stats sa

Department:
Statistics South Africa
REPUBLIC OF SOUTH AFRICA

Private Bag X44, Pretoria, 0001, South Africa, ISIbalo House, Koch Street, Salvokop, Pretoria, 0002

www.statssa.gov.za, info@statssa.gov.za, Tel +27 12 310 8911

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Mortality and causes of death in South Africa: Findings from death notification

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Preface

This statistical release presents information on mortality and causes of death in South Africa for deaths that occurred in 2020 calendar year. Deaths for the years 1999–2019 are also included to show trends in mortality and causes of death, using updated information that includes late registrations. The statistical release is based on deaths collected through the South African civil registration system maintained by the Department of Home Affairs. The information on causes of death is as recorded on death notification forms completed by medical practitioners and other certifying officials.

Mr Risenga Maluleke

Statistician-General

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Abbreviations/acronyms

AIDS	Acquired ImmunoDeficiency Syndrome
ANACoD	Analysing Mortality and Causes of Death
CDC	Centre for Disease Control
COVID-19	Corona Virus Disease of 2019
CVRS	Civil Registration and Vital Statistics
D4H	Data for Health Bloomberg Philanthropies
DHA	Department of Home Affairs
ECA	Economic Commission for Africa
GBD	Global Burden of Diseases
HIV	Human Immunodeficiency Virus
ICD-10	International Classification of Diseases 10th Revision
ICD-11	International Classification of Diseases 11th Revision
MACOD	Mortality and Causes of Death
MDR-TB	MultiDrug-Resistant Tuberculosis
NCDs	Non-Communicable Diseases
NDP	National Development Plan
NPR	National Population Register
Stats SA	Statistics South Africa
TB	Tuberculosis
UNECA	United Nation's Economic Commission for Africa
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant Tuberculosis

1. Introduction

1.1 Background

Civil Registration and Vital Statistics (CRVS) systems are the cornerstone of effective governance and public health infrastructure in any society. At the heart of these systems lies the crucial collection and analysis of mortality data, providing invaluable insights into population dynamics, health trends, and policy effectiveness, as they serve as essential tools for policymakers, public health officials, researchers, and international organizations alike. Robust CRVS systems and mortality data are indispensable for fostering sustainable development, improving health outcomes, and ensuring the well-being of populations worldwide particularly in the current era characterised by global health challenges and rapidly evolving demographics

The outbreak of the coronavirus disease (COVID-19) in Wuhan, in mainland China, and its subsequent spread to all other continents during November 2019 had a significant impact on statistical operations worldwide, including disruption of routine activities and operations of civil registration and vital statistics systems (Fu and Schweinfest 2020; UNSD 2020). Research conducted by the United Nations Economic Commission for Africa (UNECA) and the Centre of Excellence found that countries with digitized notification and registration systems experienced fewer disruptions, ensuring continuous recording of vital events during the state of national emergency.

Historically, communicable diseases have been significant contributors to mortality in South Africa, however, non-communicable diseases (NCDs) have emerged as a growing concern for South Africa's public health as there has been an increase in the proportion of deaths due to non-communicable diseases. In 2019, the leading causes of death due to NCDs in South Africa were diabetes mellitus, cerebrovascular diseases, hypertensive diseases, ischaemic heart diseases, other forms of heart disease, chronic lower respiratory diseases and malignant neoplasms of digestive organs, all of which were conditions that could increase the risk of severe outcomes if an individual contracted COVID-19 (WHO, 2020). Understanding these dynamics is essential for informed decision-making, resource allocation, and the development of targeted interventions to address the broader implications on public health and societal well-being.

1.2 Objectives of this statistical release

The mortality and causes of death statistical release is part of a regular series published by Stats SA, based on data collected through the civil registration system. This statistical release has two main objectives:

- To outline emerging trends spanning a 21-year period (1999–2020) and differentials in mortality by selected socio-demographic and geographic characteristics for deaths that occurred in 2020; and

- To present statistics on the causes of death for deaths that occurred in 2020, focusing on the underlying causes of death.

1.3 Scope of this statistical release

This release is based on mortality and causes of death information from the South African civil registration system. All death notification forms from Department of Home Affairs (DHA) for deaths that occurred in 2020 or earlier that reached Stats SA during the 2023/2024 processing phase are covered. The main focus is on deaths that occurred in 2020. Deaths that occurred during the period 1999 to 2019 are also provided to show trends in mortality and causes of death. This release excludes stillbirths, which are also collected through the civil registration system using the same death notification form. The definitions of technical terms used in this release are provided in Appendix A.

1.4 Organisation and presentation of this statistical release

This release is composed of five sections. In this release, deaths for the years 1999 to 2020 are included to show patterns in mortality over the years. The first section consists of information on the background and purpose of the release. Section two lays out the data and methods. This includes a focus on data sources, including methods used in data processing, data editing, quality assurance and data analysis. The third section on registered deaths presents mortality levels, trends and differentials, specifically focusing on the socio-demographic and geographic characteristics of the deceased.

The fourth section mainly covers information on the underlying causes of death for 2020 death occurrences (including a special analysis on COVID-19 deaths). In addition, the section provides information on immediate, contributing, and underlying causes of death differentials by natural versus non-natural causes, as well as the Global Burden of Disease (GBD Finally, the last section presents a summary of the findings and concluding remarks.

2. Data and methods

This section describes the sources of data, methods used to process, edit and analyse data as well as procedures used in assessing the quality of data.

2.1 Data source

The statistics presented in this release are based solely on administrative records from death notification forms obtained from the Department of Home Affairs (DHA). The DHA uses two types of death notification forms to capture deaths: Form BI-1663 which was introduced in 1998 and Form DHA-1663 which was introduced in 2009 as a replacement of Form BI-1663. However, BI-1663 forms will continue to be used until all remaining forms in circulation are depleted. The major difference between the two forms is that stillbirths and deaths occurring within the first seven days of life (perinatal deaths) on Form BI-1663 are recorded in the same section as all other deaths.

Form DHA-1663 has a separate section that records perinatal deaths. In instances where there is no medical practitioner available to complete the death notification form as is the case in some rural areas in South Africa, a traditional leader may complete and issue a Death Report form also known as Form B1-1680 which certifies the occurrence of death and a description of circumstances that resulted in the death. During registration at DHA offices, information on the Death Report is transcribed on to either the BI-1663 or the DHA-1663.

The Births and Deaths Registration Amendment Act, 2010 (Act No. 18 of 2010) is the legislation governing the registration of deaths in South Africa (Republic of South Africa, 1992; Republic of South Africa, 2010). Additionally, the 2014 Births and Deaths Regulations which rescinded the 1992 Regulations prescribe that notice of occurrence of death including a stillbirth must be given within 72 hours by an informant, regardless of the citizenship status of the deceased. After registration of the death, the DHA issues a death certificate to the informant and updates the National Population Register (NPR). The NPR only includes deaths for South African citizens with ID documents and permanent residents whose birth records were already captured onto the NPR prior to death South African citizens and permanent residents who died before notice of their births had been registered would also not be captured in the NPR.

Persons not eligible for inclusion in the NPR are non-South African citizens who were temporarily in the country. Stats SA, on the other-hand, collects all death notification forms, irrespective of the deceased's citizenship status for processing, analysis and dissemination of mortality and causes of death information. On this basis, the number of deaths processed by Stats SA will always be higher than the number of deaths recorded on the NPR for the same period.

2.2 Data processing

The processing of completed death notification forms takes place at the Stats SA Data Processing Centre. The process begins with sorting of the forms by year of death, pasting unique identifier labels on each of the forms, coding sociodemographic and causes of death variables, and ending with data capturing. Data from the two death notifications (Form BI-1663 and Form DHA-1663) are then merged into one dataset as data elements in these two forms are largely comparable.

2.2.1 Classification of the causes of death

The cause-of-death statistics in this publication are compiled using the International Classification of Diseases (ICD), 10th Revision, 2016 Edition. The ICD is a system of categories to which morbid entities of either external or pathological causation are assigned according to established criteria. It is developed collaboratively between the World Health Organization (WHO) and various international centres. It is revised from time to time in line with new adaptations, classifications and glossaries. All member states of the United Nations, including South Africa, agreed to use ICD as the standard classification system for compiling morbidity and mortality statistics. The South African National Information System also adopted it as a standard (WHO, 2016).

The primary purpose of ICD-10 is to provide for conversion of word descriptions of diseases or conditions into an alphanumeric code, which permit easy storage, retrieval and analysis of data. It also allows for the systematic and standardised recording, analysis, interpretation, comparison and sharing of morbidity and mortality data within a population and across countries. The ICD-10 provides for coding and classification of diseases and injuries and a wide range of signs, symptoms and other abnormal findings.

Each chapter contains three-character categories, which is subdivided into 10 four-character subcategories. However, for international comparisons, three-character coding is the mandatory level for reporting morbidity and mortality statistics, while four-character coding is recommended for more specific details about the disease or condition resulting in morbidity or mortality. Stats SA codes the causes-of-death data at four-character level where sufficient details about the causes of death were available. However, this statistical release analyses up to three-character level.

At the World Health Assembly, which was held in Geneva on 25 May 2019, ICD-11 was adopted for implementation. For the first time, ICD is fully electronic, currently providing access to 17 000 diagnostic categories, with over 100 000 medical diagnostic index terms. WHO has encouraged all Member States to use the most current version of the ICD for reporting death and disease statistics by migrating from ICD-10 to the new ICD-11. This is important because it provides a common language for recording, reporting, and monitoring diseases and allows the world to compare and share data in a consistent and standard way. To assist countries with the transition process, WHO has developed a guideline that countries need to consider in the lead up to and during the transition from an existing ICD environment to the eventual implementation of ICD-11 (WHO, 2019).

To initiate the process to transition, Stats SA requested assistance from the Centre for Disease Control and Prevention, Atlanta (CDC Atlanta) with support from Data for Health Bloomberg Philanthropies (D4H). The initial step was the development of the transition plan followed by ICD-11 training which was a training-of-trainers course. Participants included Stats SA Mortality and Causes of Deaths senior coders, programmers from data processing and analysts. It is envisaged that Stats SA will transition from ICD-10 to ICD-11 over a period of two processing years. As a means of ensuring stability of the

Mortality and Causes of Deaths (MACOD) product, during the transition period, the organisation will still be publishing MACOD data using ICD-10, while the impact of transitioning on quality and consistency of data is being assessed.

The quality of the causes of mortality statistics depends on completeness and accuracy of certified death notification forms. Coders at Stats SA follow the principle of, 'what you see is what you code' when coding causes-of-death statistics. The coders use the ICD-10 for categories of causes of death coded in the ICD-10 manual. For categories that are not coded in the ICD-10 manual, Stats SA has outlined specific guidelines and procedures. For example, according to these rules and procedures immunosuppression is coded as immunodeficiency and not as human immunodeficiency virus (HIV) disease.

Medical practitioners sometimes report the cause of death as acquired immune suppression which is not coded in the ICD-10 manual. Based on the Stats SA guidelines, this is coded as human immunodeficiency virus (HIV) disease (B20-B24). Multidrug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB) were assigned the ICD-10 special codes U51 and U52, respectively, and are included in the tuberculosis (A15-A19) broad group causes of mortality.

2.2.2 Generation of the underlying causes of death

The underlying cause of death is defined as: "(a) the disease or injury that initiated the sequence of events leading directly to death, or (b) the circumstances of the accident or violence that produced the fatal injury" (WHO, 2016: 31). Stats SA uses IRIS software for the automated derivation of the underlying causes of death according to the ICD-10 rules. In occasions where the software fails to derive the underlying cause of death, experienced coders at Stats SA derived the underlying cause of death manually.

2.3 Data editing

On completion of all data processing, an internally developed Stats SA editing program was used to check for accuracy and flag implausible causes of death for further investigation. Additionally, two electronic tools developed by WHO: Analysing mortality levels and causes-of-death (ANACoD) version 2.0 and CoDEdit version 1.0 were used to further check data consistency and plausibility (WHO, 2014a and WHO, 2014b, respectively). The tools were developed to enhance the value of mortality statistics in informing health policies and programmes. The main difference between the two tools is that CoDEdit assesses data consistency and plausibility for each unit record, while ANACoD checks the data at an aggregate level.

ANACoD version 2.0 and CoDEdit version 1.0 tools were used to automatically check the 2020 mortality data for accuracy and consistency. The tools were also used for highlighting cases with causes unlikely to cause death categorised by age and sex (sex-specific causes, age-specific causes and notifiable diseases). They also assist with assessment with possible misuse of ICD-10 codes as well as providing a summary of records within the dataset (WHO, 2014a; WHO, 2014b). For instance, regarding causes of death that are specific to one sex, the tools warn and flag for errors where the combination of sex and cause is incorrect. Errors flagged by the tools, were manually investigated for verification and corrections where necessary.

2.4 Assessment of the quality of data

The importance of producing quality mortality statistics derived from the civil registration system cannot be over-emphasised, since they are the only source of health information data continuously available at national and local administrative levels.

Mortality data have the potential to support decentralised population health administration, while the usability of statistics derived from such data depends wholly on their quality (WHO, 2013). An accurate, complete and timely civil registration system provides the foundation for the production of reliable and routine vital statistics. However, the data can suffer from a range of quality limitations such as late registrations, completeness of death registration, timeliness of data dissemination, accuracy of reporting, high proportion of ill-defined causes of death and misreporting or misclassification of causes of death. It is therefore important to assess data quality and to be transparent about data limitations, to identify areas of improvement.

For the purpose of this statistical release in addition to the quality assessment undertaken through ANACoD and CoDEdit electronic tools, the framework proposed by Mahapatra et al. (2007) was used to evaluate quality of the 2020 causes of death data. This section presents a summary of the results of this assessment. A detailed discussion of the assessment is provided in Appendix C.

In the 2015 statistical release (Stats SA, 2018), an estimated 96,0% completeness level of adult deaths (15 years and older) was reported for the 2011–2016 intercensal/survey period. Male adults had a completeness level of 97,0%, higher than the adult female completeness level of 95,0%.

Estimates for the 2020 deaths completeness level remain the same, and a revised estimate will be provided once Census 2022 data is available.

2.5 Data analysis

A two-pronged data analysis approach was followed for this release, which includes mortality analysis and causes of death analysis. The first section on mortality describes information on selected socio-demographic variables and mortality patterns, based on frequency distributions and cross-tabulations.

The section further covers demographic indicators such as sex ratios at death, age-specific death rates and median ages at death for the reported deaths. Sex ratios at death show the ratio of male deaths per 100 female deaths and age-specific death rates show variations in mortality taking into consideration the population size of each age group. Median ages show how early or late mortality occurs in the population and specifies the age at which half of the reported deaths occur.

The second section lays out analysis of information on causes of death, mainly based on ranking the natural underlying causes of death and proportions of deaths due to specific causes. The top-ranking causes determine the leading causes of death. The ranking indicates the frequency of causes of death among those causes eligible to be ranked and does not reflect causes of death in terms of their importance from a public health perspective. Causes of death with the same number of deaths received the same rank, and a rank was skipped for the next cause. For example, if two causes of death had the same frequency and were ranked third, they both received the same rank, and the next cause received rank five.

The process of ranking natural underlying causes of death excluded symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99), because such information is not sufficiently detailed to be of use for public health purposes. It is therefore essential to raise awareness among certifying practitioners to seek sufficient evidence to assign causes of these deaths to the more precise categories through training programmes and other initiatives.

Due to concerns about violence and deaths due to accidents in South Africa, natural and non-natural causes have been separated. Although non-natural causes of death were not ranked, for analysis they were disaggregated by characteristics such as age, sex and province of death of the deceased, which relay important information on the levels and patterns of non-natural deaths. Due to the emergence of the COVID-19 pandemic, additional analysis on the subject is presented in the cause of death section.

In addition, the second section also provides information on causes of death based on the Global Burden of Disease as generated by ANACoD. Causes of deaths are categorised into three broad groups, namely Group I (communicable diseases), Group II (non-communicable diseases) and Group III (injuries). Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99) deaths which are ill-defined natural causes of death were accorded across communicable and non-communicable diseases categories. The release also presents tables on mortality and causes of death for district municipalities in the country in the appendices section. Information on local

municipalities is not provided in this release, but it can be made available in an aggregated dataset format and not as unit records datasets to users on request.

3. Mortality

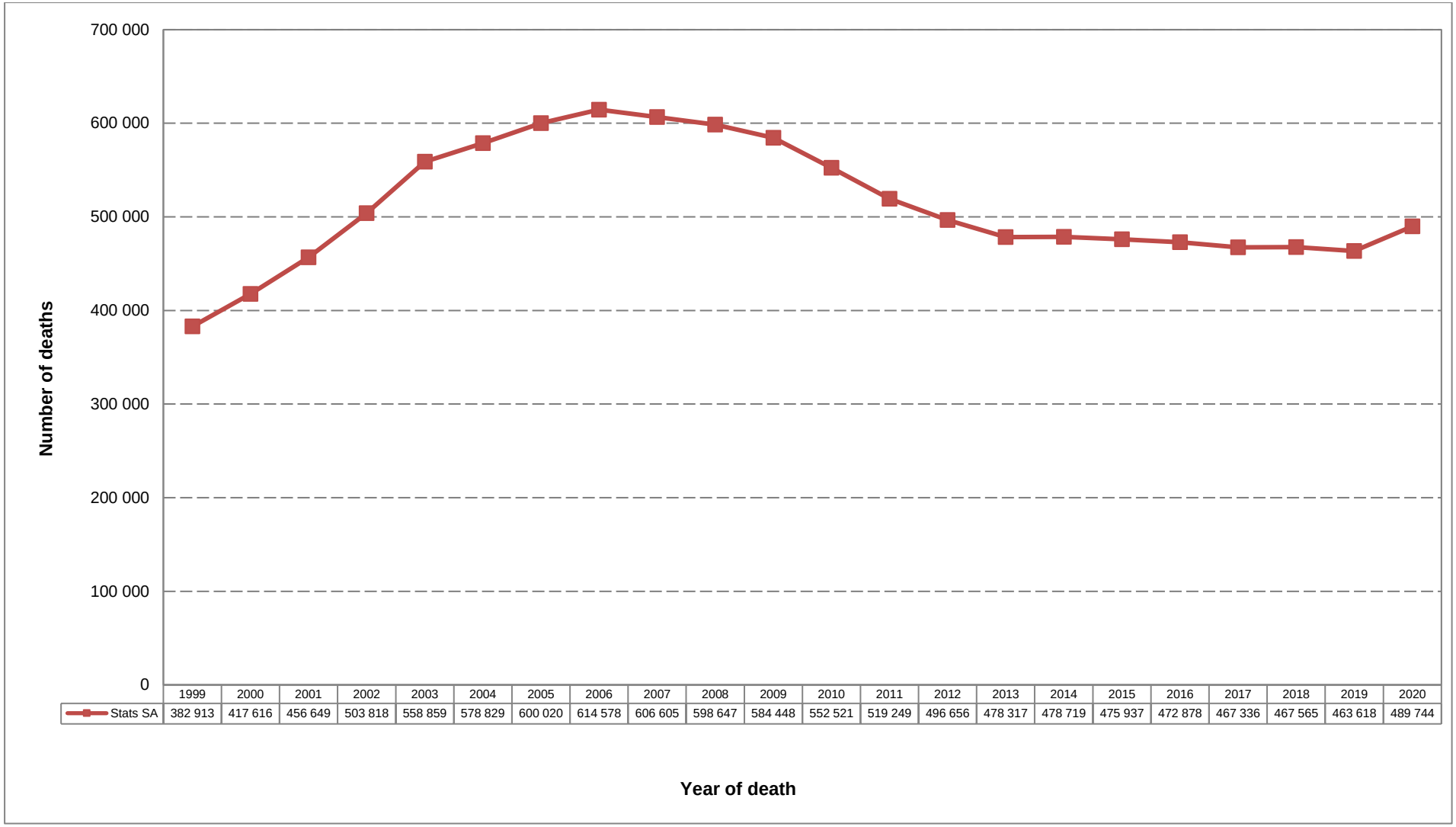
This chapter provides analysis on the distribution of 2020 registered deaths that reached Statistics South Africa (Stats SA) during the 2023/2024 processing phase. The section mainly focuses on absolute numbers and percentage distributions of 2020 deaths by selected background characteristics of the deceased such as age, sex, place/institution of death and geographic information (province and district municipalities). Levels and trends of registered deaths over the period 1999−2020 are also included.

3.1 Levels and trends of mortality in 2020

Figure 3.1 shows that the total number of deaths that occurred and were registered in 2020 at DHA and processed by Stats SA during 2023/2024 were 489 744. This indicates a 5,3% increase from the 463 618 deaths recorded for 2019.

The general trend in the number of registered deaths processed by Stats SA indicates an increase from 1999 to 2006 when the number of deaths peaked at 614 578 in 2006, and decreased thereafter, except for the year 2020. The overall number of deaths per year increases as additional forms are processed at Stats SA. Additional forms may result from delayed registration or delayed transmission of forms from DHA regional offices to head office in time for processing at Stats SA. It is, therefore, expected that additional forms, 2020 forms in particular as well as forms for the previous years, will still be received for processing at Stats SA. Updated information will be provided in the next statistical release.

Figure 3.1 – Number of registered deaths by year of death, 1999–2020*



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Stats SA	382 913	417 616	456 649	503 818	558 859	578 829	600 020	614 578	606 605	598 647	584 448	552 521	519 249	496 656	478 317	478 719	475 937	472 878	467 336	467 565	463 618	489 744

*Data for 1999–2019 have been updated with late registrations / delayed death notification forms processed in 2023/2024.

3.2 Age differentials

The distribution of deaths by age group is presented in Table 3.1. The highest number of deaths that occurred in 2020 was among individuals aged 65–69, comprising 9,3% of all deaths. This age group was followed by age groups 60–64 and 70–74; each respectively comprising 9,2% and 8,7% of all deaths. Deaths that occurred among infants (age zero) accounted for 4,1% of all deaths, while the lowest percentages of deaths were observed in age groups 5–9 and 10–14, each representing 0,5% and 0,6%, respectively.

Table 3.1 – Number and percentage (%) distribution of deaths by age group, 2020

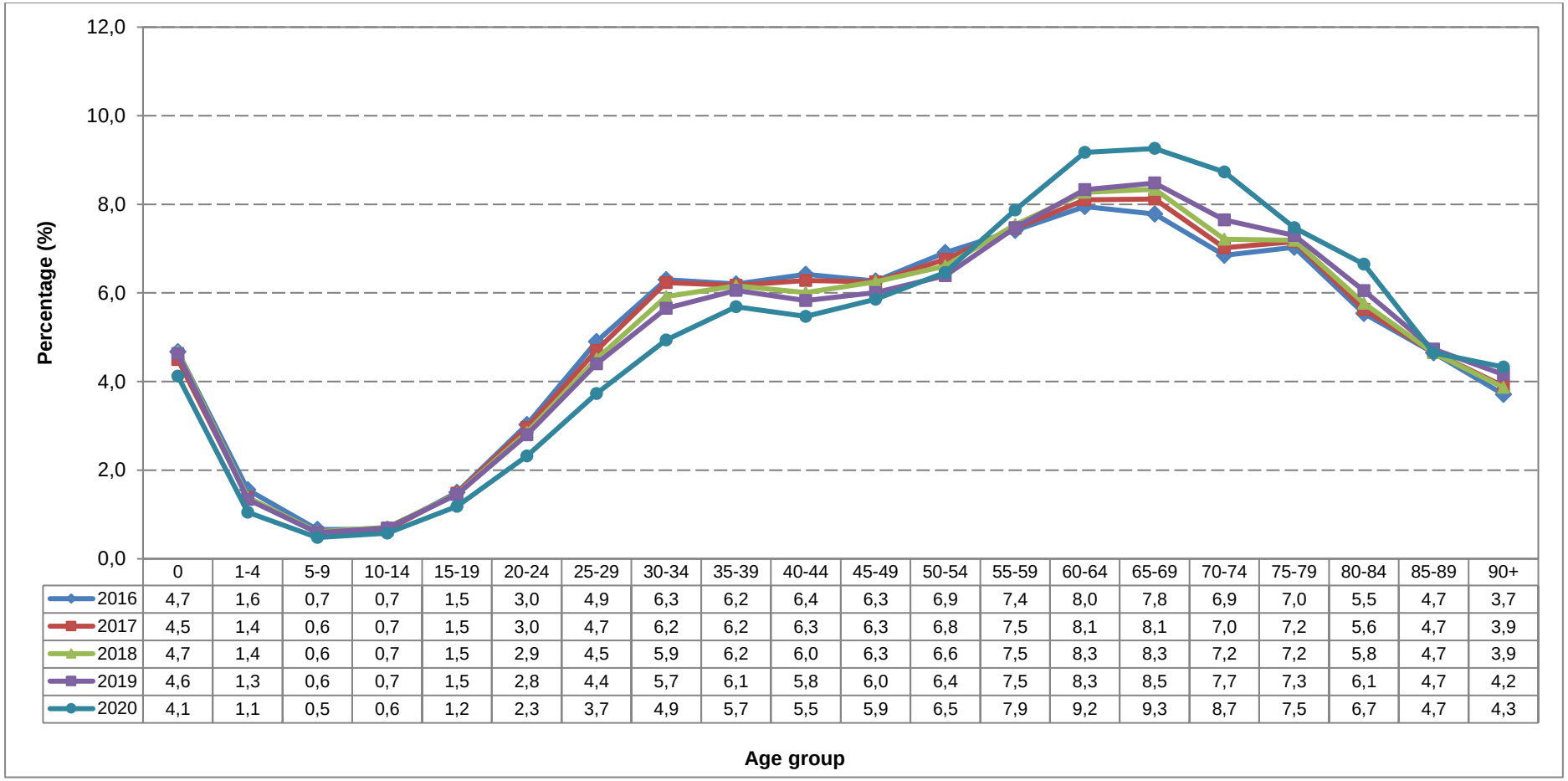
Age group	Number	Percentage (%)
0	20 162	4,1
1−4	5 130	1,0
5−9	2 346	0,5
10−14	2 834	0,6
15−19	5 765	1,2
20−24	11 384	2,3
25−29	18 289	3,7
30−34	24 179	4,9
35−39	27 885	5,7
40−44	26 781	5,5
45−49	28 693	5,9
50−54	31 651	6,5
55−59	38 524	7,9
60−64	44 894	9,2
65−69	45 330	9,3
70−74	42 753	8,7
75−79	36 601	7,5
80−84	32 559	6,6
85−89	22 762	4,6
90+	21 222	4,3
Total	**489 744**	**100,0**

Figure 3.2 shows the percentage distribution of deaths by age group and year of death between 2016 and 2020. A general observation is that the age pattern of mortality was somewhat consistent over the five-year period. The pattern is generally characterised by high proportions of deaths among infants (age zero), lower proportions for ages 1–4, lowest proportions between 5–9 years and 10–14 years, rising but still low proportions between age group 15–19 and 20–24. High proportions averaging over 7,0% are observed from age groups 55–59 to 75–79.

The figure further shows that in 2020 age group 65–69 recorded the highest proportion of deaths at 9,3%, followed by the age group 60–64 at 9,2%. The lowest proportions throughout the years were observed are within age group 5–9, with 2020 recording the lowest in the five years at 0,5%. Moreover, in 2020, the percentage distribution of deaths for individuals in age groups zero to 45–49 were generally

lower than the previous four years. Additionally, while deaths in the age groups 55 to 79 have been the highest over a number of years, in 2020 the proportion of deaths in these age groups rose to levels which had not been seen in recent years. The age groups 60–64 to 70–74 each recorded approximately 1,0% more deaths than the previous years. Notably, the percentage distribution of deaths for age group 85–89 has remained the same from 2016 to 2020 at 4,7%.

Figure 3.2 – Percentage (%) distribution of deaths by age group and year of death, 2016–2020*



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
2016	4,7	1,6	0,7	0,7	1,5	3,0	4,9	6,3	6,2	6,4	6,3	6,9	7,4	8,0	7,8	6,9	7,0	5,5	4,7	3,7
2017	4,5	1,4	0,6	0,7	1,5	3,0	4,7	6,2	6,2	6,3	6,3	6,8	7,5	8,1	8,1	7,0	7,2	5,6	4,7	3,9
2018	4,7	1,4	0,6	0,7	1,5	2,9	4,5	5,9	6,2	6,0	6,3	6,6	7,5	8,3	8,3	7,2	7,2	5,8	4,7	3,9
2019	4,6	1,3	0,6	0,7	1,5	2,8	4,4	5,7	6,1	5,8	6,0	6,4	7,5	8,3	8,5	7,7	7,3	6,1	4,7	4,2
2020	4,1	1,1	0,5	0,6	1,2	2,3	3,7	4,9	5,7	5,5	5,9	6,5	7,9	9,2	9,3	8,7	7,5	6,7	4,7	4,3

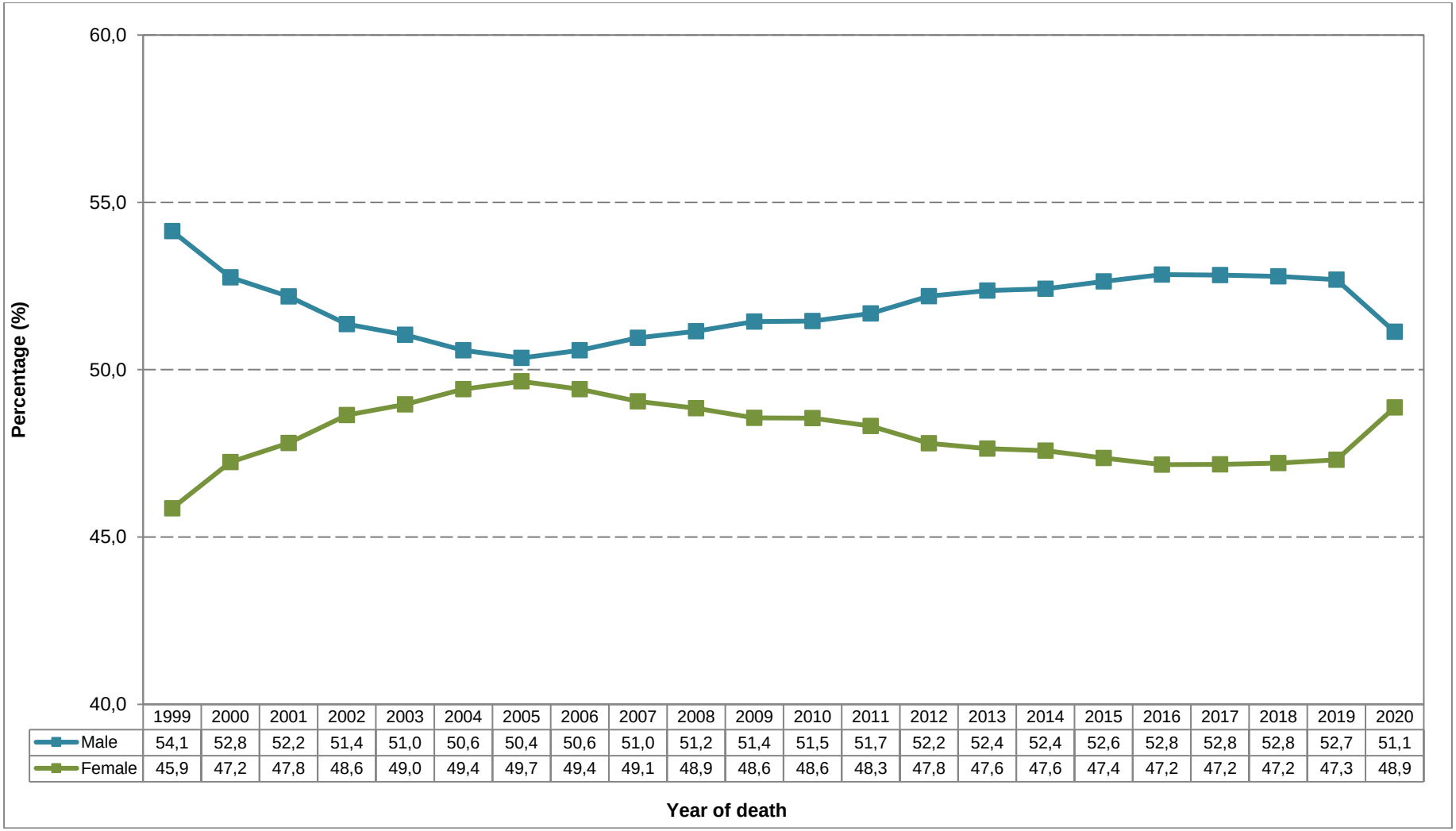
*Excluding deaths with unspecified age.
Data for 2016–2019 have been updated with late registrations / delayed death notification forms processed in 2023/2024.

3.3 Sex differentials

Figure 3.3 presents the percentage distribution of deaths by sex and year of death from 1999–2020. The results show that prior to 2006, the proportion of male deaths persistently decreased while that of females increased, and the reverse was observed from 2006 to 2016 for both sexes. The percentage of male deaths declined consistently from a high of 54,1% in 1999 to a low of 50,4% in 2005. The opposite was true for females where their contribution to total deaths increased from a low of 45,9% in 1999 and reached a peak of 49,7% in 2005. The proportion of female deaths decreased yearly from 49,4% in 2006 to 47,2% in 2016. Conversely, during the same period, the percentages of male deaths increased from 50,6% to 52,8%.

Notably, between 2016 and 2018, the percentage distribution of deaths remained the same between the two sexes, with males accounting for 52,8% of deaths and females for 47,2%. From 2019, a change in pattern was observed as male deaths decreased to 52,7% in 2019 and further to 51,1% in 2020, and female deaths increased to 47,3% and 48,9% for those years.

Figure 3.3 – Percentage (%) distributions of deaths by sex and year of death, 1999–2020*



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	54,1	52,8	52,2	51,4	51,0	50,6	50,4	50,6	51,0	51,2	51,4	51,5	51,7	52,2	52,4	52,4	52,6	52,8	52,8	52,8	52,7	51,1
Female	45,9	47,2	47,8	48,6	49,0	49,4	49,7	49,4	49,1	48,9	48,6	48,6	48,3	47,8	47,6	47,6	47,4	47,2	47,2	47,2	47,3	48,9

*Excluding deaths with unspecified sex.
Data for 1999–2019 have been updated with late registrations / delayed death notification forms processed in 2023/2024.

The annual percentage changes in the number of deaths by sex from 1999–2020 are shown in Appendix E. Appendix F provides Age-specific Death Rates (ASDRs) for the years 2016 to 2020 in order to show differentials in mortality by age group, taking into account the population size of each age group. The ASDRs provided should be interpreted with caution as they are based on the observed number of deaths that have not been adjusted for incomplete death registration, which may vary by age group.

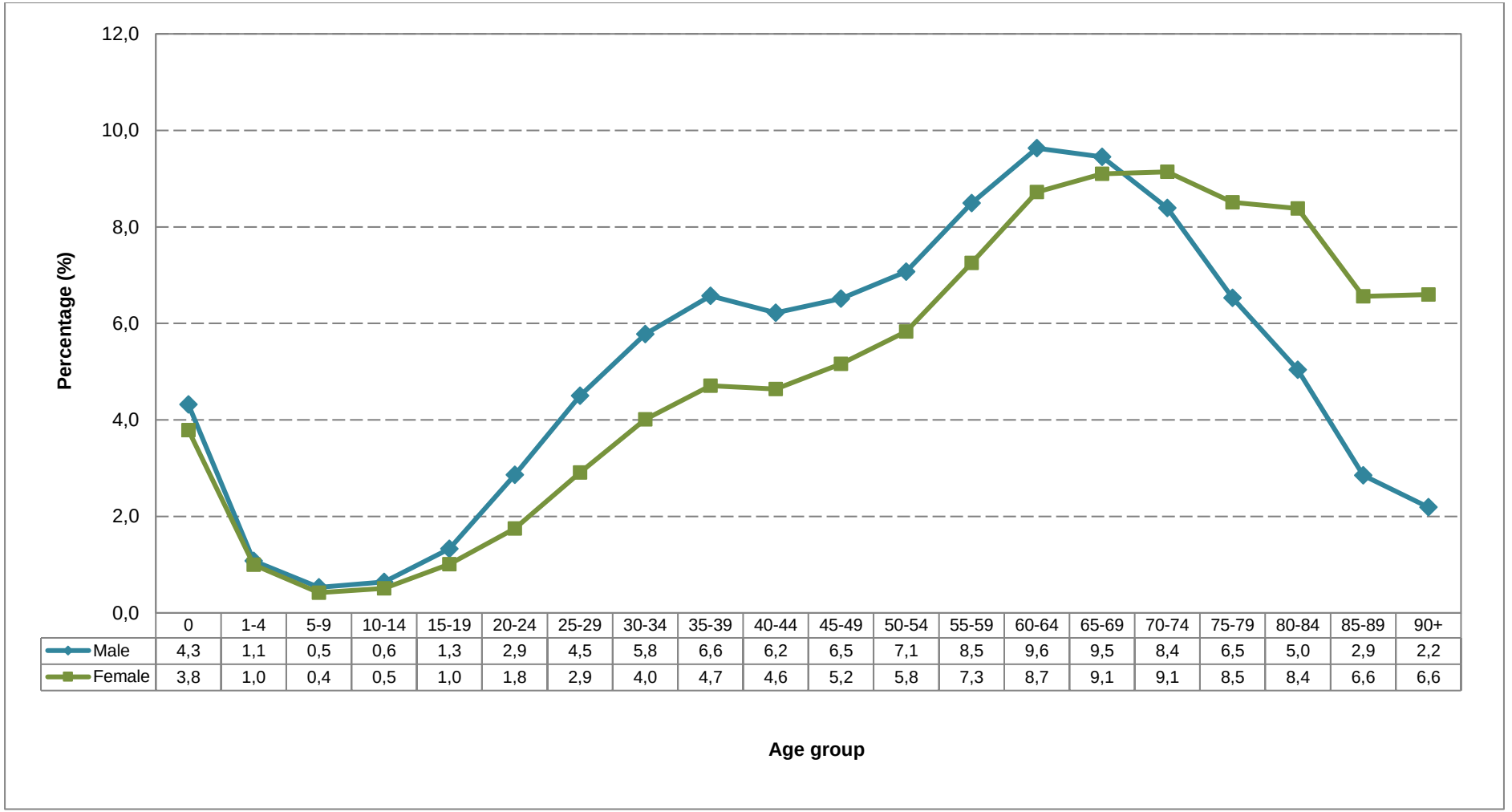
3.4 Age and sex differentials

3.4.1 Distribution of deaths by age group and sex

Figure 3.4 shows the age and sex percentage distribution of deaths for 2020 (absolute numbers are presented in Appendix D). The differences between proportions of male and female deaths were minimal at younger ages (age groups 1–4 to 15–19 years). The distribution shows that the percentage of male infant deaths marginally exceeded the percentage of female infant deaths (4,3% for males and 3,8% for females). For both males and females, the lowest proportions of deaths occurred among those aged 5–9 (0,5% for males and 0,4% for females).

Male deaths peaked at the age group 60–64 (9,6%), followed by age group 65–69 (9,5%) and age group 55–59 (8,5%). The highest proportions for females were observed at age groups 65–69 and 70–74 with 9,1%, followed by age group 60–64 accounting for 8,7% of total female deaths. Overall, from age 70 and older, there were more female than male deaths. The gap in the proportion of male and female deaths was highest in the age group 90 and older, followed by age group 85–89.

Figure 3.4 – Percentage (%) distribution of deaths by age group and sex, 2020*



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Male	4,3	1,1	0,5	0,6	1,3	2,9	4,5	5,8	6,6	6,2	6,5	7,1	8,5	9,6	9,5	8,4	6,5	5,0	2,9	2,2
Female	3,8	1,0	0,4	0,5	1,0	1,8	2,9	4,0	4,7	4,6	5,2	5,8	7,3	8,7	9,1	9,1	8,5	8,4	6,6	6,6

*Excluding deaths with unspecified sex.

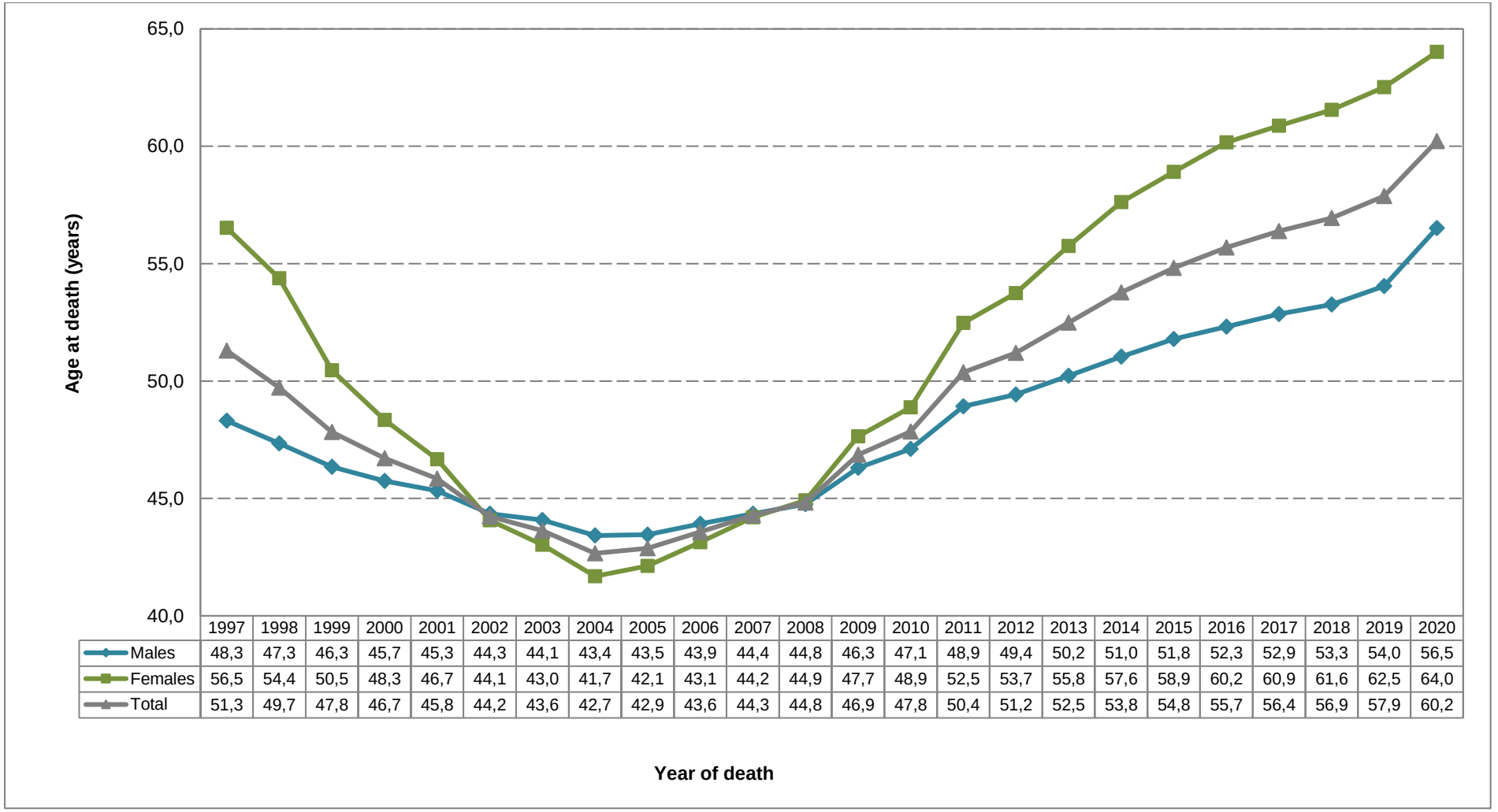
3.4.2 Median ages at death by sex

The median ages at death by sex are presented in Figure 3.5. Median ages show how early or late mortality occurs in the population and specifies the age at which half of the reported deaths occur. An analysis of median ages can reveal changes in patterns of mortality over time; lower median ages at death indicate that mortality is occurring earlier while higher median ages indicate that mortality is occurring later.

Figure 3.5 shows that the median ages at death for total deaths declined notably from 47,8 years in 1999 and reached their lowest level of 42,7 years in 2004. The decreases were more rapid for females compared to males. The median age at death for females decreased by 8,8 years from 50,5 years in 1999 to 41,7 years in 2004, while the median age at death for males decreased by 2,9 years from 46,3 years in 1999 to 43,4 years in 2004.

Since 2005, the median ages at death for both males and females have been increasing, reflecting improvement in mortality. The median age at death for all deaths increased from 42,7 in 2004 to 60,2 in 2020. Female median age at death had the sharpest increase from 41,7 in 2004 to 64,0 in 2020, with the median age at death for males increasing from 43,4 to 56,5 in the respective years.

Figure 3.5 – Median ages at death by sex and year of death, 1999–2020*



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Males	48,3	47,3	46,3	45,7	45,3	44,3	44,1	43,4	43,5	43,9	44,4	44,8	46,3	47,1	48,9	49,4	50,2	51,0	51,8	52,3	52,9	53,3	54,0	56,5
Females	56,5	54,4	50,5	48,3	46,7	44,1	43,0	41,7	42,1	43,1	44,2	44,9	47,7	48,9	52,5	53,7	55,8	57,6	58,9	60,2	60,9	61,6	62,5	64,0
Total	51,3	49,7	47,8	46,7	45,8	44,2	43,6	42,7	42,9	43,6	44,3	44,8	46,9	47,8	50,4	51,2	52,5	53,8	54,8	55,7	56,4	56,9	57,9	60,2

*Data for 1999–2019 have been updated with late registrations / delayed death notification forms processed in 2023/2024.

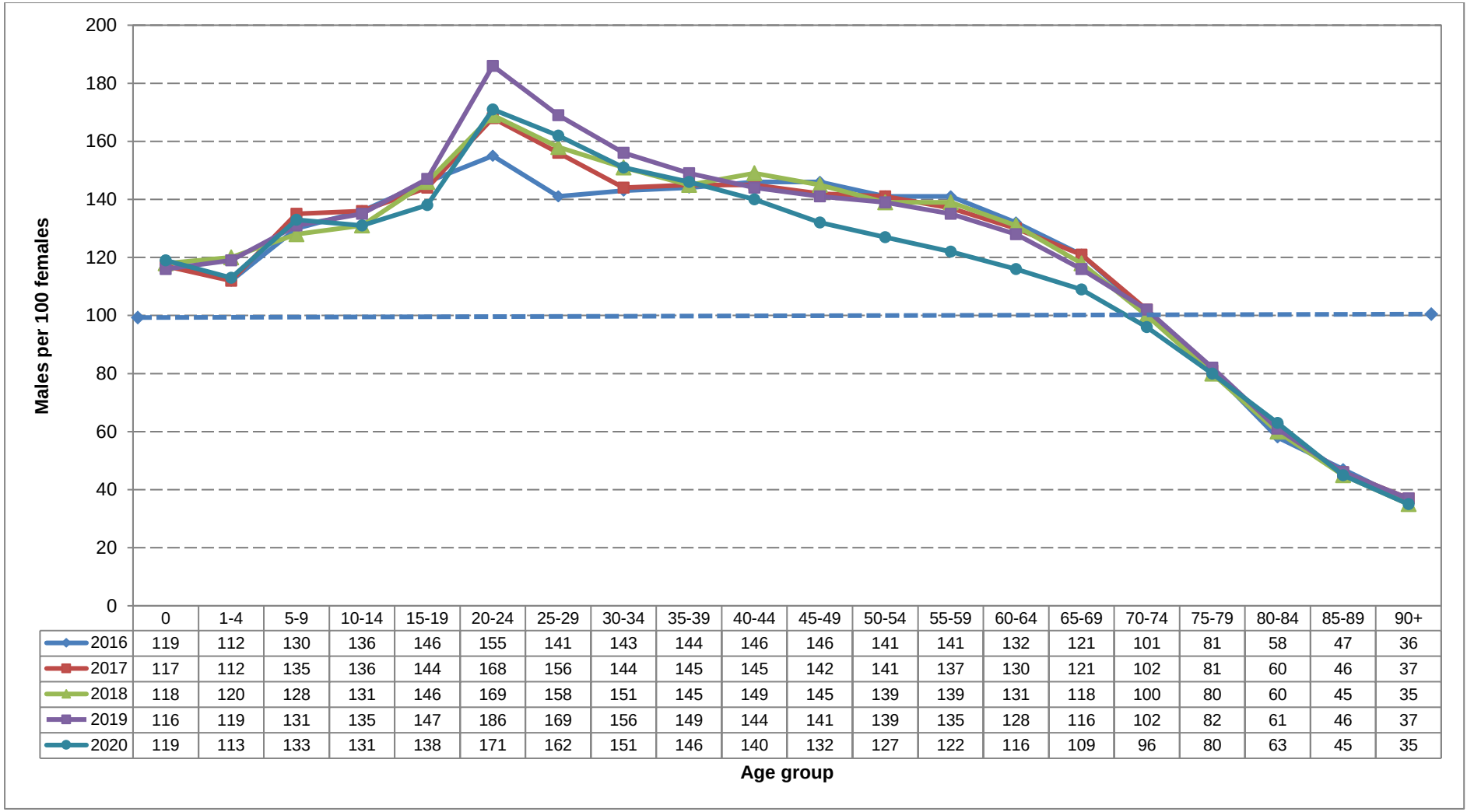
3.4.3 Sex ratios by age groups

The sex ratio at death is an important demographic indicator, highlighting the number of male deaths relative to the number of female deaths. When there are equal numbers of male and female deaths, the sex ratio at death is equal to 100. If there are more males than female deaths, the sex ratio is above 100 and excess female deaths are indicated by a sex ratio at death that is less than 100.

Figure 3.6 represents the sex ratio at death by age groups and year of death for the period 2016–2020. Over the five-year period, more male than female deaths were consistently observed from age zero up to age group 65–69. Generally, there were more female deaths among those aged 75 and older. However, a shift in the trend was noted in 2020 with a ratio for the age group 70–74 being below 100.

The results also indicate that the highest sex ratio (186 male deaths per 100 female deaths) was observed in 2019 in the age group 20–24 years. This age group persistently remains the age group with the highest sex ratio of male to female deaths, increasing from 155 to 186 in 2016 to 2019 and decreasing to 171 in 2020.

Figure 3.6 – Sex ratios by age group and year of death, 2016–2020*



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
2016	119	112	130	136	146	155	141	143	144	146	146	141	141	132	121	101	81	58	47	36
2017	117	112	135	136	144	168	156	144	145	145	142	141	137	130	121	102	81	60	46	37
2018	118	120	128	131	146	169	158	151	145	149	145	139	139	131	118	100	80	60	45	35
2019	116	119	131	135	147	186	169	156	149	144	141	139	135	128	116	102	82	61	46	37
2020	119	113	133	131	138	171	162	151	146	140	132	127	122	116	109	96	80	63	45	35

*Excluding deaths with unspecified age and sex.
Data for 2016–2019 have been updated to include late registrations/death notification forms processed in 2023/2024.

3.5 Population group differences in mortality

Mortality differentials by population group reflect the stage of health transition. Black Africans and coloureds are faced with the quadruple burden of disease, while profiles for Indians/Asians and whites are dominated by non-communicable diseases. The effect of HIV/AIDS and tuberculosis has been greatest in black Africans, exacerbating mortality differentials. The discussion and distribution of underlying causes of death by population group are provided in Appendices Q and Q1.

Table 3.2 shows the absolute and percentage distribution of deaths by population group for 2020. To account for the population composition, the table also shows deaths per thousand population. The population group with the highest proportion of deaths was black Africans who accounted for 66,3% of all deaths. The Other population group and the Indian/Asian population group accounted for the least percentage of deaths with 0,2% and 2,4% of all registered deaths, respectively. The table also indicates that 9,4% and 7,5% of all deaths were for the white and coloured population groups, respectively. Just above 14,0% of the cases had unknown or unspecified population groups. The proportion of unknown/unspecified population groups was above 14,3%, in 2020, the highest proportion observed in recent years. While there has been an improvement in other aspects of reporting on the death notification forms, the proportion of deaths with unknown or unspecified population groups remains considerably high and therefore, these results should be interpreted with caution.

The percentage of deaths within the entire population indicates that the black African population group has a higher proportion of deaths. However, a look into the death rate within each population group, as seen in the deaths per thousand population column, reveals a different picture. The death rate is higher among the white population group at 9,8%, followed by the Indian/Asian population groups (7,6%) and the coloured population group (7,0%). Among the black African population group, the death rate was 6,7%.

Table 3. 2 – Number and percentage (%) distribution of deaths by population group, 2020

Population group	Number of deaths	Percentage of deaths (%)	Population group size	Deaths per thousand population
Black African	324 451	66,3	48 153 727	6,7
White	46 064	9,4	4 679 770	9,8
Indian/Asian	11 641	2,4	1 541 113	7,6
Coloured	36 802	7,5	5 247 740	7,0
Other	914	0,2	*	*
Unknown or unspecified	69 872	14,3	*	*
Total	**489 744**	**100,0**	**59 622 350**	

*Other and unknown/unspecified population groups are not reported in 2020 mid–year population estimates

3.6 Marital status differences in mortality

The informant reporting a death has to indicate the marital status of the deceased at the time of death. Table 3.3 shows the number and percentage distribution of deaths by marital status of the deceased. About 34,4% of the deceased were reported as never married at the time of death. Nearly a quarter (24,1%) of the deaths were for individuals that were married. Furthermore, 11,0% and 2,2% of all deaths occurred among widowed and divorced persons, respectively. The marital status of the deceased at the time of death was missing in 28,3% of all registered deaths and, therefore, these results must be interpreted with caution.

Table 3.3 – Number and percentage (%) distribution of deaths by marital status, 2020

Marital status	Number	Percentage (%)
Never married	168 329	34,4
Married	118 005	24,1
Widowed	54 018	11,0
Divorced	10 649	2,2
Unknown/unspecified/not applicable	138 743	28,3
Total	**489 744**	**100,0**

3.7 Differences in mortality by smoking status of the deceased

The number and percentage distribution of registered deaths from the year 2020 as classified by smoking status of the deceased is depicted in Table 3.4. Smoking status of the deceased is defined as the regular smoking of tobacco during the five years prior to death, and the question is applicable if the deceased was aged 16 and older.

The table shows that the highest percentage of deaths were among people who were non-smokers (41,0%) while 16,5% of the deaths occurred among people who were smokers. The table also shows that 36,4% of registered deaths in 2020 had smoking status classified as unknown or unspecified. The high proportion of deaths with missing information on smoking status shows a poor reporting of this information on the death notification forms, therefore these results must be interpreted with caution.

Table 3.4 – Number and percentage (%) distribution of deaths by smoking status among those aged 16 and older, 2020

Smoking status	Number	Percentage (%)
Yes	75 457	16,5
No	187 885	41,0
Do not know	28 225	6,2
Unknown or unspecified	166 846	36,4
Total	**458 413**	**100,0**

3.8 Differences in mortality by place or institution of death occurrence

Table 3.5 shows the number and percentage distribution of registered deaths by place or institution of death occurrence for 2020. The results indicate that 37,9% of the deaths took place in hospitals, 2,1% were emergency room or outpatient facility deaths and 1,8% died in nursing homes. These three places of death occurrence accounted for 41,8% of total deaths that occurred within a healthcare facility. A total of 127 492 deaths (26,0%) occurred at home in 2020, while 11 681 deaths (2,4%) were of people who had already died by the time they reached the hospital (dead on arrival). Of the 489 744 death notification forms processed for the year 2020, 28,5% had unknown or unspecified information on place or institution of death of the deceased.

Table 3.5 – Number and percentage (%) distribution of deaths by place of death occurrence, 2020

Place of death	Number	Percentage (%)
Hospital	185 566	37,9
Emergency room / Out patient	10 334	2,1
Dead on arrival	11 681	2,4
Nursing home	8 777	1,8
Home	127 492	26,0
Other	6 536	1,3
Unknown / unspecified	139 358	28,5
Total	**489 744**	**100,0**

3.9 Geographic variations in mortality

This section presents information on the distribution of registered deaths by province and district municipality where the death occurred, and by the deceased's usual residences. The district and province information was derived based on the 2016 municipal boundaries. The number and percentage distribution of deaths by province of the deceased are provided in Appendix I (absolute numbers and percentages, respectively); Appendix J presents the sex distribution of these.

3.9.1 Differences by province, age and sex

Table 3.6 shows the distribution of 2020 deaths by province of death occurrence and province of usual residence of the deceased at the time of death. The province of death occurrence may not always be similar to the place of usual residence.

For the province of death occurrence, the highest proportion of deaths (22,0%) occurred in Gauteng, followed by KwaZulu-Natal and Eastern Cape each comprising 19,3% and 15,9%, respectively. The lowest percentage of deaths occurred in the Northern Cape (3,1%).

With regard to the province of usual residence, Gauteng (21,7%) had the highest proportion of deaths, followed by KwaZulu-Natal (19,0%) and Eastern Cape (15,1%).

A cross-tabulation of province of death occurrence and province of usual residence of the deceased is given in Appendix H and H1. It must be noted that analysis on geographic distribution of deaths is based only on place of death occurrence, not place of residence or place of birth of the deceased. However, information on the distribution of deaths by place of residence and place of birth of the deceased is available on request from Stats SA.

Table 3.6 – Distribution of deaths by province of death occurrence and province of usual residence of the deceased, 2020

Province	Province of death occurrence		Province of usual residence of deceased	
	Number	Percentage (%)	Number	Percentage (%)
Western Cape	55 695	11,4	55 488	11,3
Eastern Cape	78 067	15,9	74 017	15,1
Northern Cape	14 940	3,1	14 001	2,9
Free State	31 734	6,5	31 284	6,4
Kwa-Zulu Natal	94 765	19,3	93 187	19,0
North West	31 351	6,4	32 868	6,7
Gauteng	107 899	22,0	106 082	21,7
Mpumalanga	29 873	6,1	31 706	6,5
Limpopo	44 712	9,1	51 111	10,4
Unknown	105	0,0		
Unspecified	603	0,1		
Total	**489 744**	**100,0**	**489 744**	**100,0**

The number distribution of deaths by age and province of death occurrence as shown in Appendix I indicates that Gauteng had the highest number of deaths for most age groups (age 0 [5 463], 15–44 years [25 675], 45–64 years [31 469] and 65 years and older [43 203]). While Kwa-Zulu Natal had the highest number of deaths for the age group 1–14 years [2 107]. It must be noted that the distribution of deaths does not take into account potential under-reporting of deaths at specific ages, which may vary by district of death occurrence.

Percentage variations in 2020 deaths by age and district municipality are presented in Appendix I1. At province level, North West (6,1%) had the highest proportion of infant deaths. Limpopo (3,1%) had the highest percentage of deaths among children 1–14 years. Deaths in Mpumalanga (26,3%), followed by KwaZulu-Natal (25,0%) had the highest percentage in the 15–44 age category. Northern Cape had the highest proportion of deaths occurring in the 45–64 age group (32,7%), with the least percentage of deaths under this age group observed in Limpopo at 26,0%. Western Cape had the highest percentage of elderly deaths [ages 65 and older (44,2%)], followed by Eastern Cape (43,4%) and Limpopo (43,3%).

3.9.2 Differences by district municipality, age group and sex

The distribution of deaths by age and district municipality of death occurrence as shown in Appendix I indicates that out of the 52 district municipalities, the top three district municipalities were metropolitan municipalities: City of Johannesburg (34 353), City of Cape Town (32 779) and eThekwini (30 594). The district municipalities that recorded the least number of deaths were Central Karoo (746), Xhariep (892) and Namakwa (1 530). Differentials by age group indicate that the City of Johannesburg had the highest number of deaths for age 0 (1 978) as well as 1─14 years (644) and among those aged 15–44 (8 664). Lastly, the City of Cape Town had the highest number of deaths for age groups 45–64 (9 820) and 65 years and older (14 645). The percentage variations by age and district municipality are also shown in Appendix I.

Appendix J shows the sex distribution of the deceased by the district municipality of death occurrence. The four metropolitan municipalities, the City of Cape Town, the City of Johannesburg, eThekwini and the City of Tshwane, had a high prevalence of death for males and females (over 20 000). It is also observed that eighteen district municipalities had sex ratios below 100, which means there were more female deaths than male deaths. These district municipalities were in Free State, Limpopo, Eastern Cape and Kwa-Zulu Natal provinces.

4. Causes of death

This section presents information on causes of death for all registered deaths that occurred in 2020, as well as some comparisons with data for the previous years. The section has nine sub-sections, namely: introduction, reported causes of death, method of ascertaining the cause of death, main groups of the underlying causes of death, natural and non-natural causes of death, major group of causes of death, broad groups of natural causes of death, non-natural causes of death, and comparisons between immediate, contributing and underlying causes of death.

The 10th revision of the International Classification of Diseases (ICD-10) was used to classify the causes of death data in this publication. The analysis undertaken focuses mainly on the underlying cause of death, which is defined as the disease or injury that initiated the train of events leading directly to death; or the circumstances of the accident or violence which produced the fatal injury (WHO, 1992). Previous publications have shown that Non-Communicable Diseases (NCD) pose a major barrier to health, quadrupling the burden of disease and as such, this necessitated the inclusion of analysis on the Global Burden of Diseases. Global Burden of Diseases is a critical resource for informed policymaking, as it provides a tool to quantify and compare the effects of different diseases in a population.

Trend analysis for the period 1999–2020 is also done to establish patterns between natural and non-natural causes of death. A summary of causes of death by age, sex and province of occurrence is also included in this section.

The final subsection provides a comparison between underlying, immediate and contributing causes of death. This analysis gives an overview of the recorded instances of multiple causes of death, as death notification forms allow for reporting one or more causes of death on each form.

4.1 Reported causes of death

The BI-1663 and DHA-1663 forms make provision for the recording of multiple causes of death. These are Part 1 and Part 2 under “Medical Certificate of Cause of Death” on both death notification forms, or under “Causes of Death” for perinatal deaths on the new form (DHA-1663). Part 1 is for reporting a chain of events leading directly to death, with the immediate cause of death on line (a) and the underlying cause on the lowest used line. Part 2 is for reporting other conditions that contributed to death but did not cause any of the causes of death mentioned in Part 1. These are other important diseases or conditions that were present at the time of death and may have contributed to, but did not lead to the underlying cause of death listed in Part 1.

Table 4.1 provides information on the number of causes of death reported on each death notification form for deaths that occurred in 2020. It is observed that less than one per cent (0,5%) of the forms had no cause of death indicated on the forms. There are two possible circumstances under which no cause of death is indicated on the form. Firstly, in instances where a doctor has ticked on the form to show that the death was a natural cause but did not provide a specific cause. Secondly, where a death was

still under investigation when the form was completed and causes of death had not yet been established, or the page with causes of death information was missing.

All these causes were subsequently coded to other ill-defined and unspecified causes of mortality (R99) or other conditions originating in the perinatal period (P96), depending on the age of the deceased. If the deceased was aged 28 days or younger, the cause of death was finally reported as other conditions originating in the perinatal period (P96), while for ages greater than 28 days it was reported as other ill-defined and unspecified causes of mortality (R99).

More than half of the death notifications (51,6%) had one cause recorded, followed by 25,1% of death notification forms which had two causes of death recorded and 20,6% which had three causes recorded.

Table 4.1 – Number and percentage (%) distribution of death notification forms by the number of causes entered on the notification form, 2020

Number of the reported causes of death	Number of death notification forms	Percentage (%)
No cause	2 471	0,5
One cause	252 589	51,6
Two causes	123 014	25,1
Three causes	100 634	20,6
Four or more causes	11 036	2,3
Total	**489 744**	**100,0**

4.2 Method of ascertaining cause of death

The death notification form makes provision for a certifying official to indicate the method that was used to ascertain the cause of death. Table 4.2 shows the nine options available on the form for method used to ascertain the death.

With the exclusion of unspecified method of ascertainment, the opinion of the attending medical practitioner at 25,3% was the most common method of ascertaining causes of death. It was followed by the opinion of the attending medical practitioner on duty at 14,6% and interview of family member at 12,6%. Autopsy was performed in 8,8% of the deaths. There were 1,7% of forms that indicated that cause of death was ascertained through post mortem examination.

Table 4.2 – Number and percentage (%) distribution of deaths by method used to ascertain the cause of death, 2020

Method of ascertaining the cause of death	Number	Percentage (%)
Autopsy	42 912	8,8
Post mortem examination	8 479	1,7
Opinion of attending medical practitioner	123 899	25,3
Opinion of attending medical practitioner on duty	71 472	14,6
Opinion of registered professional nurse	4 943	1,0
Interview of family member	61 757	12,6
Other	4 527	0,9
Autopsy results may be available later*	14	0,0
Autopsy not performed	758	0,2
Unknown	1 191	0,2
Unspecified	169 792	34,7
Total deaths	**489 744**	**100,0**

*For perinatal deaths only

4.3 Main groups of the underlying causes of death

This section presents an overview of the underlying causes of death for main groups (chapters) of classification of causes of death. The ICD-10 classifies diseases and related health problems into 22 chapters, of which 19 are used in the reporting of information on underlying causes of death (see Table 4.3).

The chapters in the ICD excluded in this report are chapters 19, 21 and 22. These are discussed briefly below:

1. Chapter 19: *Injury, poisoning and certain other consequences of external causes (S00-T98)*. These codes are used to classify causes of death in other causes but not in the underlying causes.
2. Chapter 21: *Factors influencing health status and contact with health services (Z00-Z99)*. These are only used in morbidity coding.
3. Chapter 22: *Codes for special purpose*s. These codes are used by WHO for the provisional assignment of new diseases of uncertain aetiology. U51 and U52 were used for coding multidrug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB) in this release for individual causes of death, but were both recoded to the broad group of tuberculosis (A15-A19) in the analyses.

Stats SA adopted to include COVID-19 as part of the 22 chapters for the ease of analysis as well as aligning with other countries who have adopted similar approach. This is because the 2016 version of ICD-10 did not have COVID-19 as a chapter on the underlying causes of death.

Table 4.3 shows both the number and percentage distribution of deaths by the 19 main groups (chapters) of the classification of causes of death. The most common main group of causes of death in 2020 was *diseases of the circulatory system*, comprising 18,0% of all deaths. The second most common main group of causes of death was *symptoms and signs not elsewhere classified*, accounting for 16,5% of deaths. This main group consists mainly of information about various symptoms and signs that may not fit into other categories; for example, some common conditions under this group include abnormal heart sounds (R01) and abnormal blood chemistry (R79).

The third most reported main group of causes of death was *certain infectious and parasitic diseases*, accounting for almost 13,5% of deaths. The rest of the groups contributed less than 10,0% of deaths in 2020. Among these were *external causes of morbidity and mortality* (9,6%), *diseases of the respiratory system* (8,8%) and *neoplasms* (8,3%).

Table 4.3 – Distribution of deaths by main causes of death, 2020

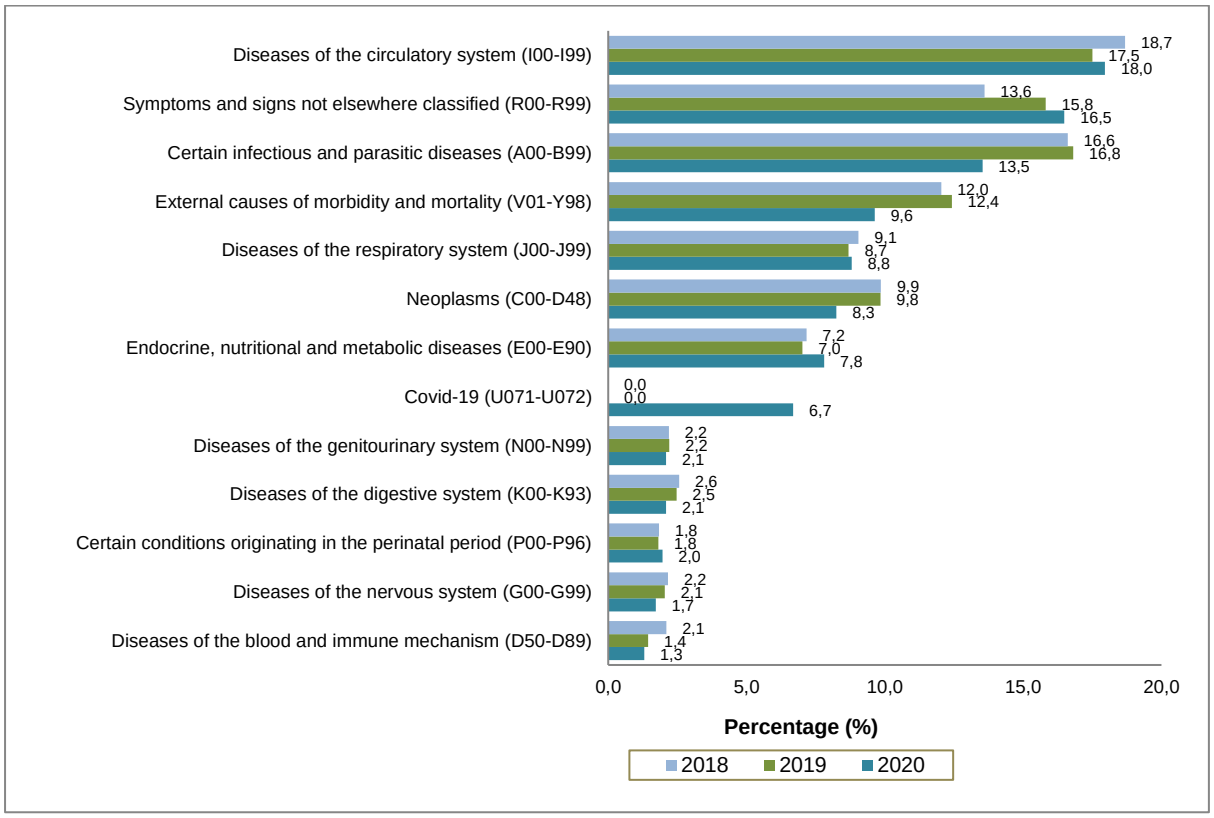
No.	Main groups of underlying causes of death (based on ICD-10)	Number	Percentage
9	Diseases of the circulatory system (I00-I99)	87 970	18,0
18	Symptoms and signs not elsewhere classified (R00-R99)	80 782	16,5
1	Certain infectious and parasitic diseases (A00-B99)*	66 243	13,5
20	External causes of morbidity and mortality (V01-Y98)	47 186	9,6
10	Diseases of the respiratory system (J00-J99)	43 098	8,8
2	Neoplasms (C00-D48)	40 396	8,3
4	Endocrine, nutritional and metabolic diseases (E00-E90)	38 231	7,8
	Covid-19 (U071-U072)	32 757	6,7
14	Diseases of the genitourinary system (N00-N99)	10 233	2,1
11	Diseases of the digestive system (K00-K93)	10 217	2,1
16	Certain conditions originating in the perinatal period (P00-P96)	9 602	2,0
6	Diseases of the nervous system (G00-G99)	8 426	1,7
3	Diseases of the blood and immune mechanism (D50-D89)	6 367	1,3
5	Mental and behavioural disorders (F00-F99)	2 882	0,6
17	Congenital malformations (Q00-Q99)	2 055	0,4
13	Diseases of the musculoskeletal system etc. (M00-M99)	1 678	0,3
12	Diseases of the skin and subcutaneous tissue (L00-L99)	1 013	0,2
15	Pregnancy, childbirth and puerperium (O00-O99)	565	0,1
8	Diseases of the ear and mastoid process (H60-H95)	28	0,0
7	Diseases of the eye and adnexa (H00-H59)	15	0,0
	Total	**489 744**	**100,0**

*Including deaths due to *MDR-TB* and *XDR-TB.*

A three-year (2018–2020) trend analysis on the distribution of deaths by selected main groups of causes of death was undertaken and the results are shown in Figure 4.1. It is observed that the rankings of the main groups of causes of death by year have remained more or less the same during the period 2018–2020. *Diseases of the circulatory system* were the most common causes of death for the three years and accounted for between 17,5% and 18,7% of deaths across the three years. It was also the main group that accounted for the biggest percentage increase from the previous two years. *Certain infectious and parasitic diseases* were the third most common group of underlying causes in 2020 (13,5%) down from 16,8% in 2019.

A slight and gradual decline in the reference years was observed for four main groups namely: *neoplasms, diseases of the digestive system, diseases of the nervous system* and *diseases of the blood and immune mechanisms*. Five main groups that contributed the least to the causes of death for the observed years, all under 3,0% throughout, are *diseases of the digestive system, certain conditions originating in the perinatal period, diseases of the genitourinary system, diseases of the nervous system* and *diseases of the blood and immune mechanisms.*

Figure 4.1 – Percentage (%) distribution of deaths by main groups of causes of death, 2018–2020*



*Including deaths due to *MDR-TB* and *XDR-TB*.
Data for 2018–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.

4.4 Natural and non-natural causes of death

The ICD-10 codebook classifies all causes of death from chapters 1 to 18 of the ICD-10 as natural causes and chapter 20 (V01-Y98) as non-natural causes. This section discusses both natural and non-natural causes of death. Non-natural causes of death comprise all deaths that were not attributable, or may not have been attributable to natural causes. Natural and non-natural causes of death information reported in this release was derived from the underlying causes of death based on specific causes of death recorded on the death notification form.

Table 4.4 shows that since 1999, the number of deaths due to natural causes were higher than the number of deaths due to non-natural causes. Between 1999 and 2006, there was a consistent increase in the number of natural deaths, after which a decline was observed until 2019 and increased again in 2020. Further, it can be observed that there was an inconsistent pattern in the number of deaths due to non-natural causes. However, the number of deaths due to non-natural causes has increased consistently between 2012 and 2020.

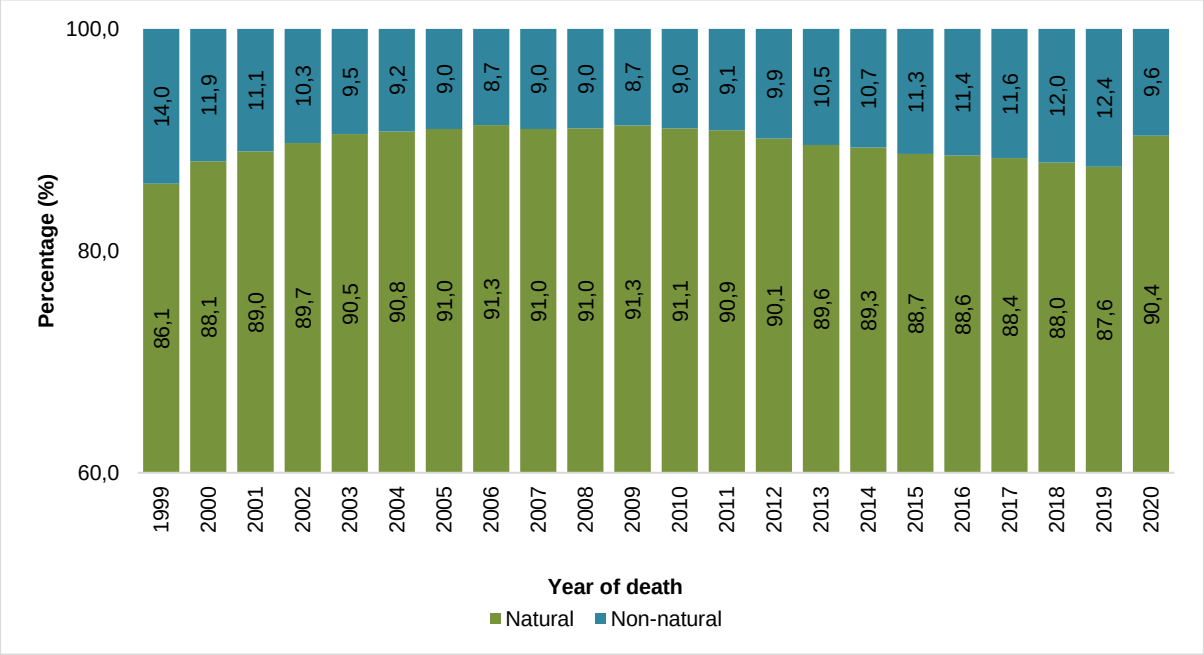
Table 4.4 – Number of natural and non-natural deaths by year of death occurrence, 1999–2020*

Year of death	Number of natural deaths	Number of non-natural deaths	Total
1999	329 504	53 409	**382 913**
2000	367 758	49 858	**417 616**
2001	406 202	50 447	**456 649**
2002	452 006	51 812	**503 818**
2003	505 882	52 977	**558 859**
2004	525 360	53 469	**578 829**
2005	545 939	54 081	**600 020**
2006	561 257	53 321	**614 578**
2007	551 941	54 664	**606 605**
2008	544 938	53 709	**598 647**
2009	533 553	50 895	**584 448**
2010	503 095	49 426	**552 521**
2011	471 815	47 434	**519 249**
2012	447 581	49 075	**496 656**
2013	428 353	49 964	**478 317**
2014	427 553	51 166	**478 719**
2015	422 366	53 571	**475 937**
2016	418 946	53 932	**472 878**
2017	412 917	54 419	**467 336**
2018	411 281	56 284	**467 565**
2019	406 014	57 604	**463 618**
2020	442 558	47 186	**489 744**

*Data for 1999–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.

Percentage distributions of natural and non-natural causes of death by year of death for the period 1999 to 2020 are shown in Figure 4.2. The pattern shows that the percentage of deaths due to natural causes was consistently above 85,0% each year. For non-natural causes of death, the pattern shows decreases in the proportion of deaths from 1999 to 2006. In 2007, the proportion of deaths due to non-natural causes increased to 9,0% and remained at this level in 2008, then declined to 8,7% in 2009. From 2010 to 2019, deaths due to non-natural causes increased steadily, although the levels were still lower than those observed in 1999 (14,0%). In 2020, deaths due to non-natural causes decreased to 9,6%.

Figure 4.2 – Percentage (%) distribution of natural and non-natural causes of death by year of death, 1999–2020*

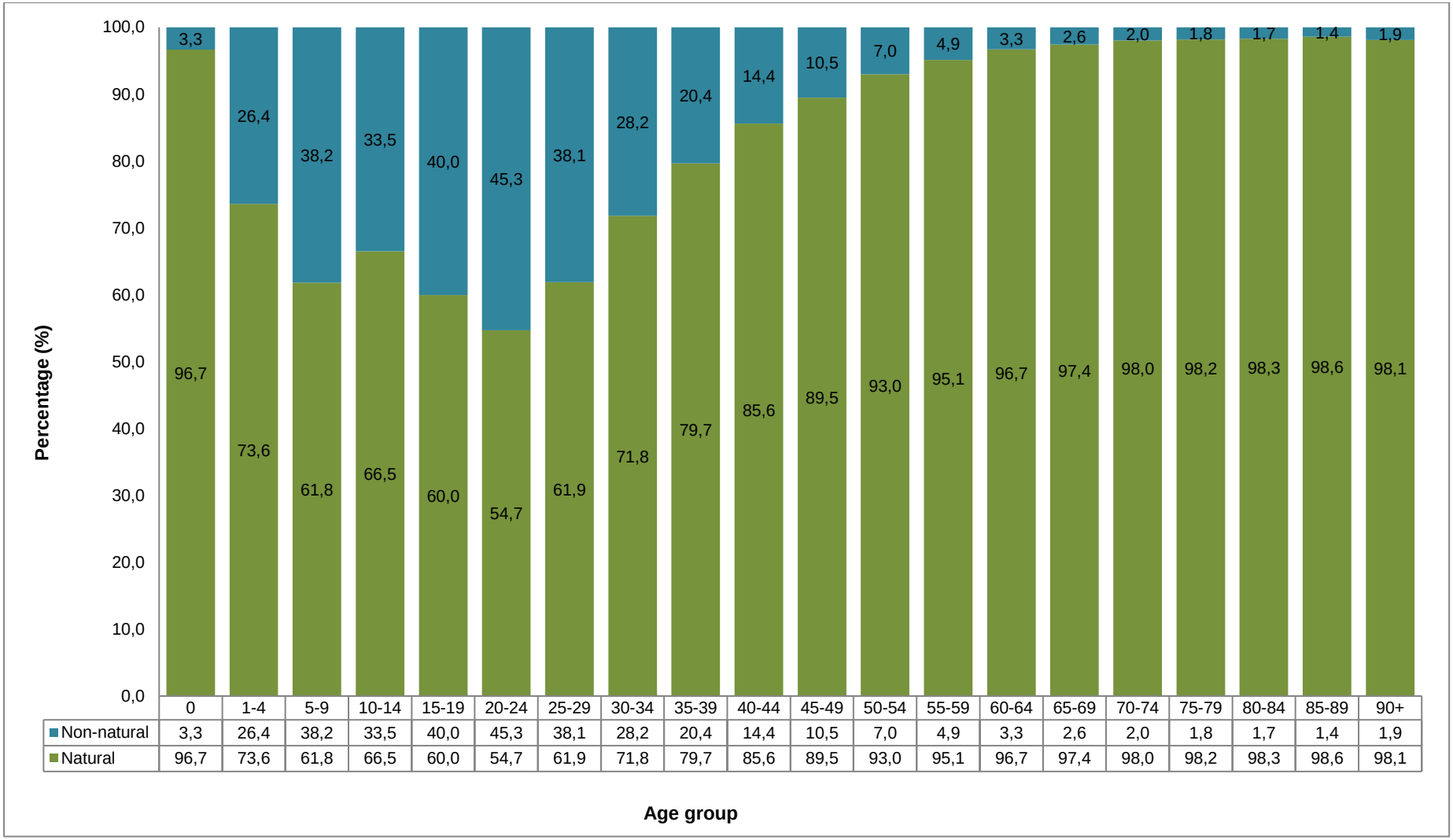


*Data for 1999–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.

4.4.1 Natural and non-natural causes of death by age

The percentage distribution of deaths due to natural and non-natural causes classified by age group for deaths that occurred in 2020 is provided in Figure 4.3. The general pattern observed that the proportion of deaths due to non-natural causes increases consistently from age 0 (3,3%) to age group 20–24 (45,3%), with the exception of age group 10–14 (33,5%), and decreased thereafter. Figure 4.3 also shows that the age group 20–24 (45,3%) was the age mostly affected by non-natural causes. Other ages with higher proportions (over 30,0%) of deaths due to non-natural causes were age groups 5–9 (38,2%), 10–14 (33,5%), 15–19 (40,0%), 20–24 (45,3%) and 25–29 (38,1%). Ages least affected by non-natural deaths were infancy (less than 0) and older ages (55 years and older) where less than 5,0% of the deaths in each of these age groups were due to non-natural causes of death. Over 90,0% of deaths occurring amongst individuals aged 50 and above, as well as age 0, were due to natural causes.

Figure 4.3 – Percentage (%) distribution of natural and non-natural causes of death by age, 2020



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Non-natural	3,3	26,4	38,2	33,5	40,0	45,3	38,1	28,2	20,4	14,4	10,5	7,0	4,9	3,3	2,6	2,0	1,8	1,7	1,4	1,9
Natural	96,7	73,6	61,8	66,5	60,0	54,7	61,9	71,8	79,7	85,6	89,5	93,0	95,1	96,7	97,4	98,0	98,2	98,3	98,6	98,1

4.5 Major groups of causes of death as per Global Burden of Disease

The Global Burden of Disease (GBD) Study is an all-inclusive program of disease burden that assesses mortality and disability from major diseases, injuries, and risk factors. It provides a comprehensive picture of mortality and disability across countries, time, age, and sex and is a landmark initiative that systematically quantifies the prevalence, morbidity, and mortality for hundreds of diseases, injuries, and risk factors of global health importance. This is a useful measure as countries can combine this type of evidence along with information about policies and their costs to decide how to set their health targets and interventions. GBD also makes comparisons across populations, enabling understanding of the changing health challenges facing people across the world.

The nineteen ICD-10 chapters used in the reporting of information on underlying causes of death can be further condensed into three groups of causes of death as per the Global Burden of Disease cause list:

Group I:

- communicable diseases (e.g., *tuberculosis, pneumonia, diarrhoea, malaria, measles*);
- maternal and perinatal causes (e.g*., maternal haemorrhage, birth trauma*); and
- nutritional conditions (e.g., *protein-energy malnutrition*).

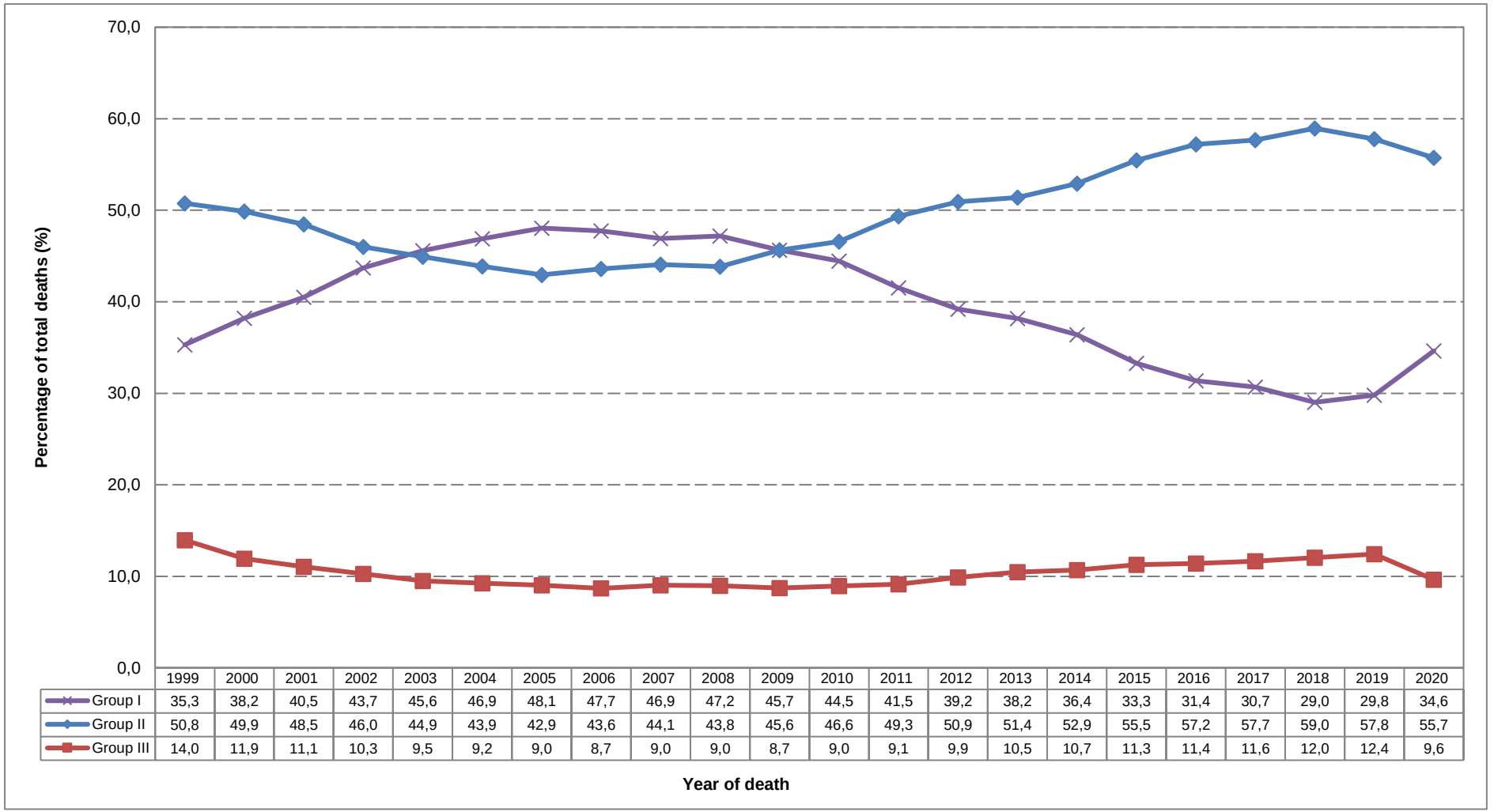
Group II: non-communicable diseases (e.g*., cancer, diabetes, heart disease* and *asthma*)

Group III: external causes of mortality (e.g., *accidents, homicide* and *suicide*)

Communicable diseases are diseases caused by pathogenic micro-organisms, such as bacteria, viruses, parasites or fungi and can be spread, directly or indirectly, from one person to another. These include, among other diseases, diarrhoea, tuberculosis and pneumonia. Non-communicable diseases are medical conditions or diseases that are non-infectious or non-transmissible among people. These diseases last for longer periods and progress slowly and include, among others, cancer, asthma and heart diseases. External causes of mortality are the non-natural causes of death which are discussed in Chapter 20 of the ICD-10.

The percentage distribution of deaths by group type and year of death are depicted in Figure 4.4. The pattern shows that before 2003, there were more deaths from non-communicable diseases relative to communicable diseases, although the gap narrowed over time. Starting from the year 2003 up to 2008, deaths due to communicable diseases surpassed non-communicable deaths. In 2009, there was an equal proportion of deaths due to communicable and non-communicable diseases. From 2010 to 2018, the gap between communicable and non-communicable diseases became wider with more deaths resulting from non-communicable diseases. The recent pattern (2019–2020) indicates a narrowing gap between communicable and non-communicable diseases.

Figure 4.4 – Percentage (%) of deaths due to communicable diseases (Group I), non-communicable diseases (Group II) and injuries (Group III) by year of death, 1999–2020*



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Group I	35,3	38,2	40,5	43,7	45,6	46,9	48,1	47,7	46,9	47,2	45,7	44,5	41,5	39,2	38,2	36,4	33,3	31,4	30,7	29,0	29,8	34,6
Group II	50,8	49,9	48,5	46,0	44,9	43,9	42,9	43,6	44,1	43,8	45,6	46,6	49,3	50,9	51,4	52,9	55,5	57,2	57,7	59,0	57,8	55,7
Group III	14,0	11,9	11,1	10,3	9,5	9,2	9,0	8,7	9,0	9,0	8,7	9,0	9,1	9,9	10,5	10,7	11,3	11,4	11,6	12,0	12,4	9,6

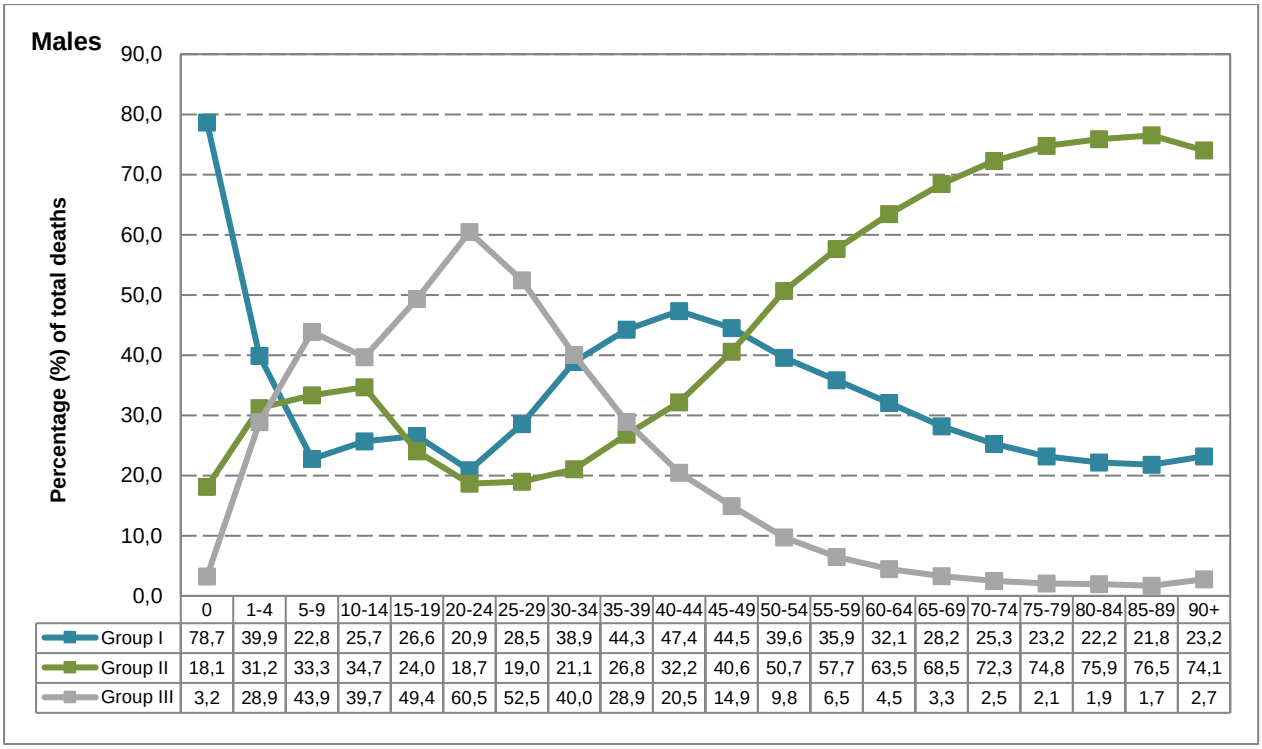
*Data for 1999–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.

Figure 4.5 shows the percentage distribution of causes of death by sex, group type and age group. For both sexes, the proportion of deaths due to communicable disease was high among children aged 0 years. Deaths due to communicable diseases peak again at ages 40–44 (47,4%) for males while it peaks again at ages 30–34 (58,6%) for females. The proportion of deaths due to communicable diseases declines gradually with age from the age of 45 for males and from the age of 35 for females.

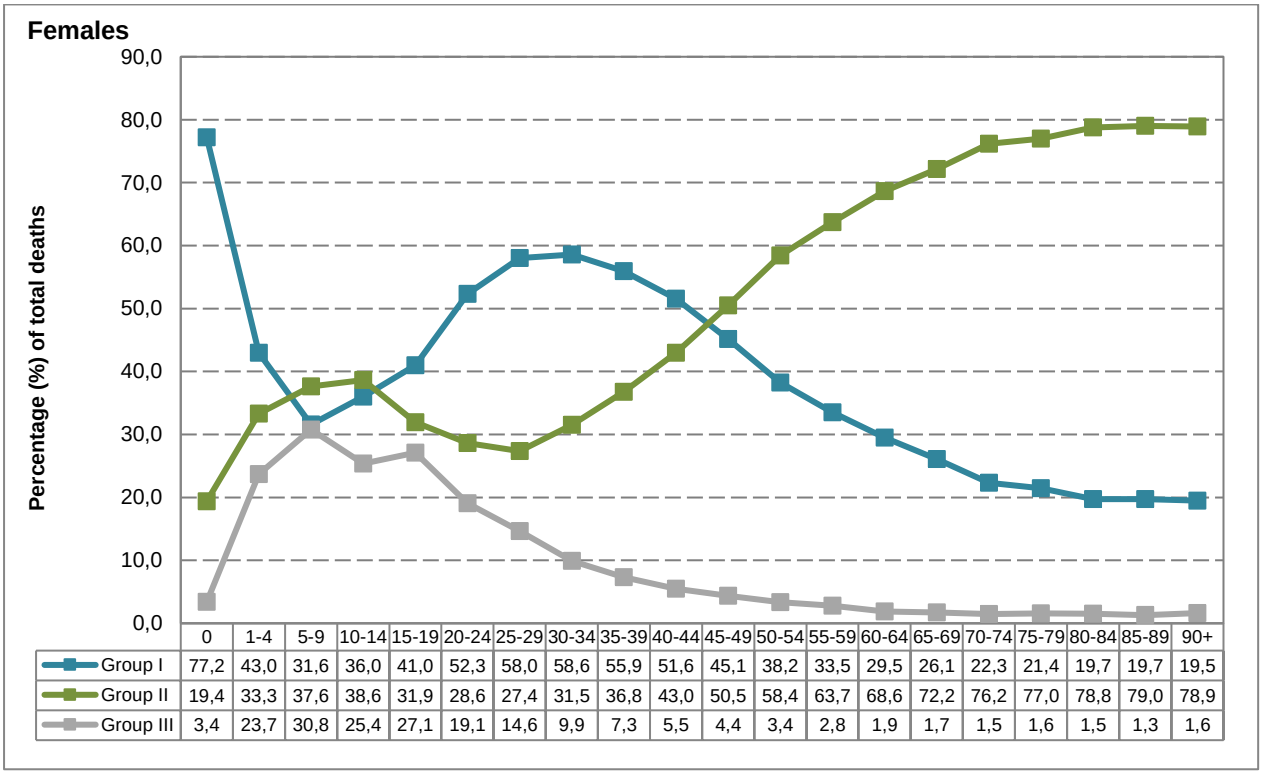
Deaths due to non-communicable diseases for females are lowest among children aged zero (19,4%), 25–29 (27,4%) and 20–24 (28,6%). While for males, deaths due to non-communicable diseases are lowest at the ages zero (18,1%), 20–24 (18,7%) and 25–29 (19,0%). Deaths due to non-communicable diseases for other age groups among females accounted for more than 30,0% of deaths. From the age of 25 for males and 30 for females, deaths due to non-communicable diseases continue to increase with age.

The proportion of deaths due to external causes of death was higher for males compared to females at all ages above age 1. For males, the proportion of deaths due to this group was particularly high at ages 20–24 where at least 60,5% of deaths due to external causes exceeded deaths due to other causes. The proportion of deaths due to injuries decreased steadily with age from the age of 25 for males, and from the age of 20 for females.

Figure 4.5 – Percentage (%) of deaths due to communicable diseases (Group I), non-communicable diseases (Group II) and injuries (Group III) by sex and age group, 2020*



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Group I	78,7	39,9	22,8	25,7	26,6	20,9	28,5	38,9	44,3	47,4	44,5	39,6	35,9	32,1	28,2	25,3	23,2	22,2	21,8	23,2
Group II	18,1	31,2	33,3	34,7	24,0	18,7	19,0	21,1	26,8	32,2	40,6	50,7	57,7	63,5	68,5	72,3	74,8	75,9	76,5	74,1
Group III	3,2	28,9	43,9	39,7	49,4	60,5	52,5	40,0	28,9	20,5	14,9	9,8	6,5	4,5	3,3	2,5	2,1	1,9	1,7	2,7



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Group I	77,2	43,0	31,6	36,0	41,0	52,3	58,0	58,6	55,9	51,6	45,1	38,2	33,5	29,5	26,1	22,3	21,4	19,7	19,7	19,5
Group II	19,4	33,3	37,6	38,6	31,9	28,6	27,4	31,5	36,8	43,0	50,5	58,4	63,7	68,6	72,2	76,2	77,0	78,8	79,0	78,9
Group III	3,4	23,7	30,8	25,4	27,1	19,1	14,6	9,9	7,3	5,5	4,4	3,4	2,8	1,9	1,7	1,5	1,6	1,5	1,3	1,6

4.6 Broad groups of natural causes of death

Information on the leading underlying natural causes of death for broad groups is presented in this subsection. The ten leading causes were identified by ranking the causes of death by the number of deaths among those eligible for ranking as described in Section 2 and excludes symptoms, signs and abnormal findings, not elsewhere classified as well as all non-natural deaths (external causes of morbidity and mortality). The top-ranking causes determine the leading underlying natural causes of death as it accounts for large numbers of deaths within a specified population and time period.

4.6.1 Overall pattern of the leading underlying natural causes of death

Table 4.5 shows the ten leading underlying natural causes of death in South Africa for the years 2018–2020. The years 2018 and 2019 have been included to show recent trends in natural causes of death. The table provides changes in the ten leading underlying causes of death by absolute numbers and percentages over the three-year period.

Table 4.5 shows that eight of the ten leading causes of death in 2020 were the same for the three-year period, although they differed in rank as well as proportions. The *COVID-19* pandemic first reached South Africa in 2020 and became the leading cause of death. *Diabetes mellitus* came in second as leading underlying causes of death. The most notable change in rank was for *tuberculosis,* which moved from being ranked first in 2018 (accounting for 6,1% of deaths), second in 2019 (5,5%) to sixth in 2020 (accounting for 4,0% of deaths).

For a list of deaths by all broad groups of causes of death ranked by frequency (including non-natural causes and symptoms and signs not elsewhere classified) for 2020, refer to Appendix K. The breakdown of individual causes for the broad groups that were among the ten leading causes in 2020 is provided in Appendix L.

Table 4.5 – The ten leading underlying natural causes of death, 2018–2020*

Causes of death (based on ICD-10)	2018			2019			2020		
	Rank	Number	%	Rank	Number	%	Rank	Number	%
Covid-19 (U071-U072)		...	...	...	...	...	1	32 757	6,7
Diabetes mellitus (E10-E14)	2	27 383	5,9	1	26 315	5,7	2	32 100	6,6
Cerebrovascular diseases (I60-I69)	3	23 509	5,0	3	23 247	5,0	3	27 066	5,5
Hypertensive diseases (I10-I15)	6	20 985	4,5	5	20 602	4,4	4	24 847	5,1
Influenza and pneumonia (J09-J18)	7	18 009	3,9	6	17 426	3,8	5	19 805	4,0
Tuberculosis (A15-A19)**	1	28 316	6,1	2	25 409	5,5	6	19 757	4,0
Human immunodeficiency virus [HIV] disease (B20-B24)	5	22 533	4,8	4	22 128	4,8	7	19 382	4,0
Ischaemic heart diseases (I20-I25)	8	13 863	3,0	7	15 969	3,4	8	15 759	3,2
Other forms of heart disease (I30-I52)	4	23 301	5,0	8	15 777	3,4	9	15 057	3,1
Other viral diseases (B25-B34)	...	...	…	9	13 257	2,9	10	12 434	2,5
Chronic lower respiratory diseases (J40-J47)	9	13 825	3,0	10	12 384	2,7	…	...	...
Malignant neoplasms of digestive organs (C15-C26)	10	11 061	2,4	...	...	...	...	...	...
Other Natural		208 496	44,6		213 500	46,1		223 594	45,7
Non-natural		56 284	12,0		57 604	12,4		47 186	9,6
Total		**467 565**	**100,0**		**463 618**	**100,0**		**489 744**	**100,0**

*Data from 2018–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024
**Including deaths due to MDR-TB and XDR-TB.
… Category not in top ten.

4.6.2 Leading underlying natural causes of death by sex

The distribution of the ten leading underlying natural causes of death by sex in 2020 is shown in Table 4.6 and indicates different patterns of underlying natural causes between males and females. The ten leading causes of male deaths contributed 41,5% of all male deaths while for females they contributed 48,3% of all deaths. All ten leading causes of death were the same for both sexes, with only two sharing the same rank.

COVID-19 was the leading cause of death among males at 6,4%, while it ranked second for females at 7,0%. However, more females (16 793) died from *COVID-19* than males (15 913). Among females, *diabetes mellitus* was the leading cause of death accounting for 8,2% of deaths, while *hypertensive diseases* at 6,5%, ranked third. *Diabetes mellitus* was the second leading cause of death accounting for 5,0% of deaths followed by *tuberculosis* accounting for 4,9% male deaths. *Cerebrovascular diseases* ranked fourth and *other viral diseases* ranked tenth for both males and females.

Table 4.6 – The ten leading underlying causes of death for males and females, 2020*

Causes of death (based on ICD-10)	Male			Female		
	Rank	Number	%	Rank	Number	%
Covid-19 (U071-U072)	1	15 913	6,4	2	16 793	7,0
Diabetes mellitus (E10-E14)	2	12 518	5,0	1	19 545	8,2
Tuberculosis (A15-A19)	3	12 305	4,9	8	7 357	3,1
Cerebrovascular diseases (I60-I69)	4	11 697	4,7	4	15 315	6,4
Influenza and pneumonia (J09-J18)	5	10 148	4,1	6	9 578	4,0
Human immunodeficiency virus [HIV] disease (B20-B24)	6	9 606	3,9	5	9 697	4,1
Hypertensive diseases (I10-I15)	7	9 210	3,7	3	15 606	6,5
Ischaemic heart diseases (I20-I25)	8	8 703	3,5	9	7 033	3,0
Other forms of heart disease (I30-I52)	9	6 919	2,8	7	8 112	3,4
Other viral diseases (B25-B34)	10	6 119	2,5	10	6 257	2,6
Other Natural		109 588	44,0		113 075	47,4
Non-natural		36 606	14,7		9 982	4,2
Total		**249 332**	**100,0**		**238 350**	**100,0**

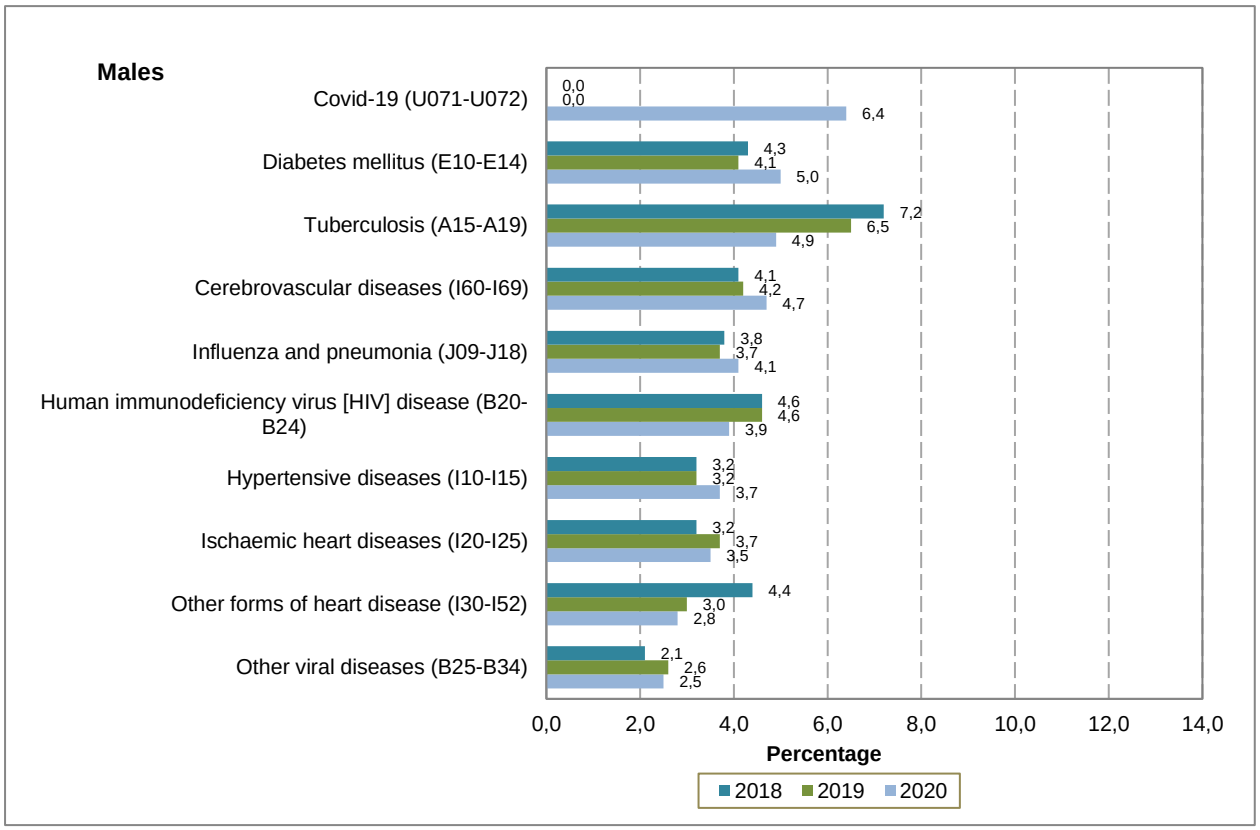
* Excluding deaths with unspecified sex.
**Including deaths due to *MDR-TB* and *XDR-TB*.

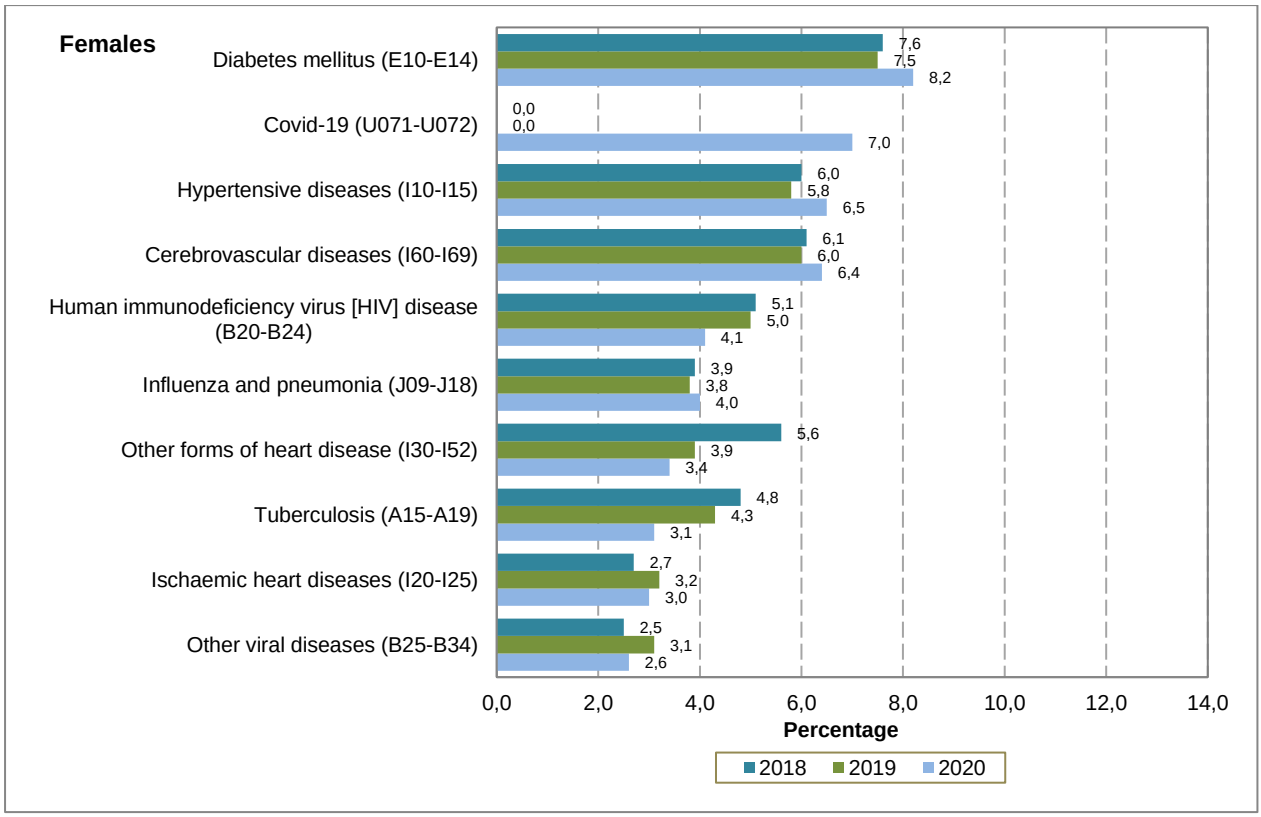
The percentage distribution of deaths associated with the ten leading causes of death classified by sex for the period 2018–2020 is shown in Figure 4.6. Among males, deaths due to *COVID-19*, which were first observed in 2020, ranked first. *Cerebrovascular diseases* continued to increase over the years. On the other hand, deaths due to *tuberculosis* decreased over the years from 7,2% in 2018 to 4,9% in 2020.

Among females, *diabetes mellitus* remained the leading cause of death over the three years. It is noteworthy that in 2020, *diabetes mellitus* increased to 8,2%, the highest in the three years and all causes of death recorded for both males and females during the reference period. *COVID-19* ranked as the second underlying cause of death for women. *Tuberculosis, other forms of heart disease* and *human immunodeficiency virus* continued to decline for females in 2020.

The main similarity between males and females is that there was a decline in the proportion of deaths due to *tuberculosis, other forms of heart disease* and *HIV diseases* in 2020 compared to the previous two years.

Figure 4.6 – Distribution of deaths for the leading causes of death by year of death and sex, 2018-2020





*(1) Data for 2018–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.
(2) Including deaths due to *MDR-TB* and *XDR-TB*.

4.6.3 Leading underlying natural causes of death by age

Analysis of the broad age groups (0, 1–14, 15–44, 45–64, and 65 and older) is recommended by the World Health Organization for classifying ages for international comparison (WHO, 2009). Table 4.7 shows the ten leading underlying natural causes of death for these age groups. Further decomposition of age and leading underlying natural causes of death are provided in Tables 4.8 (under 5 years) and 4.9 (15–24 years).

Influenza and pneumonia was the only underlying cause of death common for all age groups, although the ranking varied greatly by age. For example, deaths due to *influenza and pneumonia* were the fifth leading underlying cause of death for age zero (5,0%), second for age group 1–14 (4,7%), fifth for age group 15–44 (3,3%) and seventh for age group 45–64 (3,7%) and sixth for age group 65 and older (4,5%). *Other forms of heart diseases* were part of the ten underlying causes of death in all age groups, except infants. *Hypertensive diseases* and *ischaemic heart disease* were among the ten leading underlying causes of death only for those aged 45 and older.

The leading underlying cause of death for infant deaths (age zero) was *respiratory and cardiovascular disorders specific to the perinatal period*, responsible for 14,9% of deaths at this age. *Other disorders originating in the perinatal period* was the second leading cause of death, accounting for 9,4% of deaths. *Disorders related to length of gestation and foetal growth*, which constituted 8,1% of deaths in this age group, was the third leading cause of death. *Intestinal infectious diseases* and *other bacterial diseases* were in the top 10 leading underlying causes for age groups zero and 1–14 years. *Intestinal infectious diseases* which ranked first for deaths of children aged 1–14 responsible for 5,3% ranked sixth for infants at 4,8%.

The second leading underlying cause of death for age group 1–14 was *influenza and pneumonia*, responsible for 4,7% of deaths in this age group, followed by *tuberculosis* with 2,6% of deaths. M*alnutrition* (2,4%) was the fourth leading cause of death, followed by *Cerebral palsy and other paralytic syndromes* (2,1%).

The leading underlying cause of death for the age group 15–44 was *human immunodeficiency virus* [HIV] diseases, constituting 9,6% of deaths, followed by *tuberculosis,* accounting for 8,1% of deaths. *Other viral diseases* ranked third, accounting for 5,8% of deaths. *COVID-19* ranked fourth with 3,4% of deaths and *Influenza and pneumonia* ranked fifth at 3,3%.

Seven of the ten leading causes of death for those aged 45–64 and 65 and older were the same, with differences in rank and the contribution of each cause to the overall number of deaths in each age group. While *COVID-19* was the leading cause of death among those aged 45–64, contributing 9,5% of deaths in this age group, it was the fourth leading cause of death among those aged 65 and older, accounting for 7,5% of deaths. Conversely, *diabetes mellitus* was the leading cause of death for those aged 65 and older (9,4%) but was the second leading underlying cause of death for those aged 45–64 (7,9%).

The six underlying causes of death were not common between the two groups. *Tuberculosis*, *human immunodeficiency virus* and *other viral diseases* were on the ten leading causes of death for age group 45–64 and not for the age group 65 and older. While *renal failure*, *chronic lower respiratory diseases* as well as *malignant neoplasms of digestive organs* were on the ten leading causes of death for the 65 years and older age group, and were not listed for the 45–64 age group. It is worth noting that the ten leading causes of death in these age groups are dominated by non-communicable diseases and the only exceptions were *COVID-19*, *tuberculosis, human immunodeficiency virus*, and *influenza and pneumonia*, which are communicable diseases.

Table 4.7 – The ten leading underlying natural causes of death for broad age groups, 2020

Causes of death (based on ICD-10)	0			1–14			15–44			45–64			65+		
	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	3 010	14,9	...	...	...	...	...	...	...	...	...	...	...	...
Other disorders originating in the perinatal period (P90-P96)	2	1 896	9,4	...	...	...	...	...	...	...	...	...	...	...	...
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 626	8,1	...	...	...	...	...	...	...	...	...	...	...	...
Infections specific to the perinatal period (P35-P39)	4	1 460	7,2	...	...	...	...	...	...	...	...	...	...	...	...
Influenza and pneumonia (J09-J18)	5	1 012	5,0	2	488	4,7	5	3 804	3,3	7	5 389	3,7	6	9 112	4,5
Intestinal infectious diseases (A00-A09)	6	973	4,8	1	543	5,3	...	...	...	...	...	...	...	...	...
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	7	806	4,0	...	...	...	...	...	...	...	...	...	...	...	...
Other bacterial diseases (A30-A49)	8	500	2,5	9	181	1,8	...	...	...	...	...	...	...	...	...
Congenital malformations of the circulatory system (Q20-Q28)	9	483	2,4	...	...	...	...	...	...	...	...	...	...	...	...
Other congenital malformations (Q80-Q89)	10	379	1,9	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis (A15-A19)	…	…	…	3	263	2,6	2	9 281	8,1	3	7 043	4,9	...	...	...
Malnutrition (E40-E46)	…	…	…	4	250	2,4	...	...	...	...	...	...	...	...	...
Cerebral palsy and other paralytic syndromes (G80-G83)	…	…	…	5	221	2,1	...	...	...	...	...	...	...	...	...
Other forms of heart disease (I30-I52)	…	…	…	6	202	2,0	6	1 899	1,7	10	4 112	2,9	7	8 711	4,3
Episodic and paroxysmal disorders (G40-G47)	…	…	…	7	196	1,9	...	...	...	...	...	...	...	...	...
Human immunodeficiency virus [HIV] disease (B20-B24)	…	…	…	8	184	1,8	1	11 008	9,6	5	6 791	4,7	...	...	...
Metabolic disorders (E70-E90)	…	…	…	10	163	1,6	...	...	...	...	...	...	...	...	...
Other viral diseases (B25-B34)	…	…	…	...	...	...	3	6 606	5,8	9	4 544	3,2	...	...	...
Covid-19 (U071-U072)	…	…	…	...	...	...	4	3 907	3,4	1	13 593	9,5	4	15 113	7,5
Certain disorders involving the immune mechanism (D80-D89)	…	…	…	...	...	...	7	1 893	1,7	...	...	...	...	...	...
Cerebrovascular diseases (I60-I69)	…	…	…	...	...	...	8	1 802	1,6	4	7 010	4,9	2	18 109	9,0
Diabetes mellitus (E10-E14)	…	…	…	...	...	...	9	1 729	1,5	2	11 419	7,9	1	18 891	9,4
Renal failure (N17-N19)	…	…	…	...	...	...	10	1 507	1,3	...	...	...	10	4 102	2,0
Hypertensive diseases (I10-I15)	…	…	…	...	...	...	...	...	...	6	6 309	4,4	3	17 330	8,6
Ischaemic heart diseases (I20-I25)	…	…	…	...	...	...	...	...	...	8	4 912	3,4	5	9 819	4,9
Chronic lower respiratory diseases (J40-J47)	…	…	…	...	...	...	...	...	...	...	...	...	8	5 907	2,9
Malignant neoplasms of digestive organs (C15-C26)	…	…	…	...	...	...	...	...	...	...	...	...	9	4 813	2,4
Other Natural		7 348	36,4		4 419	42,9		40 067	35,1		64 049	44,6		85 374	42,4
Non-natural		669	3,3		3 200	31,0		30 780	26,9		8 591	6,0		3 946	2,0
Total		**20 162**	**100,0**		**10 310**	**100,0**		**114 283**	**100,0**		**143 762**	**100,0**		**201 227**	**100,0**

*Including deaths due to *MDR-TB* and *XDR-TB*

4.6.4 Leading underlying natural causes of death for children aged below five years by age groups

The ten leading causes of death for neonatal deaths (infants that died within the first 28 days of life [neonates]), post-neonatal deaths (29 days to 11 months [post-neonatal]), all infant deaths (aged less than one year), and deaths among those aged 1–4 are shown in Table 4.8.

Table 4.8 shows that there was no common underlying cause of death for all age groups. Additionally, apart from *congenital malformations of the circulatory system* and *chromosomal abnormalities, not elsewhere classified,* there were no overlapping leading underlying causes of death for those who died during the neonatal and post-neonatal periods. There were three common underlying causes of death for deaths occurring from 29 days and older to under five years of life: *influenza and pneumonia, intestinal infectious diseases, malnutrition* and *other bacterial diseases*. Their contribution towards deaths within their age groups varied.

Neonatal deaths mainly resulted from *respiratory and cardiovascular disorders specific to the perinatal period*, which was responsible for 26,7% of deaths. The second leading underlying cause of death for neonatal deaths was *other disorders originating in the perinatal period* (17,0%), followed by *disorders related to length of gestation and fetal growth* (13,6%) and *infections specific to the perinatal period,* responsible for 12,8% of deaths in this age group. The ten leading underlying causes of death during the neonatal period constituted 89,8% of deaths in this age group.

The leading cause of death for those who died during the post-neonatal period was *influenza and pneumonia* (11,0%), followed by *intestinal infectious diseases* (10,3%) and *other bacterial diseases* (4,6%). These three causes were the highest contributors of post-neonatal deaths, accounting for just over a quarter (26,0%) of deaths occurring during this period. *Malnutrition* (3,2%) was the fourth leading cause of death, and *metabolic disorders* (2,6%) was the fifth.

Overall, for infants (less than one year), the leading underlying cause of deaths was *respiratory and cardiovascular disorders specific to the perinatal period* (14,9%). *Other disorders originating in the perinatal period* (9,4%) was ranked second. *Disorders related to length of gestation and fetal growth* (8,1*%), infections specific to the perinatal period* (7,2%) and *influenza and pneumonia* (5,0%) were ranked third, fourth and fifth, respectively.

The three leading causes of death for those aged 1–4 were *intestinal infectious diseases* (7,7%), *influenza and pneumonia* (5,6%) and *malnutrition* (4,4%). *Metabolic disorders* (2,4%) was the fourth leading cause of death while *tuberculosis* (1,9%) was the fifth leading cause of death.

For those under five years, *respiratory and cardiovascular disorders specific to the perinatal period* was the leading underlying cause of death responsible for 11,9% of deaths, followed by *other disorders originating in the perinatal period* (7,5%) and *disorders related to length of gestation and fetal growth* which accounted for 6,4% of deaths in this age group*. Infections specific to the perinatal period* was ranked the fourth leading underlying cause of death among the under-5 mortality, responsible for 5,8% of deaths.

Table 4.8 – The ten underlying natural causes of death for infants and children aged below five years, 2020

Causes of death (based on ICD-10)	Neonatal (0-28 days)			Post-neonatal (29 days to 11 months)			Less than 1 year			1-4 years			Under 5 years		
	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%
Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	1	2 967	26,7	…	…	…	1	3 010	14,9	…	…	…	1	3 014	11,9
Other disorders originating in the perinatal period (P90-P96)	2	1 891	17,0	…	…	…	2	1 896	9,4	…	…	…	2	1 897	7,5
Disorders related to length of gestation and fetal growth (P05-P08)	3	1 506	13,6	…	…	…	3	1 626	8,1	…	…	…	3	1 628	6,4
Infections specific to the perinatal period (P35-P39)	4	1 416	12,8	…	…	…	4	1 460	7,2	…	…	…	4	1 461	5,8
Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery (P00-P04)	5	801	7,2	…	…	…	7	806	4,0	…	…	…	7	809	3,2
Haemorrhagic and haematological disorders of fetus and newborn (P50-P61)	6	333	3,0	…	…	…	…	…	…	…	…	…	…	…	…
Digestive system disorders of fetus and newborn (P75-P78)	7	316	2,8	…	…	…	…	…	…	…	…	…	…	…	…
Other congenital malformations (Q80-Q89)	8	314	2,8	…	…	…	10	379	1,9	…	…	…	…	…	…
Congenital malformations of the circulatory system (Q20-Q28)	9	254	2,3	6	229	2,5	9	483	2,4	…	…	…	9	539	2,1
Chromosomal abnormalities, not elsewhere classified (Q90-Q99)	10	173	1,6	10	132	1,5	…	…	…	…	…	…	…	…	…
Influenza and pneumonia (J09-J18)	…	…	…	1	997	11,0	5	1 012	5,0	2	287	5,6	6	1 299	5,1
Intestinal infectious diseases (A00-A09)	…	…	…	2	937	10,3	6	973	4,8	1	395	7,7	5	1 368	5,4
Other bacterial diseases (A30-A49)	…	…	…	3	420	4,6	8	500	2,5	7	96	1,9	8	596	2,4
Malnutrition (E40-E46)	…	…	…	4	289	3,2	…	…	…	3	227	4,4	10	526	2,1
Metabolic disorders (E70-E90)	…	…	…	5	240	2,6	…	…	…	4	124	2,4	…	…	…
Other acute lower respiratory infections (J20-J22)	…	…	…	7	227	2,5	…	…	…	…	…	…	…	…	…
Other diseases of the respiratory system (J95-J99)	…	…	…	8	166	1,8	…	…	…	8	83	1,6	…	…	…
Other viral diseases (B25-B34)	…	…	…	9	138	1,5	…	…	…	…	…	…	…	…	…
Tuberculosis (A15-A19)	…	…	…	…	…	…	…	…	…	5	99	1,9	…	…	…
Other forms of heart disease (I30-I52)	…	…	…	…	…	…	…	…	…	6	97	1,9	…	…	…
Human immunodeficiency virus [HIV] disease (B20-B24)	…	…	…	…	…	…	…	…	…	9	76	1,5	…	…	…
Episodic and paroxysmal disorders (G40-G47)	…	…	…	…	…	…	…	…	…	10	74	1,4	…	…	…
Other Natural		1 035	9,3		4 712	52,0		7 348	36,4		2 217	43,2		10 131	40,1
Non-natural		94	0,8		575	6,3		669	3,3		1 355	26,4		2 024	8,0
Total		**11 100**	**100,0**		**9 119**	**100,0**		**20 162**	**100,0**		**5 130**	**100,0**		**25 292**	**100,0**

* Including deaths due to *MDR-TB* and *XDR-TB*

4.6.5 Leading underlying natural causes of death for the population aged 15–24 years

According to the WHO recommendations, the 15–24 age group must also be included in the analysis for international comparison (WHO, 1992). This analysis is provided in Table 4.9. In 2020, *tuberculosis* was the leading cause of death for those aged 15–24, accounting for 5,9% of deaths, followed by *human immunodeficiency virus* [HIV] disease (5,6%) and *other viral diseases* (3,6%). *Influenza and pneumonia, episodic and paroxysmal disorders* and o*ther forms of heart disease* were the fourth, fifth and sixth leading causes of death, respectively. The ten leading causes of death in this age group contributed just over a quarter (25,2%) of deaths in this age group.

Table 4.9 – The ten leading underlying causes of death for the population aged 15–24 years, 2020

Causes of death (based on ICD-10)	15-24		
	Rank	Number	Percentage (%)
Tuberculosis (A15-A19)	1	1 016	5,9
Human immunodeficiency virus [HIV] disease (B20-B24)	2	956	5,6
Other viral diseases (B25-B34)	3	613	3,6
Influenza and pneumonia (J09-J18)	4	450	2,6
Episodic and paroxysmal disorders (G40-G47)	5	258	1,5
Other forms of heart disease (I30-I52)	6	257	1,5
Covid-19 (U071-U072)	7	247	1,4
Certain disorders involving the immune mechanism (D80-D89)	8	185	1,1
Other bacterial diseases (A30-A49)	9	171	1,0
Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue (C81-C96)	10	170	1,0
Other Natural		5 361	31,3
Non-natural		7 465	43,5
All Causes		**17 149**	**100,0**

* Including deaths due to *MDR-TB* and *XDR-TB*.

4.6.6 Leading underlying natural causes of death by province of death occurrence

This section looks at province-level variations in mortality and causes of death. Table 4.10 shows the provincial variations in the ranking of the ten leading underlying causes of death for 2020. Across the nine provinces, *COVID-19* was a leading underlying cause of death in Western Cape (11,2%), Eastern Cape (9,4%), Gauteng (7,0%) and Free State (6,8%). Whilst *diabetes mellitus* was the leading cause of death in Kwa-Zulu Natal (7,4%), Limpopo (7,2%) and Mpumalanga (6,6%), and *hypertensive diseases* was leading in North West (6,5%) and Northern Cape (6,2%).

Five underlying causes of death were common in all nine provinces, namely *diabetes mellitus, cerebrovascular diseases, HIV disease, hypertensive diseases* and *tuberculosis*. However, the ranks of these causes of death differed between provinces. For example, *diabetes mellitus* ranked first in Kwa-Zulu Natal, Limpopo and Mpumalanga. It ranked second in Western Cape, Eastern Cape, North West and Gauteng.

Mpumalanga (2,5%) and North West (3,4%) had the lowest proportions of *COVID-19* deaths, ranking tenth and ninth in the respective provinces. The proportion of deaths due to *tuberculosis* were high in the Eastern Cape with 5,3% of deaths in the province, followed by the Northern Cape with and the North West province with 4,8% of deaths. It had the lowest proportions of deaths in Gauteng (2,8%), Western Cape (3,4%) and the Free State (3,6%). In all three provinces, *tuberculosis* ranked eighth. Proportions of deaths due to *HIV disease* ranked second as the leading cause of death (5,8%) in Northern Cape and fifth in both Free State (5,4%) and Western Cape (5,2%).

Western Cape was the only province where *malignant neoplasms of digestive organs* (3,8%) and *malignant neoplasms of respiratory and intrathoracic organs* (3,3%) were in the top ten leading underlying causes of death. It was also the only province where *influenza and pneumonia* were not on the ten leading underlying causes of death. Only Limpopo had *renal failure* (2,2%) and *intestinal infectious diseases* (2,0%) in the top ten leading underlying causes of death, ranking ninth and tenth respectively.

Detailed information on the distribution of the ten leading underlying causes by province, sex and age is provided in Appendices M to M9.

Table 4.10 – The ten leading underlying natural causes of death in each province of death occurrence, 2020*

Causes of death (based on ICD-10)	Western Cape			Eastern Cape			Northern Cape			Free State			KwaZulu-Natal			North West			Gauteng			Mpumalanga			Limpopo		
	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%
Covid-19 (U071-U072)	1	6 217	11,2	1	7 331	9,4	5	769	5,1	1	2 163	6,8	2	6 116	6,5	9	1 057	3,4	1	7 521	7,0	10	753	2,5	...	...	...
Diabetes mellitus (E10-E14)	2	4 244	7,6	2	5 679	7,3	4	788	5,3	3	1 982	6,2	1	6 968	7,4	2	1 739	5,5	2	5 463	5,1	1	1 975	6,6	1	3 234	7,2
Ischaemic heart diseases (I20-I25)	3	3 802	6,8	...	...	...	8	523	3,5	10	769	2,4	8	2 939	3,1	...	...	...	6	3 840	3,6	8	1 079	3,6	...	...	...
Cerebrovascular diseases (I60-I69)	4	3 228	5,8	5	4 131	5,3	3	853	5,7	4	1 773	5,6	3	5 734	6,1	3	1 547	4,9	3	5 089	4,7	2	1 769	5,9	2	2 921	6,5
Human immunodeficiency virus [HIV] disease (B20-B24)	5	2 907	5,2	6	3 444	4,4	2	872	5,8	5	1 712	5,4	6	3 765	4,0	7	1 232	3,9	9	2 514	2,3	6	1 211	4,1	6	1 712	3,8
Hypertensive diseases (I10-I15)	6	2 641	4,7	3	4 673	6,0	1	923	6,2	2	2 148	6,8	5	4 046	4,3	1	2 041	6,5	5	4 322	4,0	4	1 465	4,9	4	2 560	5,7
Malignant neoplasms of digestive organs (C15-C26)	7	2 091	3,8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis (A15-A19)	8	1 882	3,4	4	4 148	5,3	6	723	4,8	8	1 135	3,6	4	4 216	4,4	4	1 508	4,8	8	2 992	2,8	5	1 307	4,4	5	1 832	4,1
Malignant neoplasms of respiratory and intrathoracic organs (C30-C39)	9	1 850	3,3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chronic lower respiratory diseases (J40-J47)	10	1 758	3,2	8	2 359	3,0	9	452	3,0	...	...	...	...	...	...	10	617	2,0	...	...	...	...	...	...	...	...	...
Influenza and pneumonia (J09-J18)	...	...	...	7	2 843	3,6	7	627	4,2	6	1 686	5,3	7	3 107	3,3	5	1 386	4,4	4	4 477	4,1	3	1 600	5,4	3	2 837	6,3
Other forms of heart disease (I30-I52)	...	...	...	9	2 048	2,6	...	...	...	7	1 255	4,0	9	2 886	3,0	8	1 081	3,4	7	3 687	3,4	9	1 022	3,4	8	1 255	2,8
Other viral diseases (B25-B34)	...	...	...	10	1 763	2,3	10	439	2,9	9	930	2,9	10	2 358	2,5	6	1 267	4,0	10	2 475	2,3	7	1 086	3,6	7	1 610	3,6
Renal failure (N17-N19)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	1 003	2,2
Intestinal infectious diseases (A00-A09)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	901	2,0
Other Natural		19 203	34,5		32 588	41,7		6 770	45,3		13 551	42,7		41 976	44,3		15 291	48,8		54 863	50,8		13 722	45,9		21 344	47,7
Non-natural		5 872	10,5		7 060	9,0		1 201	8,0		2 630	8,3		10 654	11,2		2 585	8,2		10 656	9,9		2 884	9,7		3 503	7,8
All causes		**55 695**	**100,0**		**78 067**	**100,0**		**14 940**	**100,0**		**31 734**	**100,0**		**94 765**	**100,0**		**31 351**	**100,0**		**107 899**	**100,0**		**29 873**	**100,0**		**44 712**	**100,0**

* Including deaths due to *MDR-TB* and *XDR-TB*.

4.6.7 Underlying causes of death by district/metropolitan municipality of death occurrence

4.6.7.1 Main group

The main groups of underlying natural causes of death by district/metropolitan municipalities are provided in Appendices N to O2. The number of deaths by main groups of causes of death for each district/metropolitan municipality of death occurrence are provided in Appendices N, while Appendices O show the main groups of causes of death for each district/metropolitan municipality of death occurrence by their percentage distribution. Information at a geographic level lower than district is not provided in this release; however, it is available on request from Stats SA.

4.6.7.2 Broad groups

Appendix P shows information on the ten leading natural causes of death by district/metropolitan municipality.

4.6.7.3 Underlying natural causes of death by population group

Due to a large proportion of unknown or unspecified cases, the ten leading underlying natural causes of death by population group are not discussed in this section. The discussion and distribution of underlying causes of death by population group are provided in appendices Q and Q.1.

4.7 Non-natural causes of death

The focus of this subsection is on non-natural causes of death. Information on non-natural causes of death is important in South Africa, considering the high levels of violence experienced in the country. This section profiles non-natural causes of death based on all external causes of morbidity and mortality (V01-Y98) derived from the causes of death specified on the death notification forms.

On the death notification form, where insufficient details are provided to code the non-natural cause of death accurately, Stats SA codes such deaths as *other external causes of accidental injury* or *event of undetermined intent* in line with the recommendations of WHO in classifying unknown non-natural causes of death (WHO, 2009b). This therefore contributes to the high percentage of unspecified causes of non-natural deaths. Results therefore on non-natural causes of death should therefore be interpreted mindful of the fact that nearly three-quarters of non-natural causes of death were not adequately classified. The unexpected lower number of deaths due to transport accidents, assault, complications of medical and surgical care, intentional self-harm or sequelae of external causes of morbidity and mortality may have been partly the result of causes classified as other external causes of accidental injury or event of undetermined intent.

Table 4.11 shows the number and percentage distribution of broad groups of non-natural causes of death. A proportion of 9,6% (refer to Table 4.3) of all deaths that occurred in 2020 were due to external causes of morbidity and mortality. It is observed that the majority of non-natural causes of death resulted from *other external causes of accidental injury* (70,8%). In terms of all deaths, *other external causes of accidental injury* accounted for 6,8%.

Assault was the second most common non-natural cause of death and accounted for 12,0% of non-natural causes and 1,2% of all reported deaths. The third most common cause of non-natural deaths was *transport accidents* at 9,7% and constituting 0,9% of all deaths, followed by *event of undetermined intent* (5,5%) and *complications of medical and surgical care* (1,4%). About 0,4% of non-natural deaths were due to *intentional self-harm* and 0,1% were due to *sequelae of external causes of morbidity and mortality*.

Table 4.11 – Distribution of non-natural causes of death by broad groups, 2020

Causes of death (based on ICD-10, 2016)	Number	Percentage of non-natural causes	Percentage of all causes (N = 489 744)
Other external causes of accidental injury (W00-X59)	33 386	70,8	6,8
Assault (X85-Y09)	5 668	12,0	1,2
Transport accidents (V01-V99)	4 592	9,7	0,9
Event of undetermined intent (Y10-Y34)	2 603	5,5	0,5
Complications of medical and surgical care (Y40-Y84)	683	1,4	0,1
Intentional self-harm (X60-X84)	211	0,4	0,0
Sequelae of external causes of morbidity and mortality (Y85-Y89)	43	0,1	0,0
All non-natural	**47 186**	**100,0**	**9,5**

A breakdown of the 33 386 deaths due to *other external causes of accidental injury* identified in Table 4.11 are shown in Table 4.12, for a better understanding of deaths due to this cause. The table shows that almost half of these deaths were due to *accidental exposure to other and unspecified factors*. This includes exposure to unspecified factors causing fracture and exposure to other unspecified factors. The majority of deaths in this group were *accidental exposure to other and unspecified factors* (44,0%). This was followed by deaths due to *exposure to inanimate mechanical forces* which were the second leading cause, responsible for 24,1% of deaths in this group. This group includes discharge from other and unspecified firearms as well as contact with a knife or sword. The third most common cause was *other accidental threats to breathing* (14,9%), which includes accidental hanging and strangulation. The fourth most reported death due to other external causes of accidental injury was *exposure to smoke, fire and flames* (7,0%), followed by *accidental drowning and submersion* (4,0%).

Table 4.12 – Distribution of deaths due to other external causes of accidental injury, 2020

Cause of death (based on ICD-10)	Number	Percentage
Accidental exposure to other and unspecified factors (X58-X59)	14 702	44,0
Exposure to inanimate mechanical forces (W20-W49)	8 056	24,1
Other accidental threats to breathing (W75-W84)	4 957	14,9
Exposure to smoke, fire and flames (X00 - X09)	2 341	7,0
Accidental drowning and submersion(W65-W74)	1 343	4,0
Accidental poisoning by and exposure to noxious substance(X40-X49)	814	2,4
Exposure to electric current, radiation and extreme ambient air temperature and pressure (W85-W99)	567	1,7
Exposure to forces of nature(X30 - X39)	340	1,0
Falls (W00-W19)	150	0,5
Contact with venomous animals and plants(X20-X29)	42	0,1
Exposure to animate mechanical forces (W50-W64)	35	0,1
Contact with heat and hot substances(X10-X19)	22	0,1
Overexertion, travel and privation(X50-X59)	17	0,1
Total	**33 386**	**100,0**

4.7.1 Non-natural causes of death by age and sex

This subsection looks at the distribution of non-natural causes of death by sex and broad age groups (0, 1–14, 15–29, 30–44, 45–64 and 65+). For international comparison, age group 15–44 has been divided into two age groups (15–29 and 30–44) as recommended by the WHO (1992).

Table 4.13 shows the distribution of non-natural causes of death by sex and broad age groups (0, 1–14, 15–29, 30–44, 45–64 and 65 and older) for deaths that occurred in 2020. The absolute numbers and percentages for both sexes may not be similar to the results presented in Table 4.11, as deaths with missing sex and age have been excluded.

The first section of Table 4.13 showing both sexes indicates that for both sexes, the age group mostly affected by non-natural causes of death was age group 15–29, where 40,7% of all deaths in this age group were due to non-natural causes. The age group least affected by non-natural causes for both sexes was 65 years and older, where just 2,0% of deaths in this age group were due to non-natural causes. *Assault* was more common among those aged 15–29, accounting for 17,6% of non-natural deaths in this age group. *Complications of medical and surgical care* were highest among the elderly (7,7%), while transport accidents were highest among those aged 1–14 at 12,4%.

Differentials by sex show higher proportions of non-natural deaths for males at 14,7% compared to 4,2% of female non-natural deaths. Moreover, for each of the age groups, except for age zero, males had higher proportions of deaths due to non-natural causes compared to females, with the gap much wider at age group 15–29 where as much as 54,6% of male deaths resulted from non-natural causes compared to 18,2% of females in the same age group. This is the only age group where the proportion of non-natural deaths is more than that of natural deaths for males.

Comparison between male and female deaths due to non-natural causes shows that the proportion of deaths due to *assault* was high for males (13,4%) compared to females (6,9%). For both sexes, non-natural deaths due to *complications of medical and surgical care* were higher at infancy (those aged less than a year) as well as among the elderly (those aged 65 and older). This cause of death was also high among females, with the proportion of female deaths due to complications of medical and surgical care at 3,4% compared to 0,9% for males.

The proportion of non-natural deaths due to *transport accidents* were higher among females (11,6%) compared to males (9,3%). For each of the sexes, *intentional self-harm* and *sequelae of external causes of morbidity and mortality* were uncommon, each comprising less than 1,0% of deaths for each sex.

For all age groups, *other external cause of accidental injury* was the highest non-natural cause of death. However, these broad groups do not give valuable information as they cover non-natural deaths not adequately classified.

Table 4.13 – Underlying non-natural causes of death by age group and sex, 2020

Causes of death based on ICD-10	Number							Percentage						
	0	1–14	15–29	30–44	45–64	65+	All ages	0	1–14	15–29	30–44	45–64	65+	All ages
Both sexes														
Transport accidents (V01-V99)	20	395	1 335	1 638	965	239	4 592	3,0	12,4	9,2	10,0	11,2	6,1	9,7
Other external causes of accidental injury (W00-X59)	614	2 461	9 537	11 563	6 181	3 030	33 386	91,2	77,0	66,1	70,7	71,9	76,8	70,8
Intentional self-harm (X60-X84)	0	7	86	69	35	14	211	0,0	0,2	0,6	0,4	0,4	0,4	0,4
Assault (X85-Y09)	5	68	2 540	2 199	676	180	5 668	0,7	2,1	17,6	13,5	7,9	4,6	12,0
Event of undetermined intent (Y10-Y34)	17	246	889	778	513	160	2 603	2,5	7,7	6,2	4,8	6,0	4,1	5,5
Complications of medical and surgical care (Y40-Y84)	17	18	44	93	206	305	683	2,5	0,6	0,3	0,6	2,4	7,7	1,4
Sequelae of external causes of morbidity and mortality (Y85-Y89)	0	1	4	5	15	18	43	0,0	0,0	0,0	0,0	0,2	0,5	0,1
Sub total	**673**	**3 196**	**14 435**	**16 345**	**8 591**	**3 946**	**47 186**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Non-natural causes	673	3 196	14 435	16 345	8 591	3 946	47 186	3,3	31,2	40,7	20,7	6,0	2,0	9,6
Natural causes	19 549	7 055	21 005	62 503	135 176	197 270	442 558	96,7	68,8	59,3	79,3	94,0	98,0	90,4
All causes	**20 222**	**10 251**	**35 440**	**78 848**	**143 767**	**201 216**	**489 744**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Males														
Transport accidents (V01-V99)	13	230	1 013	1 297	710	150	3 413	3,7	11,5	8,6	9,5	10,8	7,0	9,3
Other external causes of accidental injury (W00-X59)	316	1 580	7 944	9 787	4 820	1 635	26 082	90,5	79,2	67,1	71,5	73,1	76,1	71,3
Intentional self-harm (X60-X84)	0	6	63	60	28	11	168	0,0	0,3	0,5	0,4	0,4	0,5	0,5
Assault (X85-Y09)	3	43	2 294	1 918	550	108	4 916	0,9	2,2	19,4	14,0	8,3	5,0	13,4
Event of undetermined intent (Y10-Y34)	9	124	495	577	355	97	1 657	2,6	6,2	4,2	4,2	5,4	4,5	4,5
Complications of medical and surgical care (Y40-Y84)	8	12	21	41	125	137	344	2,3	0,6	0,2	0,3	1,9	6,4	0,9
Sequelae of external causes of morbidity and mortality (Y85-Y89)	0	1	3	3	8	11	26	0,0	0,1	0,0	0,0	0,1	0,5	0,1
Sub total	**349**	**1 996**	**11 833**	**13 683**	**6 596**	**2 149**	**36 606**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Non-natural causes	349	1 996	11 833	13 683	6 596	2 149	36 606	3,2	35,7	54,6	29,6	8,3	2,5	14,7
Natural causes	10 465	3 601	9 836	32 620	72 460	83 744	212 726	96,8	64,3	45,4	70,4	91,7	97,5	85,3
All causes	**10 814**	**5 597**	**21 669**	**46 303**	**79 056**	**85 893**	**249 332**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Females														
Transport accidents (V01-V99)	7	164	317	326	251	89	1 154	2,3	13,8	12,9	13,7	13,4	5,0	11,6
Other external causes of accidental injury (W00-X59)	285	870	1 486	1 553	1 260	1 373	6 827	91,6	73,4	60,4	65,3	67,1	77,5	68,4
Intentional self-harm (X60-X84)	0	1	23	9	6	3	42	0,0	0,1	0,9	0,4	0,3	0,2	0,4
Assault (X85-Y09)	2	23	226	248	122	69	690	0,6	1,9	9,2	10,4	6,5	3,9	6,9
Event of undetermined intent (Y10-Y34)	8	121	383	189	152	63	916	2,6	10,2	15,6	8,0	8,1	3,6	9,2
Complications of medical and surgical care (Y40-Y84)	9	6	23	50	81	167	336	2,9	0,5	0,9	2,1	4,3	9,4	3,4
Sequelae of external causes of morbidity and mortality (Y85-Y89)	0	0	1	2	7	7	17	0,0	0,0	0,0	0,1	0,4	0,4	0,2
Sub total	**311**	**1 185**	**2 459**	**2 377**	**1 879**	**1 771**	**9 982**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**
Non-natural causes	311	1 185	2 459	2 377	1 879	1 771	9 982	3,4	25,8	18,2	7,5	2,9	1,5	4,2
Natural causes	8 747	3 411	11 042	29 458	62 386	113 324	228 368	96,6	74,2	81,8	92,5	97,1	98,5	95,8
All causes	**9 058**	**4 596**	**13 501**	**31 835**	**64 265**	**115 095**	**238 350**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

4.7.2 Non-natural causes of death by province of death occurrence

The distribution of the underlying non-natural causes of death by province of death occurrence for 2020 is shown in Table 4.14. It is observed that KwaZulu-Natal (11,3%) is the province with the highest proportion of deaths due to non-natural causes; this is consistent with previous years. Western Cape has the second highest proportion of deaths due to non-natural causes at 10,5%, followed by Gauteng at 9,9%. Mpumalanga was the fourth with 9,7% while Eastern Cape ranked fifth at 9,1%. The lowest proportions of deaths due to non-natural causes were observed in and Limpopo (7,8%) and Northern Cape (8,0%).

The most common underlying cause of non-natural deaths in all provinces was *other external causes of accidental injury* where more than half of non-natural deaths resulted from this broad group in each province, except for Northern Cape (48,5%). The proportion of deaths due to *other external causes of accidental injury* was highest in Gauteng (78,5%), Mpumalanga (75,0%) and Western Cape (72,4). Western Cape (17,9%) had the highest proportion of deaths due to *assault*, followed by Northern Cape (17,5%) and Eastern Cape at 16,7%. Deaths due to *assault* were lowest in Limpopo (7,3%) and Mpumalanga (7,4%).

Deaths due to *transport accidents* were highest in Limpopo, responsible for 27,0% of deaths, followed by Northern Cape at 23,8% and North West at 18,4%. Traditionally, Limpopo has always had the highest proportion of *transport accidents* in South Africa compared to the rest of the other provinces. The same can be said about *assault* in the Western Cape, which has generally been higher than the rest of the other provinces.

Complications of medical and surgical care, intentional self-harm and *sequelae of external causes of morbidity and mortality* were the least common, each contributing under 3,0% or less of non-natural deaths in each province, except for Northern Cape where 4,2% of non-natural deaths were due to *intentional self-harm*.

4.7.3 Non-natural causes of death by district municipalities

The proportion of deaths due to non-natural causes of death for each district is provided in Appendix O. Non-natural causes of death are in the column labelled external causes of morbidity and mortality (V01-Y98).

Table 4.14 – Underlying non-natural causes of death by province, 2020

Causes of death (based on ICD-10)	Western Cape		Eastern Cape		Northern Cape		Free State		KwaZulu-Natal		North West		Gauteng		Mpumalanga		Limpopo	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Transport accidents (V01-V99)	288	4,9	650	9,2	286	23,8	179	6,8	1 133	10,6	476	18,4	299	2,8	331	11,5	945	27,0
Other external causes of accidental injury (W00-X59)	4 254	72,4	4 774	67,6	582	48,5	1 820	69,2	7 686	72,1	1 619	62,6	8 360	78,5	2 164	75,0	2 017	57,6
Intentional self-harm (X60-X84)	17	0,3	22	0,3	50	4,2	5	0,2	66	0,6	4	0,2	20	0,2	17	0,6	10	0,3
Assault (X85-Y09)	1 049	17,9	1 178	16,7	210	17,5	375	14,3	1 181	11,1	280	10,8	909	8,5	212	7,4	257	7,3
Event of undetermined intent (Y10-Y34)	167	2,8	390	5,5	60	5,0	211	8,0	441	4,1	172	6,7	828	7,8	138	4,8	189	5,4
Complications of medical and surgical care (Y40-Y84)	95	1,6	42	0,6	11	0,9	38	1,4	131	1,2	34	1,3	228	2,1	20	0,7	82	2,3
Sequelae of external causes of morbidity and mortality (Y85-Y89)	2	0,0	4	0,1	2	0,2	2	0,1	16	0,2	0	0,0	12	0,1	2	0,1	3	0,1
Sub total	**5 872**	**100,0**	**7 060**	**100,0**	**1 201**	**100,0**	**2 630**	**100,0**	**10 654**	**100,0**	**2 585**	**100,0**	**10 656**	**100,0**	**2 884**	**100,0**	**3 503**	**100,0**
Non-Natural causes	5 872	10,5	7 060	9,1	1 201	8,0	2 630	8,3	10 654	11,3	2 585	8,2	10 656	9,9	2 884	9,7	3 503	7,8
Natural causes	49 823	89,5	71 007	91,0	13 739	92,0	29 104	91,7	84 111	88,8	28 766	91,8	97 243	90,1	26 989	90,4	41 209	92,2
Total	**55 695**	**100,0**	**78 067**	**100,0**	**14 940**	**100,0**	**31 734**	**100,0**	**94 765**	**100,0**	**31 351**	**100,0**	**107 899**	**100,0**	**29 873**	**100,0**	**44 712**	**100,0**

*Excluding deaths that occurred outside South Africa and deaths with unspecified province of death.

4.8 Comparison between immediate, contributing and underlying causes of death

This subsection provides information on the total number of causes of death reported on each form. As previously mentioned in section 4.2, the death notification form provides for the recording of multiple causes of death. Section G of both death notification forms (BI-1663 and DHA-1663) makes provision for several causes to be reported on the form (see Appendix B). A maximum number of six causes can be recorded on the death notification form. These causes are recorded as immediate, contributing or underlying causes of death (see definitions in Appendix A).

Table 4.15 aggregates the total number of causes mentioned on each form and groups these in broad groups of causes of death. The broad groups of causes of death were then ranked, and the 20 leading causes based on all causes of death recorded on each form. The list includes all causes of death both natural and non-natural, as well as deaths due to symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified to indicate the frequency of mentioning any cause on the death notification form.

In 2020, the most frequently reported cause of death was *other forms of heart disease* and was recorded on 70 308 death notification forms. In terms of percentage distribution, about 14,4% of all death notification forms had *other forms of heart disease* recorded as either an immediate, contributing or underlying cause of death. The second most reported cause was *Ill-defined and unknown causes of mortality (R95-R99)* (13,8%), mentioned on 67 762 forms. *Hypertensive diseases* (13,8%*), influenza and pneumonia* (10,5%) and *diabetes mellitus* (8,6%) were the third, fourth and fifth most reported causes of death, respectively.

Table 4.15 – Distribution of the 20 most commonly reported causes of death, 2020

Causes of death (based on ICD-10)	Number of deaths in which the causes was reported	Percentage of all deaths
Other forms of heart disease (I30-I52)	70 308	14,4
Ill-defined and unknown causes of mortality (R95-R99)	67 762	13,8
Hypertensive diseases (I10-I15)	67 635	13,8
Influenza and pneumonia (J09-J18)	51 611	10,5
Diabetes mellitus (E10-E14)	42 086	8,6
Cerebrovascular diseases (I60-I69)	38 435	7,8
Other external causes of accidental injury (W00-X59)	35 322	7,2
Renal failure (N17-N19)	34 878	7,1
Covid-19 (U071-U072)	33 261	6,8
Tuberculosis (A15-A19)	30 561	6,2
Other bacterial diseases (A30-A49)	26 440	5,4
Other diseases of the respiratory system (J95-J99)	20 785	4,2
Other viral diseases (B25-B34)	20 073	4,1
Human immunodeficiency virus [HIV] disease (B20-B24)	19 947	4,1
Ischaemic heart diseases (I20-I25)	19 892	4,1
Chronic lower respiratory diseases (J40-J47)	16 050	3,3
Metabolic disorders (E70-E90)	14 738	3,0
Malignant neoplasms of ill-defined, secondary and unspecified sites (C76-C80)	13 339	2,7
Other acute lower respiratory infections (J20-J22)	12 850	2,6
Intestinal infectious diseases (A00-A09)	10 409	2,1

*Including deaths due to *MDR-TB* and *XDR-TB*.

All the natural underlying causes of death that appeared among the ten leading causes of death also appeared among the twenty-five most commonly mentioned causes. The ten leading underlying natural causes of death shown in Table 4.5 are presented in Table 4.16 to show the breakdown of the number of deaths by whether the death was selected as the underlying cause or whether it was reported as the immediate or contributing cause.

Within each category, the counts of underlying causes and immediate or contributing causes are not duplicated, so that they can be summed up to equal the total number of times a specific cause of death was recorded on a death notification form. For example, 27 066 deaths had *cerebrovascular diseases* as the underlying cause and another 10 863 deaths had it as an immediate or contributing cause. This gives a total of 37 929 death notification forms that had *cerebrovascular diseases* mentioned on them. The table further shows that in over 80,0% of death notification forms where *COVID-19* (96,4%), *HIV disease* (90,5%) and *ischaemic heart diseases* (84,7%) were mentioned, they were selected as underlying causes. In less than half of the cases where *influenza and pneumonia* (38,9%), *hypertensive diseases* (36,4%) and *other forms of heart disease* (26,9%) were mentioned, they were selected as the underlying causes.

Table 4.16 – Number and percentage (%) of deaths selected as underlying or reported as immediate or contributing causes of death, 2020

Causes of death (ICD-10)	Under-lying rank	Number of deaths			Percentage of any mention		
		Underlying	Immediate or contributing	Total recorded	Underlying	Immediate or contributing	Total recorded
Covid-19 (U071-U072)	1	32 757	1 231	33 988	96,4	3,6	100,0
Diabetes mellitus (E10-E14)	2	32 100	10 999	43 099	74,5	25,5	100,0
Cerebrovascular diseases (I60-I69)	3	27 066	10 863	37 929	71,4	28,6	100,0
Hypertensive diseases (I10-I15)	4	24 847	43 378	68 225	36,4	63,6	100,0
Influenza and pneumonia (J09-J18)	5	19 805	31 159	50 964	38,9	61,1	100,0
Tuberculosis (A15-A19)*	6	19 757	10 644	30 401	65,0	35,0	100,0
Human immunodeficiency virus [HIV] disease (B20-B24)	7	19 382	2 038	21 420	90,5	9,5	100,0
Ischaemic heart diseases (I20-I25)	8	15 759	2 848	18 607	84,7	15,3	100,0
Other forms of heart disease (I30-I52)	9	15 057	41 011	56 068	26,9	73,1	100,0
Other viral diseases (B25-B34)	10	12 434	8 348	20 782	59,8	40,2	100,0

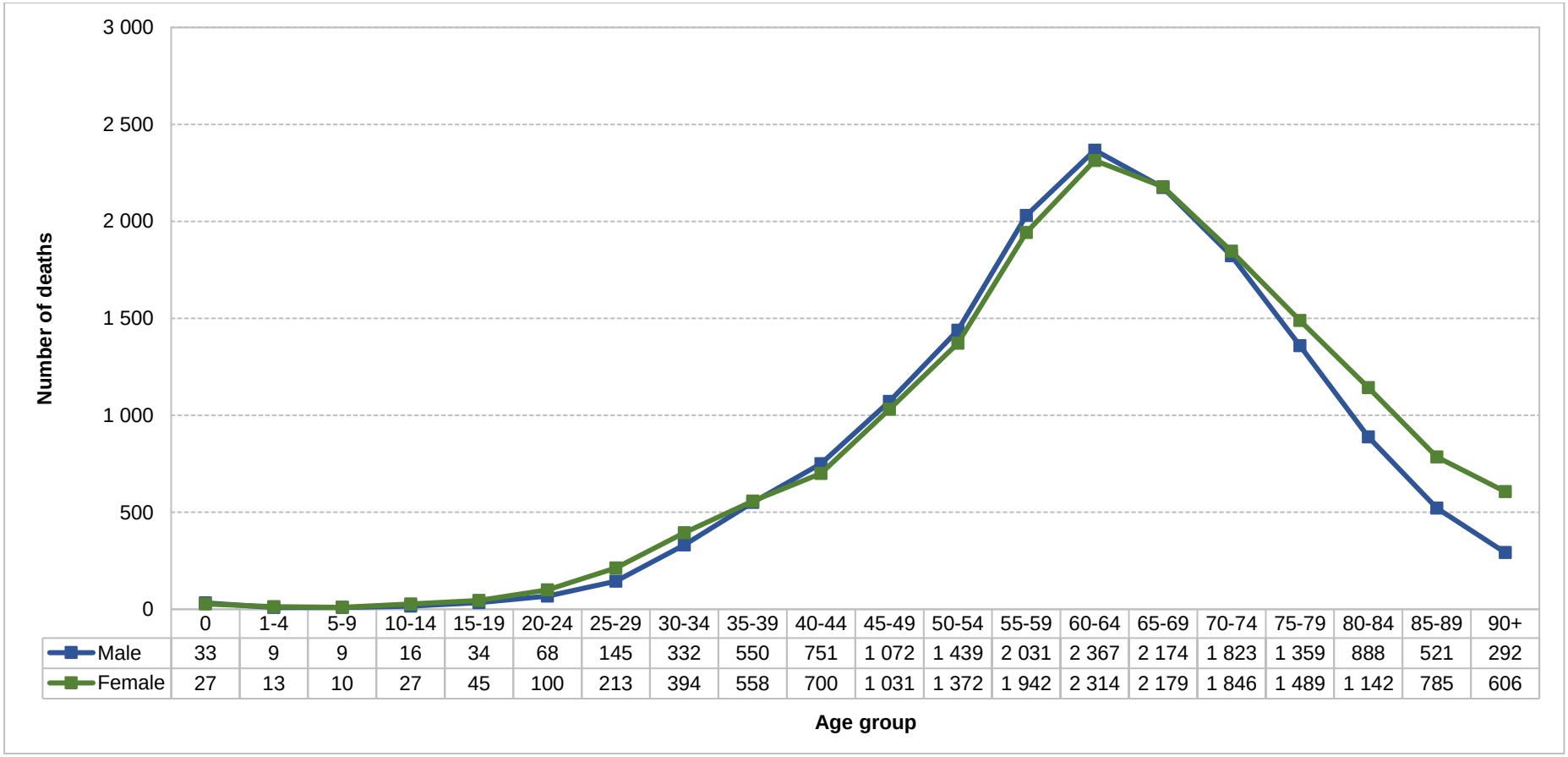
*Including deaths due to *MDR-TB* and *XDR-TB*.

4.9 Understanding COVID-19 in South Africa

South Africa, like many other countries, experienced the impact of the COVID-19 pandemic. On 5 March 2020, the Minister of Health made an official announcement of the first confirmed case of COVID-19 in South Africa with the first local death from the disease being reported on 27 March 2020 (Government of South Africa, 2020). Subsequently, the government took various measures to curb the spread of the virus, including lockdowns of varying severity, travel restrictions, and social distancing guidelines. In December 2020, South Africa experienced a second wave of COVID-19 infections, mostly with infections from the SARS-CoV-2 Beta variant (Network for Genomic Surveillance in South Africa [NGS-SA], 2022).

Figure 4.7 shows the COVID-19 mortality pattern across the different age groups by sex. It is observed that mortality rates were relatively low during infancy and childhood (although slightly higher in age group zero years) up to 19 years. From age 20, deaths began to rise steadily for both sexes albeit being higher among females until age 39. From ages 40–64, male deaths surpassed female deaths with marginal differences, with peak mortality also observed at age group 60–64 for both sexes. Although a steady decline is observed for both sexes from ages 65–90, there were more female deaths in the same age groups with a widening gap from age groups 70 and above.

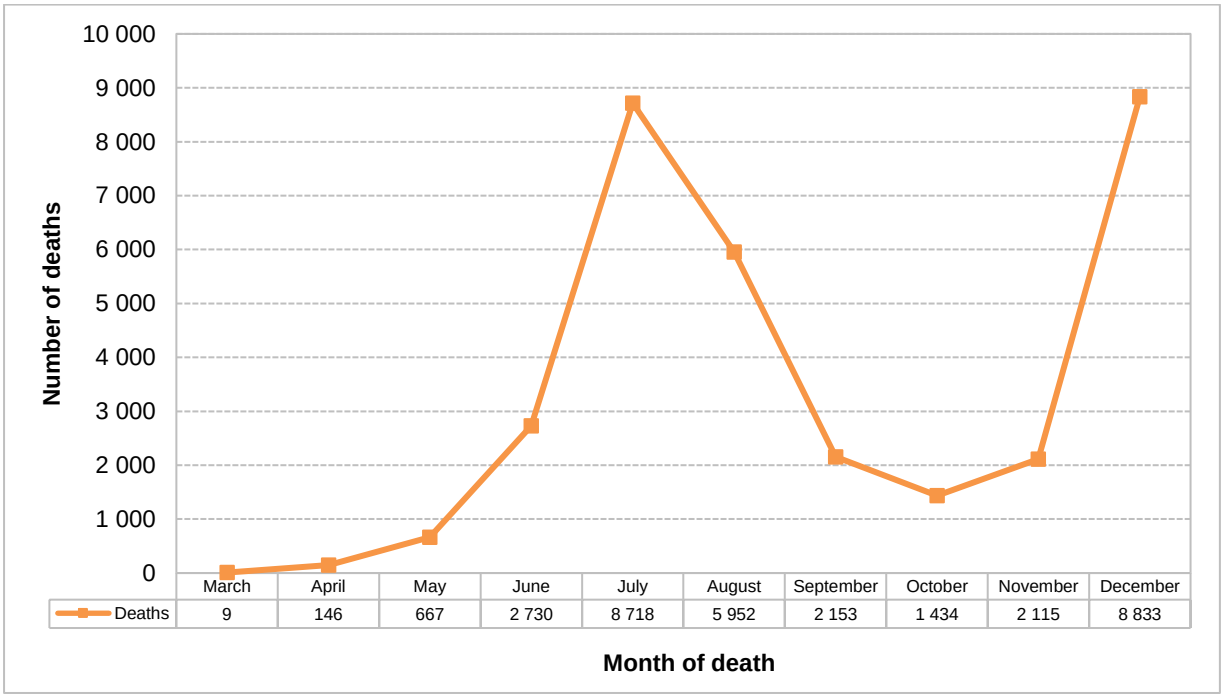
Figure 4.7 – Number of COVID-19 deaths by age and sex, 2020



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Male	33	9	9	16	34	68	145	332	550	751	1 072	1 439	2 031	2 367	2 174	1 823	1 359	888	521	292
Female	27	13	10	27	45	100	213	394	558	700	1 031	1 372	1 942	2 314	2 179	1 846	1 489	1 142	785	606

Figure 4.8 shows the distribution of deaths from COVID-19 by month of occurrence. The graph shows that in the early stage of the outbreak, mortality rates were relatively low with only nine deaths occurring in March. By the end of April, deaths had rapidly increased to 146, rising fourfold by May and June to 667 and 2 730, respectively, and reaching peak mortality in July with 8 718 deaths. From August, a sharp decline in mortality was observed with 5 952 deaths, followed by a further decline in September with mortality levels reaching their lowest in October at 1 434 deaths. A second increase was observed from November (2 115 deaths) which increased fourfold in December peaking at 8 833 deaths. This was the period during which South Africa was entering the second wave of the outbreak.

Figure 4.8 – Number of COVID-19 deaths by month of death, 2020



	March	April	May	June	July	August	September	October	November	December
Deaths	9	146	667	2 730	8 718	5 952	2 153	1 434	2 115	8 833

Table 4.17 shows the number and percentage distribution of COVID-19 deaths by province of death in 2020. It was observed that the majority of deaths occurred in Gauteng (23,0%), followed by Eastern Cape (22,4%), Western Cape (19,0%) and Kwa-Zulu Natal (18,7%). In the other six provinces, each accounted for less than 7,0% of COVID-19 related deaths.

Table 4. 17 – Number and percentage (%) distribution of COVID-19 deaths by province of death, 2020

Province of death	Number of deaths	Percentage of deaths
Gauteng	7 521	23,0
Eastern Cape	7 331	22,4
Western Cape	6 217	19,0
Kwa-Zulu Natal	6 116	18,7
Free State	2 163	6,6
North West	1 057	3,2
Northern Cape	779	2,4
Limpopo	769	2,4
Mpumalanga	753	2,3
Unknown/unspecified	51	0,2
Total	**32 757**	**100,0**

5. Conclusion

This statistical release provides information on registered deaths for 2020 in South Africa based on data from the South African civil registration system maintained by the Department of Home Affairs (DHA). The report includes levels, trends and patterns in mortality and causes of deaths by demographic and geographic characteristics. The release further presents information on the leading underlying natural causes of death, patterns and trends in non-natural underlying causes of death. Deaths for the years 1997 to 2020 are also included to provide information on trends in the occurrence of deaths.

The results showed that the total number of deaths registered at the Department of Home Affairs and processed by Stats SA for deaths that occurred in 2020 were 489 744, which indicates a 5,3% increase from the 463 618 deaths that occurred in 2019. This is mainly attributed to COVID-19 deaths that occurred in 2020. Overall, mortality trends showed that mortality levels were declining in the country before COVID-19.

While the occurrence of deaths in the country continued to decline, it differed by age and sex. The age groups 60–64 and 65–69 had the highest proportion of deaths in 2020 at 9,6% and 9,5% respectively for males followed by age group 70–74 at 8,4%. The lowest proportions of deaths were observed in age groups 5–9 and 10–14 with each contributing less than 1,0% of the deaths which occurred in 2020. Differentials by sex and age shows that for both sexes, the proportion of deaths were high in infancy then declined, with the lowest at ages 5–9 and thereafter it starts to increase with more deaths as the age increases. Overall, from age 70 and older there were more female than male deaths.

Mortality differentials by province of death showed that the distribution of deaths by province of death followed the population distribution patterns of the country. The highest proportion of deaths occurrence in Gauteng (22,0%), followed by KwaZulu-Natal (19,3%) and then Eastern Cape (15,9%). While the lowest proportion of deaths occurred in Northern Cape (3,1%). Similarly, the population group differentials were reflective of the distribution of population groups in South Africa. Black Africans had the highest proportion of deaths (66,3%) in 2020, followed by the white population group at 9,4%.

Since 2009, the proportion of deaths due to non-natural causes had been on an increase from 8,7% in 2009 to 12,4% in 2019. However, for 2020, there was a notable decline to a low of 9,6%. This can be attributed to the fact that there was a sharp increase in the number of natural deaths due to a resurgence of COVID-19, which contributed to natural deaths, thus reducing the proportion of non-natural deaths for 2020. Non-natural causes of death by age show that the age group 20–24 was the age group mostly affected by non-natural causes of death.

The assessment of mortality from major disease factors, injuries and risk factors indicated that for the period 2010 to 2020, there were more deaths due to non-communicable diseases compared to communicable diseases. Differences by sex and age show that the proportion of deaths due to communicable diseases gradually declines with age from age 45 for males and age 40 for females. The proportion of deaths due to external causes of death was high for males compared to females for all age groups.

In 2020, five of the top ten leading underlying natural causes of death were non-communicable diseases, while the remainder were communicable diseases. COVID-19 (6,7%) was the leading underlying natural cause of death followed by diabetes mellitus with 6,6% deaths. This was the first time we have had COVID-19 as the underlying cause of death, and it immediately ascended to the first leading underlying cause of death. COVID-19 was the leading cause of death for males responsible for 6,4% of male deaths, while it ranked second for females, responsible for 7,0% of female deaths.

The top ten leading underlying causes of death were the same for both sexes though it differed greatly by proportion. Four of the ten leading underlying causes of death had the same rank for both sexes, namely *cerebrovascular diseases, other forms of heart diseases, influenza and pneumonia and other viral diseases* ranked fourth, fifth, seventh and tenth respectively.

By age differentials, *COVID-19* was the leading cause of death only for age group 45–64 responsible for 9,5% of the deaths in this age group. For age group 1–14, intestinal infectious diseases remained the leading cause of death, whereas *respiratory and cardiovascular disorders specific to the perinatal period* were the leading causes for infants, and *diabetes mellitus* for those aged 65 and older.

Leading causes of death by province show that COVID-19 was the leading cause of death for four provinces, namely Western Cape, Free State, Eastern Cape and Gauteng while the only province where it was not in the top ten underlying causes of death was in Limpopo. For the provinces Northern Cape and North West, hypertensive diseases were the leading underlying cause. For KwaZulu-Natal, Limpopo and Mpumalanga, diabetes mellitus was the leading underlying of death.

Statistics on mortality and causes of death are important for planning, monitoring and evaluation of interventions and programmes aimed at improving the health and survival of the population at large. Their usefulness may, however, be undermined if data are not of high quality. As such, efforts need to be made to enhance the completeness and quality of information. Addressing gaps in deaths data will go a long way towards providing quality death statistics to inform intervention programmes and projects. The data on causes of death is still of high quality and invaluable for the country.

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Appendices

Appendix A: Glossary

Causes of death are all those diseases, morbid conditions, or injuries that either resulted in or contributed to death, and the circumstances of the accident or violence which produced any such injuries.

Contributing causes of death are morbid conditions, if any, giving rise to the immediate cause of death.

COVID-19 a highly contagious infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

Death is a permanent disappearance of all evidence of life at any time after a *live birth* has taken place.

Human immunodeficiency virus **(HIV)** is the pathogenic organism responsible for the acquired immunodeficiency syndrome (AIDS), also known as the lymphadenopathy virus (LAV).

Immediate cause of death is the disease or condition directly leading to death.

Leading underlying causes of death are the most frequent underlying causes of death in any given population. In this release, the underlying causes of death are ranked according to frequency.

Live birth in relation to a child, means the birth of a child born alive.

Multiple causes of death are all morbid conditions, diseases and injuries entered on the death certificate. These include those involved in the morbid train of events leading to the death which were classified as either the underlying cause, the intermediate cause, or any intervening cause and those conditions which contributed to death but were not related to the disease or condition causing death.

Neonatal death is the death of a live-born child during the first 28 completed days of life.

Perinatal deaths are a combination of stillbirths and infants who die in the first week after birth (early neonatal deaths).

Post-neonatal death is a live-born infant dying after 28 completed days of birth but before the first year of life is completed.

Population group: according to the Population Registration Act Repeal Act (Act No. 114 of 1991), the South African Population Register no longer stores information regarding the population group of individuals whose details are on the register. This Repeal Act is still in place; therefore, the population group used in this report refers to the population group as identified by the certifying physician/professional nurse on the death notification form and is only used for statistical purposes.

Stillbirth is the intra-uterine death of a foetus of at least 26 weeks of gestation that showed no sign of life after complete birth.

Underlying cause of death (previously known as primary cause) is the disease or injury that initiated the sequence of events leading directly to death; or the circumstances of the accident or violence which produced the fatal injury.

Appendix B: Death Notification form

Please refer to the Mortality and causes of death in South Africa: Findings from death notification, 2016 on pages 59–64 for copies of both the BI–1663 and DHA–1663 forms (Stats SA, 2018).

Appendix C: Assessment of the quality of data

The gold standard in mortality statistics is to have real-time data on the number of deaths and corresponding medically certified causes of death (WHO, 2013). However, the information needs to be of the highest quality in terms of completeness of death registration, timeliness of death registration and publication of death statistics, and accurateness of information provided embedded in deaths with correct information on characteristics of deceased, accurate causes of deaths and lower proportions of deaths with ill-defined or unspecified causes of deaths. In this regard, data quality confrontation has to be undertaken for improvements in mortality statistics to be realised. Improvements in quality of mortality data are essential in more effective policies and programmes concerning people's health and quality of life with the aim of leaving no one behind.

Completeness of death registration

The proportion of all deaths that occurred in a specific period and were covered by the civil registration of a country (referred to as completeness) was estimated at 96% for adult deaths (15 years and older) for the intercensal period 2011–2016. For 2020 adult death registration, the 96% completeness level is adopted. The completeness level for male adult deaths was estimated at 97% whereas for females it was slightly lower (95%). Revised estimates will be provided after the analysis of Census 2022 data. The methods used to derive the level of completeness for the intercensal period 2001–2007 and 2007–2011 were the Generalised Growth Balance (GGB) as proposed by Hill (1987), and the Synthetic Extinct Generation method (SEG) by Bennett and Horiuchi (1981, 1984). For the underlying assumptions and method followed, refer to Stats SA (2014). The extent of completeness of child deaths registration (0–14 years), however, is less certain, given the lack of completeness level estimates.

Timeliness of death registration

In South Africa, the Regulations for the Registration of Births and Deaths published in 2014 mandate that a death must be registered within 72 hours (3 days) of occurrence (Republic of South Africa, 2014). Timeliness in death registration indicates that all deaths are registered within the legally stipulated time allowance (UN, 2014). In general, timeliness of death registration refers to the interval between the date of death occurrence and the date it was registered with the Department of Home Affairs (DHA).

The number of days it took for deaths to be registered at DHA offices in 2020 is shown in Table C.1. For deaths that occurred in 2020, 18,0% were registered within a day of occurrence, 32,0% a day after the death had occurred, 17,7% on the second day after death occurrence and 12,2% on the third day. The proportion of deaths which were registered within the 72 hours (3 days) stipulated by the Regulations legislative framework was 80,0%. Strategies are needed to improve adherence to the

legislative framework especially for the delayed deaths that did not reach Stats SA in time for the 2020 deaths processing phase.

Table C.1 – Distribution of deaths by the number of days it took to register the death, 2020

Number of days	Number of deaths	Percentage	Cumulative percentage
Within a day of death	88 397	18,0	18,0
1 day	156 953	32,0	50,1
2 days	86 583	17,7	67,8
3 days	59 692	12,2	80,0
4 days	34 347	7,0	87,0
5 days	19 162	3,9	90,9
6 days	11 011	2,2	93,1
7 -13 days	18 843	3,8	97,0
14-20 days	2 770	0,6	97,6
21-30 days	1 838	0,4	97,9
31-364 days	9 528	1,9	99,9
1 year+	620	0,1	100,0
Total	**489 744**	**100,0**	

Timeliness of publication of statistics

The United Nations (UN) recommends that a one-year time lapse from the end of the reference period to publication and dissemination of death statistics from the civil registration be maintained in order for vital statistics to be considered timely (UN, 2014). This statistical release fell short of this recommendation as it is published 72 months from the time the event occurred. Since civil registration deaths are continuously updated, the proportion of total registrations that are delayed or late provide an estimate of under-reporting in previous time periods.

Table C.2 shows the number of deaths published in the 2020 mortality and causes of death report for the years 1997 to 2020, and late or delayed death registrations processed during the processing of deaths registered in 2023/2024. The table shows that 4 683 additional death notification forms for deaths that occurred between 1997 and 2019 were processed during the 2023/2024 processing phase. In general, the years closer to the reference period have higher additional death notification forms, which in principle means that deaths become more complete over time. The majority (2 612) of the additional forms were for deaths that occurred in 2019. The distribution of deaths for 1997 to 2020 updated for late or delayed death notification forms is provided in Appendices D (1997–1999), D.1 to D8.

Table C.2 – Number of deaths published in 2019 publication and late registrations processed during the 2023/2024 processing phase by year of death, 1997–2019

Year of death	Number of deaths published in 2019 publication	Additional forms received in the 2019/2020 processing phase	Total number of deaths
1997	318 152	26	318 178
1998	366 811	41	366 852
1999	382 885	28	382 913
2000	417 568	48	417 616
2001	456 616	33	456 649
2002	503 738	80	503 818
2003	558 830	29	558 859
2004	578 794	35	578 829
2005	599 986	34	600 020
2006	614 544	34	614 578
2007	606 586	19	606 605
2008	598 620	27	598 647
2009	584 415	33	584 448
2010	552 418	103	552 521
2011	519 109	140	519 249
2012	496 501	155	496 656
2013	478 270	47	478 317
2014	478 617	102	478 719
2015	475 853	84	475 937
2016	472 745	133	472 878
2017	466 881	455	467 336
2018	467 180	385	467 565
2019	461 006	2 612	463 618
Total	**11 456 125**	**4 683**	**11 460 808**

Data confrontation

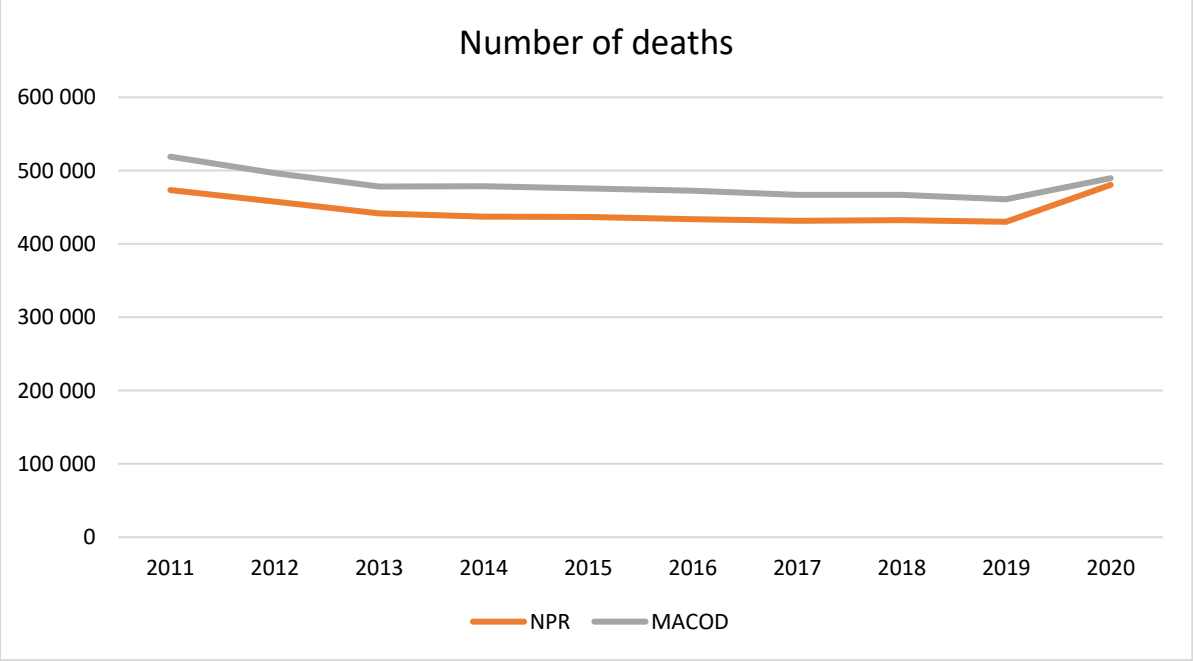
Figure C.1 presents the number of registered deaths processed by Stats SA and those recorded on the National Population Register (NPR) maintained by the DHA from 2011–2020. Comparing data from the two systems provides another means of evaluating the quality in terms of completeness of deaths from the civil registration system over time. Trends in the number of deaths from Stats SA and those from the DHA (NPR) follow a similar pattern over time, however, the numbers from Stats SA are always expected to be higher than those from the DHA (NPR). This is attributed to two reasons:

- The DHA (NPR) includes South African citizens and permanent residents whose birth records already exist on the DHA (NPR). In contrast, the number of deaths processed by Stats SA also includes deaths eligible to be included on the DHA (NPR), deaths of foreign citizens and South African citizens whose births were not registered on the DHA (NPR).
- Stats SA reports on all deaths registered at the DHA, but the number of deaths processed are less than the deaths that may have been registered at the DHA because they did not reach

Stats SA in time for processing. Consequently, the magnitude of the difference between the two data sources may be affected by the delayed transmission of forms to Stats SA.

Figure C.1 shows that the number of deaths processed by Stats SA (MACOD) has been higher than that recorded on the DHA (NPR). The trend analysis reveals that both data sources had consistent decreases in the number of deaths for the period 2011–2006 and remained steady between 2014 and 2019. This was followed by a sharp increase from 461 006 in 2019 to 489 744 in 2020. These increases were reflecting for both sources. The high number of deaths processed by Stats SA as compared to the deaths recorded on the NPR is noticeable when processing late registrations.

Figure C 1 – Number of deaths registered by source of data and year of death, 2011–2020



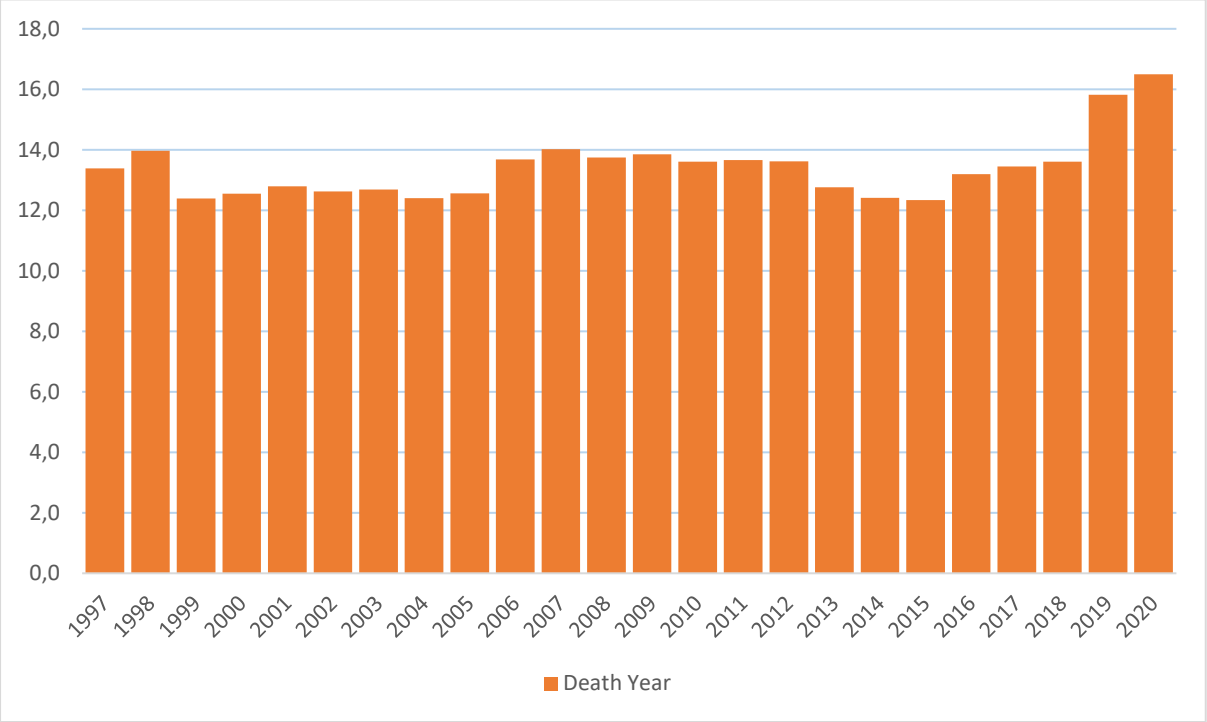
Quality of causes of death information

Quality information on underlying causes of death is critical to guide decision-making in public health. As such, it is important that this information is assessed from data processing through to the data analysis phase in order to measure the extent to which the data may be used for health policies and programmes. Table C.3 provides the assessment of the quality of causes of death data based on the number and percentage distribution of ill-defined causes by sex of the deceased. The ill-defined causes refer to diagnoses that are vague, non-specific and have insufficient details to be of value in promoting preventive and curative health interventions. Although ill-defined causes still help to provide the overall mortality due to broad diseases, they fail to provide a concise picture as they poorly attribute the underlying cause.

The results show that for both sexes the highest proportions of ill-defined causes were s*ymptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified* (60,2%) followed by *essential (primary) hypertension (12,3%)* and then *heart failure* (6,7%). About 2,0% of ill-defined causes were

due to *event of undetermined intent* for both sexes, with much higher proportions for males (2,7%) than for females (1,3%).

Figure C 2 – Percentage (%) distribution of deaths assigned to symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified and year of death 1997–2020*



*Data for 1997–2019 have been updated with late registrations/delayed death notification forms processed in 2023/2024.

Assessment framework for death registration data

This statistical release adopts the assessment framework proposed by Mahapatra et al. (2007) to assess the quality of the 2020 death registration data received from the civil registration system. The framework proposed two categories, namely general vital statistics and causes-of-death statistics. Both categories measure quality in terms of level of accuracy, relevance, comparability, timeliness and accessibility.

The results of the Mahapatra et al. 2007 assessment framework for the 2020 mortality and causes of death data from the South African civil registration system are shown in Table C.4 and Table C.5. Table C.4 shows the percentage of key variables with unknown or unspecified information and forms part of the accuracy criteria in the assessment framework for the year 2020. The unknown cases refer to cases where more than one option was selected on the form or where the information could not be classified according to specified categories while unspecified cases refer to missing data for that variable.

For the selected variables shown in table C.4 the variables that have been poorly reported before 2014 and have now been well reported over time (less than 1,0%) of deaths are sex of deceased (0,4%) and province of death occurrence (0,1%). A notable increase in missing information was observed for province of usual residence from 2,0% in 2019 to 14,3% in 2020. The information on province of birth

occurrence was not well reported as 30,0% of the variable had missing information. Missing information for marital status was 22,3% in 2020.

The 2020 results further indicate that 14,3% of the deaths had unknown or unspecified information on population group, up from 13,2% in 2019. This variable has been improving in the recent years considering that over the period 1997 to 2014 missing information on this variable was constant at around 25%.

In this release, no analyses were undertaken for all variables where almost more than half of the deaths had unknown or unspecified information. In 2020, education level (46,4%); occupation group (68,8%); industry (88,9%) and pregnancy status (76,0%) remained the four variables with almost half or more of the information classified as unknown or unspecified. However, a dataset containing unit records on mortality and causes of death 2020, which include variables not covered in this release due to poor reporting, is available on request from Stats SA.

Table C.3 – Percentage (%) of deaths classified as unknown/unspecified for selected variables, 2020

Variables	Applicable group	Percentage unknown or unspecified
Sex	All	0,4
Age	All	0,0
Province of death occurrence	All	0,1
Province of usual residence of deceased	All	14,3
Province of birth	All	30,0
Population group	All	14,3
Place or institution of death occurrence	All	28,5
Method used to ascertain cause of death	All	34,9
Marital Status	All	22,3
Smoking status	Aged 16 and older	36,4
Education	Aged 6 and older	46,4
Occupation	Aged 15 and older	68,8
Industry	Aged 15 and older (economically active)	88,9
Pregnancy status	Females aged 10–55	76,0

In addition, for the accuracy dimension, Table C.5 indicates that 96% of adult (15 years and older) death registrations were reported for the 2011–2016 intercensal period. The table also shows that the relevance and comparability of general vital statistics is regarded as complete.

The table further shows that for causes-of-death-statistics, 41,8% of the 2020 deaths occurred within a health care facility. This approximates the percentage of deaths whose causes are more likely to be detailed enough for the underlying cause to be derived. Cause-of-death-statistics are regarded as completely relevant as they are based on routine tabulations by sex and five-year age groups as well as the fact that tabulation of cause-of-death information is provided for the nine provinces and 52 district municipalities in the country. The tools used in coding causes of death (International Classification of Diseases 10th revision) for 2020 and the variables analysed were similar to those in previous years. Therefore, comparability over time and with other countries is also regarded as complete.

The 2020 deaths show that 13,8% of all deaths were assigned to ill-defined causes. Mahapatra et al. (2007) propose that at most 10% of cause-of-death statistics should be assigned to symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified categories. This remains a cause for concern and requires urgent attention.

The table further shows that processing 2020 data on causes of death took 36 months and the mean time from the end of the reference period to publication was 48 months. This was due to backlog introduced by COVID-19 where there was no capturing taking place for almost 6 months and upon return there was a huge number of forms to be processed. Shorter processing time ensures that the mean time from the end of the reference period to publication is reduced, which in turn improves timeliness. Stats SA has introduced auto coding on the processing phase which is aimed at reducing both the mean time period and processing time.

In terms of meeting user needs, there is wide accessibility to the statistical release and datasets published on mortality and causes of death. The data published on this release are available in a wide range of formats and can be accessed through the Stats SA website and also by making use of Stats SA User Information Services.

Table C.4 – Assessment of the 2020 South African death statistics from the civil registration system using the framework proposed by Mahapatra et al. (2007)

General vital statistics		Cause-of-death statistics	
Criteria and indicators	**Measure**	**Criteria and indicators**	**Measure**
Accuracy		**Accuracy**	
Completeness of death registration	96%	Proportion of deaths that occurred in healthcare facilities	41,8%
Missing data		Proportion of deaths assigned to symptoms and signs of disease not elsewhere classified	13,8%
See Table 2.5			
Relevance		**Relevance**	
Routine tabulations by sex and 5-year age groups	100%	Routine tabulation by sex and 5-year age groups	100%
Deaths in children under five years tabulated by 0 and 1-4-year age group	100%	Number of cause-of-death tabulation areas	9 provinces and 52 district municipalities
Comparability		**Comparability**	
Stability of key definitions over time	100%	Consistency of cause specific mortality proportions over consecutive years	100%
Uniformity of definitions across areas	100%	ICD coding for certification and coding of causes of death, revision used and code level to which tabulations are published	Coding causes of death using the tenth revision at 4/5-digit level
Timeliness			
Processing time	36 months		
Mean time from end of reference period to publication	48 months		
Accessibility			
Media - number of formats in which data are released	Two: website and compact discs		
Metadata	Published on the web and with compact disc and available on request		
Availability of user service	Email: info@statssa.gov.za / Tel: 012 310 8600 / Fax (012) 310 8500 / 8495		