Gender and Family Promotion)
MINALOC	Ministère de L'Administration Locale (Ministry of Local Government)
MINIJUST	Ministry of Justice
MoH	Ministry of Health
NGO	Non-Governmental Organizations
NIDA	National Identification Agency
NISR	National Institute of Statistics of Rwanda
NMR	Neonatal Mortality Rate
NSDS	National Strategy for Development of Statistics
RBC	Rwanda Biomedical Centre
RPHC	Rwanda Population and Housing Census
TFR	Total Fertility Rate
UN	United Nations
UNECA	United Nations Economic Commission for Africa
UNICEF	United Nations Children's Fund
VS	Vital Statistics
VSR	Vital Statistics Report
WHO	World Health Organization

EICV	Enquête Intégrale sur les conditions de vie des ménages
RDHS	Rwanda Demographic and health survey
NCI-CRVS	National Centralized and Integrated Civil Registration and Vital statistics System

Definitions of key concepts

Age-specific fertility rate (ASFR): The annual number of births to women of a specified age or age group per 1,000 women in that age group.

Age-specific mortality rate (ASMR): A mortality rate limited to a particular age group. The numerator is the number of deaths in that age group; the denominator is the number of persons in that age group in the population.

Cause of death: All those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries.

Child mortality rate: The probability (expressed as a rate per 1,000 live births) of dying between the first and the fifth birthday.

Civil Registration: UN defines civil registration as "the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events pertaining to the population as provided through decree or regulation in accordance with the legal requirements of a country. This process establishes and provides legal documentation for such events.

Completeness of registration: The proportion of vital events that are registered. It is the number of registered vital events divided by the 'actual' number of vital events that occurred in the same population during a specific period of time.

Crude Birth Rate (CBR): The number of live births relative to the size of that population during a given period, usually one year. It is expressed in numbers of births per 1,000 population per year.

Crude marriage rate: The crude marriage rate is the ratio of the number of marriages in a population during a reference period over the person-years lived by the population during the same period. It is expressed as marriages per 1,000 population.

Crude Death Rate (CDR): The number of deaths relative to the size of the population during a given period, usually one year. It is expressed in numbers of deaths per 1,000 population per year.

Death: The permanent disappearance of all evidence of life at any time after live birth has taken place (postnatal cessation of vital functions without capability of resuscitation). This definition excludes foetal deaths, which are defined separately.

Delayed registration: is a registration that arrives too late for inclusion in the annual (or monthly or quarterly) statistics; after one year of occurrence of the event, according to the law of the country.

Ill-defined cause of death: Any code that cannot or should not be used for the underlying cause of death (generally referring to 'R codes' in the International Classification of Diseases). For instance, a 'mode of death' such as heart failure or kidney failure; symptoms such as back pain or depression; and risk factors such as high blood pressure, are all uninformative codes for public health purposes.

Infant Mortality Rate (IMR): Probability (expressed as a rate per 1,000 live births) of a child born in a specific year or period dying before reaching the age of one, if subject to age-specific mortality rates of that period.

Late registration: is vital events that are registered after the deadline for registration according to the law of the country, but before exceeding one year.

Life expectancy at birth: The average number of years that a newborn could expect to live if he or she were to pass through life exposed to the sex- and age-specific death rates prevailing at the time of his or her birth, for a specific year, in a given country, territory, or geographic area.

Live birth: The complete expulsion or extraction from the mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born (all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration, and if they die at any time following birth, they should also be registered and counted as deaths).

Low Birth Weight (LBW) refers to the weight at birth of fewer than 2,500 grams (5.5 lbs.) as per World Health Organization definition.

Marriage is a special contract of permanent union between a man and a woman entered into in accordance with law for the establishment of conjugal and family life.

Neonatal Mortality Rate (NMR): Number of deaths during the first 28 completed days of life per 1,000 live births in a given year or period.

Place of Occurrence refers to the place where the vital event took place,

Sex ratio at birth: The number of male births for a specific area and during a specified period divided by the number of female births for the same area and period.

The General Fertility Rate (GFR) is the number of resident live births for a specific area during a specified period divided by the female population age between 15 and 49 years (usually estimated at mid-year) for the same area and period multiplied by 1,000.

Timely registration: is the registration effected within the time stipulated by the law (30 days for births and death in Rwanda).

Total Fertility Rate (TFR): The sum of age-specific fertility rates for females aged between 15 and 49 years during a specified period, usually one year. It is an estimate of the average number of children a cohort of women would bear if they went through their child-bearing years experiencing the same age-specific fertility rates.

Under-five mortality rate (U5MR): Is the probability for a new-born to die before his/her fifth anniversary. Under-five mortality rate is the probability of dying between birth and exactly 5 years of age, expressed per 1,000 live births.

Underlying cause of death: The cause of death to be used for primary statistical tabulation purposes has been designated as the underlying cause of death. The underlying cause of death is defined as "(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury" (ibid., sect. 4.1.2).

Vital statistics system: A vital statistics system is defined as the total process of (a) collecting information by civil registration or enumeration on the frequency of occurrence of specified and defined vital events, as well as relevant characteristics of the events themselves and the person or persons concerned, and (b) compiling, processing, analyzing, evaluating, presenting, and disseminating theses data in statistical form.

Executive summary

The National Institute of Statistics of Rwanda (NISR) within the third National Strategy for Development of Statistics (NSDS3), which is being implemented from 2019/20 to 2023/24, committed to strengthen administrative data collection system including Civil Registration and Vital Statistics System (CRVS) in Rwanda to complement official statistics from surveys and censuses.

To ease registration services delivery and enable the digitization of CRVS system, the National Centralized and Integrated CRVS system (NCI-CRVS) was initiated and started to be operational in August 2020. This system was, in December 2020, integrated with CRVS-web based system, an electronic web-based system initiated in 2015, to facilitate the collection, storage and use of vital statistics data. The compilation of this report made use of data from these electronic systems.

The report is organized within 7 chapters namely: 1) Introduction and background; 2) Rwanda's civil registration system; 3) Data quality, timeliness and completeness of registration; 4) Births statistics, 5) Deaths statistics 6) Causes of death statistics; 7) Marriages statistics. To assess the reliability of results obtained, a comparative analysis involving data from other sources was performed. Only vital events that occurred in 2022 were considered for analysis in this report.

Birth statistics

The comparison of registered births with estimated live births at national level shows a sharp increase in rate of birth registration completeness, from 84.2% in 2021 to 92.9% in 2022. The share of births registered within 30 days of occurrence

underwent an upward shift, from 93.7% in 2021 to 95.9% in 2022. Hypothetically, these positive changes may be due to the decentralization of registration services at health facilities and cells, strengthened awareness on birth registration and changes in registration processes, familiarity of civil registration staff with the use of NCI-CRVS and enhanced monitoring of registration practices at all registration points.

The computation of fertility indicators in 2022 adopted the use of adjustment practice where the results show a crude birth rate (CBR) equivalent to 27.7‰, general fertility rate (GFR) equivalent to 106.6‰ and total fertility rate (TFR) equivalent to 3.7 live births per woman. The results are very close to the findings from 5-PHC where TFR is 3.6; GFR is 105.5‰; and CBR is 27.8‰. Further analysis of CRVS data show an average weight at birth equivalent to 3,0801 grams in 2022 slightly down from 3112.0 grams in 2021; and a share of low-birth-weight equivalent to 7.7%, up from 6.5% in 2021. The sex ratio at birth was found to be 102 male births per 100 female births slightly down from 103 in 2021.

Death statistics

Vital statistics on deaths show a total of 25,577 deaths registered in 2022 of which 47.2% occurred in the community. The comparison of registered deaths with expected deaths gives 31.1% completeness rate of death registration in 2022, up from 26.2% in 2021. Mortality statistics show a high number of deaths among males compared to females with a sex ratio at death equivalent to 122.2 males' deaths per 100 females' deaths, up from 119.8 in 2021. Due to the low completeness rate of death

registration, adjustment techniques were used to obtain country representative estimates where the crude death rate was found to be 5.8‰.

Causes of deaths

Analysis of causes of death data depicts a slight decrease in the percentage of deaths causes that are usable for policies and proper decision-making representing 54.5% of the total number of deaths causes reported by health facilities in 2022, slightly down from 56.6% in 2021. Across age groups, analysis shows that among institutional deaths, the group of non-communicable diseases is generally more frequent to females aged 15 and above. Among males, they are more frequent to adult males aged 45 and above and young males aged 10-14. The external causes and injuries were found to be more frequent among males than females. Generally, a group of communicable diseases, maternal, perinatal and nutritional conditions represents 46% of the total usable causes while the group of non-communicable diseases and external causes represents 45% and 8%, respectively.

Marriage statistics

Marriage statistics were computed based on legal marriages registered in 2022 where CRVS system generated data show a total of 35,529 marriages registered in 2022, slightly up from 33,809 legal marriages registered in 2021; giving annual crude marriage rate equivalent to 2.7‰ in 2022. Further analysis shows that below age of 30, females are more frequently married than their counterpart males while at age of 30 and above, males predominate. The most frequently chosen matrimonial regime is "Community of property" representing 98.2% of the total marriage regimes recorded. This report did not manage to release divorce statistics as the system that could provide accurate information on divorces is under revision.

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1.   Background

An effective civil registration and vital statistics system provides essential data, rates and other quantitative measures for the accurate planning of programmes designed to promote the wellbeing of the citizens. The data collected from vital events registration are essential to planning for social development, including the design and implementation of public health measures, maternal and childcare, family planning, social security, education, housing and economic development. Accurate information is essential for proper planning for the needs of the community, particularly for health and education facilities, as well as for housing and the labour market. Accurate and comprehensive vital statistics generated from civil registration provide for comparison and evaluation of differences among regions, between districts and wards within a region, and at the international level between countries. Death records are of particular importance in public health, for identifying the magnitude and distribution of major disease problems, epidemics and pandemics. Data from these records can be used for epidemiological studies. Cause of death information is essential for medical research for major causes of death such as cancer and heart diseases.

As a source of vital statistics, civil registration has important uses for individuals, societies, and the government. For individuals, copies of registration records can be used as legal documents for evidentiary purposes. Information compiled from registration records is needed for administrative applications such as national identity programmes and the electoral roll. It also serves as the starting point for several operational programmes, particularly in family planning, medical research, maternal and childcare programmes, historical demography, genetic studies and so forth. The establishment of the vital events registration system is in-line with the national development plan of Rwanda.

Civil registration has administrative and legal use on one hand, and statistical, demographic and epidemiological use on the other. Vital statistics are used to get precise and up-to-date measurements of demographic changes and for the study and analysis of trends. Vital statistics are also primary data sources for the health sector in the implementation, monitoring and evaluation of different health interventions and epidemiological studies.

Measuring the progress towards the realization of Sustainable Development Goals requires a sustained source of data that speaks to the outlined indicators. The global 2030 development agenda implicitly recognizes and underlines the importance of individual and aggregate records and data on birth and death in the realization of basic human and civil rights as well as in the monitoring of development. The Sustainable Development Goals (SDGs), anchored on the vision of eradicating extreme poverty from the face of the earth by the year 2030, have as the first of its five transformative shifts to "Leave no one behind." They emphasize the need to ensure that no person is excluded or denied universal human rights and access to basic economic opportunities. Several SDGs indicators require data from civil registration to measure progress. The domestication of SDGs in Rwanda re-emphasized the crucial role of CRVS data in monitoring a successful implementation and measuring achievements.

The African Agenda 2063 similarly re-echoes social inclusiveness as a prerequisite to the continent's growth and development. A fundamental challenge to the realization of these

visions remains the fact that civil registration systems are largely very weak in most of the developing world; hence a majority of the population remain legally "invisible" in the eyes of the state, denying them the right to be known and planned for by their governments, access to fundamental opportunities and services, as well as the ability to claim their rights or to participate in governance processes.

Individual identity records and documents generated from a CRVS system help to fulfill the first fundamental human right that every individual is entitled to upon birth i.e., the right to a name and an identity; from which other human and civil rights are founded. The recognition of the existence of persons by their governments, and the ability of individuals to transact with each other and with the state, through legal identity documents, are fundamental attributes good governance that can only be realized by states where complete civil registration systems exist. Records of birth, marriage, divorce, and death derived from civil registration systems also provide a permanent, continuous, universal and reliable source of vital statistics for accurate and timely planning, resource allocation and for good governance. Measurements and monitoring of many of the SDGs indicators require vital statistics data on a continuous and timely basis.

Civil registration and vital statistics system in Rwanda is still under development and as a result, like in many other African countries, some of our people have come into this world and left without leaving a trace on official records. However, efficient civil registration and vital statistics system is a precondition for enabling regular production of vital statistics reports that are essential for informing policies and programs for various purposes. In its place, the need for vital statistics was met by conducting expensive periodic surveys and decennial population censuses; something that produces reliable data but late compared to the CRVS system.

Despite that, an efficiently working CRVS system enables a continuous supply of reliable data on vital events to support informed policymaking, implementation and monitoring of development plans. Also, in the absence of reliable information on causes of death there is no solid basis to determine which diseases have major impacts on the population.

The production of this report adopted the vital statistics report production template, revision 1 jointly developed by Vital Strategies, United Nations Economic Commission for Africa, United Nations Economic and Social Commission for Asia and the Pacific, and Statistics Norway (2020). The template serves as a comprehensive document which provides detailed background information that is useful and recommended by the UN in the preparation of the Vital Statistics Reports.

Vital events that are covered in this report are births, deaths, and marriages that took place in 2021 and reported via the CRVS system. The annual vital statistics report presents a great opportunity to learn from experience in terms of registration of births, deaths and causes of death and evaluate the quality of the available data in the country. This report is also expected to be a benchmark for the next reports and a reference source for further publications in the same scope.

1.2.   Objectives, Scope and organization of the report

1.2.1.   General Objective

The main objective of producing this vital statistics report is to showcase the status of vital events registration for informing policies and decisions in this regard, identifying gaps and strengths within the system, and to track the progress made toward achieving the target set under the CRVS strategic plan elaborated in 2017.

1.2.2.   Specific objectives include:

 i.   To assess the level of completeness of birth and death registration.
 ii.   To highlight limitations/challenges in the data in terms of coverage, quality and timeliness for registration of civil events.
 iii.   To assess the level of reliability of demographic indicators obtained from CRVS data through comparison with indicators from other sources.

1.2.3.   Scope of the report

The United Nations recommends that countries should register and collect information on the following vital events for civil registration and vital statistics purposes: birth; death; foetal death; marriage; divorce; annulment; judicial separation; adoption; legitimization (acknowledgment); and recognition (judicial declarations of paternity) (UN, 2014). However, foetal deaths and judicial separation are not yet recorded in Rwanda as appearing in UN recommendations, although it remains to be the eventual goal. The African Ministers responsible for civil registration have also recommended the recording of the four vital events. In September 2016, the law No 32/2016/ of 28 August 2016 governing persons and family assigned an order of registration priority by selecting most of the internationally recommended vital events and by dropping some which were considered less important. In line with these recommendations, the scope of the CRVS improvement process has been set to address births, deaths, and marriages. In this regard, the top priority vital events to be recorded are births, marriages, and deaths. Against this background and taking into consideration the relative weight attributed to vital events in terms of policy orientation for our country context, the content of this report is limited to the registration of birth; death and causes of deaths; and marriages that occurred in 2022.

1.2.4.   Organization of the report

The report is organized in seven chapters namely (1) Introduction and background; (2) Rwanda's civil registration system; (3) Data quality, timeliness and completeness of registration (4) Births statistics (5) Deaths statistics (6) Cause of deaths statistics and (7) Marriages statistics. Descriptive narratives were made to clarify the results.
 ▪ Chapter 1 presents the introduction and the general overview of the role of vital statistics, objectives and scope of the report.
 ▪ Chapter 2 describes Rwanda's civil registration system including history, legal background, administrative structure; organizational structure, registration process and the flows of information; organization of vital statistics production and dissemination

plan; incentives and disincentives for civil registration and plans for further improvement of CRVS.

- Chapter 3 describes the quality, coverage and completeness of civil registration data.
- Chapter 4 gives statistical data on births, disaggregated in accordance with various aspects and with explanatory narratives.
- Chapter 5 gives disaggregated statistics on deaths with explanatory narratives.
- Chapter 6 gives summary statistics on causes of deaths.
- Chapter 7 gives disaggregated statistics on marriages with explanatory narratives.
- Finally, the appendix showcases references and other informative attachments that are meaningful to the process of vital statistics data collection.

1.3. Country profile

1.3.1. Geography

Rwanda is located in central Africa, immediately in south of the equator between latitude 1°4' and 2°51' S and longitude 28°63' and 30°54' E. The country lies 75 miles South of the Equator in the Tropic of Capricorn, 880 miles 'as the crow flies' west of the Indian Ocean and 1,250 miles East of the Atlantic Ocean - literally in the heart of Africa.

Rwanda is a mountainous country with the lowest point about 950 meters above sea level and the highest point about 4,507 m. The terrain is hilly, and the country is often referred to as "the land of a thousand hills". Rwanda has a surface area of 26,338 square kilometers. It is bordered by Uganda to the North, Tanzania to the East, the Democratic Republic of the Congo to the West, and Burundi to the South.

Figure 1: Map of Rwanda by administrative divisions

1.3.2. Economic performance

Rwanda's economy has tremendously recovered over the last two decades. Rwanda's Gross Domestic Product (GDP) has risen from $752 million in 1994 to $10.6 billion in 2022. In 2022, GDP at current market prices was estimated at Frw 13,716 billion, up from Frw 10.930 billion in 2021. Services sector contributed 47 percent of GDP, Agriculture sector contributed 25 percent of the GDP, and Industry sector contributed 21 percent of GDP while 7 percent was attributed to adjustment for taxes less subsidies on products (NISR, 2022).

The country registered an average GDP growth of around 8 percent per year over the last two decades. In 2022, the economy continued to grow throughout the year. GDP growth was 7.9 percent in the first quarter, 7.5 percent in the second quarter, 10 percent in the third quarter and 7.3 percent in the fourth quarter. This led the year 2022 to grow by 8.2 percent when compared to 2021. In the year 2022, GDP per Head in current US Dollars was estimated at 1004 from 853 in the previous year of 2021.

1.3.3. Country demographic and social profile

The fifth Rwanda Population and Housing Census (RPHC-5) indicates that Rwanda's population was 13,246,394 as of August 2022, of which 51.5 percent were females. The Rwandan population is essentially young, with 45 percent of all Rwandans under-age of 18 and 27.1 percent are youth aged 16-30. The elderly population aged 60 and above represent 6.5% of the population. According to census estimates, the natural growth rate was 2.3 percent

between 2012 and 2022 and 3.1 percent between 1978 and 1991. The low natural growth rate of 1.2 percent was observed between 1991 and 2002 due to the high number of deaths caused by the 1994 genocide committed against Tutsi.

The population is projected to increase from 13.2 million in 2022 to 23.6 million (medium scenario) by 2052. A direct consequence of this change is the increase in population density. The current population density is 501 inhabitants per square kilometer (in mid-year 2022) and is expected to increase to about 894 (medium scenario) at the end of the projection period, 2052. The population is largely rural. The ratio of Rwandan urban-rural population indicates that there are approximately three urban residents (i.e. 27.9%) for every seven rural residents (72.1%).

Agriculture is widely practiced by a big share of the population in Rwanda. According to the fifth Rwanda population and housing census, around 2.3 million Rwanda's households (69 percent of private households) practice agricultural activities while around 1.7 million households (50 percent of private households) own at least one livestock. Access to electricity by private households in Rwanda currently amounts to 61% (47% on grid and 14% solar panels).

Figure 2: 5-Years Age-group Population Pyramid, 2022
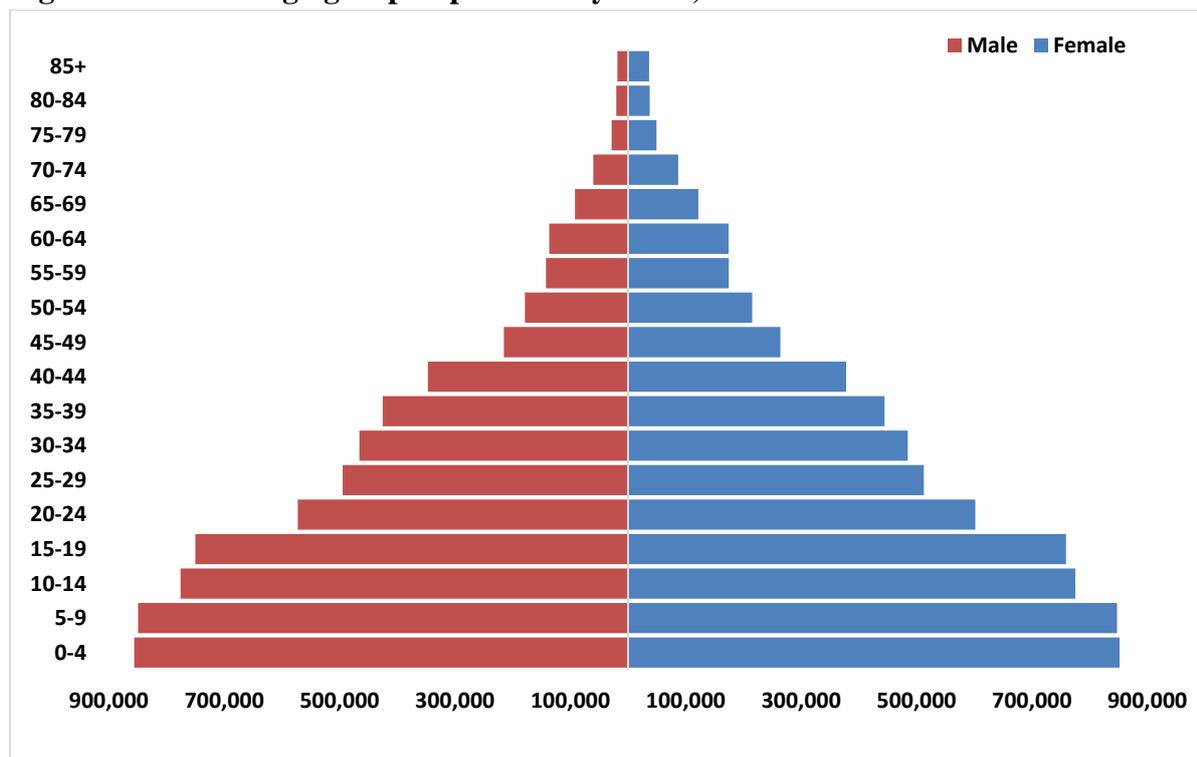
Source: NISR, 5th Rwanda Population and Housing Census, 2022

The illiteracy rate in Rwanda has significantly declined for the past years. Following the PHC5, 79% of the population aged 15 and above could read and write with understanding in any language. The same results show that 22.3% of the population have never been to school. The overall Net Attendance Rate (NAR) at primary was 89.3% in 2022 and was higher among females than the male population. Net Attendance Rate (NAR) at the secondary level of

education was 22.3%. From a gender point of view, results show that females had the highest proportion in terms of NAR in secondary compared to males (25.8 and 18.8% respectively).

Nearly all Rwandans speak the same language, Kinyarwanda, which is the country's official first language, followed by English and French. Kiswahili, the third most common foreign language, is generally spoken in some areas of the districts bordering other countries where this language is widely spoken, such as the Democratic Republic of the Congo and Tanzania. The sixth RDHS has shown that maternal mortality ratio has declined significantly to 203 deaths per 100,000 live births in 2019/20 down from 1,071 in 2000 while under-five mortality dropped to 45 deaths per 1000 in 2019/20 from 196 deaths per 1000 in 2000.

CHAPTER 2: RWANDA'S CIVIL REGISTRATION SYSTEM

2.1. History and Legal Background

In Rwanda, as in most African countries, registration of vital events started during the colonial period. However, the registration laws were only for the nationals of the colonial powers. The laws which were regulating civil registration in Rwanda evolved in connection with the stages of its political and administrative history. During the colonial period, from 1931 up to the end of 1961, under the decree of May 4, 1895, on the civil code of persons-book one, all Rwandans aged 18 years and above were issued identity cards known as identity booklet or "Ibuku". This card was written in Dutch and Kinyarwanda languages. Information entered into the booklet was a set of characteristics such as names, approximate date of birth, parents' names, sex, and marital status, height, names of descendants, profession and ethnic or clan affiliation (1).

In the early days of independence, the registration of the civil status of the population in Rwanda was governed by the order issued by the Belgian Governor on the 25th of July 1961. This order continued to be used after independence in 1962 with few amendments such as assigning the civil registration responsibilities to the Ministry of Internal Security. From the 27th of October 1988, the order was repealed and replaced by Law Nº 42/1988 which instituted the Preliminary Title and Book One of the Civil Code. This law made registration of vital events compulsory on the Rwandan territory and was in place until the 28th of August 2016 when the new law No 32/2016 governing persons and family was enacted; the same law was amended on 17th February 2020. After the publication of the new law Nº 32/2016 governing persons and family, the mandate of civil registration was transferred from the Ministry of Justice to the Ministry of Local Government (1).

The law No 32/2016 of 28/08/2016 governing persons and family determines the following Presidential and Ministerial orders allowing its implementation namely: 1) Presidential Order **Nº 092/01 of 21/09/2020** determining responsibilities of the Executive Secretary of Cell; 2) Ministerial Order Nº 002/07.01 of 27/07/2020 determining the number, types, formats and use of civil status registers 3) The Ministerial Order Nº 001/07.01 of 17/01/2017 determining modalities and procedures for change of name 4) The Ministerial Order Nº 001/MIGEPROF/2017 of 16/01/2017 determining conditions to be considered in intercountry adoption and the procedure thereof 5) The Ministerial Order Nº 002/MIGEPROF/2017 of 17/01/2017 determining procedures for guardianship of minors by the state 6) Ministerial Order N° 001/07.01 of 27/07/2020 determining the officer of the health facility with powers of civil registrar.

The mandate of civil registration was also transferred to the former National Identification Project which later became the National Identification Agency established by Law N°43/2011 and charged with population registration, civil registration, and issuance of the national identity card.

National Institute of Statistics of Rwanda has been established by law No 09/2005 of 14/07/2005 with the mandate of coordinating activities of the national statistical system among others (Republic of Rwanda, 2013). Concerning the process of strengthening vital statistics data production system, NIDA and NISR have been working hand-in-hand to improve and

strengthen the CRVS systems in Rwanda. Despite the progress achieved concerning civil registration, it is yet to be universal and able to produce reliable and continuous vital statistics. For instance, according to Rwanda vital statistics report 2021, about 16% of births were not registered and about 74 percent of deaths go unrecorded each year. Registration of other civil status is unacceptably low.

From independence until 2006 the lowest office for civil registration was District. With the second phase of the decentralization process in 2006, the responsibilities of civil registration were extended down to the sector level, where the sector Executive Secretary was added to the list of civil registrars in the country to bring most needed services closer to the population.

On 1st January 2015, NISR launched and deployed in all public and private Rwandan health facilities and all sectors and districts, the CRVS web-based application, a system used to collect vital statistics data and to facilitate the transfer of information from health facilities to sector offices under the form of vital event notification with the ultimate purpose of facilitating the regular production of vital statistics reports. In August 2020, NIDA launched NCI-CRVS system to all health facilities to permit official registration of births and deaths subsequent to the recommendation of the CRVS strategic plan elaborated in 2017.

Figure 3: CRVS improvement timeline and key actions

	During colonial period and early days of independence	From early days of independence up to 2016	After 2016	Projects ahead
Year	**Before 1988**	**1988 - 2016**	**2016 - 2020**	**2021 - 2024**
Key Action Taken	o 1931 up to the end of 1961: under the decree of May 4, 1895, on the Civil Code of persons-book one, all Rwandans aged 18 years and above were issued identity cards known as identity booklet or "Ibuku". o In the early days of independence, the registration of the civil status of the population in Rwanda was governed by the order issued by the Belgian Governor on the 25th of July 1961. o 1962- 1988 civil registration responsibilities assigned to the Ministry of Internal Security.	o 1988- 2016: Law nº 42/1988 which instituted the Preliminary Title and Book One of the Civil Code. o In 2005: law No 09/2005 of 14/07/2005 establishing NISR. o In 2006: The responsibilities of civil registration were extended down to the sector level, where the sector Executive Secretary was added to the list of civil registrars. o 2008: Launch of NPR and electronic ID system. o 2011: Mandate of CR transferred to NDA, by law o 2012: The process of modernizing and strengthening CRVS system undertaken. o 2015: Operationalization of CRVS Web-based system to HF and sector level. o 2016: Deployment of NPR to 416 sectors	o 2016: Law No 32/2016 governing persons and family enacted. o MINALOC appointed to be the parent ministry for CR. o Comprehensive assessment of CRVS system in Rwanda conducted. o 2017: Elaboration of CRVS strategic plan 2017/18-2021/22. o Undertaking the use of ICD-10 to collect data on cause of deaths within CRVS system. o February 2020: Law No 32/2016 governing persons and family amended to allow registration of births and deaths to HFs and cells. o Production of the first national vital statistics report. o August 2020: Official launch of NCI-CRVS & undertaking official registration of birth and death at health facilities	o Strengthening official registration of birth and death at health facilities via NCI-CRVS system; o Strengthening official registration of community births and deaths at cells administrative level via NCI-CRVS system; o Operationalizing official registration of other events (Marriages, divorces, marriage annulment, recognition, adoption, legitimization etc) at sector level via NCI-CRVS system; o Operationalizing official registration of all events at all Rwandan embassies via NCI-CRVS system; o Maintaining annual production of vital statistics report.
	Continuous process of modernizing and strengthening CRVS system in Rwanda			

2.2. Legal and Administrative Issues

Rwanda has a decentralized system of governance with 4 provinces and the City of Kigali, 30 districts; 416 sectors; 2,148 cells and 14,837 villages. From independence until 2006 the lowest office for registration was District. With the second phase of the decentralization process in 2006, the responsibilities of civil registration were extended down to the sector level, where the sector Executive Secretary was added to the list of civil registrars in the country to bring most needed services closer to the population.

As described in the earlier sections, the United Nations recommends that countries should register and collect information for a number of events for civil registration and vital statistics purposes: birth; death; foetal death; marriage; divorce; annulment; judicial separation; adoption; legitimation (acknowledgment); and recognition (judicial declarations of paternity) (UN, 2014). However, though the amended law catered for some of the legal issues, one the of the persisting legal issues in 2022 is that the law No 32/2016 of 28/08/2016 governing persons and family (amended in 2020) did not provide for the registration of foetal deaths as recommended by UN as only nine events (birth, deaths, marriages, divorces, adoption, recognition, guardianship, legitimization and marriage annulment) are currently declared to the civil registrar (art. 62). Second, though the registration of vital events is free of charge, the certificate is paid for and is provided on demand; something that makes low the certification of registered events. Third, the law provides for 30 days for timely birth and death registration, but it is silent on late and delayed registration. The law doesn't provide for penalties for non-compliance to legal registration time but provides for presenting a court judgment before registering a death declared after 30 days of occurrence.

2.3. Organizational structure, registration processes and information flows

2.3.1. Organization structure

The success of the CRVS system in a large measure would hinge on systematic and active coordination among all Ministries and organizations that directly or indirectly support or benefit from the system. Coordination of activities must be built into the CRVS systems from the start. While coordination at the national level is crucial for smooth management and operations of the CRVS system in a country, coordination at various other levels of administration is also important for efficient maintenance of the system.

In Rwanda, the National Identification Agency (NIDA) currently under the Ministry of ICT is mandated to supervise and coordinate the civil registration system at the national level while the National Institute of Statistics of Rwanda (NISR) is concerned with coordinating the collection of vital statistics data and is one of the major beneficiaries of the CRVS system.

Table 1 below shows the coordination mechanisms of the CRVS system at different administrative levels that provides details of the composition of the committees and their main functions.

Table 1: CRVS organization and coordination mechanism in Rwanda, 2022

Coordination committee	Composition of committee	Main functions
High-level Coordination Committee on Civil Registration and Vital Statistics To meet once a year	Chaired by Minister of Local Government Members: Minister of Health, Minister of Finance and Planning, Minister of Justice, Ministry of gender and family promotion	Provide oversight and policy guidance to the work of civil registration and vital statistics
National CRVS Steering Committee To meet once every Quarter	Chaired by Permanent Secretary of Local Government Members: PS Ministry of health, PS Ministry of justice, PS Ministry of gender and family promotion, DG/NIDA, DG/NISR, DG/RBC, ES/NCDA and special invitees depending on the nature of the meeting	Resource mobilization, Organize and conduct annual development partners meeting and approve reports from CRVS Core Technical Team.
CRVS Core Technical Team	Technicians in charge of civil registration and vital statistics from MINALOC, MINIJUST, MOH, MIGEPROF, NIDA, NISR, RBC and NCDA	Coordinate the implementation of all policies related to CRVS and advise the CRVS steering committee on all matters related to CRVS.
National mortality technical committee	Chaired by Director General of Clinical and Public Health services in the MoH and Co-Chaired by Chairman of Rwanda Medical and Dental Council. Members: MoH, RBC Heads of programs, RBC Epidemiologists, NISR, NIDA, MINALOC, Senior clinicians from Referral hospitals, WHO, CDC, Epidemiologists from Universities, Rwanda National Police, National Forensic Laboratory of Rwanda.	Coordinate all mortality activities and review mortality reports and ensure high quality of causes of death statistics are reported in compliance with global standards.

Source: NISR, National strategic plan, 2017/18-2021/22

2.3.2. The state of CRVS system in Rwanda as is in 2022

The status of CRVS system in 2022 is characterized by an effort to extend operationalization of the NCI-CRVS system modules, smoothing integration of such system with other CRVS related systems and scaling up operationalization of verbal autopsy. By the time, 7 out 9 modules of NCI CRVS system are operational all relevant registration points. The 7 events currently registered through NCI-CRVS system are: births, deaths, marriages, divorces, annulment of marriage, recognition of a child born out of wedlock and adoption. The system development for the remaining 2 modules (legitimization and guardianship) is almost completed, and an effort is being made to undertake their operationalization. It is important to mention here that each module relates to the electronic registration of a particular event.

2.3.2.1. National Centralized and Integrated Civil Registration and Vital Statistics system (NCI-CRVS)

One of the major recommendations from the first National CRVS Strategic plan elaborated in 2017 was to develop a national centralized and integrated CRVS system that will respond to the needs of various institutions in CRVS data collection; to cater for existence of multiple systems working in silos and reduce a related duplication of effort. Thus, to enforce implementation of the strategic plan, a new system (NCI-CRVS) was developed and initiated. This system has indeed the benefit of capturing vital events information on real time and directly at the site of occurrence where official registration of event is done. It quiet reduces the multiple recording of the same events into different systems as it provides for a single data entry point taking into consideration the requirements of other existing systems. The same system is linked to other legacy systems including the national population registry (NPR) for back up of national identity production; CRVS web-based system for vital statistics production; HMIS for public health and epidemiological related needs; and Irembo for issuance of certificates. The operationalization of NCI-CRVS was officially launched on August 10th, 2020, where it started with all public and private hospitals with incremental scale up rollout plan. By end of 2022, the system was operational at all hospitals, health centres, clinics, and polyclinics; both public and private, administrative cells and sectors and Rwandan embassies abroad.

2.3.2.2. CRVS paper-based system

Under the transition towards a fully digitized CRVS system, a paper-based system continued to be operational at sector offices to enable a continuous registration of vital events that are not yet captured via NCI-CRVS system. Altogether there are seven registers of civil status (Article 74 of the law Nº 32/2016 of 28/08/2016): 1) Register of birth records; 2) Register of death records; 3) Register of marriage records; 4) Register of guardianship records; 5) Register of acknowledgment of children born out of wedlock; 6) Register of adoption records; and 7) Register of other records. Upon the deployment of each completed NCI-CRVS module, physical related register gets closed within a maximum of 6 months.

2.3.2.3. CRVS web-based application

In Rwanda, reliable vital statistics were mainly available from national census and other demographic and heath surveys that are periodically conducted. Recognizing importance of

timely vital statistics and in line with the second National Strategy for the Development of Statistics (NSDS II), where strengthening the civil registration system as a source of vital statistics was one of its strategic objectives, the NISR initiated a web-based system since 2015 to ease the collection and storage of vital events registration data and enable the production of vital statistics reports. However, with introduction of NCI-CRVS system and under the prevailing transition from a paper-based system to a fully digitized registration system, NISR's CRVS web-based system was linked to NCI-CRVS to facilitate existence of a single data entry point and reduce a duplication of effort to data entry staff. Under the transition period, CRVS web-based system is timely pulling birth and death registrations from NCI-CRVS since December 2020 and is still being used at its own to capture information on vital events other than those captured via NCI-CRVS.

2.3.2.4. Health Management Information System (HMIS)

The Health Management Information System (HMIS) operates countrywide under the management of the Ministry of Health (MoH) to collect technical data for epidemiological and other health related use. With the introduction of NCI-CRVS, HMIS is expected to continue capture aggregated information on births and deaths to provide denominators for counter verification of NCI-CRVS records. This will facilitate the monitoring and improvement of both systems.

2.3.2.5. National Population Registry

The national population registry (NPR) was developed by NIDA to facilitate the issuance of the national identity card with 2D technology to those aged 16 years and above as well as hosting electronic population registration forms: first registration, change of marital status, change of address and death registration. Since 2015, the National Population Registry has been decentralized up to the Sector level where all 416 Civil Registration Officers (CROs) access and use it to serve people who need different population registration-related services and capture vital events mentioned above. This system also helps in validating and authenticating identification of recorded people. With the development of NCI-CRVS, NPR was linked to the civil registration system where each event registered is instantly captured in NPR.

2.3.3. Registration processes and information flows

Figure 4 below summarizes registration process and information flow, taking into consideration the 10 milestones[1]

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[1] Refer to: https://gh.bmj.com/content/bmjgh/3/2/e000673.full.pdf for more information

Figure 4: Ten CRVS Milestones' framework with a working definition of each milestone
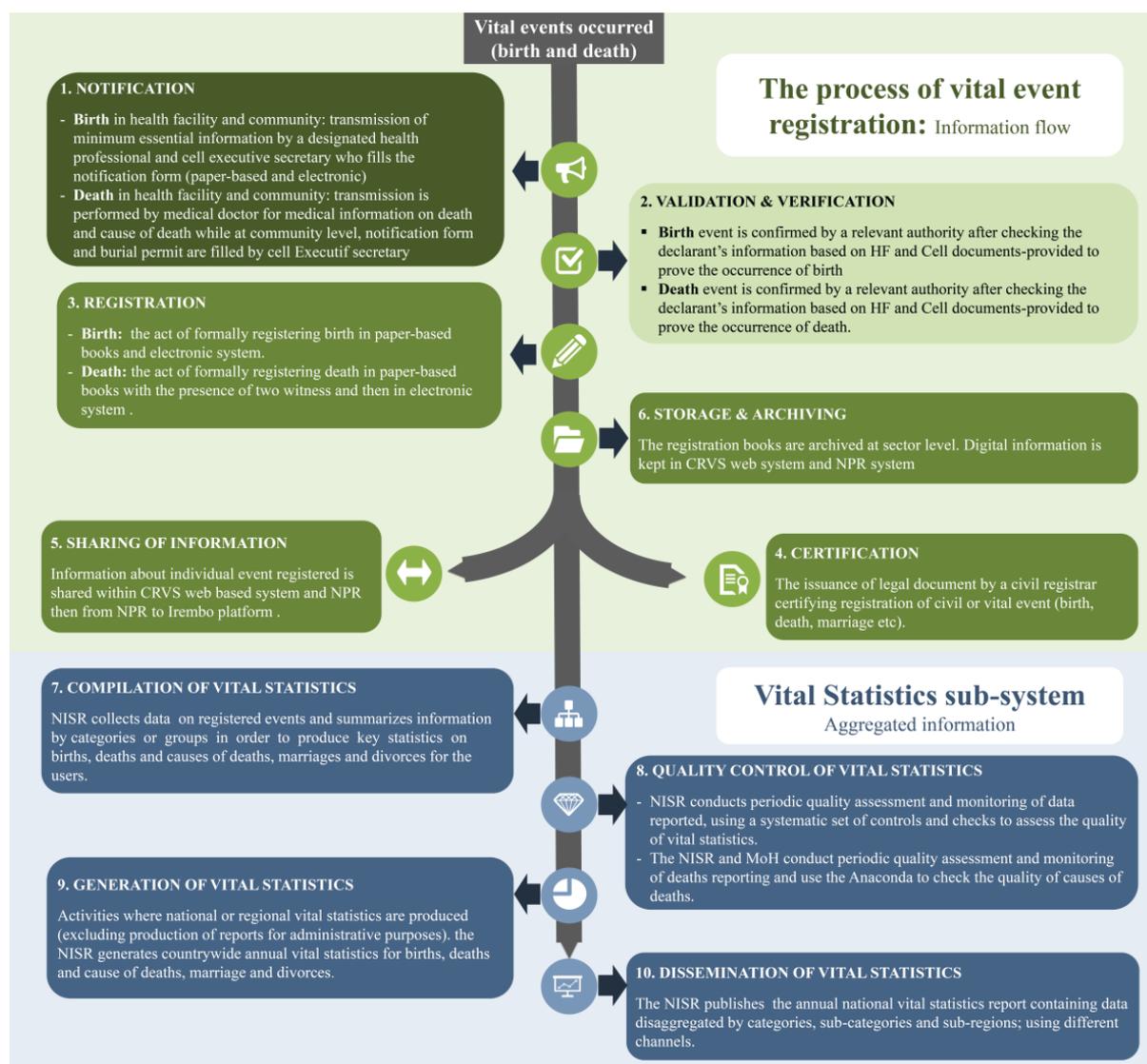
2.3.4. Timeliness of Registration

According to the law No 32/2016 of 28/08/2016 governing persons and family in Rwanda; that was amended in February 2020, registration of birth and death must be done within 30 days of occurrence (art, 100 and 106). The same law provides for a ministerial order determining modalities for late and delayed registration, but the order is not yet enacted. For reporting purposes, late registration was considered to be an event (birth or death) registered after 30 days of occurrence but without exceeding one year while delayed registration was considered to be an event (birth or death) registered after one year from its occurrence.

By current practice, marriage registration is mostly done at sector office after 20 days of notice made to the public. The consensual cohabitation (unions) and forms of marriages other than those solemnized by a civil registrar (monogamous) are not accepted by law and thus not registered. Nevertheless, such marriages are still taking place, though they are not within the scope of this report.

2.4. Organization of vital statistics production and dissemination

In Rwanda vital statistics are regularly collected via the recording of registered vital events (births, deaths, marriage etc) in a digitized CRVS system. Each year (starting by 2019), countrywide vital statistics report is produced and disseminated through the NISR website and other platforms. More information on CRVS system coordination and implementation with involved stakeholders is displayed in Figure 5 below.

Figure 5: Organization of CRVS system and production of vital statistics, 2022
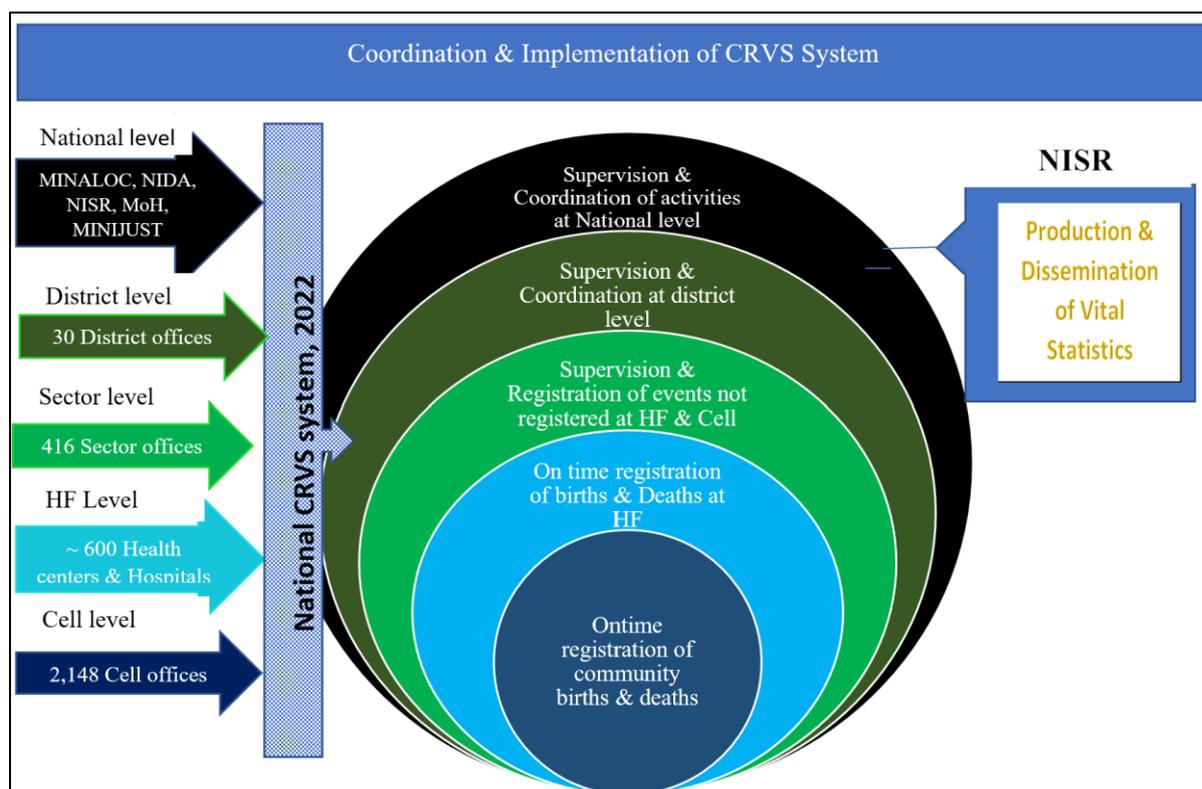
CHAPTER 3: DATA QUALITY, TIMELINESS AND COMPLETENESS OF REGISTRATION

3.1. Data and methods

3.1.1. Data source

Vital events used in this report are outputs of different sources, but mainly National Centralized and Integrated CRVS (NCI-CRVS) system and CRVS web-based system. The NCI-CRVS system was launched in August 2020 to enable official registration of events via a digitized system. However, as a way of assessing the reliability of CRVS released data and to enable the computation of indicators requiring existence of denominators, systems'-generated data were triangulated with data from other sources including Rwanda Demographic Survey and Fifth Rwanda Population and Housing Census (5-RPHC). Due to the under-reporting of deaths, especially community deaths, the low number of deaths was obtained at the national level when compared to expected deaths. In this regard, adjustment techniques were used to estimate country-representative mortality statistics.

Regarding the timeframe, only events that occurred from January to December 2022 were considered for analysis at all the events. In this report, the term marriage only refers to legally celebrated marriage as provided for by the law Nº 32/2016 of 28/08/2016 governing persons and family in Rwanda, amended in February 2020. The report does not therefore include other forms of unions not recognized by the law as marriage.

3.1.2. Data quality assessment

According to United Nations Principles and Recommendations, "The quality of vital statistics is measured according to completeness, correctness or accuracy, availability and timeliness" (UN, 2014). Therefore, quality control measures must be put in place in terms of four quality dimensions mentioned above. In this report, data quality issues observed were mainly duplicates, typing errors on date of occurrence of an event when compared to the registration date, erroneous or missing information, especially on causes of death.

Duplicate entries on births were detected based on mother's ID number or child's unique ID. On all datasets, the respective unique identifier was used to check for duplicated entries. Some duplicates were obvious and easy to detect while some others were difficult to detect. All erroneous entries were dealt with in accordance with the nature of errors. For example, missing values were replaced with a word missing or not stated in order to run pivot tables in Excel. However, for the most complex cases to handle, respective records were removed from the datasets.

3.1.3. Desk review

The process of compiling this report was preceded by assembling the materials available regarding the setup and operations of the systems as well as vital statistics reports from other countries. Some of the reports consulted in this regard include but not limited to: Alaska Vital Statistics Annual report 2017, Namibia Vital Statistics Report for data collected from 2011-2015, Philippines Vital Statistics report 2013-2014, Georgia Vital Statistics report 2015, Missouri Vital Statistics Report 2018, U.S National Vital Statistics Reports, Vol. 68, No. 13, November 27, 2019; Maryland Vital Statistics Annual Report 2018; etc. The compilation

indeed conformed to the previous versions of Rwanda vital statistics reports and consulted the production of vital statistics report: template, revision 1 developed by Vital Strategies et al (2020).

3.1.4. Dialogue with registration officers to ensure correctness of information

Civil registration staff at all categories of registration points were contacted through phone calls to clarify on suspected erroneous records for providing clear information on them or otherwise make corrections whenever possible, based on the source documents of recorded information. The general observation was that most of errors were related to the mistyping of information during data entry and were therefore corrected before data analysis.

3.2. Timeliness of registration

As per the Law Nº**32/2016 of 28/08/2016** governing persons and family, a birth or death is said to be timely registered if it is done within 30 days of occurrence. However, the law is silent on late and delayed registration. For the purpose of reporting, a late registration was considered to be a vital event (birth or death) registered after 30 days of occurrence but without exceeding one year, while delayed registration was considered to be a birth or death registered after one year. Findings from different versions of Rwanda vital statistics report show improvement in shares of timely registered births and deaths since 2019 up to 2022. Hypothetically, this can be the effect of decentralizing registration services to bring them closer to the population. Figure 6 shows the shares (in %) of timely registered births and deaths out of the total number of registered events from 2019 to 2022.

Figure 6: Timeliness of birth and death registration in %, 2019 to 2022
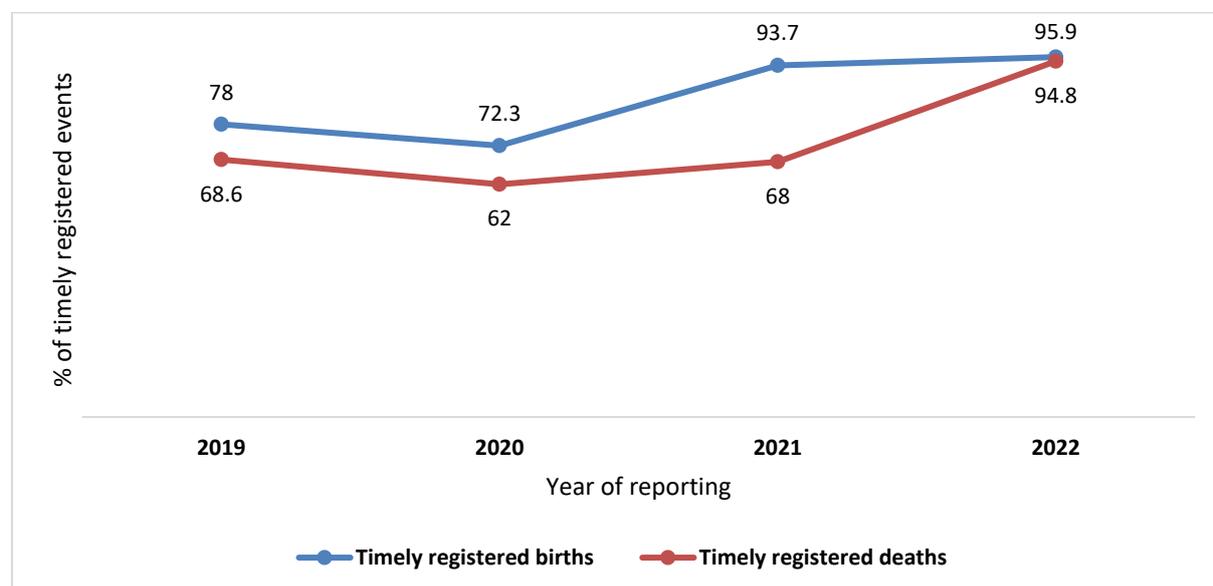
Source: Data from CRVS system, 2019-2022

3.3. Data availability and completeness of birth and death registration

Calculating the completeness of registration can be used to monitor the performance of the CRVS system in capturing all vital events and allows for adjustment of incomplete data. Completeness is defined as the proportion of actual vital events in a population that are registered, divided by the estimated number of vital events that occurred in the same year.

$$\text{Completeness} = \frac{\text{Number of vital events registered}}{\text{Estimated number of vital events}} \times 100$$

To compute birth and death registration completeness, the denominators were sourced from the population and housing census reports while the numerators were generated by CRVS system. Figure 7 shows changes in birth and death registration completeness rate since 2019 to 2022. It is to be noted that, following the CRVS strategic plan elaborated in 2017, the fixed targets for birth and death registration completeness rates were 95% and 90%, respectively.

Figure 7: Birth and death registration completeness rate in %, 2019 to 2022
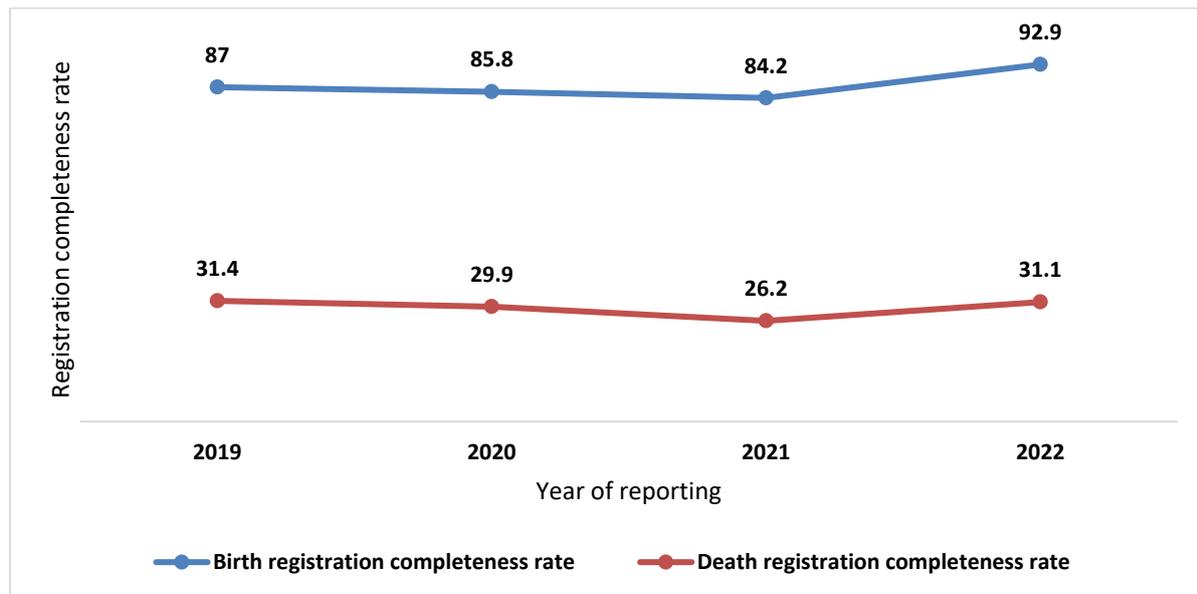
Source: Data from CRVS system; 4-PHC and 5-PHC RPHC, 219-2022 (NISR)

3.4. Adjustment for incomplete registration

3.4.1. Fertility statistics

Achieving complete vital registration remains a challenge, especially for deaths. As mentioned via Figure 7 above, birth registration completeness stands at 92.9% in 2022 at country level with significant improvement from 87% in 2019. For the sake of minimizing the effect incompleteness of birth registration on the resulting fertility indicators, the numbers of registered births were first adjusted before computation of indicators such as ASFR, TFR, GFR, CBR. Based on denominators sourced from 5-PHC that helped in finding out birth registration completeness rate, adjusted birth numbers were obtained by dividing existing numbers by the completeness rate (0.929). The following table 3 demonstrates an example.

Table 2: Adjustment for fertility statistics

Mothers' age groups	Female population, census 2022	Unadjusted numbers, 2022		Adjusted numbers, 2022	
		Number of registered births	ASFR per 1,000	Number of births	ASFR
10-14	775575	102	0.13	110	0.14
15-19	759178	20,109	26.49	21646	28.51
20-24	602006	76,770	127.52	82637	137.27
25-29	512713	85,371	166.51	91896	179.23
30-34	485003	74,273	153.14	79949	164.84
35-39	444670	55,097	123.91	59308	133.37
40-44	378154	26,195	69.27	28197	74.56
45-49	263941	3,014	11.42	3244	12.29
50-54	215118	191	0.89	206	0.96

Source: CRVS system and 5-PHC, 2022

By considering information here above mentioned in Table 3, and with prior knowledge of denominators from 5-PHC where the total population number is 13,246,394; and given available information on the number of females aged 15-49 by 5 years age groups; adjusted TFR and GFR becomes 3.7 and 106.6 respectively (up from 3.4 and 99.0 when unadjusted) while adjusted CBR becomes 27.7 (up from 25.8 when unadjusted).

3.4.2. Mortality statistics

There exist several methods used in determining total population estimates in the presence of under-reporting. This report uses one of the non-parametric methods used by Maina et al. (2017) to estimate the number of deaths and enable the calculation of approximately country representative indicators as the reporting completeness is low (26.2%). The adjustment can be expressed as follows (Maina et al 2017):

$$n(adjusted) = n + n\left(\frac{1}{c} - 1\right) * k \qquad (1)$$

Where:

n = is the output number
c = reporting completeness
k = the adjustment factor

k is between 0 and 1. If we assume that deaths occurred at the same rate in the reporting and non-reporting incidences then, k = 1. On the other hand, if the non-reporting means that no deaths occurred, then k=0 in that case and so no adjustment is required. The selection of the most likely value of k is done through a comparison of CRVS data with the survey results (MAS), and by selecting a value of k that brings the adjusted CRVS statistic close to the survey statistic. A k of 0.9 was considered and used for the 2022 data adjustment. Reporting completeness was computed as:

$$Unreported\ deaths\ (\%) = \frac{Census\ estimate - CRVS\ statistic}{Census\ estimate} \times 100\% \quad (2)$$

And therefore:

$$reporting\ completeness\ (c) = 100\% - unreported\ deaths(\%) \quad (3)$$

The choice of adjustment factor (k) was made by applying aforementioned formula (1) to the CDR results from 2 sources; namely MAS2 and CRVS 2022 and then, the results were plotted on a graph, as shown in Figure 7. The k value was thereby determined by the coordinates that are very close to the intersection between the resulting two lines of the scatter plot giving a k value of 0.9 as below displayed.

Figure 8: Trends of CDR from CRVS and MAS under different values of k
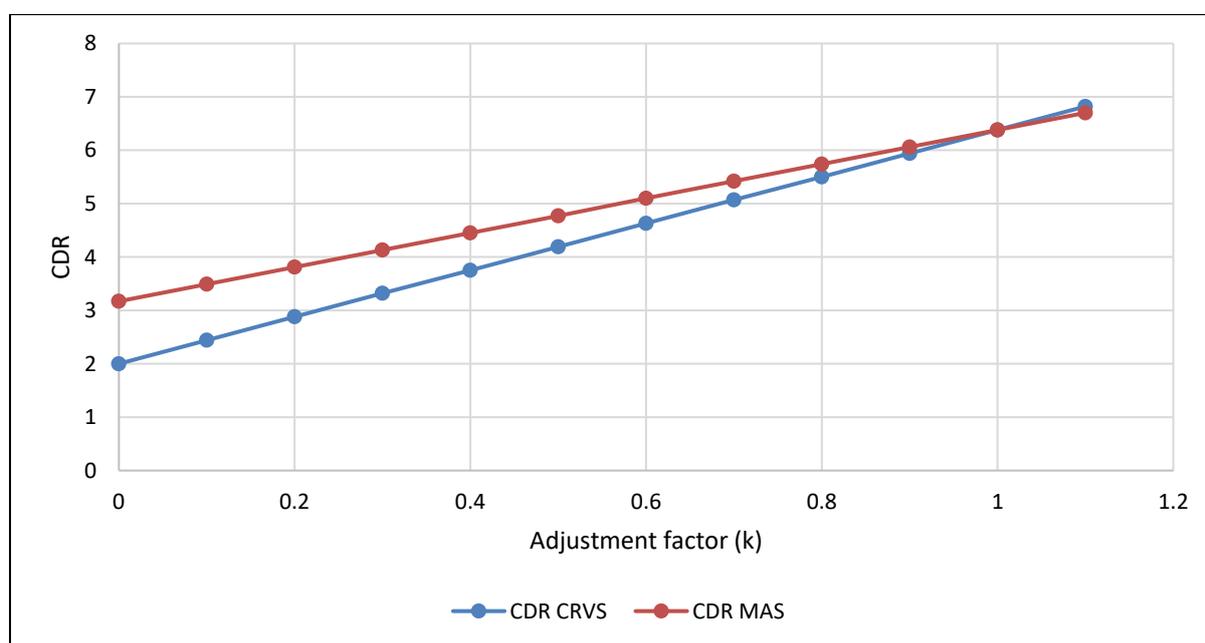
By applying aforementioned technique (non-parametric method) to the CRVS results (with k=0.9), the adjusted number of deaths becomes 76,545 up from 25,567 deaths and, this gives adjusted CDR equivalent to 5.8. The same practice was used to get adjusted values for neonatal mortality, infant mortality and under five mortality rates; under assumption that the completeness rate of death registration has been the same across all ages. Table 4 shows unadjusted and adjusted values of CDR since 2019.

Table 3: Adjusted and unadjusted values of CDR, 2019-2022

Indicator	2019	2020	2021	2022
Population size	12,374,397	12,663,116	12,955,763	13,246,394
Registered deaths (number)	23,771	22,634	19,797	25,567
Adjusted number of deaths	70,518	75,570	75,561	76,545
Unadjusted CDR (per 1000)	1.9	1.8	1.5	1.9
Adjusted CDR (per 1000)	5.9	6	5.8	5.8

Source: CRVS system, 4th PHC Projections and 5-PHC, 2022

3.5. Comparison with data from other sources

As a way of assessing the reliability of CRVS data, the results were compared with indicators from other sources. Table 5 shows the comparisons for selected mortality indicators.

Table 4: Comparing CRVS death indicators (adjusted) with the results from other sources

Indicator	CRVS (adjusted)				RDHS 2019/20	RDHS 2014/15	MAS 2018	5-PHC
	2022	**2021**	**2020**	**2019**				
Crude death rate	5.8	5.8	6	5.9	-	-	3.2	6.3
Neonatal (0-27 completed days)	25.4	23.7	23	23.5	19	20	14.1	-
Infant mortality rate (0-<1 year)	34.3	31.6	30	31.5	33	32	23.3	28.9
Under five mortality rate	40.9	37.4	37.1	38.5	45	50	32.3	40.8

Source: CRVS system, MAS, RDHS and PHC

CHAPTER 4: BIRTH STATISTICS

Following the law governing persons and family in Rwanda, all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration. This chapter gives an in-depth analysis of data on registered live births that occurred from January to December 2021. Table 6 gives a summary of statistics on births obtained. The same table shows a decline in the completeness of birth registration in 2021 compared to 2020. Hypothetically, that decrease may be attributed to the effect of COVID-19 prevention measures and the effect of a transition from a paper-based registration to a digitized registration system that started in August 2020 in compliance with amended law governing persons and family.

Table 5: Summary statistics on births

Indicator	2019	2020	2021	2022
Registered live births (number)	313,398	312,678	310,249	341,122
Males	158,826	158,450	157,615	172,540
Females	154,572	154,228	152,634	168,582
Expected live births (number)	360,388	364,342	368,251	367,312
Males	182,857	184,863	186,847	187,873
Females	177,531	179,479	181,404	179,439
Registration completeness (%)	87	85.8	84.2	92.9
Males	86.9	85.7	84.4	91.8
Females	87.1	85.9	84.1	93.9
Sex ratio at birth	103	103	103	102
Adjusted Crude birth rate (per 1,000 population)	29.1	28.8	28.4	27.7
Total fertility rate (births per woman)	3.8	3.7	3.5	3.7

Source: CRVS system and 5-PHC, 2022

4.1. Completeness of birth registration

The current report considers officially registered births (numerator) which were compared with the number of live births sourced from the 5th population and housing census conducted in 2022 (denominator) to obtain the completeness. As shown in table 7, the completeness of birth registration was found to be 92.9% at national level with female registration rate slightly higher than males (94.0% Vs 91.8% respectively). By districts, the completeness of birth registration was found to be high in Gakenke and Gicumbi districts (98.7% and 98.6%, respectively) and low in Nyagatare (83.2%), Karongi (88.6%) and Gatsibo (88.8%).

Table 6: Birth registration completeness (in %) by districts and sex, 2022

District Name	Registered live births			Completeness of birth registration		
	Both sexes	Male	Female	Both sexes	Male	Female
Rwanda	**341,122**	**172,540**	**168,582**	**92.9**	**91.8**	**93.9**
Bugesera	15,071	7,649	7,422	89.8	89.4	90.3
Burera	9,723	4,874	4,849	98.3	96.7	99.9
Gakenke	8,871	4,424	4,447	98.7	97.2	100.0
Gasabo	23,621	11,966	11,655	93.8	93.1	94.5
Gatsibo	14,070	7,150	6,920	88.8	87.8	89.7
Gicumbi	11,558	5,830	5,728	98.6	97.3	100.0
Gisagara	11,466	5,787	5,679	96.3	95.3	97.4
Huye	9,850	4,998	4,852	96.2	95.2	97.2
Kamonyi	10,779	5,461	5,318	91.0	89.4	92.7
Karongi	8,367	4,299	4,068	88.6	88.7	88.5
Kayonza	12,500	6,440	6,060	93.8	93.2	94.5
Kicukiro	13,033	6,554	6,479	96.4	94.9	98.0
Kirehe	12,656	6,471	6,185	93.1	92.9	93.3
Muhanga	8,529	4,247	4,282	98.4	97.4	99.5
Musanze	11,944	5,943	6,001	90.5	90.3	90.7
Ngoma	10,867	5,482	5,385	92.8	90.5	95.4
Ngororero	8,745	4,437	4,308	94.9	93.7	96.2
Nyabihu	8,770	4,418	4,352	95.4	93.7	97.3
Nyagatare	17,071	8,675	8,396	83.2	82.5	83.9
Nyamagabe	8,688	4,354	4,334	92.4	91.5	93.4
Nyamasheke	10,596	5,309	5,287	88.8	87.5	90.2
Nyanza	9,172	4,623	4,549	92.8	91.5	94.1
Nyarugenge	9,588	4,897	4,691	95.9	95.1	96.7
Nyaruguru	8,743	4,437	4,306	98.0	97.9	98.0
Rubavu	14,505	7,400	7,105	90.0	89.6	90.4
Ruhango	8,470	4,300	4,170	93.1	91.1	95.3
Rulindo	8,319	4,196	4,123	96.5	94.5	98.6
Rusizi	13,750	6,951	6,799	91.6	89.5	93.9
Rutsiro	9,441	4,793	4,648	93.8	94.4	93.2
Rwamagana	12,176	6,078	6,098	90.2	87.7	92.9
Not stated	183	97	86	-	-	-

Source: CRVS system and 5-PHC, 2022

4.2. Timeliness of birth registration

By the law currently in force, birth registration must be done within 30 days of occurrence and, this was timely registration in this report. However, the law is not specific on definition of late registration. For reporting purpose, late registration was a birth registered after 30 days but before exceeding one year. As the report considers registered live births whose year of occurrence is 2022, delayed registrations were excluded from analysis. The comparison of registered births taking into consideration registration timeliness shows an increase in the shares of timely registered births in 2022 compared to 2021, from 93.7% to 95.9%, something that may indicate a positive impact of decentralizing registration services to health facilities and cells. Figure 8 below gives a picture.

Figure 9: Timeliness of birth registration in %, 2019 to 2022

Source: CRVS system, 2022

4.3. Live births registered by residence of mothers

As presented in Table 8 below, there has been diversity in numbers of births registered taking into consideration their mothers' residence districts whereby a high number of births is observed in Rusizi (16,112), Nyamasheke (14,978), and Gicumbi (14,042) districts while low numbers are observed in Nyarugenge (6,639) and Kicukiro (6,632) districts.

Table 7: Registered live births by mothers' residence districts

District	Number of live births			Sex ratio at birth
	Both sexes	**Female**	**Male**	
Rwanda	**341,122**	**168,582**	**172,540**	**102**
Bugesera	11,851	5,836	6,015	103
Burera	10,883	5,450	5,433	100
Gakenke	12,181	6,065	6,116	101
Gasabo	11,871	5,860	6,011	103
Gatsibo	13,460	6,709	6,751	101
Gicumbi	14,042	6,963	7,079	102
Gisagara	12,891	6,360	6,531	103
Huye	10,777	5,366	5,411	101
Kamonyi	10,571	5,184	5,387	104
Karongi	10,800	5,230	5,570	107
Kayonza	10,153	4,927	5,226	106
Kicukiro	6,632	3,273	3,359	103
Kirehe	12,359	6,061	6,298	104
Muhanga	10,319	5,057	5,262	104
Musanze	11,262	5,677	5,585	98
Ngoma	11,146	5,522	5,624	102
Ngororero	11,825	5,828	5,997	103
Nyabihu	11,156	5,513	5,643	102
Nyagatare	12,174	6,003	6,171	103
Nyamagabe	12,126	6,003	6,123	102
Nyamasheke	14,978	7,456	7,522	101
Nyanza	9,627	4,732	4,895	103
Nyarugenge	6,639	3,261	3,378	104
Nyaruguru	11,577	5,748	5,829	101
Rubavu	12,850	6,271	6,579	105
Ruhango	9,892	4,952	4,940	100
Rulindo	9,654	4,765	4,889	103
Rusizi	16,112	7,973	8,139	102
Rutsiro	11,782	5,811	5,971	103
Rwamagana	9,349	4,640	4,709	101
Not stated	183	86	97	113

Source: CRVS system, 2022

4.4. Registered births by place of occurrence and by the usual residence of mothers

Table 9 shows the level of variations between the place of birth occurrence and the usual residence of mothers across districts where the results show that for 64.2% of all registered births, the place of birth occurrence and the place of mothers' usual residence are the same. Across districts, high shares of births that occurred in in places other than their mothers' usual residence districts are observed in Nyarugenge and Kicukiro districts (51.2% and 64.5% respectively) while the low shares are observed in Rusizi and Kirehe districts (22.5%; 21.0%) The following table displays more details.

Table 8: Registered live births by place of occurrence and by place of usual residence of mothers, 2022

District Names	Place of usual residence (counts)			Place of usual residence (%)		
	Same as place of occurrence	Other locations	Total	Same as place of occurrence	Other locations	Total
Rwanda	**218,602**	**122,520**	**341,122**	**64.1**	**35.9**	**100.0**
Bugesera	9,089	5,234	14,323	63.5	36.5	100.0
Burera	6,965	969	7,934	87.8	12.2	100.0
Gakenke	7,384	1,963	9,347	79.0	21.0	100.0
Gasabo	5,653	17,519	23,172	24.4	75.6	100.0
Gatsibo	10,014	4,591	14,605	68.6	31.4	100.0
Gicumbi	9,837	2,094	11,931	82.4	17.6	100.0
Gisagara	9,222	1,655	10,877	84.8	15.2	100.0
Huye	6,429	4,644	11,073	58.1	41.9	100.0
Kamonyi	5,079	2,180	7,259	70.0	30.0	100.0
Karongi	7,227	2,521	9,748	74.1	25.9	100.0
Kayonza	7,154	5,298	12,452	57.5	42.5	100.0
Kicukiro	2,325	11,191	13,516	17.2	82.8	100.0
Kirehe	9,595	3,032	12,627	76.0	24.0	100.0
Muhanga	5,796	3,930	9,726	59.6	40.4	100.0
Musanze	8,294	4,517	12,811	64.7	35.3	100.0
Ngoma	8,271	2,600	10,871	76.1	23.9	100.0
Ngororero	7,448	2,148	9,596	77.6	22.4	100.0
Nyabihu	5,917	3,322	9,239	64.0	36.0	100.0
Nyagatare	8,892	7,018	15,910	55.9	44.1	100.0
Nyamagabe	7,565	1,020	8,585	88.1	11.9	100.0
Nyamasheke	9,255	1,376	10,631	87.1	12.9	100.0
Nyanza	5,639	3,122	8,761	64.4	35.6	100.0
Nyarugenge	3,454	13,047	16,501	20.9	79.1	100.0
Nyaruguru	7,202	726	7,928	90.8	9.2	100.0
Rubavu	9,452	4,589	14,041	67.3	32.7	100.0
Ruhango	5,352	3,290	8,642	61.9	38.1	100.0
Rulindo	5,568	2,380	7,948	70.1	29.9	100.0
Rusizi	11,631	1,492	13,123	88.6	11.4	100.0
Rutsiro	7,570	760	8,330	90.9	9.1	100.0
Rwamagana	5,323	4,109	9,432	56.4	43.6	100.0
Not stated	-	183	183	0.0	100.0	100.0

Source: Data CRVS system, 2022

4.5. Registered live births by age group of mothers

CRVS system released data show variations in the number of births registered per age groups of mothers. The number of registered births has been high among females aged 25-29 compared to the remaining ages and low among females aged 50 and above or less than 15. More details are displayed in Figure 9.

Figure 10: Registered live births by age of mothers
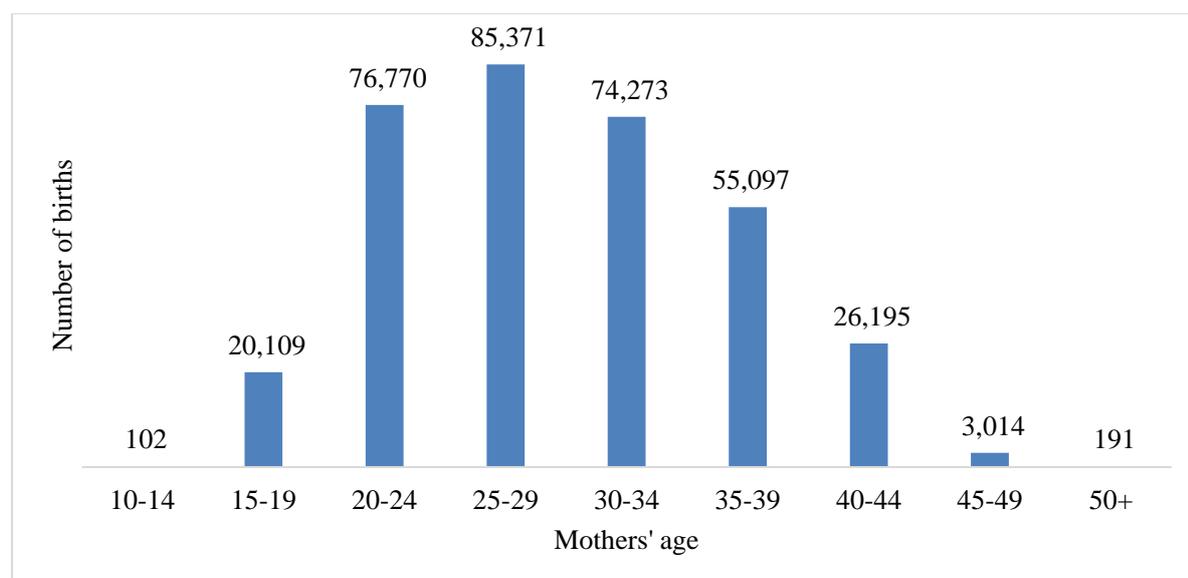
4.6. Registered live births by type of pregnancy

CRVS system-generated data were analyzed to find out the rate of multiple births and the results revealed that out of 341,122 live births registered only 9,247 (2.7%) were multiple births (twins, triplet, etc) while the remaining share was singleton births. Across age groups, the rate of multiple births is high to females aged 30-34 while the rate of single birth is high to females aged 25-29. Table 10 below shows the frequency of single and multiple births across age groups of mothers.

Table 9: Registered live births by age of mothers and type of pregnancy

Age	Counts			Percentages		
	Single births	Multiple births	Total	Single births	Multiple births	Total
All	**331,875**	**9,247**	**341,122**	**100.0**	**100.0**	**100.0**
10-14	102	-	102	0.0	0.0	0.0
15-19	19,878	231	20,109	6.0	2.5	5.9
20-24	75,413	1,357	76,770	22.7	14.7	22.5
25-29	83,064	2,307	85,371	25.0	24.9	25.0
30-34	71,772	2,501	74,273	21.6	27.0	21.8
35-39	53,117	1,980	55,097	16.0	21.4	16.2
40-44	25,398	797	26,195	7.7	8.6	7.7
45-49	2,953	61	3,014	0.9	0.7	0.9
50+	178	13	191	0.1	0.1	0.1

Source: CRVS system, 2022

4.7. Registered live births by weight at birth

Weight at birth is a meaningful indicator on the health status of live-born infant. Figure 10 shows variations in the weights of the newborns by weight ranges where in 2022, the weight range with a high number of births was 3000- 3499 grams. The same range contains an average (3081 grams for both sexes). Analysis shows that in 2022, females' average weight at birth was slightly less than males' average (3,034 grams for females Vs 3,126 grams for males). The percentage of low birth weight (<2500 grams) and very low birth weight (<1500 grams) were relatively small (7.7% and 1.1%, respectively), though slightly increased compared to the 2021 results (6.5% and 1.0%, respectively). By sex, females are predominant in the age ranges that are below 3000-3499 grams while males are predominant in the weight ranges that are grater or equal to 3000-3499. Average weight at birth for both sexes is 3,0801 grams.

Figure 11: Registered live births by weight at birth and sex
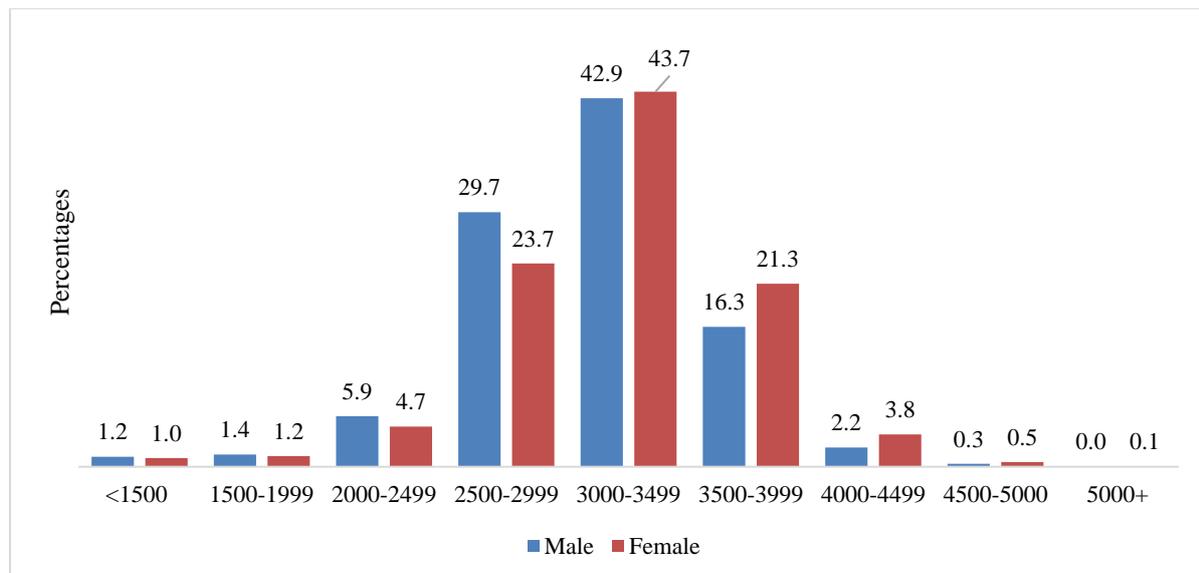
Source: CRVS system, 2022

4.8. Registered live births by birth order

Birth order refers to the order a child is born in the family; first-born and second-born are examples. Birth order is often believed to have a profound and lasting effect on psychological development. To some extent, it may play an impactful role in orientation and initiation of family planning related policies and laws. CRVS system generated data show insignificant differences in birth order among live births registered in 2022 compared to 2021as shown in Figure 11 below.

Figure 12: Frequency of birth order (%) in 2022 compared to 2021
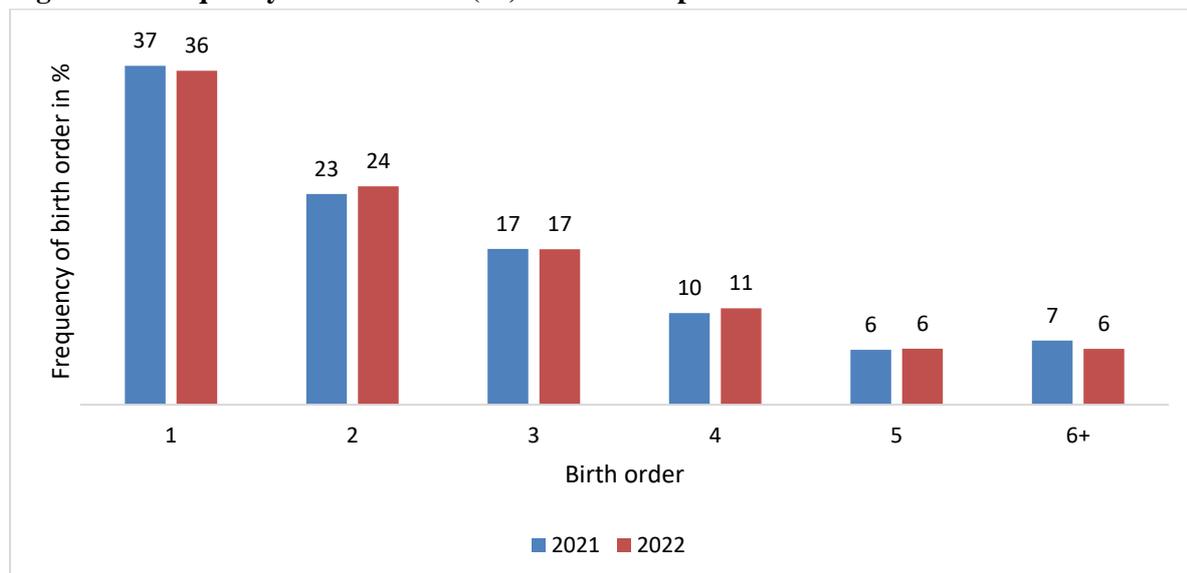
Source: CRVS system, 2022

4.9. Key fertility indicators

This section shows fertility indicators computed using CRVS system-generated data in 2021 including: crude birth rate (CBR), sex ratio at birth, general fertility rate (GFR) and total

fertility rate (TFR). Some indicators like CBR, TFR and GFR were computed based on adjusted data as the completeness of birth registration in 2022 is not good enough. Moreover, in order to assess the reliability of indicators computed from CRVS data, a comparison with data from other sources was performed. Table 11 provides a summarized situation.

Table 10: Summary comparison of fertility indicators from CRVS with other sources

Indicator	CRVS				MAS 2018	RDHS 2019/20	5-PHC 2022
	2019	2020	2021	2022			
TFR	3.7	3.7	3.5	3.7	3.7	4.1	3.6
GFR	110.8	108.7	106	106.6	108.7	134	105.5
CBR	29.1	28.8	28.4	27.7	27.6	31.8	27.8
Sex ratio at Birth	103	103	103	102	102	-	104.7
Average weight at birth in grams	3,100	3,108	3,112	3,081	-	-	-
Low birth weight (%)	7.4	7.1	6.5	7.7	-	-	-

Note: Only sex ratio at birth and birth weight related indicators are based on unadjusted data.

4.9.1. Sex ratio at birth

The sex ratio at birth is the number of male live births for a specific area during a specified period divided by the number of resident female live births for that area and period multiplied by 100. In the human species the ratio between males and females at birth is slightly biased towards the male sex. The natural "sex ratio at birth" is often considered to be around 105. This means that at birth on average, there are 105 males for every 100 females. A sex ratio that is less than 100 means that male births are less than female births something that doesn't often happen. CRVS system-generated data show the sex ratio at birth equivalent to 102 in 2022 something implying 102 new males born for every 100 new females born. Details regarding sex ratio by districts are displayed in Table 8.

4.9.2. Crude birth rate (CBR)

The crude birth rate is the number of live births occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year. The crude birth rate is called "crude" because it does not take into account age or sex differences among 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. When combined with the crude death rate and net migration, crude birth rates can tell us how much our population is increasing or decreasing. They can also help with planning and resource allocation by providing important information such as how many infants will require vaccinations and child health care, how many will be entering school in the coming years, or how many adults will be entering the workforce. The calculation of crude birth rate requires having both the number of live births within a specific period and the total population located in the area under consideration for a period of time under consideration. Usually, the mid-year population is used as an estimate of the total population. CRVS system-generated data show adjusted CBR of 27.7‰ in 2022 (25.8‰ if unadjusted) something implying 27.7 live births per 1,000 population annually, regardless of age and sex differentials. More details are displayed below in Table 12.

Table 11: Unadjusted and Adjusted crude birth rate, 2019-2022

Year	Unadjusted		Adjusted	
	Total registered live births	CBR (Per 1,000 population)	Total estimated live births	CBR (Per 1,000 population)
2022	341,122	25.8	367,312	27.7
2021	310,249	23.9	368,251	28.4
2020	312,678	24.7	364,427	28.8
2019	313,398	25.3	360,228	28.4

Source: CRVS system & 5th RPHC, 2022

4.9.3. General fertility rate

The general fertility rate is the number of live births for a specific area during a specified period divided by the female population aged between 15 and 49 years (usually estimated at mid-year) for the same area and period multiplied by 1,000. CRVS system-generated data show that the adjusted value of GFR was 106.6 in 2022, something implying 106.6 live births for every 1,000 women in childbearing age (15-49) annually.

4.9.4. Age-specific birth rate (ASFR)

The age-specific birth rate is the number of live births to women in a specific age group for a specific area during a specified period divided by the total population of women in the same age group for that area and period multiplied by 1,000. As shown in figure 12, ASFRs is high to mothers aged 25-39 at the national level. Shares of births occurring from females aged under 15 and females aged 50 and above are relatively small.

Figure 13: Age Specific Fertility Rate per 1,000 women
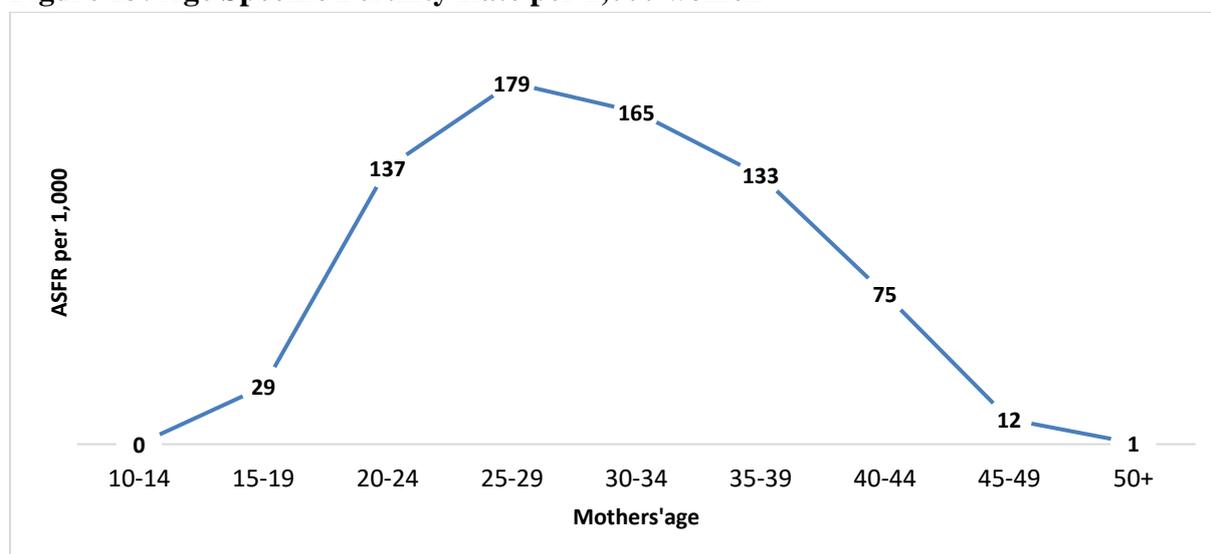
Note: Female population data were sourced from the 5th RPHC, 2022

4.9.5. Total fertility rate (TFR)

TFR represents the number of children who would be born per woman (or per 1,000 women) if she/they were to pass through the childbearing years bearing children according to a current

schedule of age-specific fertility rates. The computation of TFR is the sum of the age-specific birth rates (usually for 5-year age groups between 15 and 49) for female residents of a specific area during a specified period multiplied by 5 (where the age-specific birth rates are 5-year birth rates). It can also be calculated as the sum of a 1-year age-specific birth rate for females aged between 15 and 49. TFR is also interpreted as 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. CRVS system generated data (adjusted) in 2022, show TFR equivalent to 3.7. Details on computation of TFR are displayed in Table 3.

CHAPTER 5: DEATHS STATISTICS

5.1. Background

Rwanda adopted the United Nations Sustainable Development Goals (SDGs) that are also founded on leaving no one behind in health. Goal three of the SDGs aims to improve maternal and child health outcomes, end infectious diseases, reduce premature mortality from non-communicable diseases and injuries and ensure universal health coverage by 2030. The Africa Agenda 2063 envisages a continent characterized by universal access to healthcare, zero communicable deaths, zero maternal deaths, zero child deaths and countries capable of mobilizing domestic funding for preventing, detecting and responding to public health threats such as non-communicable diseases, health needs of the youth population and malnutrition by 2063.

Information on the number of deaths and their causes is of invaluable role in evaluating and tracking progress towards the national, regional and international goals. The information on the mortality levels, trends and differentials is important for the identification of emerging diseases and conditions, formulation of evidence-based health policies and tracking of the population health status.

Mortality data are generated from the civil registration system that permits the production of mortality statistics continuously and contribute to the understanding of the burden of diseases at national and sub national levels.

This vital statistics report contains registration of both community deaths and institutional deaths registered at various registration offices, and the cause of death that are reported by the hospitals in the CRVS system. Due to under reporting of deaths, mortality statistics produced in this report must be used with caution. Only 25,536 deaths were found registered in civil registration system which is a single source of vital statistics data, and that number was considered for analysis of mortality data in this report. It is important to mention that Health facility deaths are electronically notified and registered in presence of declarant at the place of occurrence. Since August December 2020, all health facilities adopted the use of a digital registration system known as National Centralized and Integrated CRVS system (NCI-CRVS) for official registration of births and deaths at place of occurrence to improve registration completeness and service delivery.

5.2. Death registration

5.2.1. Completeness of death registration

As noted in section 3.3 of this report, knowing about the completeness of death registration is essential for several reasons. From a civil registration perspective, knowing completeness of death registration is important for improvement of the health system. From a statistical perspective, estimating registration completeness enables adjustments to be made when calculating mortality rates and computing demographic indicators such as population projections, age-and-sex-specific mortality rates and population dynamics.

As shown in Table 14, death registration completeness is 31.1% in 2022 at national level. The computation is based on the number of deaths registered (25,567 deaths, excluding delayed registrations) divided by expected deaths from the recent Rwanda population and housing

census conducted in 2022 which gives a total of 82,242 deaths that occurred 2022. Given the relatively low death registration completeness, it would be close to worthless to use registration data directly to calculate key mortality indicators and therefore, adjustments were made to estimate the key indicators. Adjustment for incomplete registration is a common practice and a guidance from the UN Principles and Recommendations for a Vital Statistics System (2014) as described in section 3.4. Table 12 gives a summary of registered deaths and adjusted values for key mortality indicators. For further information on adjusted mortality indicators see chapter 3; section 3.4.

Table 12: Summary mortality statistics, 2022

Indicator	2019	2020	2021	2022[2]
Registered deaths (number)	23,791	22,634	19,797	25,567
Male	13,188	12,659	10,792	14,041
Female	10,603	9,975	9,005	11,495
Expected number of deaths (number)	75,712	75,624	75,653	82,242
Male	38,760	38,803	38,774	-
Female	36,952	36,821	36,879	-
Death registration completeness (%)	31.4	29.9	26.2	31.1
Male	34	32.6	27.8	-
Female	28.7	27.1	24.4	-
Crude death rate per 1,000 (Adjusted)	5.9	6	5.8	5.8
Under-5 mortality rate per 1,000 live births (Adjusted)	38.5	37.1	39.8	43.9
Sex ratio at death	124	124.1	119.8	122.1

Source: CRVS system and 5th PHC (NISR), 2022

5.2.2. Timeliness of death registration

By the law currently in force, death registration must be done within 30 days of occurrence, and this was timely registration in this report. As the current report considers deaths whose year of occurrence is 2022, delayed registrations of deaths are not mentioned in this section. For reporting purposes, late registration was a death registered after 30 days but before exceeding one year. Figure 14 below shows that 94.8% of the total registered deaths were registered within 30 days of occurrence (timely registration). The same figure indicates an impressing increase in the proportion of timely registered deaths by 26.8 percentage points, from 68% in 2021 to 94.8% in 2022.

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[2] The completeness rate is obtained by dividing actual number of registered events by the number of expected events. As mortality section of the 5-PHC is still under analysis stage where details on deaths by sex are not yet availed, this report did not manage to showcase the completeness rate of deaths registration by sex due to lack of sex disaggregated data for expected deaths whose source is population and housing census 2022.

Figure 14: Proportion of timely registered deaths in %, 2019 to 2022
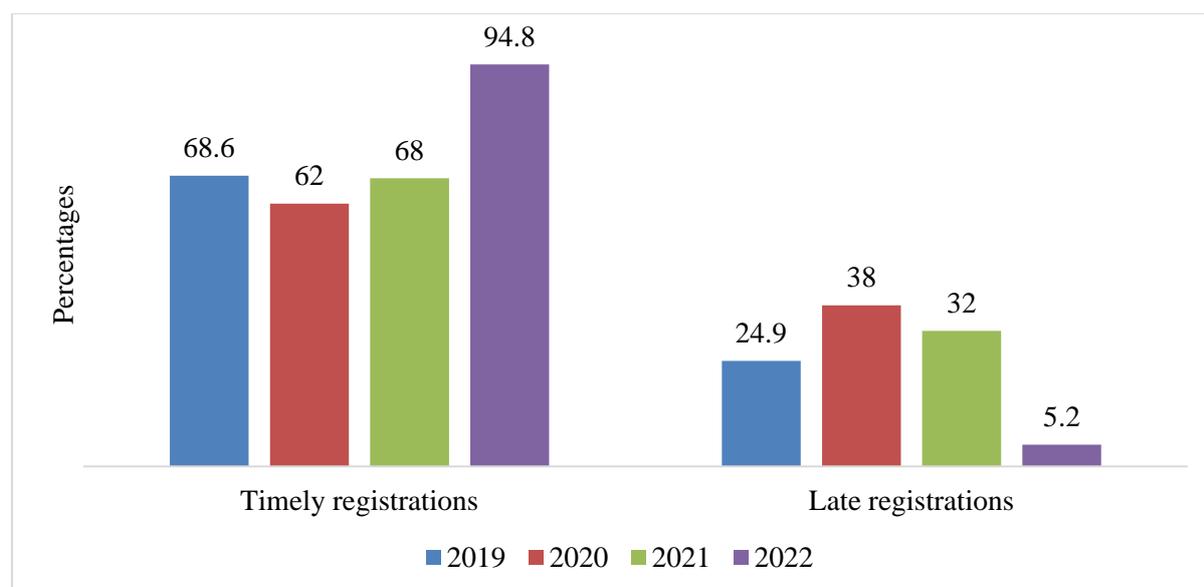
Source: CRVS system, 2022

5.2.3. Registered Deaths by place of usual residence

Table 13 shows the numbers of deaths registered in civil registration system by province of usual residence in comparison with estimated total number of populations residing in that province. The high numbers of registered deaths is observed in the Southern province followed by the Western province whereas the lowest were found in the city of Kigali. Given the low completeness of death registration, information regarding the numbers of registered deaths is to be used with caution as many efforts are still being vested to raise up the completeness.

Table 13: Registered deaths by provinces with estimated population and by sex of decedent

Province of residence	Number of Populations	Number of registered deaths		
		Both sexes	**Female**	**Male**
Rwanda	13,246,394	25,577	11,509	14,068
Eastern Province	3,563,145	5,195	2,194	3,000
Kigali city	1,745,555	2,245	972	1,274
Northern Province	2,038,511	5,256	2,413	2,843
Southern Province	3,002,699	6,997	3,155	3,842
Western Province	2,896,484	5,884	2,775	3,109

Source: CRVS system, 2022

5.2.4. Registered deaths by place of occurrence and by residence district

The CRVS system generated data show a high proportion of health facility deaths registered (**13,502**) compared to community deaths (**12,075**) in 2022. The share of community deaths occupies 47% of the total registered deaths in 2022 (down from 51.4% in 2021) while health

facilities' deaths represent 53% (up from 49.8% in 2021). This may be a result of decentralizing death registration to health facilities via NCI-CRVS and calls for more effort to cater for community death registration completeness by strengthening operationalization of community deaths registration at cells. The disaggregation of registered deaths based on place of occurrence and place of residence of decedent shows that in Gasabo district there are more health facilities death recorded (806) compared to (304) registered at community level, while in Gicumbi district deaths occurring at community level (692) were higher than those occurring at hospital level (555). Table 14 gives details.

Table 14: Registered deaths by place of occurrence and residence districts

District name	Counts			Percent distribution		
	Community	Health facility	Total	Community	Health facility	Total
Rwanda	**12,075**	**13,502**	**25,577**	**47.2**	**52.8**	**100.0**
Bugesera	435	498	933	46.6	53.4	100.0
Burera	367	399	766	47.9	52.1	100.0
Gakenke	649	578	1227	52.9	47.1	100.0
Gasabo	304	806	1110	27.4	72.6	100.0
Gatsibo	459	468	927	49.5	50.5	100.0
Gicumbi	692	555	1247	55.5	44.5	100.0
Gisagara	338	451	789	42.8	57.2	100.0
Huye	409	511	920	44.5	55.5	100.0
Kamonyi	452	490	942	48.0	52.0	100.0
Karongi	283	366	649	43.6	56.4	100.0
Kayonza	344	350	694	49.6	50.4	100.0
Kicukiro	143	466	609	23.5	76.5	100.0
Kirehe	165	442	607	27.2	72.8	100.0
Muhanga	495	409	904	54.8	45.2	100.0
Musanze	381	506	887	43.0	57.0	100.0
Ngoma	367	348	715	51.3	48.7	100.0
Ngororero	503	358	861	58.4	41.6	100.0
Nyabihu	417	309	726	57.4	42.6	100.0
Nyagatare	309	360	669	46.2	53.8	100.0
Nyamagabe	432	456	888	48.6	51.4	100.0
Nyamasheke	519	397	916	56.7	43.3	100.0
Nyanza	254	401	655	38.8	61.2	100.0
Nyarugenge	201	700	901	22.3	77.7	100.0
Nyaruguru	612	340	952	64.3	35.7	100.0
Rubavu	490	546	1036	47.3	52.7	100.0
Ruhango	368	416	784	46.9	53.1	100.0
Rulindo	656	337	993	66.1	33.9	100.0
Rusizi	353	477	830	42.5	57.5	100.0
Rutsiro	375	366	741	50.6	49.4	100.0
Rwamagana	297	363	660	45.0	55.0	100.0
Foreigners	6	33	39	15.4	84.6	100.0

Source: CRVS system, 2022

5.2.5. Deaths registered by age and sex

Figure 15 shows the distribution of registered deaths (counts) by sex and age groups. Given the large proportion of young children in Rwanda's population and high risk of death at early ages of birth, it is not surprising that most deaths occur within the under 5-year-old age group. Despite high females' proportion among the total population compared to males (51.4% against 48.6% respectively), the number of registered deaths is high among males compared to females across all age groups except at too old ages (80+) and young people aged 10-14. It is important also to mention here that a high number of infant male deaths compared to female deaths was observed. Despite low completeness of reporting, the figures indicated here below portray the mortality structure with respect to age and sex.

Figure 15: Age-Sex structure of registered deaths (counts), 2022
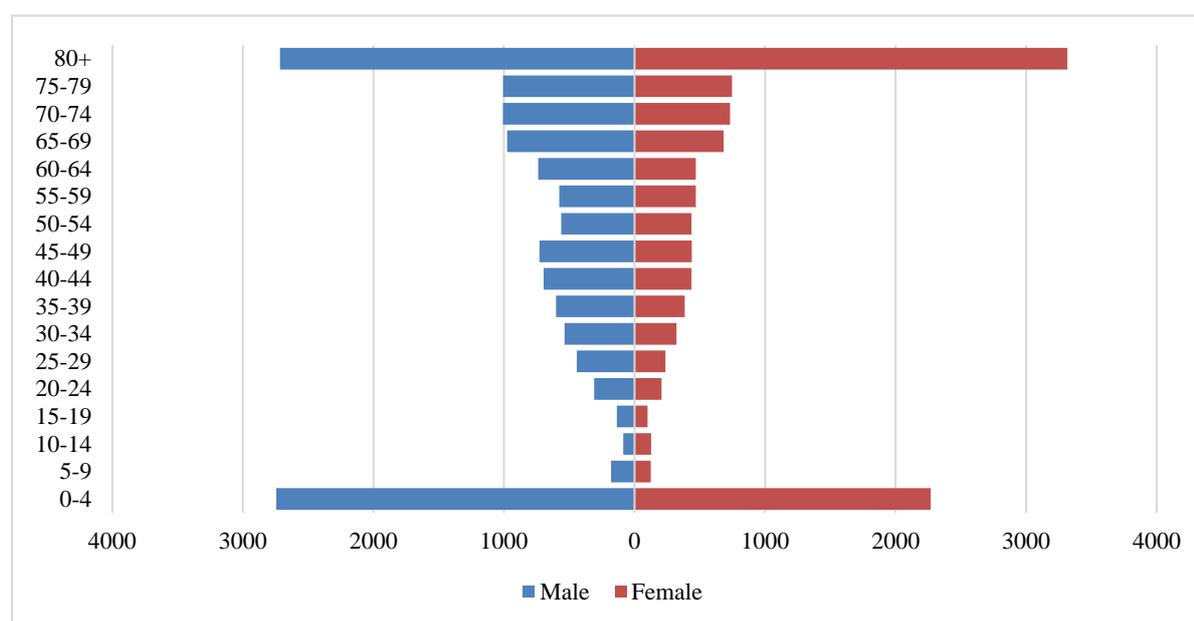
Source: CRVS system, 2022

5.2.6. Age-sex distribution of registered deaths by place of residence

The patterns of age-sex distribution across age groups differ slightly in urban areas compared to rural areas as displayed on figure 16 and 17. The small difference is observed at old ages where the share of males' deaths is smaller than females' deaths in rural areas.

Figure 16: Age-sex distribution of registered deaths in rural areas
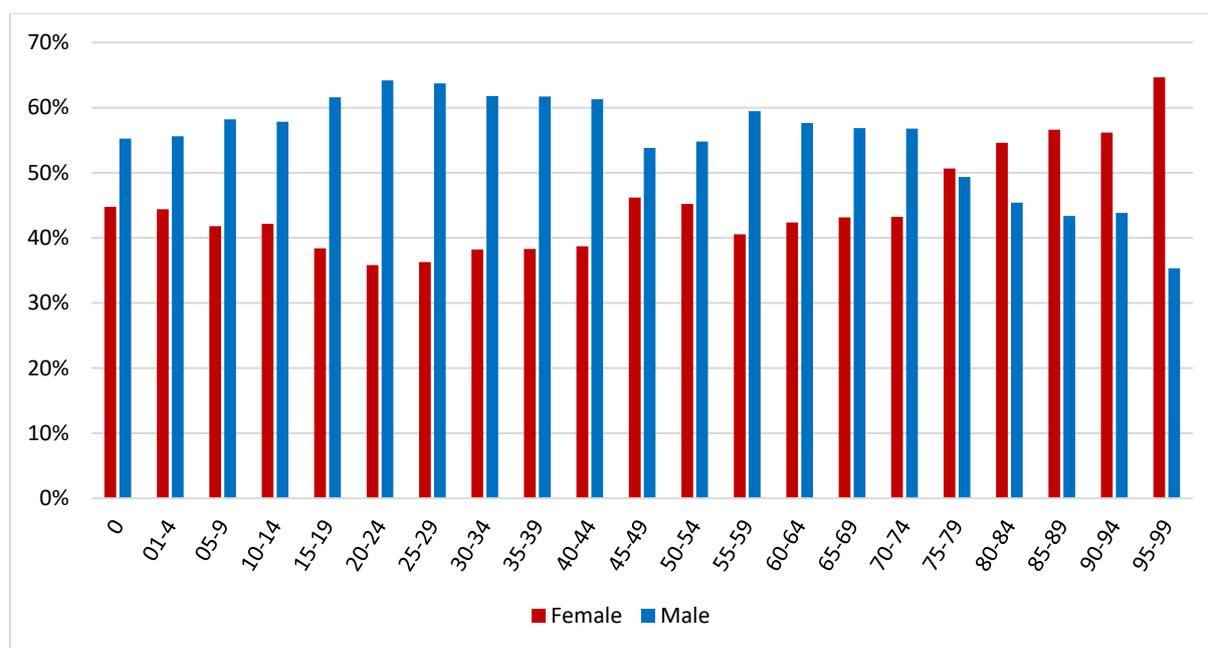
The same graph in urban areas shows almost the same distribution as in rural areas except the difference observed in the very old age where in urban areas females deaths are higher than males deaths.

Figure 17: Age-sex distribution of registered deaths in urban areas
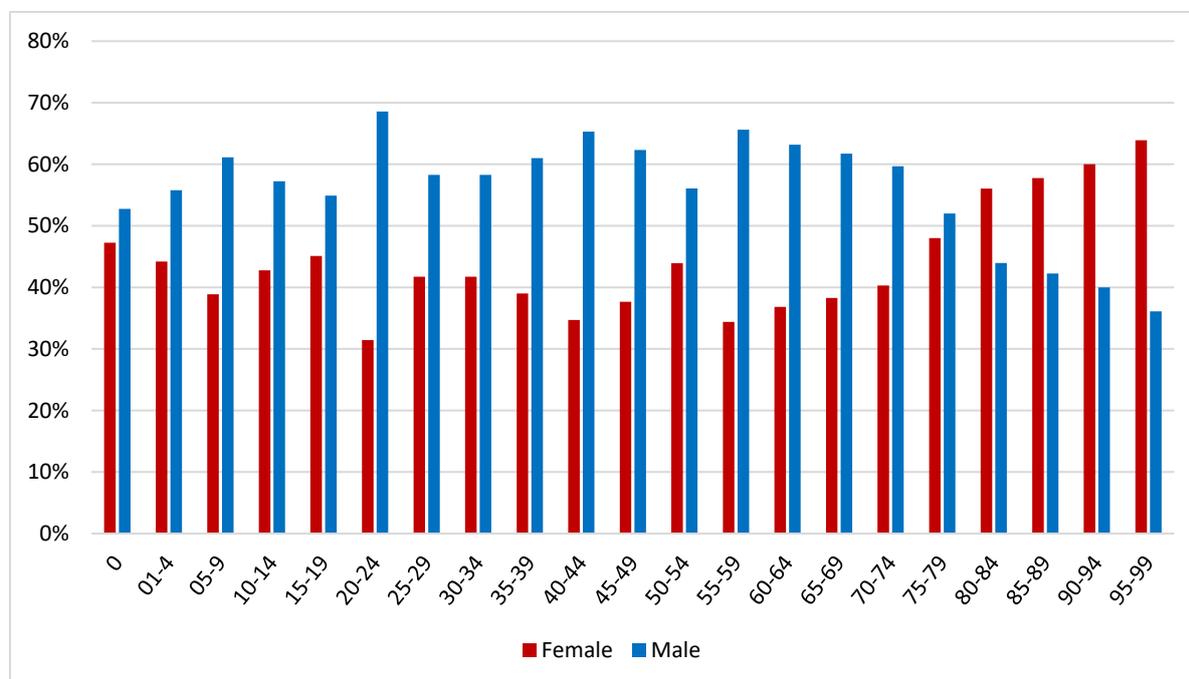
5.2.7. Registered deaths by place of death and place of residence

The CRVS system generated data show that among registered deaths, a high proportion occurred at health facilities (52.8%) compared to community deaths (47.2%) in 2022. The share

of community deaths occupies 47.2% of the total registered deaths in 2022 (down from 51.4% in 2021) while health facilities' deaths represent 52.8% (up from 52.8% in 2021). This may be a result of decentralizing death registration to health facilities via NCI-CRVS and calls for more effort to cater for community death registration completeness by strengthening operationalization of community deaths registration at cells. The disaggregation of registered deaths based on place of occurrence and place of residence of decedent shows that in rural areas, the share of community deaths is slightly higher than health facilities deaths (52% Vs 48%, respectively); while in urban areas, the share of deaths occurring in health facilities is higher than community deaths' share (58% Vs 42%). More effort in improving community deaths reporting is to be put in rural areas. Figure 18 shows details.

Figure 18: Deaths registered by place of residence (urban and rural) and place of occurrence
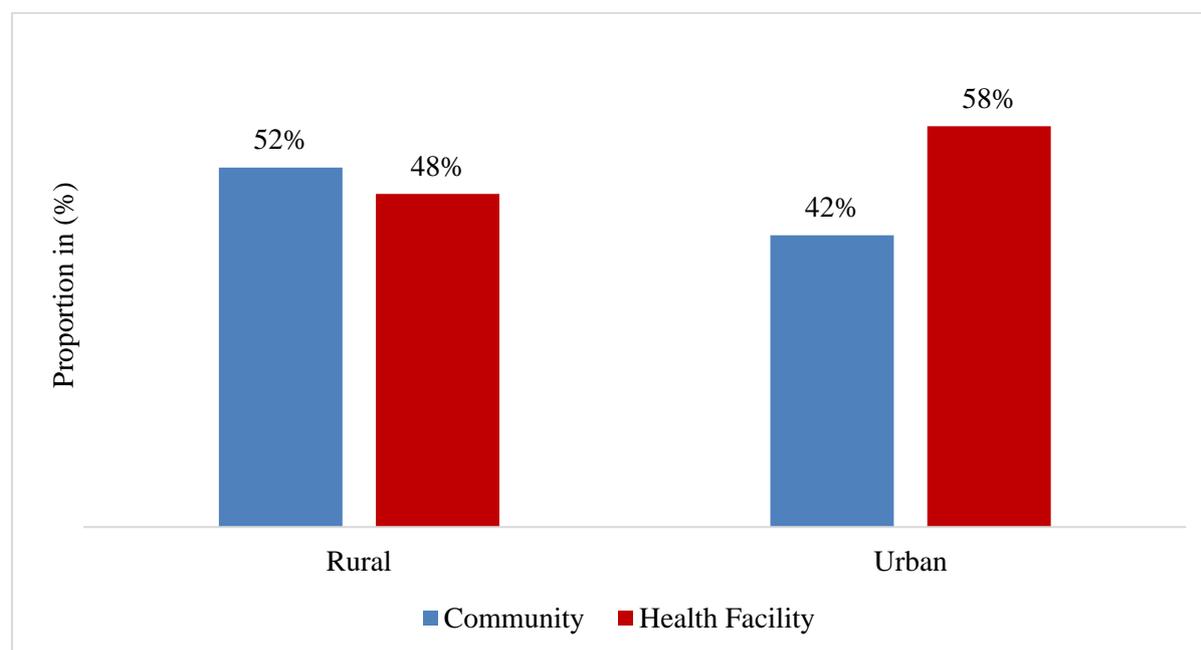
Source: CRVS system, 2022

CHAPTER 6: CAUSE OF DEATH STATISTICS

6.1. Background

Prior to October 2017, medical doctors in Rwanda had not been trained on certifying causes of death according to international standards. The 2016 World Health Organization's (WHO) International Medical Certificate of Cause of Death (MCCoD) was not used in health facilities and the quality of cause of death data was poor with many deaths attributed to ill-defined causes which are of little utility for public health decision making.

In response, the Ministry of Health issued a ministerial order to all health facilities requesting them to correctly certify and report deaths using the MCCoD form, in line with the International Classification of Diseases (ICD), 10th Revision. Since 1st January 2018, this has been the standard reporting of diseases and health conditions that enables the comparison and sharing of health and mortality information. The WHO has recommended the countries to use the standardized tools in District Health Information System (DHIS2) mortality module that has been linked to the CRVS system for better reporting and comparability with other mortality statistics.

Recording cause of death is the subset of mortality module in the civil registration system in Rwanda. According to the amended law N° 001/2020 of 02/02/2020 amending law N° 32/2016 governing persons and family, the declaration of death is done at sector office, at health facility, at Cell administration level and other designated registration points upon presentation of death notification form (other than MCCoD). The national centralized and integrated CRVS system is used to collect, transmit and store death and causes of death information to be used in the production of vital statistics.

The use of the ICD coding facilitates storage, retrieval and analysis of data and enables the systematic and standardized recording, analysis, interpretation comparison and sharing of morbidity and mortality data within a population and across countries.

ICD-10 causes of death are organized into 21 chapters covering three broad groups of causes:

- Group 1: Infectious and parasitic diseases (i.e. tuberculosis, pneumonia, diarrhoea, malaria, measles); maternal/perinatal causes (i.e. maternal haemorrhage, birth trauma); and malnutrition.
- Group 2: Non communicable diseases (i.e. cancer, diabetes, heart disease, stroke); and mental health conditions (i.e. schizophrenia).
- Group 3: Injuries (i.e. road accidents, homicide, and suicide).

6.2. Medical certification of cause of death

To improve the quality of causes of death statistics in Rwanda, the government initiated two major interventions namely: the introduction of verbal autopsy to gain a better understanding of the patterns of causes of death when people die out side health facility where there is no physician to certify death (see section 6.3.2); and the integration of Medical Certification of Causes of Death (MCCoD) and International Classification of Disease (ICD 10) 2016 Edition into Health care settings to determine underlying causes of death that occur in Health facilities.

In this report, cause-of-death statistics are compiled from the civil registration system that uses the ICD-10 full list to record the underlying cause of death (UCOD) as reported by trained physicians on medical certification of causes of death (MCCD) for deaths occurring in Health facilities. Currently, all hospitals and clinics certify causes of death using the standardized MCCoD form and statistical coding according to the ICD-10 coding system. A total of 13,561 deaths were reported by competent health facilities in CRVS system, of which 93% were certified using standardized MCCoD. In principle, every death should have a medically defined cause. However, when the quality of medical certification is imperfect, some deaths will be assigned to ill-defined causes of limited value for public health purposes (sometimes designated as "unusable" or "garbage" codes). For this report, ANACONDA version 5.0.0 (Analysis of National Causes of Death for Action) and ANACoD version 3.0 (Analyzing mortality levels and causes of death) tools were used to perform a comprehensive and systematic analysis of mortality and cause of death data.

6.2.1. Data quality and usability

The current year of experience in medical certification of cause of death according to international standards shows that quality improvements continue to be required. It is important to continue the capacity building of certifiers using WHO standardized tools and quarterly MCCoD quality assessment on individual death certificate using the death certificate quality assessment tool (Appendix 3) to improve the quality of causes of death reported. To improve the quality of causes of death, the Ministry of health in collaboration with Rwanda Medical and Dental Council established MCCoD eLearning course for practicing medical doctors as a part of Continuous Professional Development (CPD) credits required for annual licensure.

The ANACONDA tool provides a detailed information about the quality of cause-of-death information from the health-related information system. This indicates that the proportion of causes of death assigned to usable causes slightly decreased from 56.6% in 2021 to 54.5% in 2022. The decline may be attributed partly to a number of newcomers in medical profession who did not complete MCCoD eLearning course. This calls for an effort to incorporate the use of MCCoD for death certification into the course curriculum of all medical schools to equip the pre-service medical doctors with enough skills on MCCoD. Indeed, more efforts are required to improve the quality of causes of death through regular data quality checks and adopting IRIS ICD coding tool for automated, interactive mortality coding system, which codes multiple causes of death and helps to select the correct underlying cause of death according to the ICD-10 rules for statistical tabulation. Figure 19 shows details.

Figure 19: Distribution of causes of death by usability, 2022 (ANACONDA output)
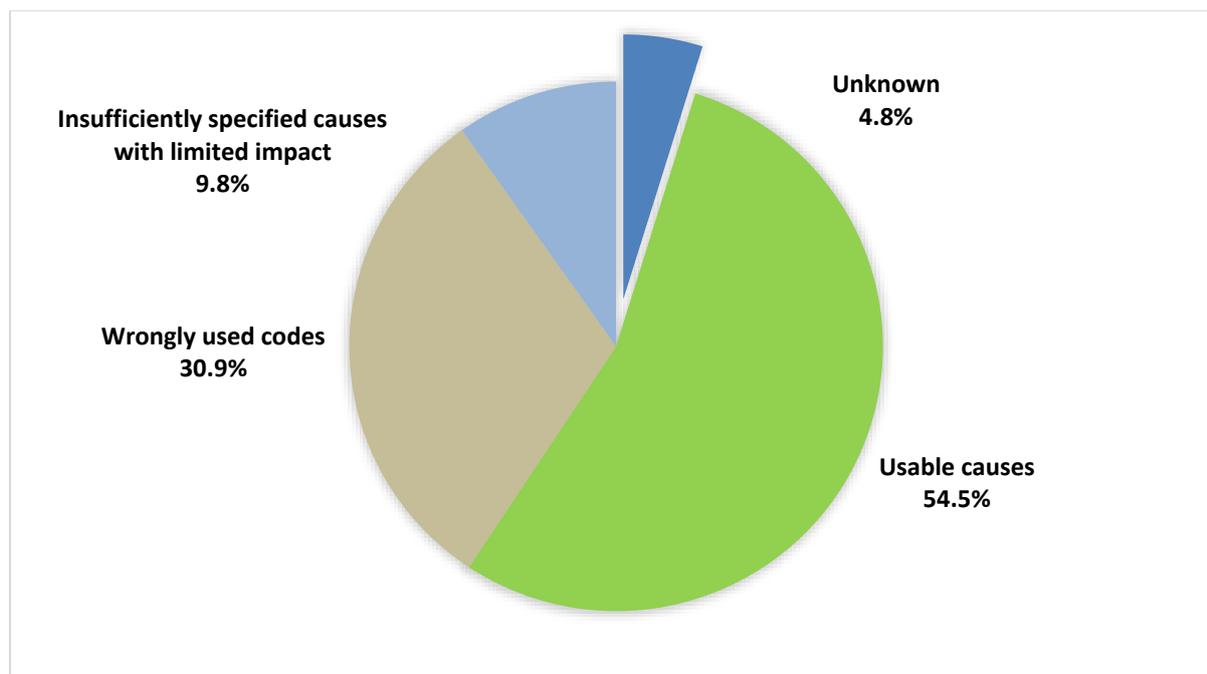
Source: Data from CRVS system, 2022

In the recent years (2020), WHO launched ANACoD3 (The Analysing Mortality and Causes of Death 3) for facilitating the analysis of mortality data. ANACoD3 is an online WHO tool for monitoring quality and trends using cause-of-death data. It helps you to perform a comprehensive and systematic analysis of mortality and cause-of-death data. The tool automatically tabulates data and presents basic mortality measures in tables and figures. It highlights potential inconsistencies and errors in the data and estimates the completeness of reporting. ANACoD3 generates indicators that reveal potential data-quality issues, as well as an array of comparable indicators including sex- and age-specific mortality rates, crude death rates, life expectancy at birth, causes of death distributed by global burden of disease categories, the top 20 causes of death, and the percentage of ill-defined causes of death. Using this tool for the 2022 CRVS data, it is found that the proportions of ill-defined causes and defined causes become 67% and 33%, respectively. The following figure 20 portrays the results.

Figure 20: Distribution of causes of death by usability, 2022 (ANACoD3 output)
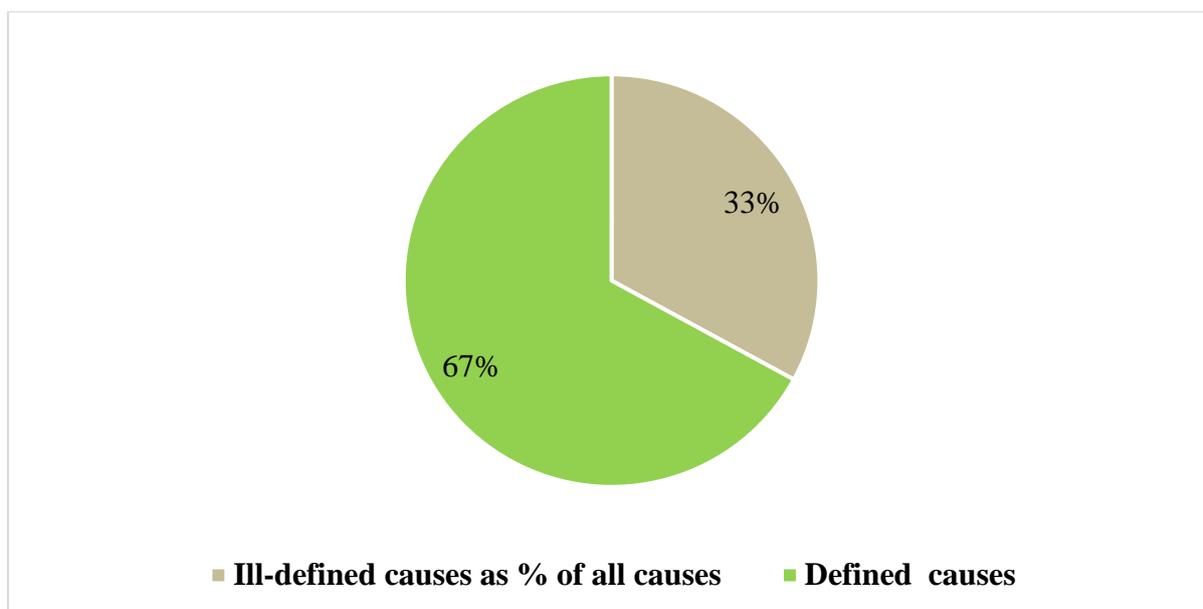
Source: Data from CRVS system, 2022

6.2.2. Distribution of usable death causes by three broad groups

Considering the distribution of usable codes in three broad groups as shown in figure 21, the causes of death are dominated by communicable diseases with 46% down from 51% in 2021, followed by non-communicable diseases with 45% up from 41% in 2021 and group of injuries and external causes that remained unchanged in 2021 and 2022 (8%).

Figure 21: Distribution of usable cause of death by three broad groups (ANACoD output)
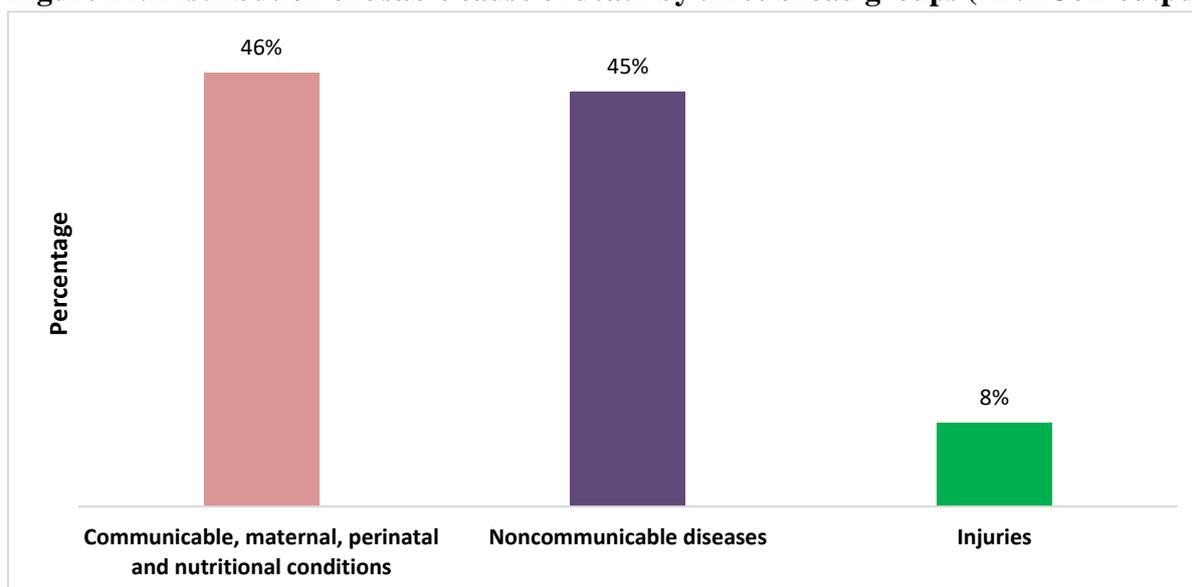
Source: CRVS system, 2022

6.2.3. Distribution of deaths with defined causes in three broad groups by age and sex

The three main GBD groups (Global Burden of Diseases groups) of causes of deaths were considered for the reported data with causes of death in broad groups namely the group of communicable diseases, maternal and perinatal, nutrition conditions; the group of non-communicable conditions/diseases and the group for all other external causes and injuries. Mortality due to these groups was tracked across the age groups for both males and females. Among males; at the early stages of life (except 10-14), most of death causes belong into the group of communicable diseases while the group of non-communicable takes over at the age of 50 and above. The external causes and injuries were also predominant among males aged 1 to 50 compared to other groups. More details are found in the figures 22 and 23 below and in annexes.

Figure 22: Death causes in broad groups by age of males (ANACONDA output)
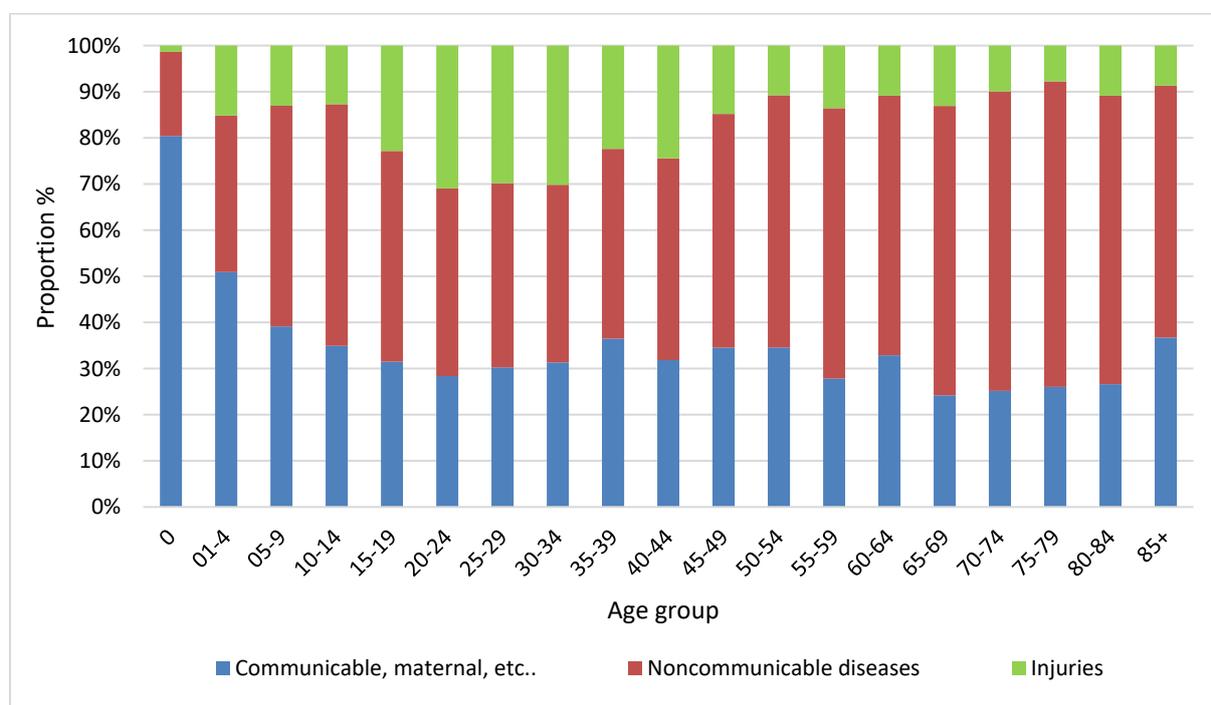
Source: Data from CRVS system, 2022

Using ANACoD3, the distribution remains almost the same with minor differences. In both ANACoD3 and ANACONDA, external causes are high among males aged 20-34 while communicable diseases are more frequent among young people. The following figure 23 displays ANACoD results.

Figure 23: Death causes in broad groups by age of males (ANACoD output)
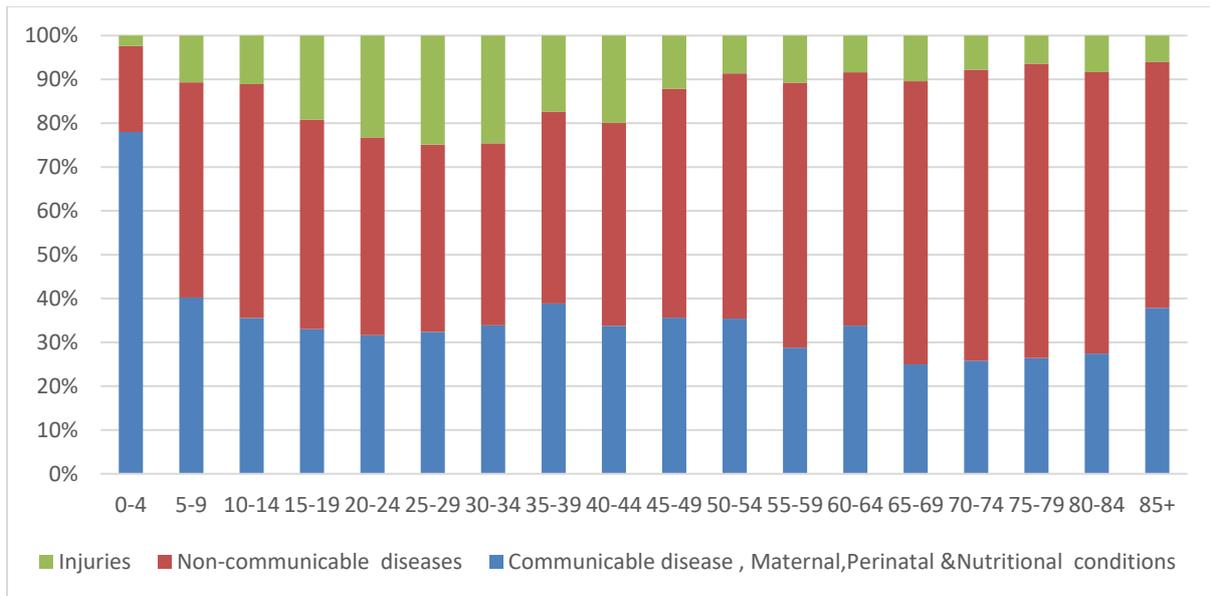
Source: Data from CRVS system, 2022

Among females as shown in Figure 24 and 25; the group of communicable diseases, perinatal and nutritional conditions is high among females aged under 5 and low thereafter. Non communicable diseases are predominant among females aged 15 and above while external causes are more frequently among the young females aged below 15.

Figure 24: Death causes in broad groups by age of females (ANACONDA output)
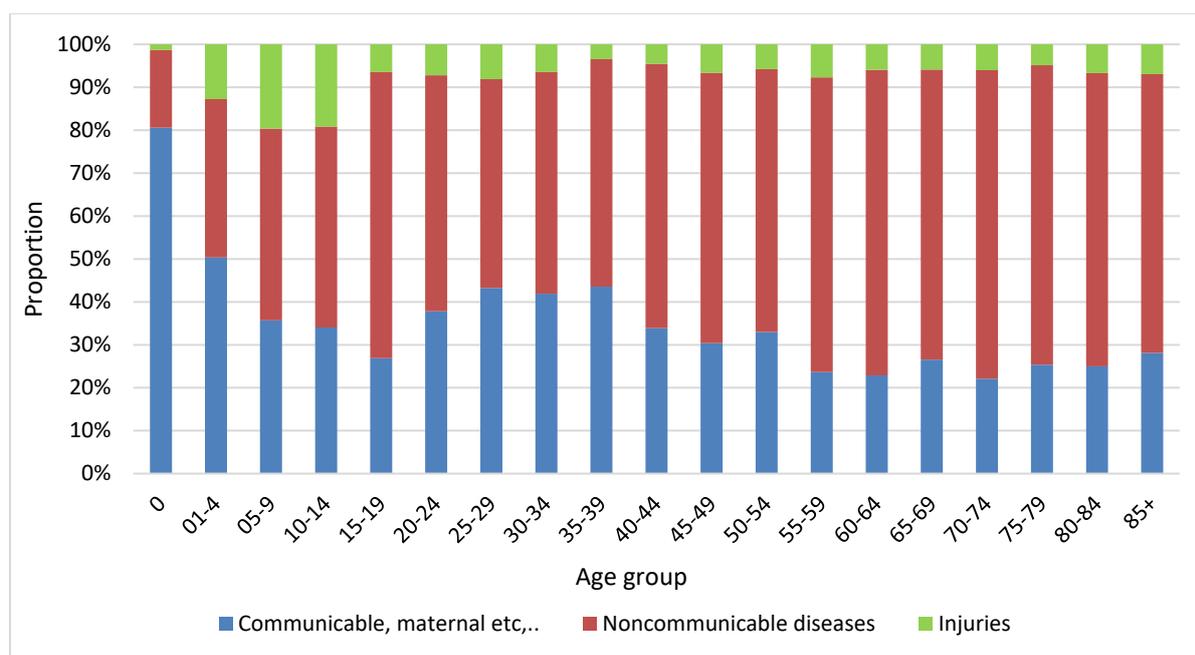
Source: Data from CRVS system, 2022

The distribution of death causes by three broad groups among females looks almost the same when ANACONDA and ANACoD outputs are compared. Figure 25 shows the ANACoD3 outputs for females.

Figure 25: Death causes in broad groups by age of females (ANACoD output)
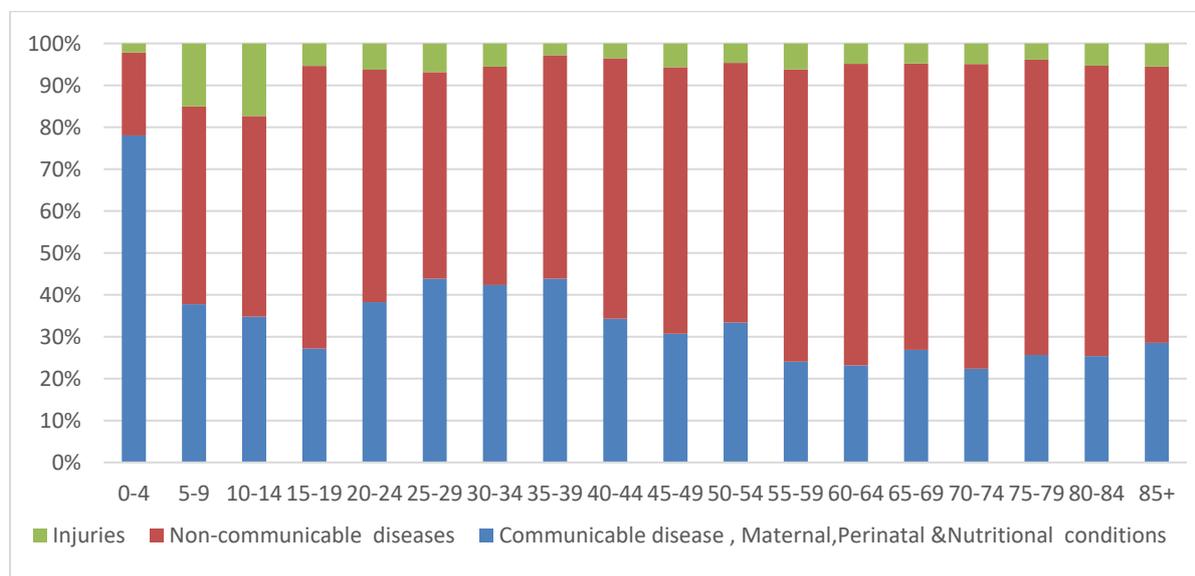
6.3. Priorities for action improvements

6.3.1. Data quality for institutional deaths

According to the results on the quality of cause of death; 54.5% usable causes of death, 30.9% are garbage codes, 9.8% are insufficiently specified causes with limited impact and 4.8% have unknown codes. Though the achievement is not too bad, there is need for continuous quality

improvement through regular monitoring of deaths certification and reporting at health facility level. Figure 26 illustrates priority policy actions for improving the quality of causes of death according to the ANACONDA tool where it mentions the reporting completeness and the quality of cause of death reporting as the main priority areas to fucus on for improvement. Efforts are required to operationalize verbal autopsy for community deaths and enforce MCCoD learning mechanisms to improve the quality of facility reported deaths.

Figure 26: Priority action areas for improving data quality, 2022 (ANACONDA output)
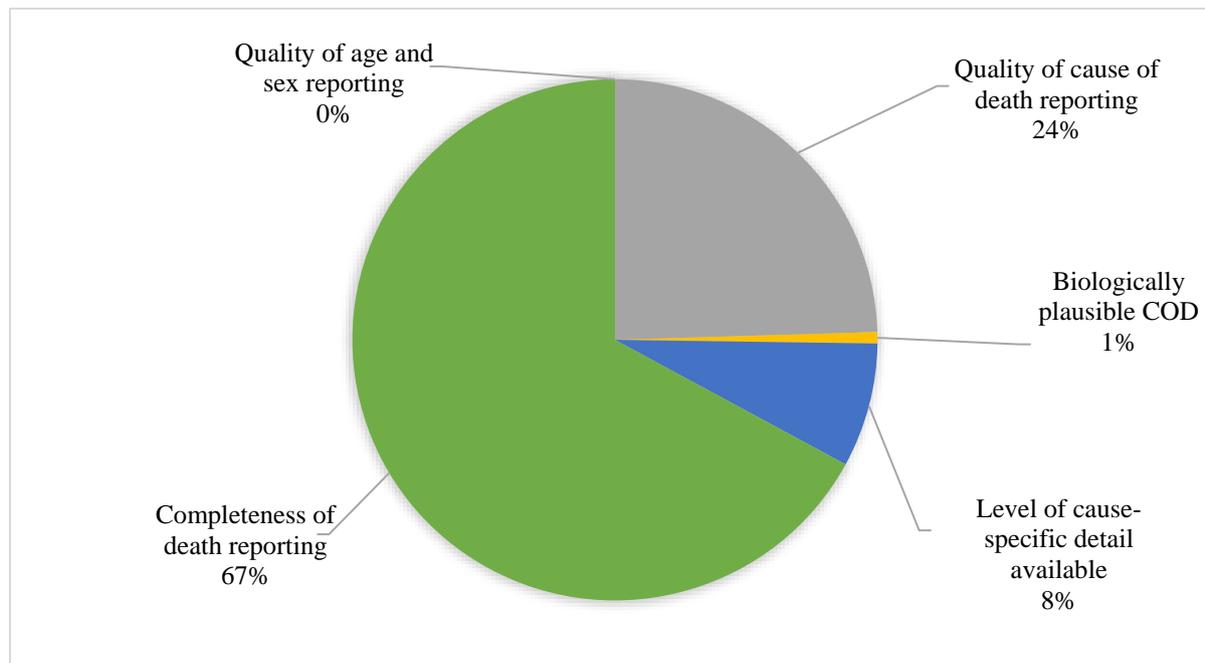
Source: Data from CRVS system, 2022

6.3.2. Verbal autopsy for deaths occurring outside health facilities

It has been realized that a large number of deaths occur outside health facilities and most of such deaths are not registered in CRVS system at the same rate as deaths occurring in health facilities. Indeed, such deaths are certified by any medical doctor and hence, related causes stay unrecorded. As a solution to this, the regulation allowed cell civil registrars to register community deaths and conduct verbal autopsy for deaths that occurred outside health facilities where there are no physicians to certify death using MCCoD form. Allowing civil registrars to conduct verbal autopsy has been a cornerstone to undertaking data collection on community cause of death and integrating verbal autopsy with the civil registration system. The conduct of verbal autopsy at by cell executive secretaries was then undertaken in May 2022 after training 1,510 cells with an incremental scale up plan. By end of 2022; 1,641 cells were trained on VA practice and had been given android tablets to start the VA conduct. As a result, 2038 Verbal Autopsies were conducted by end of 2022. The following figure 27 shows a distribution of conducted verbal autopsies by month in which the VA was conducted.

Figure 27: Submitted verbal autopsies by month VA conduct

Source: CRVS system, 2022

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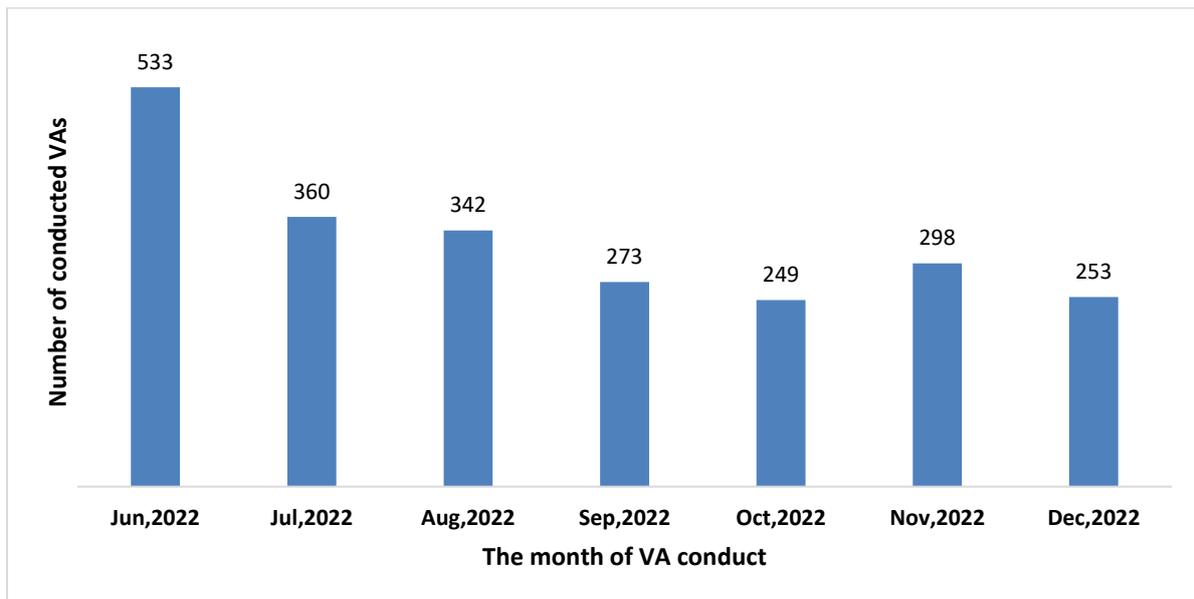
CHAPTER 7: MARRIAGE STATISTICS

This section provides details on marriages officially registered from January to December 2022. The data source for marriages used in this chapter is CRVS web-based system and NCI-CRVS. As in our country context, only legal marriages are registered, other forms of consensual unions are not covered within the content of this section. This report did not manage to release divorce statistics as the system that could provide accurate information on divorces is still under revision.

7.1. Legal marriages registered

Marriage is the act, ceremony and process by which the legal relationship of spouses is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country. By current law in force in Rwanda, marriage is officiated by a civil registrar at sector office, district office or Rwandan embassy. The data sourced from CRVS web-based system and NCI-CRVS shows an increase in the number of marriages registered in 2022 compared to 2021, from 33,809 to 35,529 marriages implying a 4.9% increase. The comparison of registered marriages with resident population size gives a crude marriage rate equivalent to 2.7 ‰. More details are shown in table 15.

Table 15: Registered marriages, 2019-2022

Year	Number of marriages	Population	Crude marriage rate (0/00)
2019	48,526	12,374,398	3.9
2020	30,859	12,663,116	2.4
2021	33,809	12,955,763	2.6
2022	35,529	13,246,394	2.7

Source: data from CRVS system, 2022.

7.1.1. Marriages registered by districts

The CRVS web-based system and NCI-CRVS-generated data show a total of 35,529 marriages registered in 2022. The same data show high numbers of marriages celebrated in Gasabo (2,451) and Gicumbi (2,396) districts. Low numbers were observed in Kayonza district (263).

Figure 28: Marriages registered by districts

District	Value
Kayonza	263
Burera	294
Karongi	458
Ngororero	540
Kirehe	605
Nyanza	691
Ngoma	744
Rwamagana	811
Rubavu	846
Nyabihu	873
Gisagara	876
Rulindo	884
Nyagatare	887
Gatsibo	999
Ruhango	1,132
Kamonyi	1,174
Huye	1,174
Musanze	1,202
Nyarugenge	1,288
Rutsiro	1,354
Muhanga	1,398
Bugesera	1,407
Gakenke	1,548
Nyaruguru	1,628
Kicukiro	1,822
Nyamagabe	1,853
Nyamasheke	1,874
Rusizi	2,057
Gicumba	2,396
Gasabo	2,451

Source: CRVS system, 2022.

7.1.2. Marriages registered by age of bride and groom

CRVS web-based system-generated data show variations in marriage registrations across ages of brides and grooms at marriage date. In the age interval of 21–29 years, the number of brides is higher than the number of grooms, while data show a reversed situation at age of 30 and above. The following Figure 29 gives the picture.

Figure 29: Marriages registered in 2022 by age of bride and groom
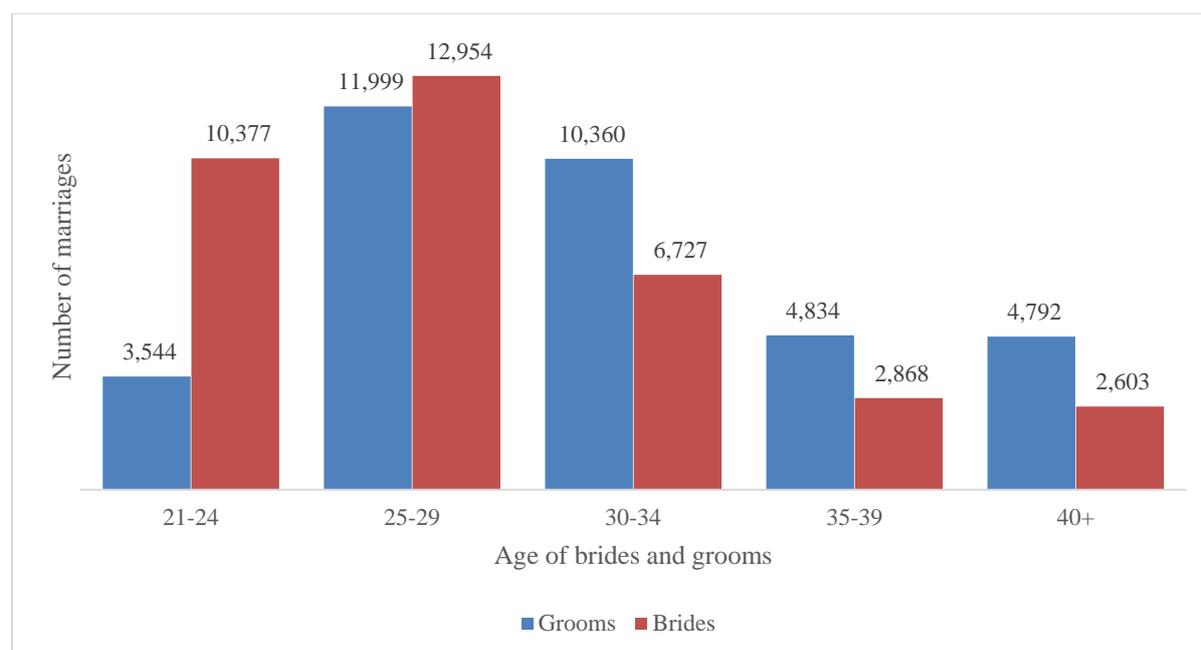
Source: Data from CRVS system, 2022.

CRVS system generated data were also used to correlate the age of brides to age of grooms to depict the picture of age differences among married partners. The resulting matrix shows that the age range with high number of marriages for both females and males is the 25-29 age group. The numbers of marriages are also high between males aged 25-29 and females aged 21-24 and between males aged 30-34 and females aged 25-29. Generally, the numbers of marriages are high among males aged 25-34 on one side, as well as among females aged 21-29 on the other side.

Table 16: Groom and Bride age relationship at marriage date

		Age of brides					
	Age	21-24	25-29	30-34	35-39	40+	**Total**
Age of grooms	21-24	2,272	980	228	52	12	**3,544**
	25-29	5,093	5,410	1,184	230	82	**11,999**
	30-34	2,329	4,646	2,725	524	136	**10,360**
	35-39	501	1,393	1,727	940	273	**4,834**
	40+	182	525	863	1,122	2,100	**4,792**
	Total	**10,377**	**12,954**	**6,727**	**2,868**	**2,603**	**35,529**

Source: Data from CRVS system, 2022.

7.1.3. Registered Marriages by matrimonial regime

By the law currently in force, there are three types of matrimonial regimes in Rwanda. The **community of property**: a contract by which the spouses opt for marriage settlement based on joint ownership of all their property-movable as well as immovable and their present and their future charges; it is also a primary-default-regime. The **limited community of property**: a contract by which spouses agree to pool their respective properties owned on the day of marriage celebration, to constitute the basis of the acquests as well as the property acquired

during marriage by a common or separate activity, donation, legacy or succession. The **separation of property** which is a contract by which spouses agree to contribute to the expenses of the household in proportion to their respective abilities while retaining the right of enjoyment, administration, and free disposal of their personal property.

The CRVS web-based system and NCI-CRVS-generated data show that most of couples in Rwanda choose "community of property" as their matrimonial regime as it represents 98.2% of marriages registered in 2022. Refer to the following Table 17 for more details.

Table 17: Registered marriages by matrimonial regime

Regime of marriage	Count	Percentage
Community of property regime	34,890	98.2
Limited community of property	530	1.5
Separation of property	93	0.3
Not stated	16	0.0
Grand Total	**35,529**	100.0

Source: Data from CRVS system, 2022.

7.1.4. Marriages by previous marital status of the bride and groom

The law currently in force (Law Nº**32/2016 of 28/08/2016** governing persons and family) doesn't allow for simultaneous marriage contracts per one individual (bigamy). CRVS system-generated data show disparities in the numbers of married persons in accordance with their previous marital status. As described in table 18; 98.7% of the brides married in 2022 were previously single while this percentage was 99.7% for grooms. The shares of previously divorced and widowed ladies and gents were relatively quite small.

Table 18: Marriages registered by previous marital status

Previous marital status	Counts		Percentages	
	Grooms	**Brides**	**Grooms**	**Brides**
All	**35,529**	**35,529**	**100.0**	**100.0**
Single	35,145	35,432	98.9	99.7
Widow(er)	275	41	0.8	0.1
Divorced	109	56	0.3	0.2

Source: Data from CRVS system, 2022.

Looking at the previous marital status by age of groom; the results show that among grooms who were previously single, marriages are most frequent among those aged 25-34; while among widows, marriages are most frequent to those aged 60 and above. High number of marriages among previously divorced grooms occurred among those aged 35-44. Generally, the more people's age goes up, the little the number of marriages among grooms who were previously single is observed. In contrast, the more the people get aged, the greater number of grooms who were previously widowed is observed. More details are displayed in Table 19.

Table 19: Marriages by age of groom and previous marital status

Age of groom	Previous marital status			Total
	Single	Widowed	Divorced	
21-24	3,543	1		3,544
25-29	11,988	8	3	11,999
30-34	10,340	10	10	10,360
35-39	4,801	13	20	4,834
40-44	2,057	29	20	2,106
45-49	787	20	17	824
50-54	500	21	12	533
55-59	351	25	12	388
60-64	307	42	7	356
65-69	213	33	3	249
70+	258	73	5	336
Total	**35,145**	**275**	**109**	**35,529**

Source: Data from CRVS system, 2022.

The status of previous marital status against their respective age at marriage date looks a little bit different among brides when compared to their counterpart grooms as among brides who were previously single, marriages are most frequent to those aged 21-29 while among those who were previously widowed, marriages are most frequent to those aged 25-49. While 73 grooms who were previously widowed were observed at age 70 and above; only 4 brides who were previously widowed were observed at that age category. Previously divorced brides are most frequent among those aged 35-44. More details are shown in Table 20.

Table 20: Marriages by age of bride and previous marital status

Age of brides	Previous marital status			Total
	Single	Widowed	Divorced	
21-24	10,359	11	7	10,377
25-29	12,903	34	17	12,954
30-34	6,666	43	18	6,727
35-39	2,796	44	28	2,868
40-44	1,148	46	18	1,212
45-49	551	42	12	605
50-54	305	24	5	334
55-59	165	12	1	178
60-64	119	11	2	132
65-69	77	4		81
70+	56	4	1	61
Total	**35,145**	**275**	**109**	**35,529**

Source: Data from CRVS system, 2022.

7.2. Crude marriage rate

The crude marriage rate is the number of marriages occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given

geographical area during the same year. The crude marriage rate was 2.8‰ in 2022 slightly up from 2.6‰ in 2021.

Conclusion

Births statistics:

The findings show an increase of birth registration completeness rate from 84.2% in 2021 to 92.9% in 2022. Hypothetically, this may be the effect of enhanced awareness, familiarity of civil registration staff with a new digital system and enhanced monitoring. On the other side, timely registered births increased from 93.7% in 2021 to 95.9% in 2022, something that may indicate an effect of decentralizing registration services to health facilities and cells. To keep raising both the completeness and timeliness of registration, there is a need for enhancing a continuous awareness and strengthen operationalization of registration services at decentralized levels. Additionally, there is a need for raising demand creation as one of related incentives.

Death statistics:

The findings show a very low completeness rate of death registration despite undergoing an upward shift (from 26.2% in 2021 to 31.1% in 2022). However, the proportion of timely registered deaths underwent an impressive shift from 68% in 2021 to 94.8% in 2022. Further analysis of deaths registered shows a reduction in percentage of community deaths registered from 51.4% in 2021 to 47.2% in 2022, despite current expectation to have more community deaths than health facilities deaths. This informs on two important things. First, there is strong need for a sustained effort to boost the completeness of death registration nationwide focusing more on community deaths by strengthening aligned initiatives including verbal autopsy and official registration of community deaths at cells offices. Second, there is a need to raise public awareness on death registration practice and creating more demand for death registration. Enhanced monitoring of community death registration is crucial to strengthen operationalization of community death registration at cell level.

Cause-of-death statistics:

Analysis of causes of death data highlights the need to focus more on data quality improvement among institutional deaths reported as many deaths are ascribed to vague and ill-defined causes where only 54.5% of reported cases have a cause of death that is sufficiently informative to be used to guide health policies and decisions. Indeed, cause of death data shows that only 12,612 deaths (i.e. 49.4% of registered deaths) were reported with respective causes.
Given the low completeness of death registration and low rate of the cause of death reporting, there is a need for vesting more effort in boosting death and cause of death registration focusing on both the quality and number of deaths reported with respectively well-defined causes. Strengthening a sustainable training framework for in-service and pre-service medical doctors (death certifiers) and data managers (cause of death coders) on the cause of death certification using MCCoD could be a solution to cater for data quality issues. Indeed, strengthening operationalization of verbal autopsy for community deaths will raise the share of reported deaths with respective causes.

Marriages statistics:

The findings show high frequency of marriages among person aged 21 to 34, something inspiring the need to plan taking into consideration the implications of potential new families founded in this regard.

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ANNEXES

Annex 1: Top 20 most preferred baby's kinyarwanda names in 2022 by sex[3]

Rank	Boys		Girls	
	Child' surnames	Counts	Child' surnames	Counts
1	ISHIMWE	8,461	INEZA	7,328
2	MUGISHA	3,915	UWASE	5,924
3	IRAKOZE	3,178	ISHIMWE	5,713
4	HIRWA	2,766	IRAKOZE	3,650
5	IGIRANEZA	2,328	IGIRANEZA	2,991
6	INEZA	2,189	Uwineza	2,661
7	IRADUKUNDA	2,167	IRADUKUNDA	2,348
8	KWIZERA	2,069	UMUTONIWASE	1,810
9	IRASUBIZA	2,060	IRASUBIZA	1,657
10	IGANZE	1,835	INEZAYIMANA	1,571
11	GANZA	1,751	NISHIMWE	1,488
12	IRANZI	1,492	IGANZE	1,331
13	IZIBYOSE	1,466	IGIHOZO	1,304
14	MANZI	1,376	ISIMBI	1,229
15	NIYOGISUBIZO	1,330	UMUKUNDWA	1,228
16	NIYONKURU	1,298	UWAMAHORO	1,227
17	BYIRINGIRO	1,256	UMUHOZA	1,197
18	BYISHIMO	1,081	UWIDUHAYE	1,143
19	NDAYISHIMIYE	1,061	NIYOGISUBIZO	1,067
20	NSHIMIYIMANA	964	NIYOGUSHIMWA	970

Source: CRVS system, 2022

[3] The names mentioned in this annex table relate to births that occurred from 1st January 2022 to 31st December 2022, from the dataset of births registered officially in 2022.

Annex 2: Top 20 leading causes of death all ages (ANACoD outputs)

Top 20 Leading COD, Male, all ages				Top 20 Leading COD, Female, all ages		
Rank	Cause	%		Rank	Cause	%
1	Prematurity and low birth weight	10.3		1	Prematurity and low birth weight	12
2	Birth asphyxia and birth trauma	5.8		2	Birth asphyxia and birth trauma	4.8
3	Nephritis and nephrosis	3.4		3	Cerebrovascular disease	3.8
4	Cerebrovascular disease	2.9		4	HIV	3.1
5	HIV	2.7		5	Nephritis and nephrosis	2.5
6	Road traffic accidents	2.1		6	Diabetes mellitus	2.5
7	Diabetes mellitus	1.9		7	Endocrine disorders	1.9
8	Lower respiratory infections	1.8		8	Lower respiratory infections	1.5
9	Endocrine disorders	1.8		9	COVID-19	1.2
10	Tuberculosis	1.5		10	Hepatitis C	1.2
11	Protein-energy malnutrition	1.2		11	Tuberculosis	1.1
12	Congenital heart anomalies	1.1		12	Congenital heart anomalies	1
13	Meningitis	1		13	Abdominal wall defect	1
14	Hepatitis C	1		14	Leukaemia	0.9
15	Hepatitis B	0.9		15	Hypertensive disease	0.9
16	Liver cancer	0.9		16	Protein-energy malnutrition	0.9
17	Diarrhoeal diseases	0.8		17	Liver cancer	0.8
18	Leukaemia	0.7		18	Cervix uteri cancer	0.8
19	Lymphomas and multiple myeloma	0.7		19	Trachea, bronchus and lung cancers	0.6
20	COVID-19	0.7		20	Meningitis	0.6

Source: CRVS system, 2022

Annex 3: Top 20 leading causes of death, both Sexes (ANACoD outputs)

Top 20 Leading COD, both sexes, all ages				Top 20 Leading COD, both sex ,0 -4 Years		
Rank	Cause	%		Rank	Cause	%
1	Prematurity and low birth weight	11.1		1	Prematurity and low birth weight	33.7
2	Birth asphyxia and birth trauma	5.4		2	Birth asphyxia and birth trauma	16.1
3	Cerebrovascular disease	3.3		3	Congenital heart anomalies	3
4	Nephritis and nephrosis	3		4	Abdominal wall defect	2.4
5	HIV	2.9		5	Lower respiratory infections	2
6	Diabetes mellitus	2.2		6	Protein-energy malnutrition	1.5
7	Endocrine disorders	1.8		7	Down syndrome	0.9
8	Lower respiratory infections	1.7		8	Endocrine disorders	0.8
9	Road traffic accidents	1.4		9	Diarrhoeal diseases	0.6
10	Tuberculosis	1.3		10	Meningitis	0.6
11	Hepatitis C	1.1		11	Nephritis and nephrosis	0.3
12	Congenital heart anomalies	1.1		12	Iron deficiency Anaemia	0.3
13	Protein-energy malnutrition	1		13	Malaria	0.3
14	COVID-19	1		14	Chronic obstructive pulmonary disease	0.2
15	Liver cancer	0.9		15	Spina bifida	0.2
16	Meningitis	0.8		16	Anencephaly	0.2
17	Leukaemia	0.8		17	Cerebrovascular disease	0.2
18	Abdominal wall defect	0.8		18	Ischaemic heart disease	0.1
19	Hepatitis B	0.7		19	Leukaemia	0.1
20	Diarrhoeal diseases	0.7		20	Lymphomas and multiple myeloma	0.1

Source: CRVS system, 2022

Annex 7: Number of births registered at health facilities in 2022 by weight at birth, by age of mothers and by sex

Mothers' age	<1500	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4999	5000+	Grand Total
Female	**1,950**	**2,376**	**9,819**	**49,385**	**71,513**	**27,156**	**3,743**	**529**	**85**	**166,556**
10-14	2	1	4	9	25	5	2	-	-	48
15-19	127	150	728	3,575	4,113	1,091	94	9	4	9,891
20-24	369	530	2,381	12,537	16,245	5,115	526	56	10	37,769
25-29	449	530	2,266	12,333	18,015	6,965	883	120	15	41,576
30-34	420	489	1,964	9,865	15,783	6,446	959	128	18	36,072
35-39	376	426	1,567	7,167	11,502	4,950	794	131	25	26,938
40-44	181	224	796	3,447	5,207	2,322	440	78	10	12,705
45-49	23	24	105	425	581	252	43	7	3	1,463
50+	3	2	8	27	42	10	2	-	-	94
Males	**1,743**	**2,110**	**7,985**	**40,440**	**74,570**	**36,379**	**6,430**	**874**	**146**	**170,677**
10-14	-	1	5	17	20	10	1	-	-	54
15-19	102	142	579	2,930	4,503	1,612	182	19	9	10,078
20-24	362	410	1,935	10,512	17,204	6,991	895	106	15	38,430
25-29	397	458	1,879	9,878	19,188	9,327	1,634	162	34	42,957
30-34	385	440	1,627	7,992	16,027	8,861	1,730	233	36	37,331
35-39	308	419	1,245	5,983	11,474	6,346	1,274	217	32	27,298
40-44	169	215	617	2,786	5,475	2,906	646	122	20	12,956
45-49	18	21	93	321	639	309	65	14	-	1,480
50+	2	4	5	21	40	17	3	1	-	93
Grand Total	**3,693**	**4,486**	**17,804**	**89,825**	**146,083**	**63,535**	**10,173**	**1,403**	**231**	**337,233**

Source: CRVS system, 2022

Annex 8: Numbers of total population in 2022 by age groups and sex

Age groups	Both sexes	Male	Female
All	13,246,394	6,429,326	6,817,068
0-4	1,708,460	856,228	852,232
5-9	1,697,005	849,389	847,616
10-14	1,551,347	775,772	775,575
15-19	1,509,341	750,163	759,178
20-24	1,174,549	572,543	602,006
25-29	1,007,307	494,594	512,713
30-34	950,747	465,744	485,003
35-39	869,983	425,313	444,670
40-44	724,954	346,800	378,154
45-49	479,255	215,314	263,941
50-54	393,788	178,670	215,118
55-59	316,729	142,329	174,400
60-64	311,001	136,793	174,208
65-69	214,001	92,098	121,903
70-74	147,138	60,277	86,861
75-79	77,805	28,476	49,329
80-84	57,999	20,408	37,591
85+	54,985	18,415	36,570

Source: NISR, Fifth Rwanda population and Housing census, 2022

Annex 9: Numbers of Urban and Rural populations in 2022 by age and sex

Age groups	Urban			Rural		
	Both sexes	**Male**	**Female**	**Both sexes**	**Male**	**Female**
All	**3,701,245**	**1,854,525**	**1,846,720**	**9,545,149**	**4,574,801**	**4,970,348**
0-4	476,206	238,913	237,293	1,232,254	617,315	614,939
5-9	431,408	216,386	215,022	1,265,597	633,003	632,594
10-14	360,474	178,399	182,075	1,190,873	597,373	593,500
15-19	392,964	183,178	209,786	1,116,377	566,985	549,392
20-24	392,928	192,193	200,735	781,621	380,350	401,271
25-29	371,753	189,192	182,561	635,554	305,402	330,152
30-34	345,484	178,965	166,519	605,263	286,779	318,484
35-39	274,836	147,185	127,651	595,147	278,128	317,019
40-44	211,344	113,177	98,167	513,610	233,623	279,987
45-49	128,894	66,456	62,438	350,361	148,858	201,503
50-54	94,326	49,237	45,089	299,462	129,433	170,029
55-59	66,666	33,937	32,729	250,063	108,392	141,671
60-64	57,188	27,532	29,656	253,813	109,261	144,552
65-69	37,154	17,061	20,093	176,847	75,037	101,810
70-74	25,366	10,826	14,540	121,772	49,451	72,321
75-79	13,760	5,071	8,689	64,045	23,405	40,640
80-84	10,240	3,628	6,612	47,759	16,780	30,979
85+	10,254	3,189	7,065	44,731	15,226	29,505

Source: NISR, Fifth Rwanda population and Housing census, 2022

Annex 10: Persons who contributed to the production of the Rwanda Vital statistics (V.S) Annual report, 2022

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- MURANGWA Yusuf, Director General of NISR
- MURENZI Ivan, Deputy Director General of NISR

National technical coordinators

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- NGOMITUJE Xavier, Statistician – NISR
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- MAZIMPAKA Jean Claude, Statistician – NISR
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- MANZI Yves – NIDA
- MUTIJIMA Bernard – NIDA
- BUGINGO Stephen, IT staff – NIDA
- NTAGANZWA Eric, IT staff – NIDA
- UMURERERWA Christine, Lawyer – MINIJUST
- HAVUGIMANA Charles, Statistician – MINIJUST
- MUHIRE Jean Baptiste – MIGEPROF
- NYIRIMANZI Jean Claude – NISR
- KABERA Jean Luc - NISR

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APPENDIX

1. MCCOD FORM USED IN HEALTH FACILITIES

REPUBLIC OF RWANDA

MINISTRY OF HEALTH

MEDICAL CERTIFICATE OF CAUSE OF DEATH

Name of the deceased:.. File Nº:.................................... Health Facility:.................................

National Identification Number/Passport Number :...Nationality:.............................Residence:

District..Sector...Cell.......................................Village................................

Marital status: .... Sex .... Place of Death:............................. Date of Birth:................................

Date of Birth unknown (Estimated age)......................Date of Death: .... Time of Death ....p.m/a.m

Frame A: Medical data: Part 1 and 2				
I			Cause of death	Time interval from onset to death
Report disease or condition directly leading to death on line a		a		
Report chain of events 'due to' (b to d) in order (if applicable)		b	Due to:	
		c	Due to:	
State the underlying cause on the lowest used line		d	Due to:	
II				
Other significant conditions contributing to death (time intervals can be included in brackets after the condition)				

Frame B: Other medical data				
Was surgery performed within the last 4 weeks?	☐ Yes	☐ No	☐ Unknown	
If yes please specify date of surgery			D D M M Y Y Y Y	
If yes please specify reason for surgery (disease or condition)				
Was an autopsy requested?	☐ Yes	☐ No	☐ Unknown	
If yes were the findings used in the certification?	☐ Yes	☐ No	☐ Unknown	

Manner of death:

☐ Disease	☐ Assault	☐ Could not be determined
☐ Accident	☐ Legal intervention	☐ Pending investigation
☐ Intentional self-harm	☐ War	☐ Unknown

If external cause or poisoning:	Date of injury	D D M M Y Y Y Y
Please describe how external cause occurred (If poisoning please specify poisoning agent)		

Place of occurrence of the external cause:

☐ At home	☐ Residential institution	☐ School, other institution, public administrative area	☐ Sports and athletics area
☐ Street and highway	☐ Trade and service area	☐ Industrial and construction area	☐ Farm
☐ Other place (please specify):			☐ Unknown

Fetal or Infant Death

Multiple pregnancy	☐ Yes	☐ No	☐ Unknown
Stillborn?	☐ Yes	☐ No	☐ Unknown
If death within 24h specify number of hours survived		Birth weight (in grams)	
Number of completed weeks of pregnancy		Age of mother (years)	
If death was perinatal, please state conditions of mother that affected the fetus and newborn			

For women, was the deceased pregnant?	☐ Yes	☐ No	☐ Unknown
☐ At time of death		☐ Within 42 days before the death	
☐ Between 43 days up to 1 year before death		☐ Unknown	
Did the pregnancy contribute to the death?	☐ Yes	☐ No	☐ Unknown

Referred from (level of care)		Parity		Mode of delivery	☐ SVD	☐ Assisted	☐ Caesarean
Place of Delivery	☐ Health Facility	☐ Home	☐ In transit	☐ Don't Know	Delivered by skilled attendant	☐ Yes	☐ No	☐ Don't Know

Declaration

I hereby certify that (*tick as appropriate*)   a) I attended the deceased before death

b) I examined the body after death

c) I conducted the post mortem of the body

d) Other (specify) ....

Medical Doctor's Name: ....

Signature .... Date...

2. DEATH CERTIFICATE QUALITY ASSESSMENT TOOL

REPUBLIC OF RWANDA

MINISTRY OF HEALTH
P.O. BOX 84 KIGALI
www.moh.gov.rw

DEATH CERTIFICATE QUALITY ASSESSMENT TOOL V1.2

A correctly filled-in death certificate has none of the following errors. Please indicate whether the death certificate has:

No.	Error Type	Yes*	No
1	Date of birth missing		
2	Date of death missing		
3	Time of death (a.m./p.m.) missing		
4	Sex of the deceased not specified		
5	Multiple causes of death per line		
6	Missing time interval from onset to death		
7	Abbreviations used in certifying cause of death		
8	Blank lines within chain of events leading to death		
9	Incorrect or clinically improbably chain of events leading to death		
10	Incorrect injuries or illnesses listed as contributory causes of death		
11	**Ill-defined condition(s) entered as the underlying cause of death**		
If yes, was the ill-defined condition:			
11.1	*Assigned impossible underlying cause of death i.e. signs and symptoms*		
11.2	*Mode of dying entered as underlying cause of death e.g. respiratory/ heart arrest*		
11.3	*Intermediate cause entered as underlying cause of death eg Septicaemia*		
11.4	*Unspecified causes within a larger death category entered as underlying cause of death*		
12	If surgery was performed, it is not indicated in Frame B		
13	For deaths as a result of neoplasms, additional details were missing		
14	For deaths due to external causes, additional details were missing		
15	For fetal or infant deaths, additional details were missing		
16	For deaths of women, additional details were missing		
17	Illegible hand writing		
18	The form is not signed by the medical doctor		

* Whenever there is "*Yes*" response, clarify with certifying Medical doctor.