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Mid-year population estimates

2022

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The Mid-year estimates 2022 series does not include data from Census 2022. The census data will be released in 2023. The MYPE will incorporate findings from the published Census 2022 in the MYPE 2024 series. Subsequently, there will be no MYPE report in 2023.

Acronyms and abbreviations

AIDS	acquired immune deficiency syndrome
AIM	AIDS Impact model
ANC	antenatal care
ART	antiretroviral therapy
CBR	crude birth rate
CDR	crude death rate
COVID-19	coronavirus disease 2019
CSIR	Council for Scientific and Industrial Research
DATCOV	Daily hospital surveillance for COVID-19
DemProj	Demographic projections
DHA	Department of Home Affairs
HIV	human immunodeficiency syndrome
IMF	International Monetary Fund
IMR	infant mortality rate
IOM	International Organisation for Migration
NDoH	National Department of Health
NICD	National Institute for Communicable Diseases of South Africa
NPR	National Population Register
NSO	National Statistical Organisation
OECD	The Organisation for Economic Co-operation and Development
PMTCT	prevention of mother-to-child transmission
PLWHIV	People living with HIV
RAPID	Rapid Mortality Surveillance
RNI	rate of natural increase
SDDS	Special Data Dissemination Standards
Stats SA	Statistics South Africa
TFR	total fertility rate
U5MR	under-five mortality rate

Definition of concepts

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

Annual growth rate (GR) – The rate at which the population is increasing or decreasing in a given year due to natural increase and net migration, expressed as a percentage of the base population.

Cohort component projection – A projection made by subjecting all cohorts, on an annual or five-year basis, to mortality and migration assumptions, and applying fertility assumptions to women of reproductive age.

Crude birth rate (CBR) – The number of live births per 1 000 population in a given year.

Crude death rate (CDR) – The number of deaths per 1 000 population in a given year

Epidemic – A disease that affects a large number of people within a community, population or region.

Excess deaths – The number of deaths observed during the pandemic above a baseline of recent trends

Life expectancy at birth (e(0)) – The average number of years a new-born can expect to live based on the mortality conditions at the time.

Life table – A table of values based on a series of related functions having to do with survivorship over intervals of time.

Pandemic – An epidemic that has spread over multiple countries or continents.

Population projection – Computations depicting the future course of a population's size, its structure, and its interaction with dynamics such as fertility, mortality, and migration. The projection is constructed based on assumptions about the future course of those population dynamics.

Rate of natural increase (RNI) – The rate at which the population is increasing or decreasing in a given year due to the surplus or deficit of births over deaths, expressed as a percentage of the base population.

Sex ratio – The number of males per 100 females in a population.

Total fertility rate (TFR) – The average number of children that would be born alive to a woman (or a group of women) during her lifetime if she were to pass through all her childbearing years conforming to the age-specific fertility rates of a given year.

Under five-mortality rate (U5MR) – The number of deaths to children under the age of five per 1 000 live births

Summary

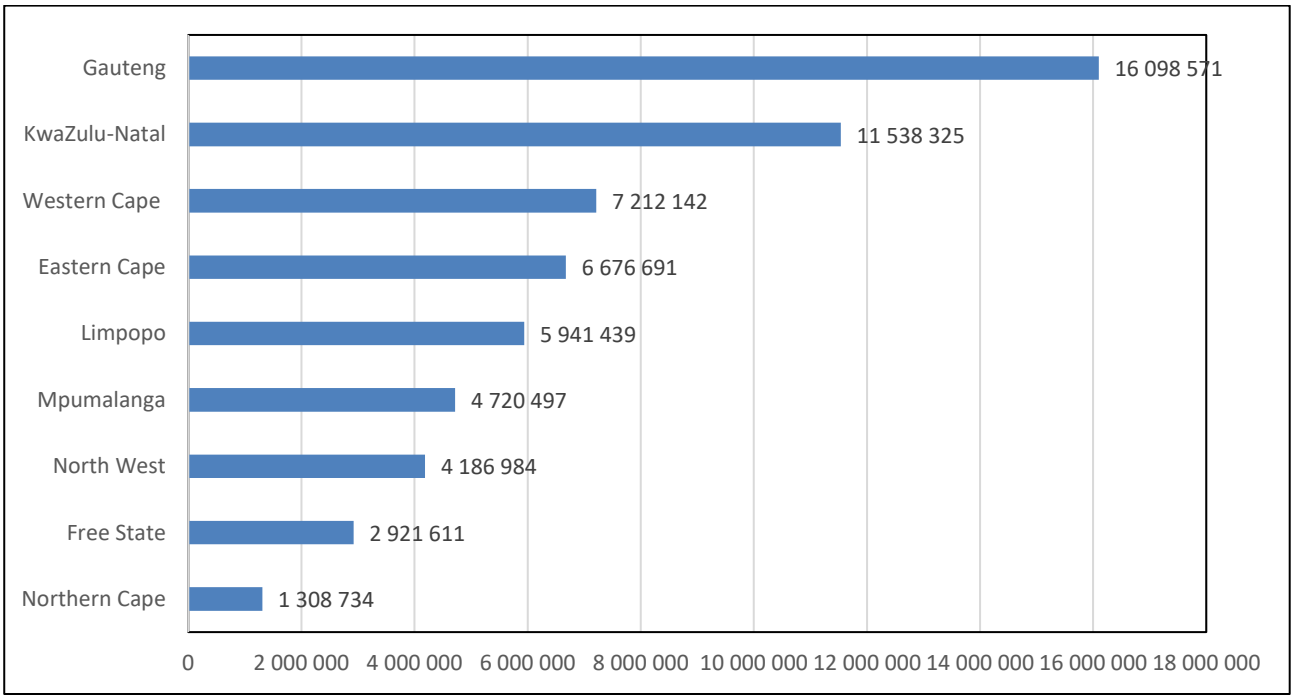
- The Mid-Year estimates 2022 series does not include inputs from the 2022 Census. Census data will be released in 2023.
- The cohort-component methodology is used to estimate the 2022 mid-year population of South Africa.
- The estimates cover all the residents of South Africa at the 2022 mid-year point, and are based on the latest available information. Estimates may change as new data become available. The updated estimates are accompanied by an entire series of revised estimates for the period 2002–2022. On this basis, comparisons between this model and previous ones should not be made.
- For 2022, Statistics South Africa (Stats SA) estimates the mid-year population at 60,60 million people. Approximately 51,1% (approximately 30,98 million) of the population is female.
- On 5 March 2020, South Africa recorded its first case of COVID-19. By the 11th of March, the World Health Organization (WHO) declared COVID-19 a global pandemic. South Africa's first COVID-19 related death occurred on 27th March 2020. As the spread of the disease occurred over time, there was a rise in the number of direct and indirect deaths in the population due to COVID-19. In conjunction, there was a rise in innovation in COVID-19 related treatment protocols, prevention measures and vaccination development over this time.
- Life expectancy at birth for 2022 is estimated at 60,0 years for males and 65,6 years for females.
- The infant mortality rate for 2022 is estimated at 24,3 per 1 000 live births.
- The estimated overall HIV prevalence rate is approximately 13,9% among the South African population. The total number of people living with HIV (PLWHIV) is estimated at approximately 8,45 million in 2022. For adults aged 15–49 years, an estimated 19,6% of the population is HIV positive.
- There is a reduction in international migration, which is indicative of the COVID-19 travel restrictions and subsequent impact on migratory patterns since March 2020. Migration is an important demographic process, as it shapes the age structure and distribution of the provincial population (and so the country's population structure). For the period 2021–2026, Gauteng and Western Cape are estimated to experience the largest inflow of migrants of approximately, 1 443 978 and 460 489 respectively.
- Gauteng still comprises the largest share of the South African population, with approximately 16,10 million people (26,6%) living in this province. KwaZulu-Natal is the province with the second largest population, with an estimated 11,54 million people (19,0%) living in this province. With a population of approximately 1,31 million people (2,2%), Northern Cape remains the province with the smallest share of the South African population.
- About 28,07% of the population is aged younger than 15 years (17,01 million) and approximately 9,2% (5,59 million) is 60 years or older. The provinces reflecting the highest percentage of children younger than 15 within its structure are Limpopo (33,6%) and EC (32,7%). The proportion of elderly persons aged 60 years and older in South Africa is increasing over time and as such policies and programmes to care for the needs of this growing population should be prioritised.

Table 1: Mid-year population estimates for South Africa by population group and sex, 2022

Population group	Male		Female		Total	
	Number	% distribution of males	Number	% distribution of females	Number	% distribution of total
Black African	23 985 479	81,0	25 085 330	81,0	**49 070 809**	**81,0**
Coloured	2 601 932	8,8	2 737 987	8,8	**5 339 919**	**8,8**
Indian/Asian	794 882	2,7	760 114	2,5	**1 554 996**	**2,6**
White	2 242 589	7,6	2 396 679	7,7	**4 639 268**	**7,7**
Total	**29 624 882**	**100,0**	**30 980 110**	**100,0**	**60 604 992**	**100,0**

**Due to rounding totals may not add up to 100%*

Figure 1: Mid-year population estimates for South Africa by province, 2022



1. Introduction

In a projection, the size and composition of the future population of an entity such as South Africa is estimated. The mid-year population estimates produced by Statistics South Africa (Stats SA) uses the cohort-component method for population estimation. In the cohort-component method, a base population is estimated that is consistent with known demographic characteristics of the country. The cohort base population is projected into the future according to the projected components of change. Selected levels of fertility, mortality and migration are used as input to the cohort-component method. For the 2022 mid-year estimates, the cohort-component method is utilised within the Spectrum Policy Modelling system. Spectrum is a Windows-based system of integrated policy models (version 6,2 Beta 7). The DemProj (Demographic Projection) module within Spectrum is used to develop the demographic projection, whilst the AIDS Impact Model (AIM) is used to incorporate the impact of HIV and AIDS on fertility and mortality, and ultimately the population estimates. Within the DemProj, a COVID-19 editor allows for the inclusion of COVID-19 related deaths by age and sex to be incorporated into the model. Spectrum requires annual estimates regarding births, deaths, and migration, among other indicators. The population estimates produced aim to take into account the impact of COVID-19 on births, deaths and migration. The impact of COVID-19 on demographic processes is discussed in detail throughout this report.

Stats SA subscribes to the specifications of the Special Data Dissemination Standards (SDDS) of the International Monetary Fund (IMF). This standard dictates that the MYPE release should be disseminated within one month of the mid-year. The mid-year estimates are an estimate of the population as at 30 June in a given year. The estimates of stock such as population size, number infected with HIV etc. pertain to the middle of the year i.e. 30 June, whilst the estimates of flow e.g. births, deaths, Total Fertility Rates (TFRs), Infant Mortality Rates (IMRs) etc. are for a 12-month period e.g. 1st July 2021 to 30th June 2022. A stock variable is measured at a given time, and represents a quantity at each moment in time – e.g. the number of people within the population at a certain moment whilst an estimate of flow is typically measured over a certain interval of time. The mid-year population estimates are published annually. It would be misleading to compare values and rankings with those of previously published reports, due to revisions and updates of the underlying data and adjustments. Users are advised to use the complete series, published along with this report on the Stats SA website.

2. Demographic and other assumptions

The mid-year population estimates and projections is tasked with determining the demographic profile of the country so as to better assist with planning as it relates to health, economics and welfare. A cohort-component projection requires a base population distributed by age and sex. Levels of mortality, fertility and migration are estimated for the base year and projected for future years. The cohort base population is projected into the future according to the projected components of population change.

3. Fertility

The DemProj module of Spectrum is used to produce a single-year projection, thus the TFR and the life expectancy at birth must be provided in the same format i.e. annually. The time series of TFR estimates for all population groups in South Africa are derived following a detailed review of TFR estimates (1985–2022), [both published and unpublished], from various authors, methods and data sources.

The impact of COVID-19 on conception and subsequently the expected births post-2020 is anticipated to decline given the escalation in economic uncertainty. Literature has shown that in times of economic downturn people become more risk averse (Adsera, 2011; Goldstein et al, 2013; Matysiak et al., 2021; Vignoli et al., 2019). Matysiak et al. (2021) indicate that among the economic indicators influencing fertility, unemployment and the deterioration of the labour market is shown to be associated more so with a decline in fertility. In South Africa the unemployment rate increased by 3,4% in the fourth quarter of 2020 (32,5%) when compared to the fourth quarter of 2019 (29,1%) (pre COVID-19) (Stats SA, 2021(a)). By the fourth quarter of 2021, the official unemployment rate further increased to 35,3%, but declined in the first quarter of 2022 to 34,5% (Stats SA, 2022(a)), The vulnerability of the economy during this period could affect fertility choices in this period. Orsal and Goldstein (2010) in their study of 22 developed countries, found a decline in immediate fertility with higher unemployment among men and women. These effects may be temporal, resulting in postponement of birth and having greater influence on first births. Few studies however in Africa have demonstrated the impact of recession and unemployment on fertility, including South Africa. Studies investigating the fertility intentions in Europe and United Kingdom post COVID-19 have indicated most women in childbearing ages deciding to postpone their first birth (Luppi, Arpino & Rosina, 2020; Sobotka, et al., 2021). Along with decreased job security, family routines around domestic work, childcare, school supervision and other stressors have shown to sway women to further delay births post COVID-19 (Lewis, 2020; Berrington, 2020). The lockdown measures themselves have also inadvertently prevented physical contact and as a result delaying or even limiting possible pregnancy in the short term.

Whilst the aforementioned factors are likely to result in a decline in fertility due to the COVID-19 pandemic, there are factors brought about during the COVID-19 pandemic that increase the likelihood of increased births. Past experiences with infectious diseases such as influenza and even HIV has shown that there has been a reaction of high fertility to high levels of mortality. However, these historical experiences of epidemics and shocks should be understood within the context of their time. The influenza resulted in deaths among all ages, disproportionately among young adults although infants and children were also affected, at a time when children were valued for labour (Reid, 2005). High infant deaths were followed by higher compensating birth rates; however, contraceptive methods were not as readily available as they are now. The age specificity of the mortality pattern due to COVID-19 is such that those at older ages and those with co-morbidities are at higher risk of death. Anticipation of higher birth rates post COVID-19 based on such past epidemics may be unrealistic (Aassve et al; 2020).

Health professionals and planners are concerned with the impact of the lockdown measures due to COVID-19 on the rollout of sexual and reproductive health services such as access and uptake of contraceptive methods, prenatal care provided to mothers, rollout of ARTs and early treatment and diagnosis of diseases

and illnesses. Collateral impacts of this nature are also likely to occur due to the constraints on or overburdening of the health care system due to COVID-19, resulting in higher births. Similarly, there is a concern that adolescent pregnancies may rise due to the hampering of sexual and reproductive programmes and campaigns due to COVID-19. A study by the Human Sciences Research Council (HSRC) showed a rise in adolescent pregnancies (Shisana et al., 2012), while Mchunu et al., (2012) also show high adolescent pregnancies in their sample. These may likely continue, given the collateral impact of COVID-19 as well as the closure of schools for extended periods. Stone et al. (2020) indicate that past experience of economic and environmental stressors have resulted in short term decline of births followed by a recovery period when such stressors have been addressed. A multi-country study by the UNFPA, using civil registration data from selected countries, indicates that developing countries experienced a disruption in the provision of health services due to COVID-19, which lead to an increase in births. It was also found that COVID-19 played a role as great disruptor to already poor levels of timeliness of registration of births and under-reporting of births in developing countries (UNFPA, 2021).

Empirical data indicating the actual effect of the COVID-19 pandemic on fertility in South Africa will only be reflected in the recorded live birth occurrences and registration of 2021 and beyond (9 months after the pandemic). For this reason, current assumptions of national and provincial fertility are based on trends seen in published births data currently available at national and provincial level in the vital registration system and the District Health Information System (DHIS) (Stats SA, 2015; Stats SA, 2021(b); NDoH,2021). Given the array of possible and plausible outcomes for fertility in South Africa due to the impact of COVID-19, the MYPE has assumed a fertility pattern aligned to empirical trends seen in administrative data post 2020. The finalised TFR assumptions can be found in Table 2 (page 7). The estimates of fertility show a fluctuation over the period 2002–2022, giving rise to a population structure indicative of that of the Census 2011 population structure. Since 2009, overall fertility has declined from an average of 2,62 children per woman to 2,31 children in 2022. A dip in fertility seen in 2016 is reflective of empirical birth registration data in the DHIS and the recorded live births data (Stats SA, 2021(b); NDOH, 2021). Other inputs required in DemProj include the age-specific fertility rate (ASFR) trend and sex ratios at birth.

4. Mortality

The ultimate purpose of the mid-year population estimates, which is to assist with policy making and planning based on the population structure and profile, cannot be addressed without taking into account the COVID-19 pandemic that has greatly affected the nation for over 2 years. On 5 March 2020, South Africa recorded its first case of COVID-19. By the 11th of March, the WHO declared COVID-19 a global pandemic. South Africa's first COVID-19 death occurred on 27 March 2020. By 1 July 2020, approximately 152 000 confirmed COVID-19 infection cases and 2 700 confirmed COVID-19 related deaths were reported in South Africa (NDoH, 2020). By end of June 2022, these numbers had drastically increased with almost 4 million confirmed COVID-19 infections reported in the country. COVID-19 reported cases and deaths, during the early days of the epidemic were always cautioned with a preface that such estimates may be hampered by definitional inconsistencies, logistical issues and general aspects that come with attempting to count whilst also researching a relatively unknown pandemic with unclear testing, monitoring and classification processes at the time. It was clear that this was an underestimation. By 01 July 2021 the National Department of Health reported just over 60 000

people had lost their lives to COVID-19 and by the end of June 2022 cumulatively more than 101 000 confirmed COVID-19 deaths were reported (NICD, 2022). These are of course conservative and vastly incomplete estimates.

Working retrospectively to determine COVID-19 related deaths is not a simple task. The Medical Research Council (MRC) has, over time, prepared weekly publications indicating excess deaths in South Africa encountered during the pandemic. The report is based on deaths captured in the National Population Register (NPR) of South Africa (Dorrington et al., 2021). The MRC estimates the mortality impact of COVID-19 to be three-fold what was reported by NDoH for the 4-month period March 2020 to June 2020 (Dorrington et al., 2021; NDoH, 2020; Moultrie, 2021). Using all-cause deaths reported in the death registration system of South Africa (adjusting for late registration and incompleteness), the MRC developed estimates of excess deaths experienced during the COVID-19 pandemic (Dorrington et al., 2021). Excess deaths refer to the number of deaths observed during the pandemic above a baseline of recent trend (Dorrington et al., 2021; NDoH, 2020). Despite the rise in excess deaths since the start of the pandemic to 30th June 2020, these numbers were marginal in comparison to all cause of annual deaths for the period 1st July 2019–30th June 2020 (based on published Stats SA, 2021(c)). The indicators produced as well as the input data required in the MYPE are annual figures i.e. 1st July 2019–30th June 2020. As such the demographic impact of direct and indirect COVID-19 deaths on population estimates for the year 2020, were marginal. In contrast, between 1st July 2020 and 30th June 2021, two Waves of the pandemic swept across the country (Bradshaw et al., 2021). By June 2021, the country had technically entered a 3rd Wave. South Africa, as with many other countries, experienced the mutation of the COVID-19 virus (beta), which resulted in a higher level of COVID-19 infections and consequently higher COVID-19 mortality in the population (NICD, 2021). In the current period 1 July 2021 to 30 June 2022, South Africa endured a further 2 Waves of death due to the pandemic. The first three Waves of the pandemic in South Africa proved the health care system in South Africa ill-prepared to deal with the burden of high COVID-19 infections and morbidity. The second wave of the epidemic (larger than the first) overwhelmed hospitals and medical staff (NICD, 2021; Dorrington et al., 2021). These waves resulted in significantly higher proportions of deaths in the country. Whilst the wave of COVID-19 infection often resulted in a consequent wave of death, the availability and uptake of vaccination resulted in increased infections without a resultant wave in deaths. The third and fourth waves occurred months after the availability of the COVID-19 vaccines, which contributed greatly to the reduction in COVID-19 deaths in the third and fourth waves of infection (NICD, 2022). The omicron variant was first reported to the WHO on 24 November 2021 from South Africa and was the driver of the fourth and “fifth” waves of COVID-19 infection in South Africa. This variant was said to be highly transmissible and was spreading faster than any other previous variant. However, studies conducted in Gauteng province revealed that with omicron, there was a decoupling from infections to hospitalisation, deaths and excess deaths compared to what was seen in previous waves as the severity of the disease had decreased (Abdullah et al., 2022; Madhi et al., 2022).

To estimate the population in the DemProj model in Spectrum, age and sex specific death rates are required. The age, sex and geographic profile of deaths for all residents in South Africa for the period 2019–2022 are yet to be published by Statistics South Africa (Stats SA, 2021(c)). The South African Medical Research Council (SAMRC) have published weekly excess deaths. The published deaths have been adjusted for non-citizenship,

late registration and completion in their estimation. Internationally, measures of excess deaths indicate that the COVID-19 pandemic substantially increased mortality in 2020 and 2021 in many countries (Kalinsky and Kobak, 2021; Aburto et al., 2021). The age mortality profile of the disease indicates that older people and those with co-morbidities, specifically diabetes and hypertension, face a higher risk of mortality (Biswas, et al., 2020, Booth et al., 2021; Sanyaolu et al., 2020; Pillay et al., 2020; Goldstein and Lee, 2020). However, broader categories of respiratory diseases, circulatory diseases and cancer also face higher risk of mortality (Sanyaolu et al., 2020; Stokes et al., 2020, Biswas et al., 2020; Booth et al., 2021; Pillay et al., 2020).

By the end of June 2021, the South African Medical Research Council (SAMRC) estimated that only a third of excess deaths occurring since March 2020 had been reported by the National Department of Health (NDoH) (Moultrie et al., 2021). The data published by the NDoH are limited to direct COVID-19 cases and deaths occurring in public and private hospitals in South Africa. It is evident that deaths counted in private and public hospitals during a pandemic do not accurately reflect the mortality rates due to COVID-19 in the country. In addition, collateral deaths arising from constraints on, or overburdening on the health care system due to the COVID-19 pandemic, are often not accounted for in the impact of COVID-19, locally and globally. According to Sasson (2021), data from the Organisation for Economic Co-operation and Development (OECD) and high income countries indicate that differences in population health, standards of clinical care, readiness of healthcare systems, or data quality and reporting practices of COVID-19 deaths leads to differences in the age pattern of COVID-19 mortality (Carincini, 2020, Pasquariello & Stranges, 2020, Kang & Jung, 2020). It is clear that age specific mortality rates should be examined, bearing in mind the demographic and health context of each country. Data compiled by MRC shows that currently, there have been over 300 000 excess deaths from natural causes in South Africa, since the COVID-19 pandemic started. Almost 85% of excess deaths can be attributed to the COVID-19 pandemic (Moultrie et al., 2021). Given the various constraints in measuring the number of COVID-19 direct and indirect deaths, all-cause mortality is used to quantify the burden of the pandemic (Kalinsky and Kobak, 2020, Aburto et al., 2021, Dorrington et al., 2021).

There have been moments in South African history whereby age-sex specific death rate patterns have been affected by a breakout of illness and disease. In 1918, South Africa was among the top five countries hardest hit by the Spanish flu (Phillips, 2012). Polio, TB, and Malaria also took its toll on the health care system and the South African population (Phillips, 2012). More recently, the HIV pandemic, at its peak in 2006, contributed to almost 40% of all deaths in the country (Simbayi et al., 2019). AIDS-related deaths have remained prevalent in South Africa for more than 2 decades. Due to the age-sex specific profile of AIDS-related death rates and its subsequent impact on the population structure of South Africa, HIV estimation has remained part of the mid-year population estimation modelling. There are differences in both the nature and experience of the AIDS and COVID-19 pandemics. The far more infectious COVID-19 virus, spread via droplets or aerosols, greatly affected the entire globe, with death rates sparing no country, including developed populations (Booth et al., 2021; Sanyaolu et al., 2020; Pasquariello & Stranges, 2020). In contrast, the highest HIV infection and AIDS-related mortality are found in poorer countries with the epicentre being Africa (Simbayi et al., 2019; Gona et al., 2020). In Africa, the primary mode of transmission is via sexual transmission, with highest infection and deaths rates among youth, adult and female population as well as infants born with the infection (Simbayi et al., 2019). Research and development into the AIDS pandemic has taken place over two decades and whilst

life-saving drugs have become available, these are life-long regiments. Due to the nature of the disease, to date no HIV vaccine has been achieved. Vaccine development to address the COVID-19 pandemic has taken place in record-breaking time, building on the achievements in the study of viruses and disease globally. However, the mutations of the virus over time continue to threaten the impact of those achievements.

Whilst it is imperative to take cognisance of the public health issues occurring within the country, population estimation models do not require cause specific deaths. The estimation model is reliant on age and sex specific death rates occurring at various levels of geography to provide an age-sex structure incorporating the overall mortality of the country (all-cause mortality). In South Africa, the relative risk of COVID-19 mortality is higher for men than women (NICD, 2021, Pillay et al., 2020). The age and sex structure of direct confirmed COVID-19 deaths found in hospitals in South Africa (as provided by DATCOV) follow a similar pattern found internationally with some variability. In the absence of current empirical data regarding the age and sex structure of excess deaths by population group, estimated excess deaths occurring in MYPE for the year 1st July to 30th June will be disaggregated using a combination of the age-sex structure found in hospitals as well as the age distribution of deaths found in the NPR (Dorrington et al., 2021; NICD, 2021). As such, the population age and sex structure published in this report will incorporate the mortality experience of COVID-19 annually.

We acknowledge that the difference in age and sex structure of reported deaths in the hospital system as well as those evident in the NPR may hold particular age; sex; population group; geographic and reporting biases that we are yet to uncover. In the absence of current empirical data regarding the age and sex structure of COVID-19 distributed by population group, a similar assumption has been made using hospital and registration data currently available. The MYPE is updated annually, and will be revised to incorporate new information including the Mortality and Causes of Deaths data when made available or published.

Life expectancy at birth is a commonly used indicator of health and development in a country. Reversals and stagnation in life expectancy in South Africa due to the HIV pandemic was a result of mid-life and infant mortality crisis. The HIV/AIDS pandemic is a two-decade long public health issue that has greatly affected the demography of South Africa. The life expectancy measure, whilst useful in the context of HIV/AIDS, can actually overstate the impact of a temporary epidemic mortality (Goldstein and Lee, 2020; Heuveline, P. and Tzen, M., 2021). Life expectancy at birth is an important health indicator and should not be discredited by potentially misleading interpretations (Luy et al., 2019). The key advantage of this indicator is gained when comparisons are made over time and across countries with different population sizes and structures. The indicator is sensitive to ages at which deaths occur. Similar to the HIV pandemic, the derived life expectancy at birth during the COVID-19 pandemic is affected by the selection effect of COVID-19 deaths i.e. older persons and those with comorbidities face higher mortality (Levin et al., 2020; Sanyaolu et al., 2020; Pillay et al., 2020). The indicator should not be interpreted as a projection of an individual's lifespan but rather should be used to shed light on the cumulative burden of a crisis such as COVID-19 compared to recent trends (Aburto et al., 2021, Luy et al., 2019, Goldstein and Lee, 2020). The indicators of mortality soared to their highest levels in a matter of weeks with waves of deaths occurring over short intervals (Luy et al., 2019). Bearing in mind the sensitivity of the indicator to cohort, heterogeneity and temporal effects, it is imperative that additional

alternative indicators of mortality such as crude death rate, infant and child mortality are considered in the interpretation of health and wellbeing in the country (Luy et al., 2019, Goldstein and Lee, 2020; Heuveline, P. and Tzen, M., 2021).

The life expectancy assumption entered into DemProj by sex is the life expectancy in the absence of HIV/AIDS (see Table 2). Each population group is subjected to non-AIDS mortality according to the input non-AIDS life expectancy and the selected model life table. AIM calculates the number of AIDS deaths and determines a new set of life expectancies that incorporate the impact of AIDS, (see Figure 3, page 14). Stats SA applies the country-specific UN Model Life table for South Africa in Spectrum. The age pattern of mortality is based on various sources, data and methods – these include death data from the RAPID mortality surveillance report, Mortality and causes of death report, and the Demographic and Health Survey report – among others. Survival rates from the selected life tables were then used to project the population forward. Additionally, excess deaths in the time of COVID-19 pandemic is incorporated into the estimation process.

Table 2: Assumptions of Total Fertility rate and expectation of life at birth without HIV/AIDS & COVID-19, 2002–2022

Year	TFR	Life expectancy at birth without HIV/AIDS	
		Male	Female
2002	2,45	59,9	67,2
2003	2,42	59,8	67,9
2004	2,54	60,0	68,1
2005	2,59	60,0	68,1
2006	2,62	60,0	68,2
2007	2,65	60,3	68,2
2008	2,66	60,4	68,2
2009	2,62	60,4	68,3
2010	2,58	61,7	68,4
2011	2,51	62,9	68,9
2012	2,46	63,2	69,4
2013	2,42	63,5	69,9
2014	2,39	63,6	69,9
2015	2,35	63,7	70,2
2016	2,27	63,7	70,2
2017	2,25	64,0	70,7
2018	2,28	63,8	70,5
2019	2,33	64,1	70,6
2020	2,34	64,7	71,4
2021	2,35	64,9	71,4
2022	2,34	64,8	71,3

The Spectrum Policy Modelling System (Futures Group) consists of a number of components that result in the estimation of population size to assist in costing and planning of, and future healthcare services. For the purpose of the production of the MYPE, Stats SA uses two of the available components in this projection model, namely (a) **Demproj** for population projections and (b) **AIM** in which the consequences of the AIDS epidemic were projected. In the AIM projection, several programmatic and epidemiological data inputs specific to South Africa are required. These include programme coverage of adults and children on antiretroviral treatment (ART) and Prevention of mother-to-child-transmission (PMTCT) treatment (NDoH, 2021). In addition to eligibility for treatment as per national guidelines, the epidemiological inputs include antenatal clinic data (ANC). The assumptions regarding the HIV epidemic in South Africa are based primarily on the prevalence data collected annually from pregnant women attending public service antenatal clinics (ANC) since 1990 to the most recent estimates of 2019 (Woldesenbet, S.A, et al., 2018; NDoH, 2021). However, antenatal surveillance data produce biased prevalence estimates for the general population because only a select group of people (i.e. only pregnant women attending antenatal public health services) are included in the sample. The South African National HIV prevalence, incidence, behaviour and communication survey data that produces national estimates for the country are used in the model to correct for this bias (Shisana et al., 2014; Simbayi et al., 2019). Whilst more recent data on HIV prevalence from such survey post 2017 is not available and as such do not incorporate the impact of COVID-19 on HIV prevalence in the country, treatment data is available, and as such, programmatic coverage of adults and children on antiretroviral treatment to date has been incorporated into the model (NDOH, 2021). Other inputs in the AIM model include the following: Median time from HIV infection to death, and Ratio of new infections. Indicators of HIV prevalence, incidence and HIV population numbers over time show the impact of HIV on the population. HIV indicators shown in Figures 6 and 7 are based on the aforementioned assumptions. The Mid-Year estimates 2022 series does not include input from the 2022 Census. The latest updated Census data will be released in 2023.

5. International migration

Between 11 March 2020, when the WHO declared COVID-19 a pandemic, and 22 February 2021, nearly 105 000 movement restrictions were implemented around the world (IOM, 2021). COVID-19 restrictions and protocols, combined with increased logistical burdens around travel, limited the movement of people across international borders. Migration to OECD member countries are estimated to have fallen by an unprecedented 46% in the first half of 2020 (OECD, 2020). These estimates are informed by the number of new immigration permits issued, which only partly represents migration flow (OECD, 2020). Furthermore, Illegal migration constitutes a significant proportion of migration, often missed in official estimates, and this varies from country to country (IOM, 2019). Given the far-reaching impact of an infectious disease such as COVID-19 on travel and movement, it is only rational to expect migration to decline globally. However, the pace and level of that decline over time is somewhat more difficult to predict. Over time, travel restrictions have been amended and protocols revised, to facilitate mobility and migration. Travel restrictions and protocols brought about by the COVID-19 pandemic vary significantly from country to country. The impact of COVID-19 protocols, policies as well as movers' decision-making in the time of a pandemic, has been documented in countries with current and better quality migration data. Germany has seen zero growth in population due to declined immigration, whilst Australia has experienced a negative growth in population for the first time since 1945. Similarly, New Zealand has estimated a 78% decline in migrants entering the country since February 2020 (Stats NZ, 2021).

The data for 2020 includes partial data for when COVID-19 pandemic was present. According to the United Kingdom's Office for National Statistics, there were about 255 000 South Africans living in the UK in 2019 and this declined by about 26 000 to 229 000 in 2020 (ONS, 2020). Countries that are known to be South Africans' preferred destination of emigration (outside of Africa), have reported an overall decline in the proportions of immigrants entering those countries (ABS, 2021, Stats NZ, 2021, ONS, 2020, OECD, 2021).

Similar to other countries around the globe, South Africa, under the Disaster Management Act of SA called for the closure of South African international borders (during lockdown Level 5). This was enacted on 26 March 2020 for a period of 21 days, and further extended by two more weeks. A significant proportion of the South African international migration outside of Africa are facilitated by air travel, primarily to countries such as the USA, Canada, European countries, Australia, and New Zealand, India, Bangladesh, Pakistan, China – and this significantly was impacted by limits on air travel (Census 2011, CS 2016). Although international borders were closed, evacuation of non-citizens back to their countries of origin as well as repatriation of citizens returning to South Africa was allowed. Given the aforementioned developments, MYPE 2021 series assumes a decline in international migration for the period April, May and June 2020. The MYPE provides annual estimates of migration for the period 1st July to 30th June, as such the change in migration, for the period 20 March 2020 to end June 2020 (just over 3 months), accounts for less than a third of the migration for that year. The organogram (Figure 2), provides a timeline of the changes in lockdown levels in South Africa and the corresponding travel and border closures in South Africa. Countries worldwide have now begun lifting restrictions that were imposed to slow down the spread of COVID-19 pandemic, leading to easier and therefore increased movements. South Africa ended the state of national disaster on 4 April 2022. South Africa has followed suit and on 23 June 2022 removed all the remaining COVID-19 restrictions including entry requirements at the borders.

The South African Department of Home Affairs (DHA) office routinely collects data on travellers using official ports of entry coming into, and leaving South Africa. This data may be useful in elucidating patterns of international movements in SA and is used to develop migration estimates. According to latest data by DHA immigration officers at ports of entry into South Africa, foreign travellers arriving into SA decreased by 88,8% in February 2021 when compared to February 2020, whilst departures from the country decreased by 89,3% when comparing February 2020 to February 2021 (Stats SA, 2021(d)). By March 2021, there had been improvement in mobility, and this may be attributed to the easing of international lockdown measures over time. Foreign travellers arriving into SA decreased by 74,2%, whilst departures from the country decreased by 78,7% when comparing March 2020 to March 2021 (Stats SA, 2021(e)). It should be noted that both July 2020 and August 2020 reflect the highest drop in both arrivals and departures, when compared to 2019, this is a direct result of renewed lockdown measures due to the 2nd wave of the COVID-19 pandemic in the country (Stats SA, 2021(f)).

Figure 2: Lockdown levels and migration

Level 5	→	Level 4	→	Level 3	→	Level 2	→	Level 1	→	Adjusted Level 3	→	Adjusted Level 1
26-March-30 April 2020		01-31 May 2020		01 June-17 August 2020		18 August-20 September 2020		21 September-28 December 2020		29 December 2020-28 Feb 2021		01 March - 30 May 2021

INTERNATIONAL AND NATIONAL BORDER MOVEMENT						
Level 5	Level 4	Level 3	Level 2	Level 1	Adjusted Level 3	Level 1
All borders of the country remain closed except for transportation of good and repatriation of citizen to SA and non-citizens to their countries of citizenship Interprovincial travel is not permitted except to return to work with proof of employment; for movement of learners, with permit; in exceptional circumstances such as funerals (with approval) or essential services	All border of the country remain closed except for transportation of good and repatriation of citizen to SA and non-citizens to their countries of citizenship Interprovincial travel is not permitted except to return to work with proof of employment; for movement of learners, with permit; in exceptional circumstances such as funerals (with approval) or essential services	All border of the country remain closed except for transportation of good and repatriation of citizen to SA and non-citizens to their countries of citizenship Interprovincial travel is not permitted except to return to work with proof of employment; for movement of learners, with permit; in exceptional circumstances such as funerals (with approval) or essential services	All border of the country remain closed except for transportation of good and repatriation of citizen to SA and non-citizens to their countries of citizenship All travel between provinces is allowed for any purpose.	Borders reopened for international travel as of 01 October 2020 subject to restrictions. All travel between provinces is allowed for any purpose	Borders reopened for international travel as of 01 October 2020 subject to restrictions. 20 land borders were closed on 11 January 2021 and re-opened on 15 February 2021 while 30 remain closed. All travel between provinces is allowed for any purpose	Borders reopened for international travel as of 01 October 2020 subject to restrictions. All travel between provinces is allowed for any purpose
AVIATION						
Level 5	Level 4	Level 3	Level 2	Level 1	Adjusted Level 3	Level 1
Air transport permitted only for the shipment of cargo	Ocean and air transport permitted only for the shipment of cargo	Domestic air travel for business only International flights not permitted	Domestic air travel for business only International flights not permitted	Domestic air travel allowed. International travel allowed as of 01 October 2020.	Domestic air travel allowed. International travel allowed as of 01 October 2020.	Domestic air travel allowed. International travel allowed as of 01 October 2020.

Adjusted Level 2	→	Adjusted Level 3	→	Adjusted Level 4	→	Adjusted Level 3	→	Adjusted Level 2	→	Adjusted Level 1	→	National state of disaster lifted
31 May-15 June 2021		16-27 June 2021		28 June-25 July 2021		26 July - 12 September 2021		13 -30 September 2021		01 October 2021-4 April 2022		05 April 2022 to date

INTERNATIONAL AND NATIONAL BORDER MOVEMENT						
Adjusted Level 2	Adjusted Level 3	Adjusted Level 4	Adjusted Level 3	Adjusted Level 2	Adjusted Level 1	Lockdown ended
20 land borders of the country are fully operational and 33 remain closed. Travelling to and from the country is allowed subject to restrictions. All travel between provinces is allowed for any purpose	20 land borders of the country are fully operational and 33 remain closed. Travelling to and from the country is allowed subject to restrictions. All travel between provinces is allowed for any purpose	20 land borders of the country are fully operational and 33 remain closed. Travelling to and from the country is allowed subject to restrictions. Interprovincial travel is restricted when travelling to and from Gauteng only – except for work, business or commercial travel. Leisure travel is prohibited	20 land borders of the country are fully operational and 33 remain closed. Travelling to and from the country is allowed subject to restrictions. All travel between provinces is allowed for any purpose.	20 land borders of the country are fully operational and 33 remain closed. Travelling to and from the country is allowed subject to restrictions. All travel between provinces is allowed for any purpose	21 land borders of the country are fully operational and 32 remain closed except for the Telle Bridge port of entry. All travel between provinces is allowed for any purpose	Partial re-opening of borders still in place. 21 land borders of the country are fully operational and 32 remain closed. All travel between provinces is allowed for any purpose
AVIATION						
Adjusted Level 2	Adjusted Level 3	Adjusted Level 4	Adjusted Level 3	Adjusted Level 2	Adjusted Level 1	Lockdown ended
Domestic air travel allowed International air travel is restricted to 5 airports only.	Domestic air travel allowed International air travel is restricted to 5 airports only.	Domestic air travel allowed with restrictions to Gauteng. International air travel is restricted to 5 airports only.	Domestic air travel allowed International air travel is restricted to 5 airports only.	Domestic air travel allowed International air travel is restricted to 5 airports only.	Domestic air travel allowed International air travel is restricted to 5 airports only.	Domestic air travel allowed International air travel is restricted to 5 airports only.

Source: www.gov.za

International borders and international travel opened as of 01 October 2020; however, this was not without interruption and limitations (Figure 2). When the country was in lockdown alert level, no movements in and out of the country was allowed except for transportation of goods and repatriation of South African citizens from overseas and non-South Africans being sent back to their countries of citizenship. In the period 1st July 2020 to 30th June 2021, the country was under alert Level 1 lockdown for 5 months (July, August and September 2021 as well as January and February 2021). Taking these lockdown measures into consideration, as well as the factors influencing migrants' ability to migrate and decision-making factors to migrate which include cost of travel, employment opportunities, travel and entry protocols during COVID-19 pandemic, as well as safety issues, international migration estimates for the year 2021 and beyond were revised downwards.

Table 3 shows international migration by population group for selected periods. As already indicated, the impact of the COVID-19 pandemic on international migration for the period 1st July 2019–30th June 2020 was endured for only a quarter of the year. However, for the period 1st July 2020 to 30th June 2021, assumptions for international migration incorporated the impact of COVID-19 for a 12-month period. For the year 2021, the assumption is that international migration remained at a low level, given the situation of effective travel bans, lockdown reactions to surges in infection levels and mutation of the virus, low vaccination rollout numbers globally, worsening economic and employment opportunities, among other factors. For the year 2022, given the relaxation of the travel bans and the rise of sub-variants rather than completely new mutations, it seemed unnecessary for the revival of travel bans, with many countries opening their borders with various conditions. However, the economic climate due to COVID-19 as well as the Russia-Ukraine war impact on oil prices greatly impacted worsening economic conditions. Given this context we assumed a conservative rise in migration. The routine data collected by DHA's immigration officers at ports of entry into the country confirm a slow/gradual increase in foreign travellers/movement into South Africa in 2022. For the month of March 2022, foreign travellers arriving into SA increased by 110% from March 2021 (Stats SA, 2022(b)). However, the 110% should be interpreted with caution as it is an increase from a very low base resulting from COVID-19 Level 1 lockdown regulations. In April 2022, travellers arriving in the country increased by 128,9% when comparing 2022 to 2021 (Stats SA, 2022(c)). It should be noted that the reported number of travellers in 2021 are far lower than the number of reported travellers prior to the COVID-19 pandemic and restrictions thereof.

Table 3: International net-migration assumptions for the period by population group, 1985–2026

	African	Indian/Asian	White	Net international migration
1985–2000	632 633	36 908	-202 868	466 673
2001–2006	565 916	25 310	-99 574	491 652
2006–2011	815 780	43 222	-106 787	752 215
2011–2016	972 995	54 697	-111 346	916 346
2016–2021	894 365	49 584	-90 957	852 992
2021–2026	595 057	40 979	-43 516	592 520

Note: The estimate refers the flow figure from 1st July of the first year in the period to 30th June of the last year of the period

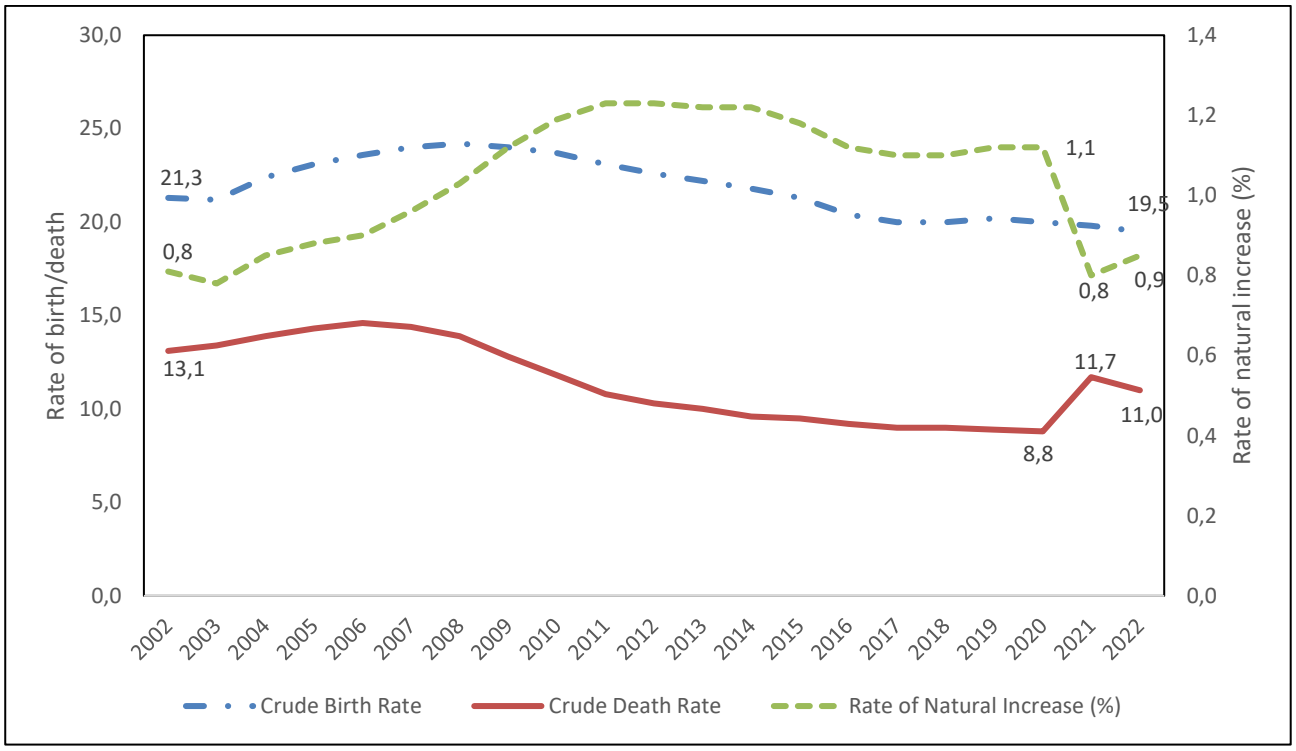
If the net flow of migrants is outward, then net migration is reflected as a negative number whilst if the net flow is inward, then it is reflected as a positive number (Table 3). Net international migration estimates are derived using not only Census 2011 migration data, but also migration numbers and proportions from various other authors, methods and data sources such as the OECD, International Organisation for Migration (IOM), which forms part of the UN network. Census data from National statistics offices (NSOs) of various countries as well as migration data is also sourced**.** Compared to other components of change, the net migration rate can be volatile, as encountered in the recent outbreak of COVID-19 since March 2020.

Projecting international migration post June 2020 is a contentious activity. This is particularly the case at a time when the pandemic and its subsequent treatment unfolds on a daily basis. Unlike the past, whereby trends were stable, the context of a pandemic results in a rather highly variable trajectory. Whilst there have been numerous revisions to policy regarding entry to and exit from SA since March 2020, in the last year the policy has remained fairly stable, affording migrants the ability to enact the migratory moves they wish to undertake. Internationally migration statistics and estimates post 2020 are yet to be published. The MYPE 2022 series has assumed a resumption in migratory patterns, whilst not entirely to the level of per COVID-19, but on an upward trajectory. As migration data comes to the fore over time, migration assumptions will be revised accordingly.

6. Demographic and other indicators

Figure 2 indicates that the crude birth rate (CBR) has increased between 2003 and 2008, thereafter it follows a general pattern of decline between 2009 and 2022. The CBR is directly related to the rise and fall of TFR assumptions over time (Table 2, page 8). Figures 3–5 and Table 4 offer a glimpse into the mortality experience of South Africa, which incorporates the impact of HIV and AIDS (using the AIM model). The crude death rate (CDR) has declined from 13,1 deaths per 1 000 people in 2002 to 8,8 deaths per 1 000 people in 2020, then increased to 11,7 deaths per 1 000 people in 2021 and has now declined to 11 deaths per 1 000 people in 2022. However, it is clear from the drastic increase in CDR from 8,8 deaths per 1 000 population in 2020 to 11,7 deaths per 1 000 population in 2021, is dramatically influenced by COVID-19 mortality rates in the country within just one year. Due to the AIDS epidemic experience, the crude death rate in South Africa did increase between 2002 and 2006 thereafter declining as access to HIV treatment and care became available. The RNI (rate of natural increase) fluctuates over time, and peaking around 2011–2014 while CBR shows a peak around 2008 with a gradual decline over time. RNI indicates the great influence of births relative to deaths over the 10-year period. However, with declining fertility and a dramatic increase (34%) in deaths in 2021 due to the COVID-19 pandemic, the rate of natural increase in South Africa dropped drastically from 1,12% in 2020 to 0,85% in 2022.

Figure 3: Crude birth rate, crude death rate, and rate of natural increase over time, 2002–2022



Life expectancy at birth declined between 2002 and 2006, largely due to the impact of the HIV and AIDS epidemic experienced, however expansion of health programmes to prevent mother-to-child transmission as well as access to antiretroviral treatment has partly led to the increase in life expectancy since 2007. Life expectancy at birth for males declined from 62,3 in 2020 to 59,2 in 2021 (3,1 year drop) and from 68,4 in 2020 to 64,2 for females (4,2 year drop). Whilst the Life expectancy at birth indicator is an important health indicator it should not be interpreted as a projection of an individual's lifespan but rather should be used to shed light on the cumulative burden of a crisis such as COVID-19 compared to recent trends. Assuming greater vaccination coverage, continued prevention practices i.e. mask wearing; social distancing and sanitising of hands and surfaces; further innovation in drug and treatment protocols and the avoidance of a more severe or infectious strain of the virus, we would likely see life expectancy in South Africa improve over time. As has been the case in 2022, whereby life expectancy at birth improved by 0,8 years for males (60,0 years) and 1,4 years for females (65,6 years). Apart from improved health, education and sanitation over time, the gains may also be related to marginal gains in survival rates due to access to ART among adults over time as well as among infants and children under-5 post 2005. The infant mortality rate (IMR) has declined from an estimated 55,2 infant deaths per 1 000 live births in 2002 to 24,3 infant deaths per 1 000 live births in 2022. Similarly, the under-five mortality rate (U5MR) declined from 74,7 child deaths per 1 000 live births to 30,7 child deaths per 1 000 live births between 2002 and 2022. The IMR and U5MR shown in Figure 5 are based on the selected model life table and may differ to similar indices published elsewhere. Infants admitted to hospitals for COVID-19 related illness experienced a case fatality rate of 6,6% whilst those aged one to four admitted, experienced a case fatality rate of 3,0%. (NICD, 2021 (b)). The children sparing pattern of COVID-19, has thus far made no impact on child mortality levels in the country (NICD, 2021 (b); Kang & Jung, 2020).

The approximately 34% rise in deaths in adults in the year 2021, significantly affected the life expectancy at birth in South Africa. The 5% reduction in deaths for 2022 has improved the LE at birth for the current year. In South Africa, female mortality was already disproportionately higher than male mortality due to the impact of HIV/AIDS (Figure 4). Whilst life expectancy and deaths are useful measures of mortality, policy makers should make use of a combination of measures, these include the crude death rate, age specific mortality found within this report, to make more informed decisions for planning purposes when experiencing transitory mortality shocks such as the COVID-19 pandemic (Goldstein & Lee, 2020).

Figure 4: Life expectancy by sex over time, 2002–2022

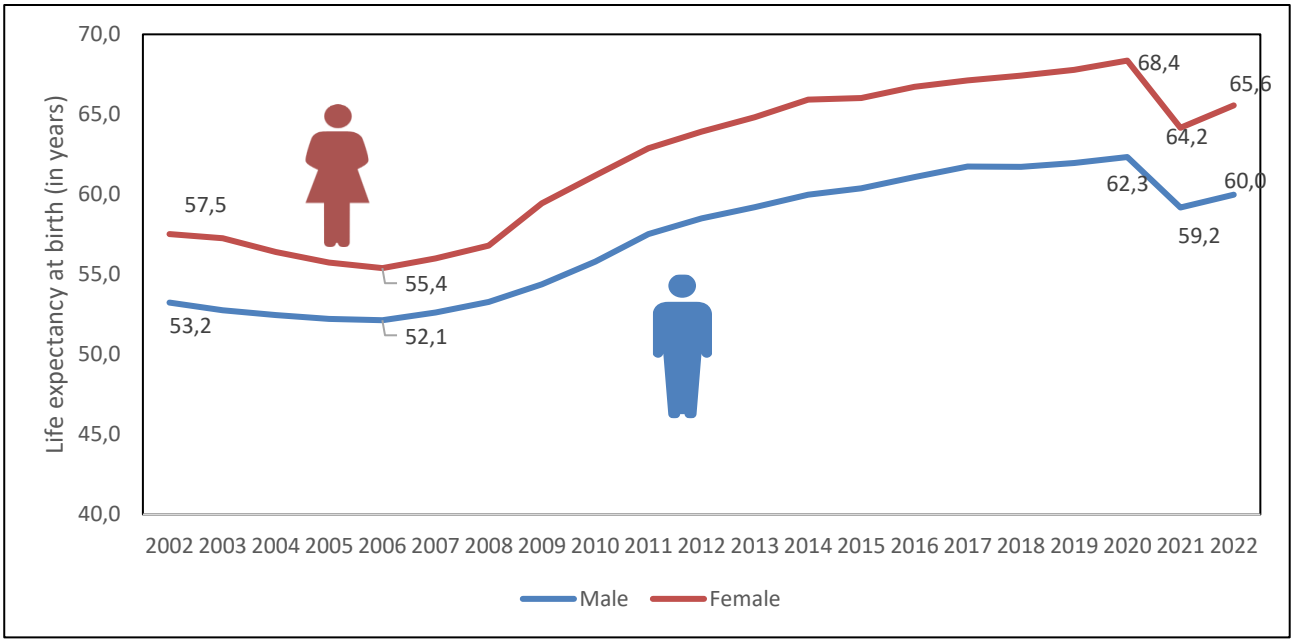


Figure 5: IMR, U5MR and Total Life Expectancy over time, 2002–2022

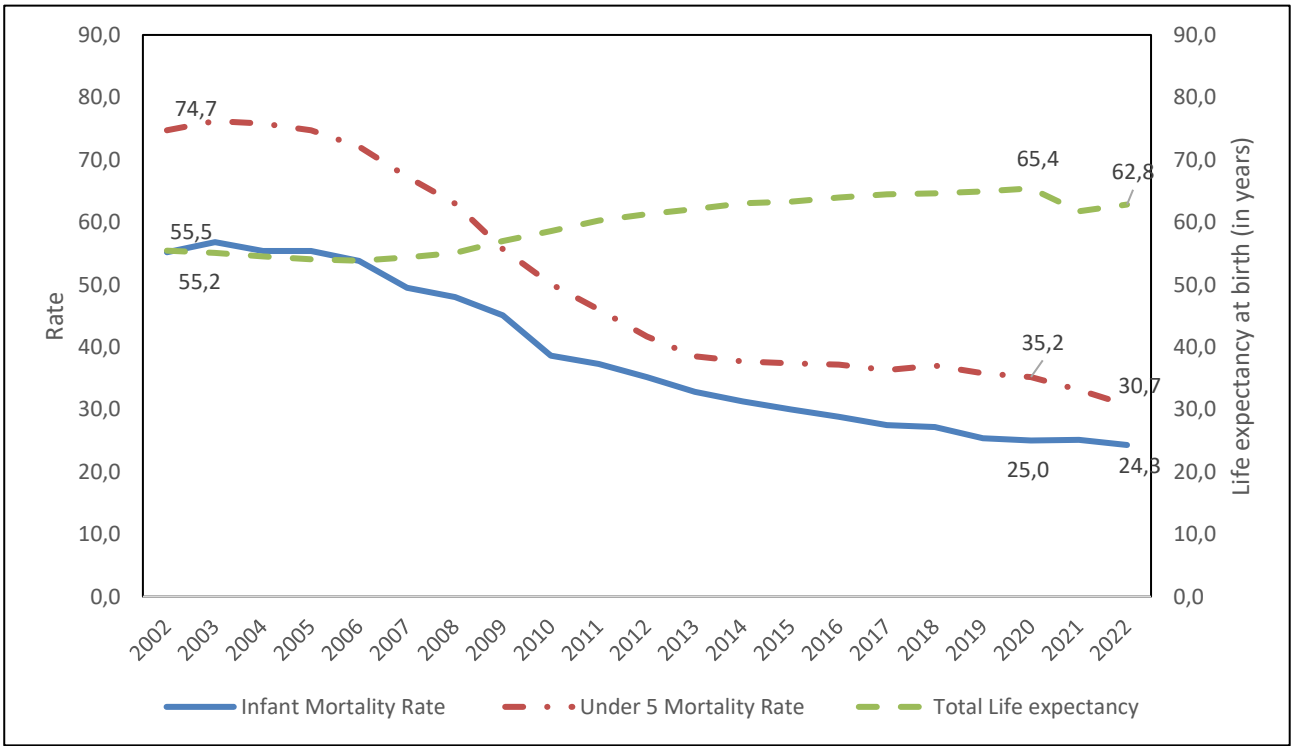


Table 4 indicates estimates for selected indicators. The highest number of deaths was estimated for the period 1st July 2005 to 30th June 2006, during the peak of the AIDS pandemic. The decline in the percentage of AIDS-related deaths since 2006 can be attributed to the increase in the roll-out of ART over time. The national roll-out of ART began in 2005 with a target of one (1) service point in each of the 53 districts of South Africa at the time (later reduced to 52 districts). The estimated number of AIDS-related deaths has generally declined since 2007 from 278 741 to 85 796 AIDS related deaths in 2022. Access to antiretroviral treatment has changed significantly over time, altering the pattern of mortality over time. Access to ART has extended the lifespan of many in South Africa, who would have otherwise died at an earlier age, as evidenced in the decline of AIDS deaths post-2006. More recently there has been a small increase in the period 2021 (87 915) and 2022 (85 796). The presence of the COVID-19 pandemic has hampered the ability of the health sector to extend life expectancy in South Africa in the year 2021. A slight increase in AIDS related deaths is apparent in the year 2021, despite efforts to ensure ART rollout and better regiments of treatment (DHIS, 2021). The proportion of AIDS related deaths relative to all deaths declined in 2021 and remained low in 2022, as the proportion of COVID-19 related deaths remains significantly high in the year 2021 and 2022. Estimated deaths in 2021 come close to levels last seen during the AIDS pandemic at its peak.

Table 4: Births and deaths for the period 2002–2022

Year	Number of births	Number of deaths	Number of AIDS related deaths	Percentage of AIDS related deaths
2002	981 336	605 943	191 210	31,6
2003	989 093	625 641	218 918	35,0
2004	1 055 572	653 530	246 919	37,8
2005	1 099 633	680 781	271 149	39,8
2006	1 134 383	702 208	282 904	40,3
2007	1 168 444	699 196	278 741	39,9
2008	1 193 952	687 606	260 357	37,9
2009	1 200 624	641 720	202 287	31,5
2010	1 201 122	598 866	175 183	29,3
2011	1 189 397	557 382	155 736	27,9
2012	1 181 869	540 499	140 360	26,0
2013	1 177 672	530 562	129 644	24,4
2014	1 175 754	516 058	108 839	21,1
2015	1 165 015	520 577	109 822	21,1
2016	1 133 518	511 458	93 370	18,3
2017	1 129 000	507 972	88 521	17,4
2018	1 146 671	516 838	79 989	15,5
2019	1 171 415	519 728	78 508	15,1
2020	1 181 447	519 342	80 199	15,4
2021	1 180 303	701 360	87 915	12,5
2022	1 175 776	663 075	85 796	12,9

Note: The flow data as shown above are for a 12-month period e.g. 1st July to 30th June

HIV prevalence

Figures 6 and 7 show the HIV prevalence estimated for the period 2002–2022. For 2022, an estimated 13,9% of the total population is HIV positive. Almost a fourth of South African women in their reproductive ages (15–49 years) are HIV positive. HIV prevalence among the youth aged 15–24 has remained stable over time. The total number of persons living with HIV (PLHIV) in South Africa increased from an estimated 3,68 million in 2002 to 8,45 million by 2022. Having the largest number of people enrolled on ART programme in the world, the South African government was indeed concerned about the impact of COVID-19 on PLWHIV as well as impact on testing and treatment programmes. Efforts to ensure continuity of care among PLWHIV, whilst de-escalating health services to lower the spread of COVID-19 was advocated and promoted by the National Department of Health and various stakeholders in the heath sector (Elsayed et al., 2020). Despite such efforts, supply of medicines are hampered when there is a global pandemic along with global lockdown measures and travel restrictions. ART regimens are lifelong and require continuity. Disruptions in access to treatment protocol can be detrimental to health and wellbeing among HIV positive persons. Studies have indicated that PLWHIV with immunosuppression, do display higher mortality risk due to COVID-19 as multi-morbidity is a constant feature (Mirzaei et al., 2021; Ssentongo et al., 2021), emphasising the imperative need for access to continual treatment. Available data suggests a decline in annual number of clients remaining on ART by approximately 4% (DHIS, 2021). It is clear that the COVID-19 pandemic has to some extent, interrupted HIV prevention and treatment programmes in South Africa as it did globally. Data from public and private hospitals in South Africa indicate that the case fatality rate (CFR) was higher for HIV infected persons (20,9%) when compared to non-HIV infected persons (18,9%) (NICD, 2021a). The presence of a competing pandemic such as COVID-19 in South Africa does present challenges that are likely to hamper progress to reach annual targets and goals set by the country and international organisations concerned with the eradication of HIV and AIDS (UNAIDS, 2020).

Figure 6: HIV prevalence by selected age groups, 2002–2022

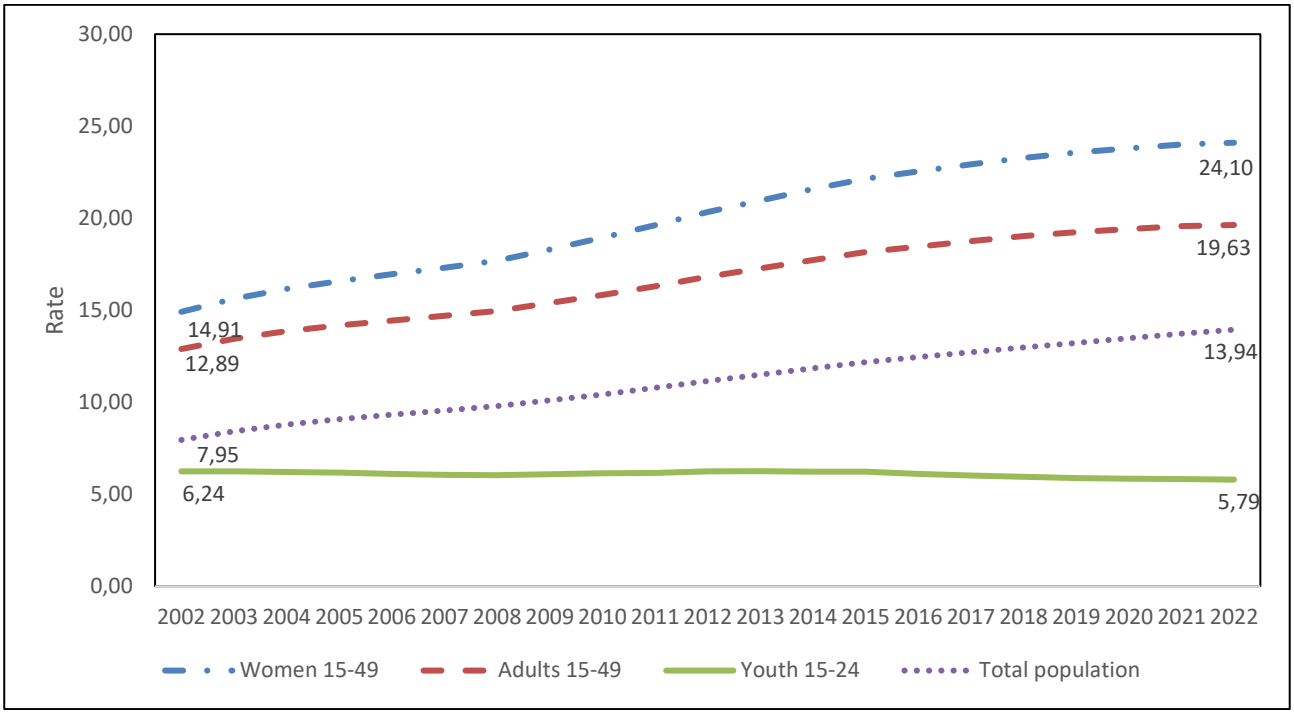
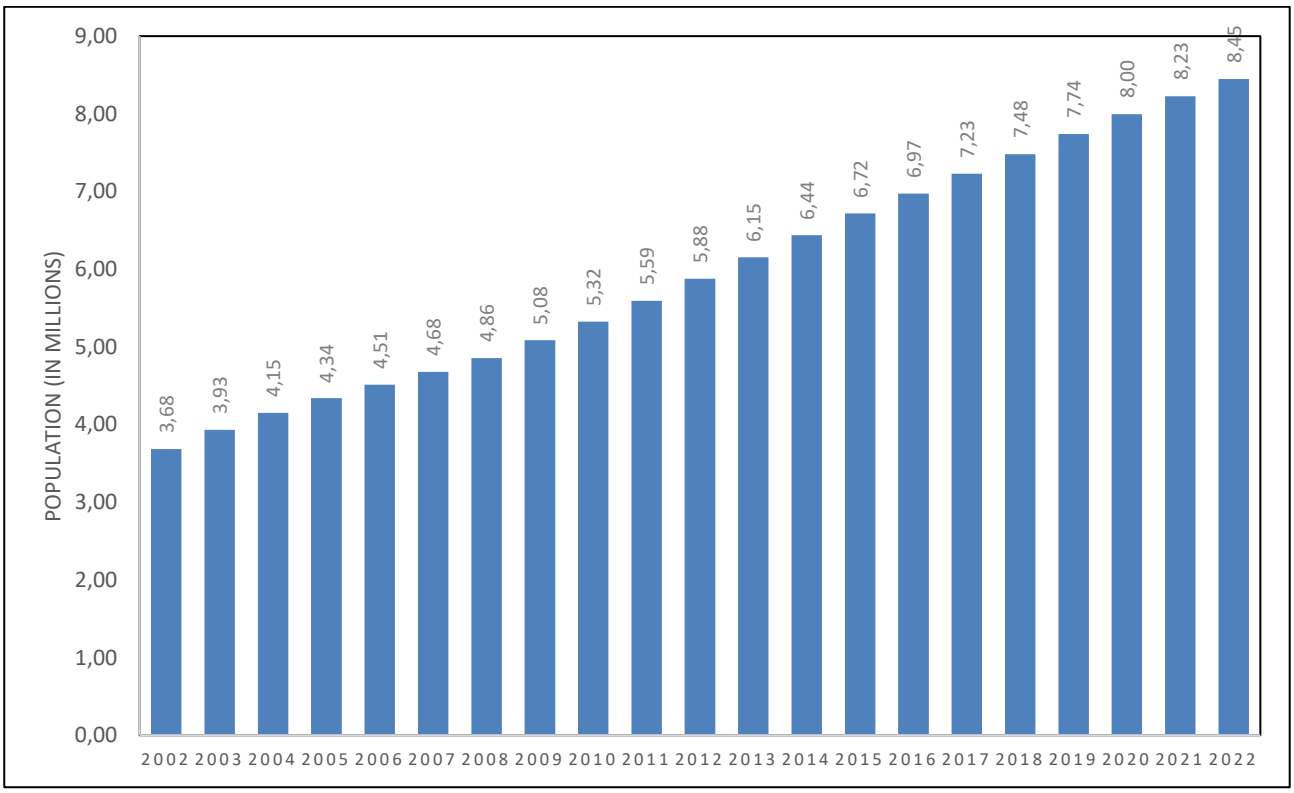


Figure 7: Persons living with HIV over time, 2002–2022



7. National population estimates

Table 5 shows the mid-year population estimates by population group and sex. The mid-year population is estimated at 60,60 million. The black African population is in the majority (49,07 million) and constitutes approximately 81% of the total South African population. The white population is estimated at 4,6 million, the coloured population at 5,3 million and the Indian/Asian population at 1,5 million. Fifty-one per cent (30,98 million) of the population is female.

Table 5: Mid-year population estimates by population group and sex, 2022

Population group	Male		Female		Total	
	Number	% of total male population	Number	% of total female population	Number	% of total population
Black African	23 985 479	**81,0**	25 085 330	**81,0**	**49 070 809**	**81,0**
Coloured	2 601 932	**8,8**	2 737 987	**8,8**	**5 339 919**	**8,8**
Indian/Asian	794 882	**2,7**	760 114	**2,5**	**1 554 996**	**2,6**
White	2 242 589	**7,6**	2 396 679	**7,7**	**4 639 268**	**7,7**
Total	**29 624 882**	**100,0**	**30 980 110**	**100,0**	**60 604 992**	**100,0**

**Due to rounding totals may not add up to 100%*

The impact of the COVID-19 deaths is evident in the change in the population structure over the years 2020–2022 specifically in the elderly aged 60 and older. Figure 8 shows the rate of growth in various age categories. With the exception of the youth (those aged 15–24), all population age categories reflected a decline in the rate of growth between 2020 and 2021. Population growth rates between 2002 and 2022 reflect changes in fertility, mortality and migration that occurred over decades. Due to achievements in health and wellbeing, population growth rates prior to the COVID-19 pandemic for youth 15–24 and adults 60+ were on the incline. The estimated annual population growth rate increased from 0,96% for the period 2002–2003 to 1,39% for the period 2019–2020. However, in the period, 2020–2021 the overall growth rate declined to 1,03%, which is directly related to the drastic increase in deaths and decline in migration. The overall growth rate is now estimated to be 1,06% in the period 2021–2022. The proportion of the elderly in South Africa was on the increase with the growth rate among elderly (60 years older) rising from 1,08% for the period 2002–2003 to 2,88% for the period 2019–2020. However, given the high mortality levels among the elderly during the COVID-19 pandemic, the growth rate among the elderly aged 60 and older drastically declined from 2,88% for the period 2019–2020 to 1,47% for the period 2020–2021, this has however bounced back to 2,11% in the period 2021–2022. The social and economic effect of losing so many elderly people to the COVID-19 pandemic is likely to be felt in many years to come. Though not as drastic, the age group 25–59 also saw a decline in the rate of growth for the period 2020–2021 as well as 2021–2022. All three aspects of demography, i.e. declining fertility, declining international migration as well as a significant rise in deaths, significantly influenced the decline in the rate of growth for South Africa as a whole. The shifts in the demographic age and sex profile of South Africa due to the COVID-19 pandemic must be taken into consideration when planning for the future health, economics and welfare.

Given the fluctuation in fertility over time, the increase in the growth rate among children aged 0–14 between 2002 and 2013 is indicative of the rise in fertility between 2004 and 2008, ageing of children into the next age category, as well as the decline in infant and child mortality post-2006 (Appendix 4). The declining rate of growth post 2018 among children aged 0–14, reflects the overall decline in fertility since 2008.

Figure 8: Population growth rates by selected age groups over time, 2002–2022

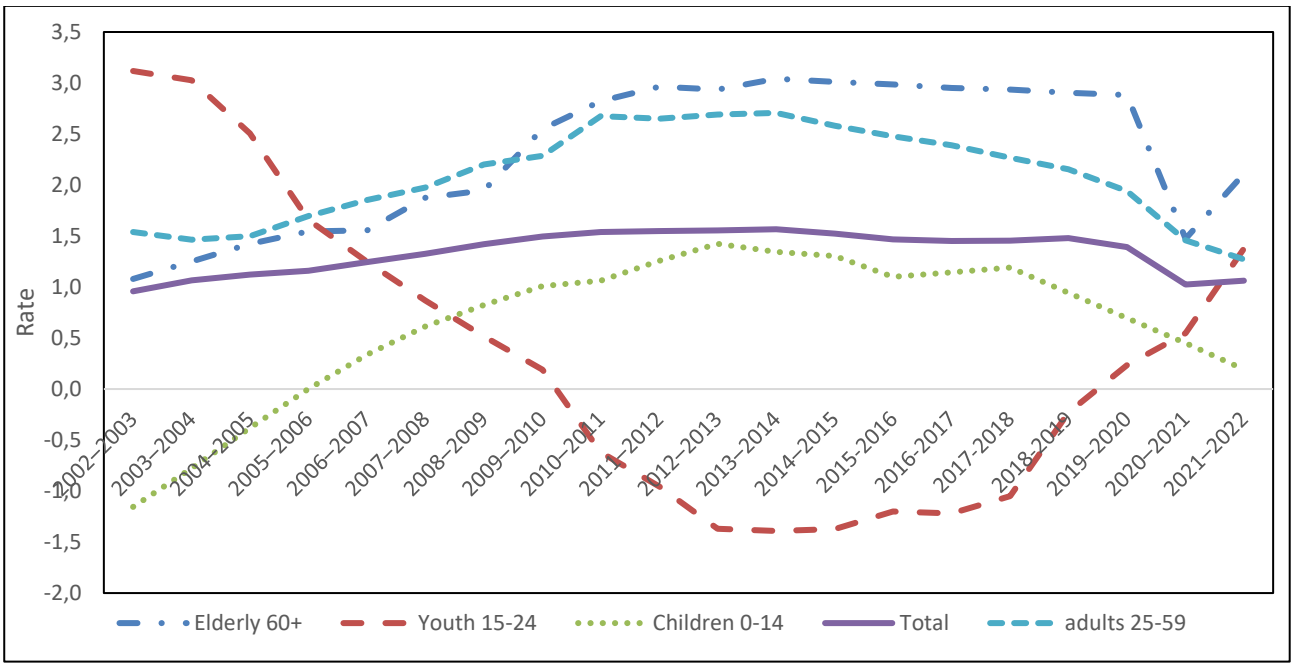


Table 6 shows the 2022 mid-year population estimates by age, sex and population group. About 28,1% of the population is aged 0–14 years and approximately 9,2% is 60 years and older. The impact of COVID-19 pandemic on the age structure is reflected in the growth rates by selected ages. As recommended by the World Health Organization (WHO), a targeted approach to ameliorating the devastation of high mortality during the COVID-19 pandemic is essential. Using population estimates by age, the National Department of Health (2021) in South Africa have prioritised the elderly aged 60 and over, indicating a target of approximately 5 million elderly as part of their phase 2 vaccination programme. As of 30 June 2021, over 3 million (3 026 636) people had been vaccinated in the country and these included health care workers, persons aged 60+, and educators. The country has been on a drive to have as many people vaccinated as possible to reduce severe illness and death. By June 2022, more than 22 million people (including children in the age group 12–17 years) in the country had received at least one dose of a vaccine while about 18,3 million adults (18+years) had been fully vaccinated (amounting to about 46% of the adult population). Disaggregated estimates by geography will further assist in logistical arrangements for the rollout of vaccine across the country.

Table 6: Mid-year population estimates by population group, age and sex, 2022

	Black African			Coloured			Indian/Asian			White			RSA		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	2 484 899	2 422 302	**4 907 201**	239 953	232 613	**472 566**	49 815	48 151	**97 966**	110 024	106 765	**216 789**	**2 884 691**	**2 809 831**	**5 694 522**
5-9	2 431 050	2 371 497	**4 802 547**	237 279	230 447	**467 726**	50 074	48 099	**98 173**	119 430	115 994	**235 424**	**2 837 833**	**2 766 037**	**5 603 870**
10-14	2 470 414	2 416 208	**4 886 622**	236 915	230 786	**467 701**	50 064	47 681	**97 745**	132 876	129 433	**262 309**	**2 890 269**	**2 824 108**	**5 714 377**
15-19	2 178 044	2 155 828	**4 333 872**	215 421	211 087	**426 508**	46 304	43 794	**90 098**	126 950	124 247	**251 197**	**2 566 719**	**2 534 956**	**5 101 675**
20-24	1 969 818	1 955 103	**3 924 921**	208 574	204 608	**413 182**	50 028	44 907	**94 935**	123 332	122 655	**245 987**	**2 351 752**	**2 327 273**	**4 679 025**
25-29	2 213 276	2 179 330	**4 392 606**	216 550	213 261	**429 811**	67 728	55 488	**123 216**	128 788	129 686	**258 474**	**2 626 342**	**2 577 765**	**5 204 107**
30-34	2 395 269	2 343 051	**4 738 320**	219 116	216 287	**435 403**	79 390	63 105	**142 495**	140 188	139 370	**279 558**	**2 833 963**	**2 761 813**	**5 595 776**
35-39	2 148 290	2 124 117	**4 272 407**	200 133	200 709	**400 842**	81 215	65 711	**146 926**	154 059	155 749	**309 808**	**2 583 697**	**2 546 286**	**5 129 983**
40-44	1 604 585	1 660 970	**3 265 555**	164 869	171 708	**336 577**	71 686	59 333	**131 019**	148 966	151 170	**300 136**	**1 990 106**	**2 043 181**	**4 033 287**
45-49	1 233 694	1 317 075	**2 550 769**	152 372	156 882	**309 254**	60 933	54 091	**115 024**	160 585	171 124	**331 709**	**1 607 584**	**1 699 172**	**3 306 756**
50-54	900 703	1 033 190	**1 933 893**	142 122	160 814	**302 936**	51 018	49 031	**100 049**	168 875	176 488	**345 363**	**1 262 718**	**1 419 523**	**2 682 241**
55-59	682 081	903 674	**1 585 755**	124 431	149 543	**273 974**	42 259	45 566	**87 825**	150 277	162 282	**312 559**	**999 048**	**1 261 065**	**2 260 113**
60-64	498 567	741 747	**1 240 314**	100 399	122 793	**223 192**	33 487	39 377	**72 864**	145 452	164 324	**309 776**	**777 905**	**1 068 241**	**1 846 146**
65-69	354 821	583 817	**938 638**	66 729	93 550	**160 279**	25 612	33 117	**58 729**	131 562	147 818	**279 380**	**578 724**	**858 302**	**1 437 026**
70-74	225 572	414 273	**639 845**	41 729	66 282	**108 011**	17 694	26 271	**43 965**	114 869	137 653	**252 522**	**399 864**	**644 479**	**1 044 343**
75-79	116 851	259 225	**376 076**	21 055	39 311	**60 366**	10 155	18 097	**28 252**	88 314	109 479	**197 793**	**236 375**	**426 112**	**662 487**
80+	77 545	203 923	**281 468**	14 285	37 306	**51 591**	7 420	18 295	**25 715**	98 042	152 442	**250 484**	**197 292**	**411 966**	**609 258**
Total	**23 985 479**	**25 085 330**	**49 070 809**	**2 601 932**	**2 737 987**	**5 339 919**	**794 882**	**760 114**	**1 554 996**	**2 242 589**	**2 396 679**	**4 639 268**	**29 624 882**	**30 980 110**	**60 604 992**

8. Provincial population estimates

Provincial estimates are derived using a cohort-component method as suggested by the United Nations (United Nations, 1992), incorporating changes in births, deaths as well as migration over time. The provincial population estimates are developed using a 5-year cohort component method. The indicators of fertility, mortality and migration are derived for an average 5-year period i.e. 2021–2026.

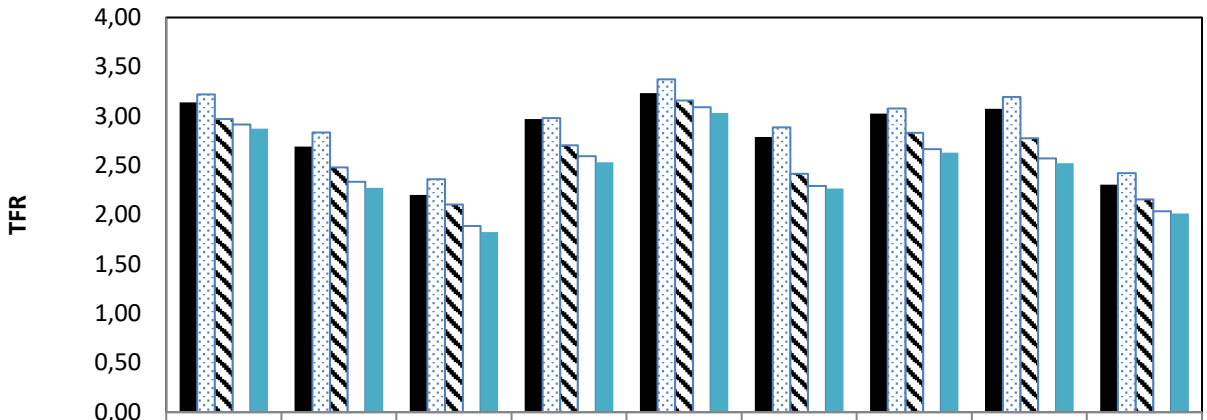
When provincial population estimates are desired and the appropriate data are available, a multi-regional approach should be considered as this is the only way to guarantee that the total migration flows between regions will sum to zero (United Nations, 1992). Multi-regional methods require the estimation of separate age-specific migration rates between every region of the country and every other region and such detailed data are rarely available. Although it is possible to estimate some of the missing data (see Willekens et al., 1978) the task of preparing data can become overwhelming if there are many regions. If there are only a few streams however the multi-regional method is the best method to use. In South Africa 2 448 (9x8x17x2) migration streams are derived if the multi-regional model is applied in calculating migration streams by age group (17 in total) and sex for each of the nine provinces.

The demographic data from the 2011 Census i.e. fertility, mortality and migration rates are incorporated in the assumptions. The population structure as per Census 2011 as well as the distribution of births and deaths from vital registrations (adjusted for late registration and completeness) are used to determine provincial estimates. Excess deaths due to COVID-19 for the period 2020–2022 have been incorporated into the model at the provincial level. The Mid-Year estimates 2022 series does not include input from the 2022 Census. Census data will be released in 2023.

8.1 Demographic assumptions

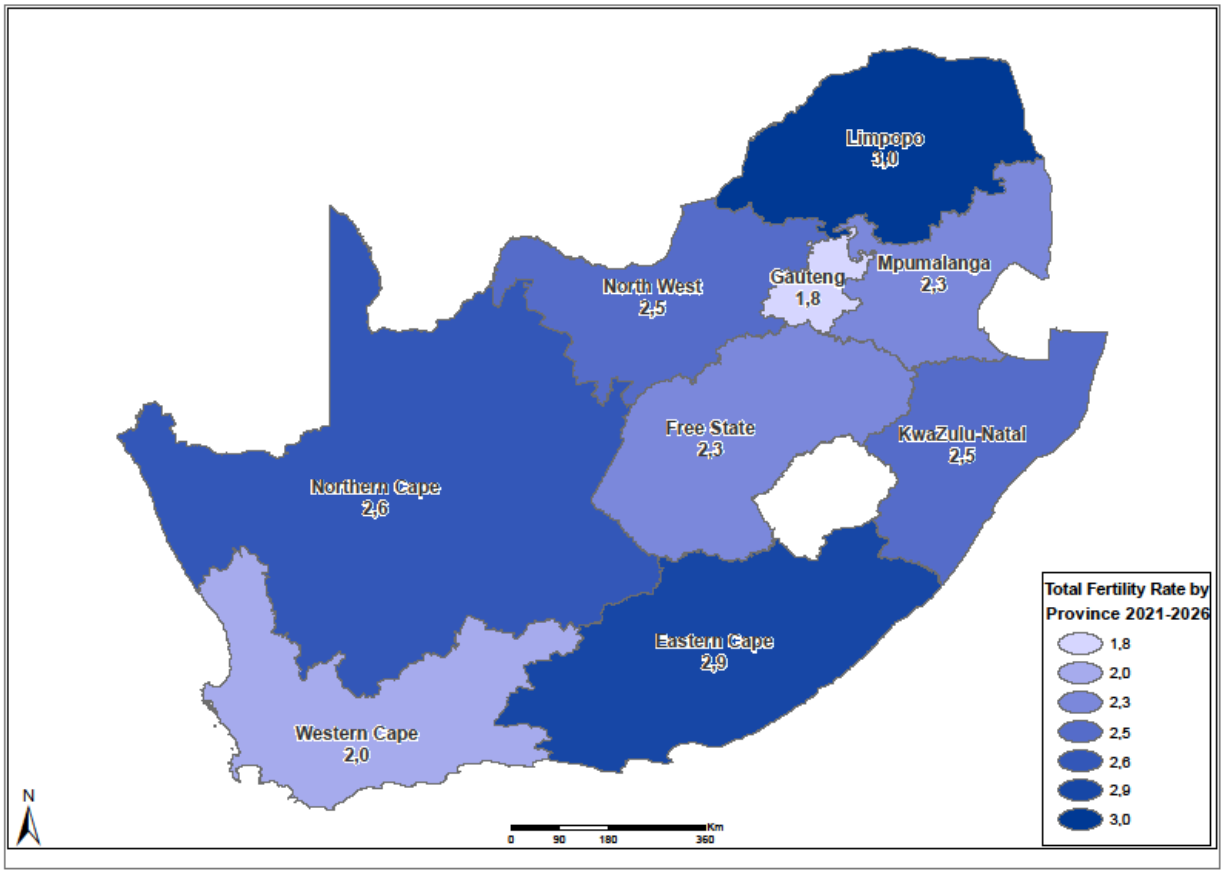
Figure 9 shows the provincial fertility estimates for the periods 2001–2006; 2006–2011; 2011–2016, 2016–2021 and 2021-–2026. In the period 2006–2011, there is a general rise in TFR, giving shape to the Census 2011 provincial population structure. However, for the period 2011–2026 there is an overall decline in TFR over time. Fertility varies from province to province as is depicted in Figure 9. The more rural provinces of Limpopo and Eastern Cape indicate higher fertility rates whilst more urbanised provinces such as Gauteng and the Western Cape indicate lower levels of fertility. Provincial estimates, will be revised when empirical data reflecting the effect of COVID-19 pandemic on births is published in the vital registration system. Current assumptions of provincial fertility are based on trends seen in published births data currently available at provincial level for the year 2022.

Figure 9: Provincial average total fertility rate over time, 2001–2022



	EC	FS	GP	KZN	LP	MP	NC	NW	WC
2001-2006	3,14	2,69	2,20	2,97	3,23	2,79	3,03	3,08	2,31
2006-2011	3,22	2,84	2,36	2,98	3,37	2,88	3,08	3,20	2,42
2011-2016	2,97	2,48	2,10	2,71	3,16	2,41	2,83	2,78	2,16
2016-2021	2,91	2,33	1,89	2,59	3,09	2,29	2,67	2,57	2,04
2021-2026	2,87	2,27	1,82	2,53	3,03	2,27	2,63	2,52	2,01

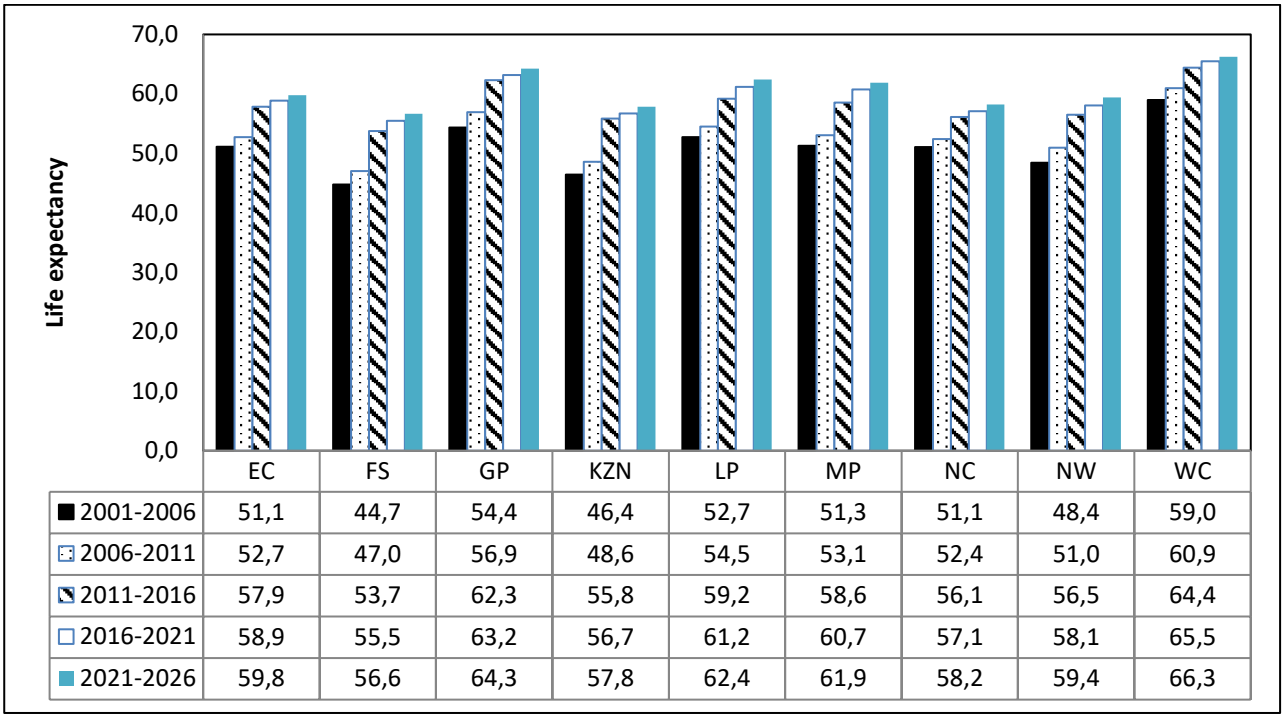
Figure 10: Provincial average total fertility rate, 2021–2026



Life expectancy at birth reflects the overall mortality level of a population. Figures 11 and 12 show the average provincial life expectancies at birth for males and females for the 5-year periods 2001–2006; 2006–2011; 2011–2016 and 2016–2021. Over the 16-month period (March 2020 to end June 2021), there has been great variability in the COVID-19 related morality rates occurring across the nine provinces and over time. Whilst the number of deaths in the Western Cape peaked earlier on during the pandemic (months of May and June 2020) other provinces soon followed suit. Behavioural factors affecting the spread, population age and sex structure of the province as well as varying health capacity across provinces, amongst others, played a determining role in mortality rates across provinces in the last 2 years (NICD, 2021). The impact of COVID-19 deaths occurring since March 2020 to end of June 2022 have been incorporated into the provincial estimation and slowed down the improvement in LE over the 5-year period.

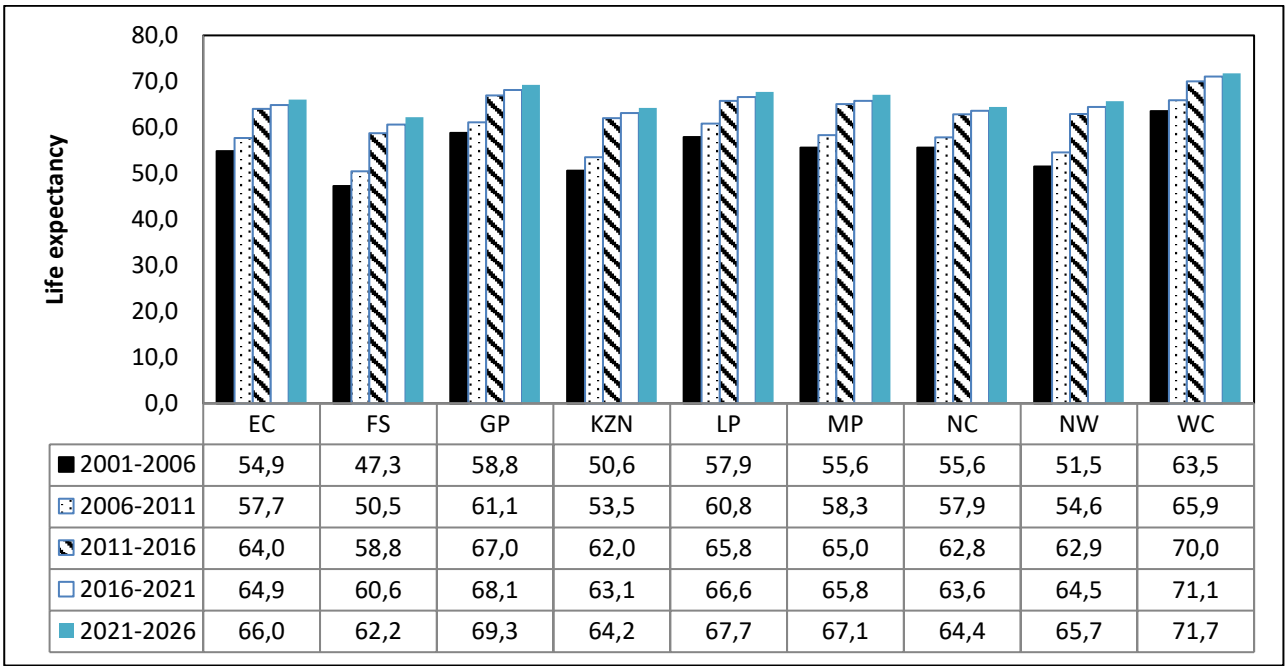
According to Figures 11 and 12, the life expectancy increased incrementally for each period across all provinces but more significantly in the period 2011–2016 due to the uptake of antiretroviral therapy over time in South Africa. Though the life expectancy in the periods 2001–2006 and 2006–2011, depicts marginal improvement, this masks the interaction between the highest number of deaths in 2006 in combination with declining numbers of deaths between 2007 and 2010. In the period 2016–2021 there is an average 6-year gap between male and female life expectancy in SA. The marginal improvement in LE expectancy across all provinces for the period 2016–2021 is indicative of the dramatic increase in deaths occurring between the 1st July 2020 and 30th June 2021. The larger improvement in LE expectancy across all provinces for the period 2021–2026 is indicative of the decrease in deaths occurring between the 1st July 2021 and 30th June 2022 due to decline in COVID-19 related deaths, but also the assumption of an increase in life expectancy due to continual reduction in overall deaths including COVID-19 related deaths in South Africa for the period 2022–2026. Western Cape consistently has the highest life expectancy at birth for both males and females over time whilst the Free State has the lowest life expectancy at birth.

Figure 11: Provincial average life expectancy at birth (males), 2001–2026



	EC	FS	GP	KZN	LP	MP	NC	NW	WC
2001-2006	51,1	44,7	54,4	46,4	52,7	51,3	51,1	48,4	59,0
2006-2011	52,7	47,0	56,9	48,6	54,5	53,1	52,4	51,0	60,9
2011-2016	57,9	53,7	62,3	55,8	59,2	58,6	56,1	56,5	64,4
2016-2021	58,9	55,5	63,2	56,7	61,2	60,7	57,1	58,1	65,5
2021-2026	59,8	56,6	64,3	57,8	62,4	61,9	58,2	59,4	66,3

Figure 12: Provincial average life expectancy at birth (females), 2001–2026



	EC	FS	GP	KZN	LP	MP	NC	NW	WC
2001-2006	54,9	47,3	58,8	50,6	57,9	55,6	55,6	51,5	63,5
2006-2011	57,7	50,5	61,1	53,5	60,8	58,3	57,9	54,6	65,9
2011-2016	64,0	58,8	67,0	62,0	65,8	65,0	62,8	62,9	70,0
2016-2021	64,9	60,6	68,1	63,1	66,6	65,8	63,6	64,5	71,1
2021-2026	66,0	62,2	69,3	64,2	67,7	67,1	64,4	65,7	71,7

8.2 Migration patterns

From Census 2011 it was possible to determine out-migration rates for each province. Applying these rates to the age structures of the province it was possible to establish migration streams between the provinces. The results of these analyses is shown in Tables 7, 8, 9 and 10. The international migration to receiving provinces reflects the reduction post COVID-19 travel restrictions and movement. Provincial estimates are developed based on a 5-year cohort component method; and as such interprovincial movement assumptions are required for a 5-year period (2021–2026). Inter-provincial migration assumptions by sex have not been revised due to the COVID-19 pandemic in the period March 2020–June 2022. No empirical data capturing the change in interprovincial migration due to COVD-19 pandemic is yet available. Movement made during lockdown constitutes a temporary one in the majority of cases whilst inter-provincial migration in the mid-year estimation constitutes a more permanent move. In addition, the provincial estimates are for a 5-year period and the 16-month period of the COVID-19 pandemic would contribute only a fourth of the 5-year period 2016–2021 and only a fifth of the period 2021–2026. The assumptions indicate that Gauteng and Western Cape received the highest number of in-migrants for all periods. The Eastern Cape, Limpopo and Gauteng experienced the largest number of outflow of migrants. Gauteng, Mpumalanga, Northern Cape, North West and Western Cape provinces received positive net migration over all three periods. For all periods, the number of international migrants entering the provinces was highest in Gauteng, with Western Cape ranking second. Census 2022 will be a key empirical resource indicating current trends in inter-provincial migration in South Africa.

Table 7: Estimated provincial migration streams 2006–2011

Province in 2006	Province in 2011									Out-migrants	In-migrants	Net migration
	EC	FS	GP	KZN	LP	MP	NC	NW	WC			
EC	0	12 856	144 087	96 991	13 804	16 587	7 967	37 216	172 610	502 118	161 832	-340 286
FS	8 166	0	79 410	7 610	6 339	10 428	8 768	22 995	11 783	155 500	114 785	-40 714
GP	40 156	31 145	0	53 951	63 983	63 504	9 712	85 364	75 128	422 942	1 392 790	969 848
KZN	23 372	11 308	205 460	0	8 775	33 632	7 880	10 692	30 534	331 655	255 892	-75 763
LP	4 159	5 406	321 913	7 635	0	44 141	2 402	30 098	10 549	426 303	221 111	-205 192
MP	4 552	4 720	121 403	11 439	21 234	0	2 091	12 129	8 859	186 426	243 336	56 910
NC	4 075	8 147	15 306	5 217	2 432	4 131	0	11 681	16 745	67 734	76 205	8 470
NW	4 560	10 391	95 344	5 376	17 568	10 492	20 755	0	8 001	172 487	275 330	102 843
WC	44 298	6 904	53 476	11 267	4 988	6 247	11 032	7 174	0	145 387	421 487	276 099
Outside SA (net migration)	**28 493**	**23 908**	**356 392**	**56 405**	**81 987**	**54 172**	**5 599**	**57 981**	**87 278**			

Table 8: Estimated provincial migration streams, 2011–2016

Province in 2011	Province in 2016									Out-migrants	In-migrants	Net migration
	EC	FS	GP	KZN	LP	MP	NC	NW	WC			
EC	0	12 933	144 942	97 541	13 890	16 688	8 029	37 354	173 543	504 920	181 009	-323 911
FS	8 344	0	81 070	7 776	6 480	10 659	8 963	23 502	12 063	158 857	128 065	-30 792
GP	46 072	35 745	0	62 069	91 540	72 994	11 153	98 133	86 636	504 342	1 524 177	1 019 836
KZN	24 676	11 937	216 770	0	9 300	35 542	8 334	11 315	32 313	350 188	280 160	-70 028
LP	4 346	5 639	335 690	7 981	0	46 058	2 513	31 380	11 002	444 609	270 986	-173 624
MP	4 923	5 095	131 328	12 350	22 877	0	2 264	13 096	9 562	201 496	270 552	69 056
NC	4 321	8 662	16 283	5 538	2 588	4 389	0	12 414	17 806	72 001	82 856	10 854
NW	4 978	11 309	103 764	5 858	19 100	11 413	22 614	0	8 740	187 776	305 744	117 968
WC	48 737	7 651	59 336	12 517	5 532	6 940	12 218	7 977	0	160 908	457 893	296 985
Outside SA (net migration)	**34 613**	**29 095**	**434 995**	**68 530**	**99 678**	**65 869**	**6 768**	**70 572**	**106 227**			

Table 9: Estimated provincial migration streams 2016–2021

Province in 2016	Province in 2021									Out-migrants	In-migrants	Net migration
	EC	FS	GP	KZN	LP	MP	NC	NW	WC			
EC	0	13 111	146 972	98 810	14 087	16 900	8 130	37 856	175 892	511 757	192 412	-319 345
FS	8 561	0	83 352	7 981	6 653	10 948	9 215	24 137	12 390	163 237	134 719	-28 517
GP	52 240	40 607	0	70 611	103 774	83 059	12 678	111 642	98 742	573 354	1 559 881	986 527
KZN	26 145	12 657	230 144	0	9 819	37 693	8 834	12 014	34 307	371 614	288 533	-83 081
LP	4 580	5 937	353 514	8 415	0	48 472	2 649	33 017	11 564	468 149	280 793	-187 356
MP	5 315	5 494	141 862	13 311	24 664	0	2 446	14 130	10 308	217 531	282 740	65 208
NC	4 582	9 226	17 372	5 882	2 756	4 668	0	13 209	18 936	76 632	88 320	11 688
NW	5 423	12 311	113 111	6 377	20 785	12 423	24 660	0	9 528	204 618	320 161	115 543
WC	53 601	8 451	65 638	13 846	6 115	7 680	13 493	8 834	0	177 658	469 984	292 325
Outside SA (net migration)	**31 965**	**26 925**	**407 915**	**63 299**	**92 140**	**60 896**	**6 214**	**65 320**	**98 317**			

Table 10: Estimated provincial migration streams 2021–2026

Province in 2021	Province in 2026									Out-migrants	In-migrants	Net migration
	EC	FS	GP	KZN	LP	MP	NC	NW	WC			
EC	0	15 251	142 666	102 367	13 540	16 965	8 161	37 994	182 281	519 225	186 500	-332 725
FS	8 737	0	85 178	8 145	6 791	11 180	9 417	24 641	12 650	166 739	136 291	-30 448
GP	54 884	45 462	0	79 074	92 948	93 027	14 194	125 009	110 604	615 201	1 443 978	828 777
KZN	26 466	13 297	231 901	0	10 277	39 615	9 278	12 631	36 077	379 542	282 916	-96 625
LP	4 775	6 184	323 810	8 777	0	50 482	2 764	34 372	12 028	443 192	243 267	-199 925
MP	5 684	5 874	151 911	14 227	26 378	0	2 619	15 117	11 021	232 830	278 544	45 714
NC	4 841	9 760	18 397	6 221	2 916	4 939	0	13 976	20 015	81 065	90 675	9 609
NW	5 844	13 276	122 044	6 875	22 411	13 396	25 391	0	10 272	219 509	316 965	97 455
WC	54 027	9 242	71 852	15 152	6 691	8 406	14 756	9 676	0	189 802	460 489	270 687
Outside SA (net migration)	**21 242**	**17 946**	**296 218**	**42 078**	**61 316**	**40 532**	**4 096**	**43 549**	**65 542**			

8.3 Provincial distributions

Table 11 below shows the estimated percentage of the total population residing in each of the provinces from 2002 to 2022. The provincial estimates show that Gauteng has the largest share of the population, followed by KwaZulu-Natal, Western Cape and Eastern Cape. Inter-provincial as well as international migration patterns significantly influence the provincial population numbers and structures in South Africa. By 2022 approximately 11,9% of South Africa's population live in Western Cape. Northern Cape has the smallest share of the population (2,2%). Free State has the second smallest share of the South African population, constituting 4,8% of the population. Figure 13 indicates that Limpopo and Eastern Cape (33,6% and 32,7% respectively) have the highest proportions of persons younger than 15 years. The highest proportions of elderly persons aged 60 years and above are found in Eastern Cape (11,5%), Western Cape (10,7%) and Northern Cape (10,1%), as shown in Figure 14. Figure 15 indicates the proportion of youth aged 25-34 within in each province. The highest proportion of youth are found in the urban provinces of Gauteng (21%) and Western Cape (18%), whilst the lowest proportion of youth are found in the Limpopo (15%) and Eastern Cape (14,4%). These proportions are reflective of provincial fertility patterns but more important migratory patterns between provinces.

Table 11: Percentage distribution of the projected provincial share of the total population, 2002–2022

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
EC	14,3	14,1	13,9	13,8	13,6	13,4	13,2	13,1	12,9	12,7	12,5	12,4	12,2	12,0	11,9	11,7	11,6	11,4	11,3	11,1	11,0
FS	5,9	5,9	5,8	5,7	5,7	5,6	5,5	5,5	5,4	5,4	5,3	5,2	5,2	5,1	5,1	5,0	5,0	4,9	4,9	4,9	4,8
GP	20,9	21,2	21,5	21,8	22,1	22,4	22,7	23,0	23,3	23,7	24,0	24,3	24,5	24,8	25,1	25,4	25,6	25,9	26,1	26,4	26,6
KZN	20,8	20,7	20,6	20,5	20,4	20,3	20,2	20,0	19,9	19,8	19,7	19,7	19,6	19,5	19,4	19,4	19,3	19,2	19,2	19,1	19,0
LP	11,0	10,9	10,9	10,8	10,7	10,7	10,6	10,6	10,5	10,4	10,3	10,3	10,2	10,2	10,1	10,1	10,0	10,0	9,9	9,9	9,8
MP	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8
NC	2,3	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2
NW	6,6	6,7	6,7	6,7	6,7	6,7	6,7	6,7	6,8	6,8	6,8	6,8	6,8	6,8	6,8	6,8	6,9	6,9	6,9	6,9	6,9
WC	10,5	10,6	10,7	10,8	10,9	10,9	11,0	11,1	11,2	11,3	11,3	11,4	11,5	11,5	11,6	11,6	11,7	11,7	11,8	11,8	11,9
Total	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

Table 12 (a): Provincial mid-year population estimates by age and sex, 2022

	Eastern Cape			Free State			Gauteng			KwaZulu-Natal		
Age	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
0-4	357 095	348 500	**705 595**	133 145	130 077	**263 222**	658 878	643 920	**1 302 798**	612 897	595 779	**1 208 676**
5-9	365 404	355 657	**721 061**	135 274	131 762	**267 036**	634 673	619 994	**1 254 667**	601 139	584 327	**1 185 466**
10-14	382 643	371 538	**754 181**	146 215	143 266	**289 482**	618 669	609 744	**1 228 413**	604 225	589 776	**1 194 001**
15-19	319 277	310 981	**630 258**	131 724	130 317	**262 041**	578 621	581 609	**1 160 230**	535 631	527 842	**1 063 474**
20-24	223 837	222 543	**446 380**	113 066	113 523	**226 589**	665 510	663 826	**1 329 336**	472 231	469 930	**942 161**
25-29	228 066	224 344	**452 410**	116 727	116 093	**232 820**	810 361	820 939	**1 631 300**	497 175	497 497	**994 671**
30-34	253 417	254 605	**508 022**	128 230	126 683	**254 914**	870 738	857 612	**1 728 349**	508 123	514 101	**1 022 224**
35-39	231 930	243 758	**475 689**	118 841	119 778	**238 619**	776 360	756 989	**1 533 349**	445 024	471 862	**916 886**
40-44	178 296	198 128	**376 423**	91 082	98 490	**189 572**	607 712	590 407	**1 198 120**	322 064	370 359	**692 423**
45-49	143 657	176 377	**320 035**	74 571	84 991	**159 562**	504 557	455 602	**960 160**	254 642	308 102	**562 744**
50-54	113 817	157 898	**271 715**	61 612	73 633	**135 245**	393 601	366 034	**759 636**	189 441	250 414	**439 855**
55-59	92 956	150 722	**243 678**	50 332	64 983	**115 315**	306 374	314 433	**620 807**	148 578	227 634	**376 212**
60-64	78 564	141 945	**220 508**	40 078	54 173	**94 251**	237 857	263 055	**500 912**	115 057	193 386	**308 444**
65-69	62 889	118 095	**180 984**	30 768	45 251	**76 019**	172 987	205 638	**378 624**	87 384	154 694	**242 078**
70-74	46 355	90 260	**136 615**	20 909	34 320	**55 229**	116 037	147 330	**263 367**	62 891	121 734	**184 625**
75-79	31 718	65 691	**97 409**	12 154	21 982	**34 135**	64 405	91 313	**155 718**	36 632	78 903	**115 535**
80+	45 836	89 891	**135 727**	8 961	18 598	**27 559**	33 904	58 881	**92 785**	28 611	60 239	**88 850**
Total	**3 155 757**	**3 520 934**	**6 676 691**	**1 413 689**	**1 507 922**	**2 921 611**	**8 051 244**	**8 047 327**	**16 098 571**	**5 521 746**	**6 016 579**	**11 538 325**

Table 12 (b): Provincial mid-year population estimates by age and sex, 2022 (concluded)

	Limpopo			Mpumalanga			Northern Cape			North West			Western Cape		
Age	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
0-4	338 120	327 214	**665 334**	222 243	217 568	**439 811**	64 528	62 761	**127 290**	199 494	196 101	**395 595**	298 292	287 909	**586 201**
5-9	338 370	328 036	**666 406**	215 028	212 409	**427 437**	64 160	62 088	**126 248**	197 583	194 019	**391 602**	286 201	277 745	**563 946**
10-14	341 170	326 210	**667 380**	232 437	230 327	**462 765**	62 924	62 579	**125 504**	206 015	202 049	**408 065**	295 970	288 616	**584 587**
15-19	292 758	277 375	**570 133**	203 223	202 343	**405 566**	55 131	56 237	**111 367**	179 636	177 570	**357 207**	270 718	270 681	**541 399**
20-24	213 984	203 721	**417 705**	188 817	187 229	**376 046**	47 102	48 587	**95 689**	155 205	148 399	**303 604**	272 000	269 516	**541 516**
25-29	218 222	208 007	**426 228**	212 513	199 004	**411 517**	51 918	50 147	**102 065**	177 532	156 651	**334 183**	313 829	305 084	**618 913**
30-34	232 942	236 223	**469 165**	233 153	213 130	**446 283**	59 830	54 629	**114 459**	202 976	175 002	**377 977**	344 553	329 829	**674 382**
35-39	216 070	222 661	**438 731**	216 813	198 562	**415 376**	57 947	50 729	**108 677**	191 806	165 192	**356 998**	328 906	316 754	**645 660**
40-44	167 300	189 699	**356 999**	162 088	159 505	**321 593**	45 514	40 614	**86 127**	154 075	135 455	**289 530**	261 974	260 525	**522 499**
45-49	127 465	168 117	**295 582**	121 809	134 533	**256 341**	36 105	34 744	**70 849**	122 773	115 344	**238 117**	222 004	221 362	**443 366**
50-54	97 385	136 484	**233 868**	91 706	110 188	**201 894**	28 997	30 528	**59 524**	98 383	95 051	**193 434**	187 777	199 293	**387 070**
55-59	74 513	123 754	**198 267**	72 210	94 670	**166 880**	22 305	26 843	**49 148**	80 768	80 938	**161 706**	151 011	177 089	**328 100**
60-64	55 685	103 830	**159 514**	54 041	73 466	**127 507**	17 521	23 043	**40 564**	64 127	66 599	**130 726**	114 975	148 745	**263 720**
65-69	42 296	88 843	**131 139**	40 422	59 181	**99 603**	13 586	19 670	**33 256**	44 059	53 272	**97 331**	84 334	113 657	**197 991**
70-74	30 009	68 876	**98 885**	27 198	43 149	**70 347**	9 425	15 287	**24 712**	27 539	39 027	**66 565**	59 502	84 497	**143 999**
75-79	17 247	45 531	**62 778**	15 168	26 999	**42 167**	5 807	10 850	**16 657**	16 163	27 758	**43 921**	37 082	57 085	**94 167**
80+	19 090	64 235	**83 325**	15 006	34 357	**49 364**	4 858	11 740	**16 598**	10 822	29 601	**40 424**	30 203	44 423	**74 627**
Total	**2 822 625**	**3 118 814**	**5 941 439**	**2 323 877**	**2 396 620**	**4 720 497**	**647 658**	**661 075**	**1 308 734**	**2 128 956**	**2 058 028**	**4 186 984**	**3 559 331**	**3 652 811**	**7 212 142**

Figure 13: Percentage of children under-15 years of age

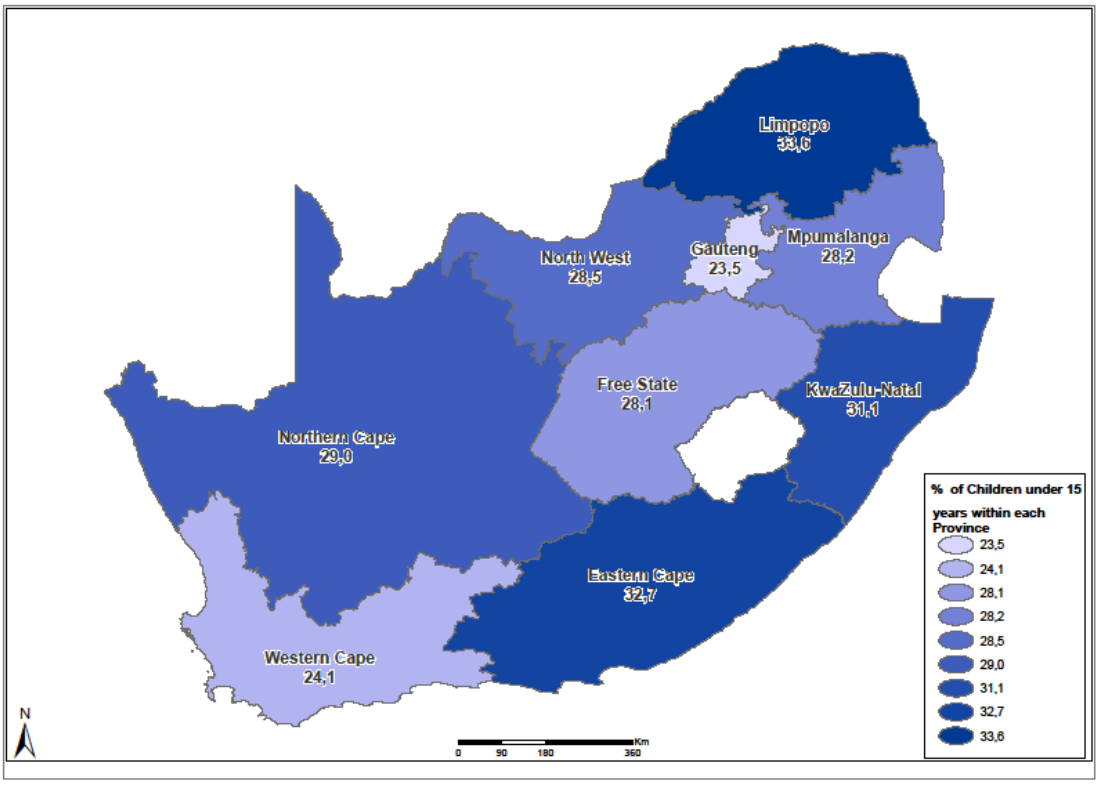


Figure 14: Percentage of elderly aged 60+

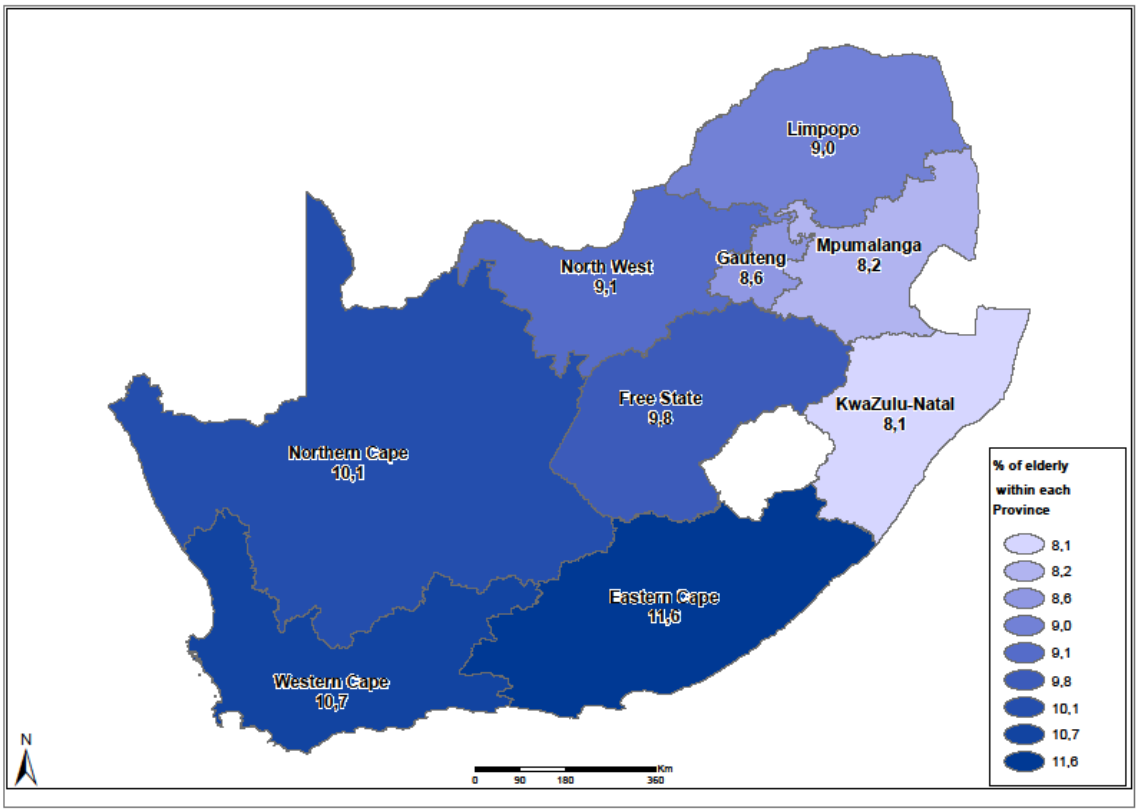
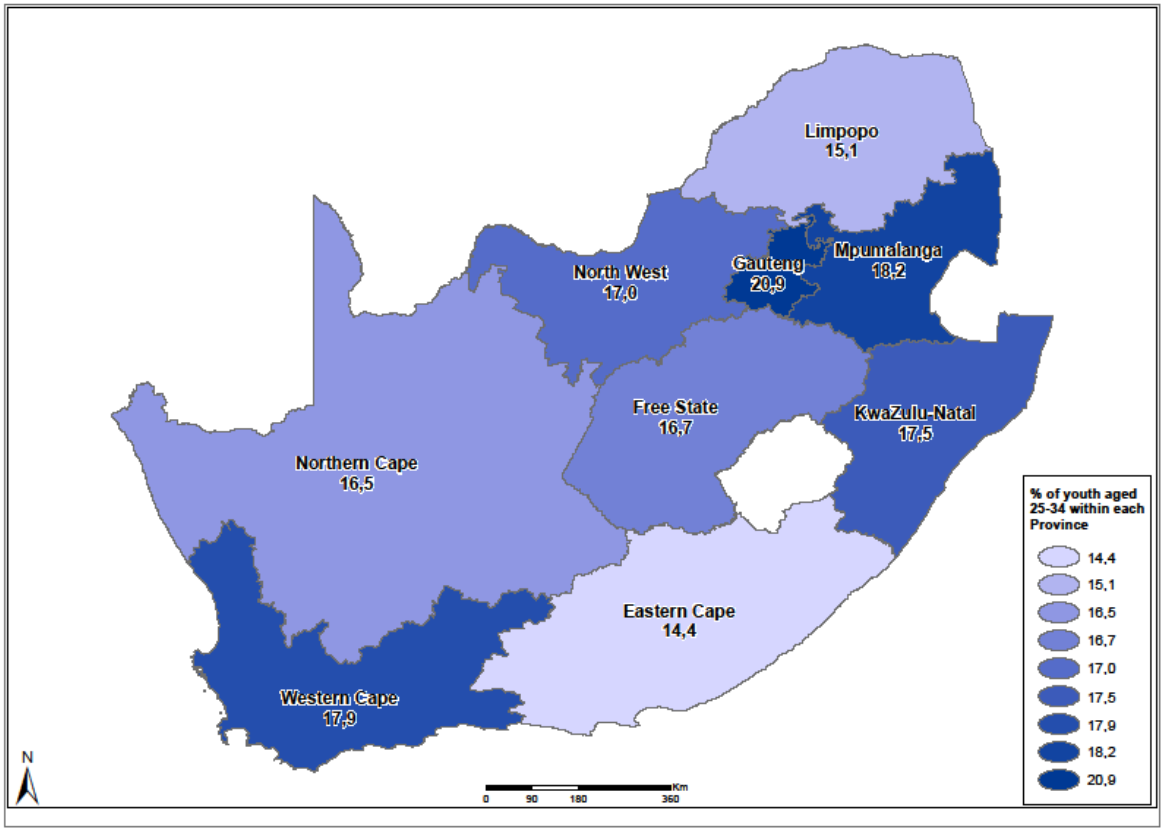


Figure 15: Percentage of youth aged 25-34 years



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Appendices

Appendix 1: Mid-year population estimates by province, 2022

	Population estimate	% of total population
Eastern Cape	6 676 691	11,0
Free State	2 921 611	4,8
Gauteng	16 098 571	26,6
KwaZulu-Natal	11 538 325	19,0
Limpopo	5 941 439	9,8
Mpumalanga	4 720 497	7,8
Northern Cape	1 308 734	2,2
North West	4 186 984	6,9
Western Cape	7 212 142	11,9
Total	**60 604 992**	**100,0**

**Due to rounding totals may not add up to 100%*

Appendix 2: Demographic indicators, 2002–2022

Year	Crude birth rate	Life expectancy			Infant mortality rate	Under-5 mortality rate	Crude death rate	Rate of natural increase (%)
		Male	Female	Total				
2002	21,3	53,2	57,5	**55,5**	55,2	74,7	13,1	0,81
2003	21,2	52,8	57,3	**55,1**	56,8	76,2	13,4	0,78
2004	22,4	52,5	56,4	**54,5**	55,4	75,8	13,9	0,85
2005	23,1	52,2	55,7	**54,0**	55,4	74,7	14,3	0,88
2006	23,6	52,1	55,4	**53,8**	53,8	72,1	14,6	0,89
2007	24,0	52,6	56,0	**54,4**	49,5	67,3	14,4	0,96
2008	24,2	53,3	56,8	**55,1**	48,0	63,0	13,9	1,02
2009	24,0	54,4	59,4	**57,0**	45,1	55,7	12,8	1,11
2010	23,7	55,8	61,2	**58,6**	38,6	50,1	11,8	1,18
2011	23,1	57,5	62,9	**60,3**	37,3	46,0	10,8	1,22
2012	22,6	58,5	63,9	**61,3**	35,2	41,7	10,3	1,22
2013	22,2	59,2	64,8	**62,1**	32,8	38,5	10,0	1,21
2014	21,8	60,0	65,9	**63,0**	31,3	37,7	9,6	1,21
2015	21,3	60,4	66,0	**63,3**	30,0	37,4	9,5	1,17
2016	20,4	61,1	66,7	**64,0**	28,8	37,2	9,2	1,11
2017	20,0	61,7	67,1	**64,5**	27,5	36,3	9,0	1,09
2018	20,0	61,7	67,4	**64,6**	27,2	37,0	9,0	1,09
2019	20,2	62,0	67,8	**64,9**	25,4	35,8	8,9	1,11
2020	20,0	62,3	68,4	**65,4**	25,0	35,2	8,8	1,12
2021	19,8	59,2	64,2	**61,7**	25,1	33,1	11,7	0,80
2022	19,5	60,0	65,6	**62,8**	24,3	30,7	11,0	0,85

Appendix 3: HIV prevalence estimates and number of people living with HIV, 2002–2022

	Prevalence %				Incidence rate %	HIV population (in millions)
	Women 15–49	Adults 15–49	Youth 15–24	Total population	15–49	
2002	14,91	12,89	6,24	7,95	1,91	3,68
2003	15,61	13,44	6,24	8,41	1,83	3,93
2004	16,15	13,86	6,21	8,78	1,76	4,15
2005	16,58	14,18	6,17	9,07	1,71	4,34
2006	16,95	14,44	6,10	9,33	1,66	4,51
2007	17,31	14,69	6,05	9,55	1,64	4,68
2008	17,69	14,96	6,03	9,78	1,62	4,86
2009	18,30	15,39	6,08	10,10	1,64	5,08
2010	18,94	15,82	6,13	10,42	1,59	5,32
2011	19,62	16,30	6,16	10,78	1,61	5,59
2012	20,33	16,81	6,24	11,15	1,61	5,88
2013	20,96	17,27	6,25	11,49	1,52	6,15
2014	21,58	17,72	6,23	11,84	1,48	6,44
2015	22,14	18,15	6,23	12,17	1,47	6,72
2016	22,55	18,46	6,11	12,44	1,30	6,97
2017	22,93	18,75	6,02	12,71	1,29	7,23
2018	23,27	19,02	5,94	12,97	1,26	7,48
2019	23,56	19,23	5,88	13,22	1,26	7,74
2020	23,80	19,41	5,84	13,47	1,26	8,00
2021	24,00	19,56	5,82	13,72	1,27	8,23
2022	24,10	19,63	5,79	13,94	1,23	8,45

Appendix 4: Estimates of annual growth rates, 2002–2022

Period	Children 0–14	Youth 15–24	Elderly 60+	Adults 25–59	Total
2002–2003	-1,16	3,12	1,08	1,54	**0,96**
2003–2004	-0,78	3,03	1,25	1,46	**1,06**
2004–2005	-0,38	2,51	1,42	1,50	**1,12**
2005–2006	0,00	1,66	1,55	1,70	**1,16**
2006–2007	0,34	1,25	1,55	1,85	**1,25**
2007–2008	0,61	0,87	1,88	1,98	**1,33**
2008–2009	0,83	0,52	1,95	2,20	**1,42**
2009–2010	1,01	0,19	2,55	2,29	**1,49**
2010–2011	1,06	-0,62	2,82	2,67	**1,54**
2011–2012	1,26	-0,96	2,96	2,65	**1,55**
2012–2013	1,42	-1,37	2,93	2,69	**1,55**
2013–2014	1,35	-1,39	3,04	2,71	**1,57**
2014–2015	1,30	-1,37	3,01	2,58	**1,52**
2015-2016	1,10	-1,20	2,99	2,48	**1,47**
2016-2017	1,14	-1,22	2,95	2,39	**1,45**
2017-2018	1,19	-1,05	2,94	2,27	**1,46**
2018-2019	0,94	-0,23	2,91	2,15	**1,48**
2019-2020	0,69	0,23	2,88	1,94	**1,39**
2020-2021	0,45	0,55	1,47	1,46	**1,03**
2021–2022	0,19	1,38	2,11	1,27	**1,06**

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