

WHO methods and data sources for life tables 1990-2019

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Estimates and analysis are available at:

http://www.who.int/gho/mortality_burden_disease/en/index.html

<http://www.who.int/gho>

For further information about the estimates and methods, please contact healthstat@who.int

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Abbreviations

DHS	USAID-supported Demographic and Health Surveys
GHE2015	WHO Global Health Estimates 2015
GHE2016	WHO Global Health Estimates 2016
ICD	International Classification of Diseases
IHME	Institute for Health Metrics and Evaluation
IMR	Infant mortality rate
MICS	UNICEF Multiple Indicator Cluster Surveys
m_x	age-specific death rates calculated from information on deaths among persons in the age group commencing at age x during a given time period and the total person-years for the population in the same age group during the same time period. For WHO abridged life tables, all age groups from 5 onwards are 5-year age groups, m_0 refers to infants aged 0 (first 12 months of life) and m_1 refers to children aged 1 to 4 (ie. between exact ages 1 and 5).
NMR	Neonatal mortality rate
${}_nq_x$	probability of dying between exact ages x and $x+n$.
U5MR	Under-5 mortality rate
UN-IGME	Inter-agency Group for Child Mortality Estimation
UNPD	UN Population Division
VR	Vital registration
WHO	World Health Organization
WHS	2002 to 2003 WHO World Health Survey program
WPP2019	World Population Prospects 2019

1 Introduction

The World Health Organization (WHO) began producing annual life tables for all Member States in 1999. These life tables are a basic input to all WHO estimates of global, regional and country-level patterns and trends in all-cause and cause-specific mortality. Since 1998, WHO has been producing annual abridged life tables for Member States as part of its mandate to monitor and report on global progress in improving health. During the MDG era, WHO has been estimating time series of life tables from 1990 onwards. To support its reporting on progress towards the 2030 Agenda for Sustainable Development, WHO has released updated annual life tables for Member States for the period 1990-2016. These are available in the WHO Global Health Observatory¹ and in World Health Statistics Reports.²⁻⁴ These updated life tables also provide the all-cause mortality estimates for the WHO Global Health Estimates 2016 (GHE2016) released in 2018.¹

For almost all WHO Member States, this current update draws on the population estimates from World Population Prospects⁵ 2019 (WPP2019) prepared by the UN Population Division (UNPD), death registration data reported to WHO by Member States⁶, as well as on infant and child mortality rates under 15 years of age that have been developed and agreed upon by the Inter-agency Group for Child Mortality Estimation (UN-IGME) which is made up of WHO, UNICEF, UNPD, World Bank and academic groups⁷, UNAIDS/WHO estimates of HIV mortality for countries with high HIV prevalence⁸, and mortality estimates from the Global Burden of Disease 2019 (GBD2019) study.⁹

Consultations with Member States were carried out for estimates of neonatal, infant and child mortality in June-July 2020 and for life table mortality rates and life expectancies in September-October 2020.

2 General approach for preparation of annual life tables

For this update, the objective was to publish WHO annual period life tables for years 1990-2019. The starting point for the preparation of WHO annual life tables was to generate estimates for mortality rates m_x from country-specific data sources as listed in Annex Table A for each age-sex-country time series. A persisting challenge for this kind of effort is that not all WHO Member States have complete Vital Registration (VR) systems recording all deaths occurring in a certain calendar year with detailed information on age and sex of the deceased. And where such systems do exist, the completeness and quality of data vary across Member States. Consequently, various types of data and methods were applied for the estimation of life tables for different Member States.

We defined two groups of Member States and non-Member territories for which data inputs and estimation methods differed. The corresponding groups are:

VR countries	77 countries and territories for which the WHO Mortality Database held mortality data from vital registration (VR) systems for 75% or more of years since 1990.
Non-VR countries	The remaining countries and territories where the most up-to-date estimates of mortality rates for child under 15 years of age from UN-IGME and for older age groups based on the GBD model life table systems ^{9,10} were used to construct annual life tables.

A full list of countries in each category is provided in Annex Table A.

3. Adjustments using death registration data

WHO holds time series of death registration data from as early as 1950s for around 100 countries.⁶ These are used to the greatest extent possible in the preparation of annual life tables. For 77 countries with at least 75% of the years in range 1990-2019 available, we evaluated the completeness of the all-cause deaths data and used completeness-adjusted death rates to inform the imputation of annual death rates for life tables.

3.1 Updated assessments of VR completeness

Completeness for child deaths under age 15 years was assessed by comparison with UN-IGME estimates of child mortality.⁷ When VR data were not available for all years for the period of interest in a country, a full time series of estimates for child completeness are interpolated and/or extrapolated. We used a Loess regression with a bandwidth 0.8 for the interpolation process. For extrapolation, the estimates of child completeness are held constant before the first and after the last observation instead of using the Loess regression. As the estimates for child mortality for ages under 15 years were derived from either 1) VR data that are considered to be complete and therefore requires no completeness-based adjustments, and 2) the direct use of IGME estimates for those age groups, the evaluation of completeness for child deaths is only used for the assessment of VR completeness for the older age groups but not for adjusting VR data for GHE's estimation of child mortality.

Completeness of death registration for ages 15 years and over was assessed using the death distribution methods (DDMs) as well as the estimated completeness under-5 VR data. In essence, DDMs assess VR completeness by comparing the age distribution of the population between two censuses with the age distribution of deaths between those same censuses. The three DDMs most widely used in demography are adopted in our assessment for adult VR completeness, including generalized growth balance (GGB), synthetic extinct generation (SEG), and a hybrid approach (GGBSEG) of the two.^{9,11-15} To produce a smoother trends of completeness estimates for adult mortality based on the initial estimates from DDMs, a regression analysis was then performed to use completeness estimates for children to predict that for adults using the formula below:

$$\log(\text{Adult completeness}) = \hat{\beta}_0 + \hat{\beta}_1 * \log(\text{Child completeness})$$

The residuals from this regression were then smoothed using a spatiotemporal model to leverage the available data from the entire time series and geographic locations, and subsequently brought back to the regression equation for calculating the final estimated completeness.^{9,16} The final completeness estimates were capped at 100% for those where the estimated values were greater than 100%. Those with estimated completeness between 95% and 100% were considered complete with the final values set at 100%. Accordingly, the estimated completeness with values between 90% and 95% were rescaled to the range of 90-100% using the formula below.

$$\text{scaled completeness} = 2 * \text{estimated completeness} - 0.9$$

Annex Table B lists estimated completeness for the most recent year of death registration data for each Member State meeting inclusion criteria.

There are five countries where registered deaths reported to WHO do not include a province or territory not under government control. These are:

Cyprus:	all data refer to government controlled areas
Georgia:	excluding Abkhazia and South Osetia
Moldova:	excluding Transnistria and Bender
Russia:	1993-2003 data exclude Chechnya
Serbia:	excluding Kosovo-Metohija province

Singapore does not report deaths for non-citizen residents, who represent approximately 30% of the de-facto population. For Mauritius, the deaths reported to WHO include all of Mauritius except for the island of Rodrigues.

Once the VR completeness for adult deaths were estimated, age and sex specific mortality rates for each country-year were calculated simply by dividing the observed mortality rates by the estimated completeness.

3.2 Revision of annual death rates

For countries with high quality and complete death registration data, mortality estimates at the older age groups 75 years above were validated and adjusted using data from the Human Mortality Database (HMD)^{17,18}, which corrects for age misstatement and under-reporting at older age groups.

For 7 countries with less than 1 million population in 2000-2015, VR death rates were smoothed using a 3-year moving average. Annual mx for ages 15+ were calculated for each VR country-year as:

$$mx = \text{VR deaths} / (\text{VR population estimate}) / (\text{annual age-sex-specific completeness estimate})$$

For all VR countries, including those where completeness was set at 100% for all age groups, total deaths for ages 75 years and over were calculated from the completeness-adjusted death registration data, and

distributed to 5 year age groups 75-79,....., 95-100, 100+ according to the distributions in the annual life tables from GBD2019 when data from HMD are absent. This was to ensure that adjustments for under-reporting of deaths in oldest age groups, and for age misstatement, were taken into account.

3.3 Quantification of uncertainty

For completeness-adjusted VR data, deaths are assumed to follow the binomial distribution, accordingly Monte Carlo simulation is applied to generate 1000 random draws of the age-specific mortality estimates from a normal approximation of the binomial distribution. The 2.5 and 97.5 quantiles are used respectively as the lower and upper 95% uncertainty bounds.

4 Infant and child mortality

Mortality rates for infants and age group 1-4 years for the WHO life tables were derived from the UN-IGME estimates of infant mortality rates (IMR) and under 5 mortality rates (U5MR) by sex, as well as for Member States for years 1990-2019.⁷ For age groups 5-9 and 10-14 years, mortality rates were derived from UN-IGME estimates of the probability of dying between ages 5 and 10 years (5q5) and between 5 and 14 (10q5) years per 1,000 child aged 5 years, for both sexes combined. We applied conventional life table method to convert these probability values to mortality rates and used sex distribution of mortality from GBD2019 for these two age groups to calculate sex-specific mortality rates. UN-IGME annually assesses and adjusts all available surveys, censuses and vital registration data, to estimate country-specific trends in mortality rates for neonates, infants, children 1-4 years and 5-14 years of age. All data sources and estimates are documented on the website www.childmortality.org. For countries with complete recording of child deaths in death registration systems, these are used as the source of data for the estimation of trends in neonatal, infant and child mortality. For countries with incomplete death registration, all other available census and survey data sources, which meet quality criteria, are used.

5 Estimated adult mortality for non-VR countries

For countries where death registration data are not available for at least 75% of the years in the period 1990-2019 available, adult mortality rates and the associated uncertainty for ages above 15 years were based on modelling. It draws on a wide range of data sources including available death registration data such as the Disease Surveillance Points (DSP) in China^{19,20} and the Sample Registration System (SRS) in India^{21,22}, census, nationally representative household surveys, and sibling survival history data. The tool for estimating the country-age-sex-specific mortality rates for this group of countries is the GBD model life table systems,^{9,16} which are a further development of the modified logit model life table previously used for WHO life table estimation in early 2000s²³. The analysis accounted for the level of HIV mortality and made use of summary mortality indices, including probability of dying for children from birth to 5 years of age (5q0) and for adults from 15 to 60 years of age (45q15), which were derived from the aforementioned data sources to generate age-specific estimates of mortality rates for the entire age span from age 0 to 85+ years in mostly 5-year age intervals. The methods are described in details elsewhere.^{9,16}

6 Data sources and methods for mortality shocks

Conflict and natural disasters (mortality shocks) may cause substantial increases in death rates for specific country-years. These may or may not be reflected in available death registration or survey/census data. Accordingly, the current update of WHO life tables draw on estimates of these deaths by country, year, age and sex from GBD2019¹⁴ as part of its overall cause of death analyses to replace the likely under-reported deaths from these causes in the VR data.¹⁴ Data and methods used for updating annual mortality shock estimates by country, age, sex and year for the period 1990-2016 are described below.

6.1 Natural disasters

Estimated deaths for major natural disasters were obtained from estimates of GBD2019 which are based on information including the EM-DAT/CRED International Disaster Database.²⁴ These data were used to supplement the VR data as described in the previous WHO Life Tables Technical Paper.²⁵

6.2 Conflict deaths

Similar to natural disasters, we used GBD2019 data for deaths due to conflicts, terrorism and legal interventions, which were primarily estimated using data from the Uppsala Conflict Data Program (UCDP), International Institute for Strategic Studies (IISS), Armed Conflict Location & Event Data Project (ACLED), Global Terrorism Database (GTD), supplemented by vital registration systems and other relevant data sources.^{26–29} Deaths were assigned for each event according to the source's cause coding and any description from available notes. When the deaths due to a certain event are reported across multiple locations and estimates by side were not provided, deaths were split between the population from both locations.

These estimates relate to deaths for which the underlying cause (following ICD conventions) was an injury due to war, civil insurrection or organized conflict, whether or not that injury occurred during the time of war or after cessation of hostilities. The estimates include injury deaths resulting from all organized conflicts, including organized terrorist groups, whether or not a national government was involved. They do not include deaths from other causes (such as starvation, infectious disease epidemics, lack of medical intervention for chronic diseases), which may be counterfactually attributable to war or civil conflict.

7 WHO estimates of life expectancy and healthy life expectancy

7.1 Life expectancy

Final estimates of age-sex-specific mortality rates for years 1990-2019 were used to compute abridged life tables for 183 WHO Member States with population of 90,000 or greater in 2019. Life expectancies at birth are reported in World Health Statistics 2019 and full life tables are available in the WHO Global Health Observatory (www.who.int/gho).¹

WHO applies standard methods to the analysis of Member State data to ensure comparability of estimates across countries. This will inevitably result in differences for some Member States with official estimates for quantities such as life expectancy, where a variety of different projection methods and other methods are used. These WHO estimates of mortality and life expectancies should not be regarded as the nationally endorsed statistics of Member States, which may have been derived using alternative methodologies and assumptions.

7.2 Healthy life expectancy

Previous WHO estimates for healthy life expectancy (HLE or HALE) for Member States have also been updated., using the updated WHO life tables and WHO YLD estimates based largely on YLD estimates from GBD2019,¹⁴ with similar adjustments to disability weights and prevalences for certain causes as previously.²⁵

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Annex Table A: Data sources and methods for WHO Life Tables

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
AFG	Afghanistan	Afghanistan Health Survey 2006 Afghanistan Multiple Indicator Cluster Survey 2003, 2010-2011 Afghanistan Demographic and Health Survey 2015-2016 Afghanistan National Risk and Vulnerability Assessment 2007-2008, 2011-2012	Model life table systems	
ALB	Albania	Life expectancy at birth: Based on life tables for 1987-2015 derived from registered deaths by age and sex and observed trends in infant and child mortality.	VR	1980, 1984-2015
DZA	Algeria	Algeria Maternal and Child Health Survey 1992 Algeria Family Health Survey 2002-2003 Algeria Multiple Indicator Cluster Survey 1995, 2000, 2012-2013 Algeria Vital Statistics - Deaths 1990, 2000, 2007-2010 Algeria Demography 2011 United Nations Demographic Yearbook 2000-2016	Model life table systems	1980-1982, 1985-1986, 1998, 2000
AGO	Angola	Angola Multiple Indicator Cluster Survey 2001 Angola Malaria Indicator Survey 2006-2007, 2011 Angola Demographic and Health Survey 2015-2016	Model life table systems	
ATG	Antigua and Barbuda	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1961-1964, 1966, 1969-1978, 1983-2009, 2012-2017
ARG	Argentina	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1966-1970, 1977-2018
ARM	Armenia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2018
AUS	Australia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-2018
AUT	Austria	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2019
AZE	Azerbaijan	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2011
BHS	Bahamas	United Nations Demographic Yearbook WHO Mortality Database	Model life table systems	1969, 1971-1972, 1974-1977, 1979-2014

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
BHR	Bahrain	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2014
BGD	Bangladesh	Bangladesh Special Demographic and Health Survey 2001 Bangladesh Demographic and Health Survey 1993-1994, 1996-1997, 1999-2000, 2004, 2007, 2011-2012, 2014 Bangladesh Multiple Indicator Cluster Survey 2012-2013 Bangladesh Population and Housing Census 2011 Bangladesh Sample Vital Registration System 2003, 2010, 2012, 2013, 2014	Model life table systems	1980-1982, 1984-1986
BRB	Barbados	WHO Mortality Database Country Mortality Data 1980-1999	Model life table systems	1955-2013
BLR	Belarus	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2015, 2018
BEL	Belgium	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1954-2016
BLZ	Belize	Belize Family Health Survey 1991, 1999 WHO Mortality Database United Nations Demographic Yearbook 2009-2010, 2015-2016 Belize Multiple Indicator Cluster Survey 2006, 2011, 2015-2016 Belize Vital Registration - Deaths 2015 ICD10	Model life table systems	1964-2016
BEN	Benin	Benin Demographic and Health Survey 1996, 2001, 2006 Benin Demographic and Health Survey 2011-2012 Benin Multiple Indicator Cluster Survey 2014	Model life table systems	
BTN	Bhutan	United Nations Demographic Yearbook 2006 Bhutan Multiple Indicator Cluster Survey 2010 Bhutan Population and Housing Census 2005 Bhutan Health Survey 1994	Model life table systems	
BOL	Bolivia (Plurinational State of)	Bolivia Demographic and Health Survey 2003-2004, 2008, 2016 Bolivia Household Survey 2000 Bolivia Multiple Indicator Cluster Survey 2000 Bolivia National Census of Population and Housing 2001 - IPUMS United Nations Demographic Yearbook 1991 WHO Mortality Database	Model life table systems	2000-2003
BIH	Bosnia and Herzegovina	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1985-1991, 1998-2011, 2014, 2016

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
BWA	Botswana	Botswana Multiple Indicator Cluster Survey 2000 Botswana Family Health Survey 1996, 2007-2008 Botswana Population and Housing Census 1981 Botswana Demographic Survey 2006 United Nations Demographic Yearbook 2013 Botswana Population and Housing Census 2011 Botswana Vital Statistics Report 2001, 2013, 2014, 2015	Model life table systems	1995
BRA	Brazil	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1977-2017
BRN	Brunei Darussalam	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2019
BGR	Bulgaria	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1964-2018
BFA	Burkina Faso	Burkina Faso Demographic and Health Survey 1992-1993,1998-1999, 2003 Burkina Faso Multiple Indicator Cluster Survey 2006 Burkina Faso Population and Housing Census 2006 Burkina Faso Demographic and Health Survey 2010-2011 Burkina Faso Malaria Indicator Survey 2014	Model life table systems	
BDI	Burundi	Burundi Multiple Indicator Cluster Survey 2000 Burundi Multiple Indicator Cluster Survey 2005 Burundi Demographic and Health Survey 2010-2011 Burundi Malaria Indicator Survey 2012-2013 Burundi Demographic and Health Survey 2016-2017	Model life table systems	
CPV	Cabo Verde	United Nations Demographic Yearbook Cape Verde Reproductive Health Survey 1998 WHO Mortality Database Cape Verde Population and Housing Census 2000 Cape Verde Demographic and Health Survey 2005	Model life table systems	1980, 1983-1985, 1990-1991, 1998, 2000, 2007, 2011-2012
KHM	Cambodia	Cambodia Special Demographic and Health Survey 1998 Cambodia Intercensal Population Survey 2004 Cambodia Socio-Economic Survey 1997, 1999, 2003-2005 Cambodia Demographic and Health Survey 2000,2005-2006, 2010-2011, 2014 Cambodia General Population Census 2008 - IPUMS Cambodia Demographic and Health Survey 2014	Model life table systems	

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
CMR	Cameroon	Cameroon Demographic and Health Survey 1991, 1998, 2004 Cameroon Multiple Indicator Cluster Survey 2000, 2014 Cameroon Population and Housing Census 2005 Cameroon Demographic and Health Survey 2011	Model life table systems	1987
CAN	Canada	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-2017
CAF	Central African Republic	Central African Republic Multiple Indicator Cluster Survey 2000, 2006, 2010-2011	Model life table systems	1988
TCD	Chad	Chad Demographic and Health Survey 1996-1997 Chad Multiple Indicator Cluster Survey 2000, 2010 Chad Demographic and Health Survey 2004,2014-2015	Model life table systems	
CHL	Chile	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1954-2018
CHN	China	United Nations Demographic Yearbook China Census of Population 2000 WHO Mortality Database China Population and Housing Census 2010 China Disease Surveillance Points 1991-2007- China CDC China - Henan Maternal and Child Health Surveillance System Under-5 Mortality Rate 1991-1996 China Mortality Registration and Reporting System, China CDC 2008-2015 China Intercensal Population Sample Survey of One-Percent 1995 China National Maternal and Child Health Surveillance System Child Mortality Data By Cause 1996-2012 – MCHS China National Maternal and Child Health Surveillance System Provincial Child Mortality 2000-2012, 2013-2014 - MCHS China Maternal and Child Mortality Data 1996-2012 - China CDC China National Maternal and Child Health Surveillance System Under-5 Mortality 1996-2013 - MCHS China National Maternal and Child Health Surveillance System 2009 China Statistical Yearbook 2002 China WHO Study on Global AGEing and Adult Health 2007-2010 China Disease Surveillance Points and Information System for Disease Control and Prevention Deaths 2013-2015	Model life table systems	1987-2000
COL	Colombia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1953-1970, 1972, 1974- 1977, 1979, 1981-2017

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
COM	Comoros	Comoros Demographic and Health Survey 1996, 2012-2013 Comoros Multiple Indicator Cluster Survey 2000	Model life table systems	
COG	Congo	Congo Demographic and Health Survey 2005,2011-2012 Congo Population and Housing Census 1984 Congo AIDS Indicator Survey 2009 Congo Multiple Indicator Cluster Survey 2014-2015	Model life table systems	
CRI	Costa Rica	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1956-2017
CIV	Côte d'Ivoire	Côte d'Ivoire Demographic and Health Survey 1994, 1998-1999, 2011-2012 Côte d'Ivoire AIDS Indicator Survey 2005 Cote d'Ivoire Multiple Indicator Cluster Survey 2016 Côte d'Ivoire General Population and Housing Census 1998	Model life table systems	1998
HRV	Croatia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2017
CUB	Cuba	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1959, 1964-1965, 1968-2017
CYP	Cyprus	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2018
CZE	Czechia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2019
PRK	Democratic People's Republic of Korea	North Korea Population Census 1993	Model life table systems	1993
COD	Democratic Republic of the Congo	Zaire Multiple Indicator Cluster Survey 1995 Democratic Republic of the Congo Multiple Indicator Cluster Survey 2001, 2010 Democratic Republic of the Congo Demographic and Health Survey 2007, 2013-2014	Model life table systems	
DNK	Denmark	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2018
DJI	Djibouti	Djibouti Intercensal Demographic Survey 1991 Djibouti Family Health Survey 2002 Djibouti Multiple Indicator Cluster Survey 2006	Model life table systems	1991

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
DOM	Dominican Republic	Dominican Republic Demographic and Health Survey 1991, 1996, 2002, 2007 , 2013 Dominican Republic Experimental Demographic and Health Survey 1999 Dominican Republic Special Demographic and Health Survey 2007 Dominican Republic Multiple Indicator Cluster Survey 2000, 2014 Dominican Republic Census 2002 - IPUMS Dominican Republic National Multipurpose Household Survey 2006 WHO Mortality Database Dominican Republic Census 2010 - IPUMS Dominican Republic Vital Registration - Deaths 2013 ICD10 Dominican Republic Deaths Occurred per Year, by Sex and Age Groups of the Deceased, 2001-2016	Model life table systems	1956-1963, 1965-1992, 1994-2013
ECU	Ecuador	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1961, 1963-1975, 1977-2017
EGY	Egypt	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1954-1967, 1970-1981, 1983-2019
SLV	El Salvador	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-1974, 1980-2015
GNQ	Equatorial Guinea	Equatorial Guinea Multiple Indicator Cluster Survey 2000 Equatorial Guinea Demographic and Health Survey 2011	Model life table systems	
ERI	Eritrea	Eritrea Demographic and Health Survey 1995-1996, 2002 Eritrea Demographic and Health Survey 2002	Model life table systems	
EST	Estonia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2019
ETH	Ethiopia	Ethiopia Population and Housing Census 1994, 2007 Ethiopia Demographic and Health Survey 2000, 2005, 2010-2011, 2016	Model life table systems	1984
FJI	Fiji	Fiji Population and Housing Census 1996, 2007 WHO Mortality Database Fiji Population and Housing Census 2007 Country Mortality Data 1980-1999	Model life table systems	1978, 1980-1987, 1992-2009, 2011-2012
FIN	Finland	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1952-2018
FRA	France	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-2016
GAB	Gabon	Gabon Demographic and Health Survey 2000-2001, 2012	Model life table systems	
GMB	Gambia	Gambia Multiple Indicator Cluster Survey 2000, 2005-2006, 2010 Gambia Demographic and Health Survey 2013	Model life table systems	

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
GEO	Georgia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2019
DEU	Germany	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2018
GHA	Ghana	Ghana Living Standards Measurement Survey 1991-1992, 1998-1999, 2005-2006 Ghana Demographic and Health Survey 1993-1994, 1998-1999, 2003, 2008, 2014 Ghana Population and Housing Census 2000 - IPUMS Ghana Special Demographic and Health Survey 2007-2008 Ghana Multiple Indicator Cluster Survey 2006, 2011 Ghana District Multiple Indicator Cluster Survey 2007-2008 Ghana - Accra Multiple Indicator Cluster Survey 2010-2011 Ghana Census 2010 Ghana Performance Monitoring and Accountability 2020 Survey, Round 4 2015 Ghana Malaria Indicator Survey 2016 United Nations Demographic Yearbook	Model life table systems	
GRC	Greece	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1956-2017
GRD	Grenada	WHO Mortality Database United Nations Demographic Yearbook Grenada Vital Registration - Deaths 2016 ICD10	Model life table systems	1974-1978, 1984-2018
GTM	Guatemala	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1958-1971, 1974-1981, 1983-2017
GIN	Guinea	Guinea General Census of Population and Housing 1996 - IPUMS Guinea Demographic and Health Survey 1992, 1999, 2005, 2012 Guinea General Census of Population and Housing 1983 - IPUMS Guinea Multiple Indicator Cluster Survey 2016 United Nations Demographic Yearbook	Model life table systems	
GNB	Guinea-Bissau	Guinea-Bissau Multiple Indicator Cluster Survey 2000, 2006, 2010, 2014	Model life table systems	
GUY	Guyana	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1975-1977, 1979, 1984, 1988-2014
HTI	Haiti	Haiti Demographic and Health Survey 1994-1995, 2000, 2005-2006, 2012, 2016-2017 United Nations Demographic Yearbook Haiti Mortality, Morbidity, and Utilization of Services Survey 1987 Haiti Population and Housing Census 2003 - IPUMS WHO Mortality Database Haiti Global Fund Household Survey 2008	Model life table systems	1980-1981, 1983, 1997, 1999, 2001- 2004

HND	Honduras	Honduras Demographic and Health Survey 2005-2006, 2011-2012 WHO Mortality Database Honduras Survey of Living Conditions 2004 Honduras Population and Housing Census 2001	Model life table systems	1966, 1968-1983, 1987-1990, 2008-2013
HUN	Hungary	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2019
ISL	Iceland	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2019
IND	India	India Demographic and Health Survey 1992-1993, 1998-1999 India District Level Household Survey 1998-1999 (DLHS) India Sample Registration System Age-Specific Death Rates 1970-2006 India Human Development Survey 2004-2005 India Demographic and Health Survey 2005-2006, 2015-2016 India District Level Household Survey 2002-2005, 2007-2008, 2012-2014 India SRS Compendium of Fertility and Mortality Indicators 1971-1997 India Sample Registration System Age- and Sex-Specific Death Rates 1983-1995 India Population and Housing Census 2001 India Annual Health Survey Data 2010-2013 India Population and Housing Census 2011 India Medical Certification of Cause of Death State-Level Tabulations 1990-1996 India Fertility and Mortality Indicators 1991 India Human Development Survey 2011-2013 India SRS Statistical Report 1995-2016 India Medical Certification of Cause of Death Report 1997-2010 India Vital Statistics 2010-2015 India Annual Health Survey 2010-2013	Model life table systems	1988-2008
IDN	Indonesia	Indonesia Population and Housing Census 1990, 2000 Indonesia Intercensal Population Survey 1995, 2005 Indonesia Demographic and Health Survey 1991, 1994, 1997, 2002-2003, 2007, 2012 Indonesia Family Life Survey 1993-1994, 1997, 2000, 2007-2008, 2014-2015 Indonesia Population Census 1990, 2000, 2010 Indonesia Special Demographic and Health Survey 2012 United Nations Demographic Yearbook	Model life table systems	
IRN	Iran (Islamic Republic of)	Iran Demographic and Health Survey 2000 Iran Population and Health Sample Survey 1974 WHO Mortality Database Iran General Census of Population and Housing 2006, 2011, 2016 United Nations Demographic Yearbook - Historical Supplement 1997 Iran Mortality and Fertility Survey 1996 Iran Vital Registration - Deaths 1996-2001 Iran Death Registration System 2001-2015 Iran Civil Registration Recorded Deaths 2011-2016 Iran Multiple Indicator Demographic and Health Survey 2010	Model life table systems	1974-1975, 1978-1987, 1991, 1995-1999, 2001, 2005-2008, 2013-2016

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
IRQ	Iraq	Iraq Multiple Indicator Rapid Assessment 2004 Iraq Population and Housing Census 1997 - IPUMS Iraq Child and Maternal Mortality Survey 1999 Iraq Multiple Indicator Cluster Survey 2006, 2011 Iraq Family Health Survey 2006-2007 Iraq Infant and Child Mortality and Nutrition Survey 1991 Iraq Living Conditions Survey 2004 Mortality in Iraq Associated with the 2003-2011 Invasion and Occupation WHO Mortality Database	Model life table systems	1987-1989, 2008, 2015-2016
IRL	Ireland	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1950-2015
ISR	Israel	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1975-2019
ITA	Italy	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1951-2017
JAM	Jamaica	Jamaica Multiple Indicator Cluster Survey 2000, 2005 Jamaica Population Census 2001 - IPUMS WHO Mortality Database Jamaica Multiple Indicator Cluster Survey 2005 Country Mortality Data 1980-1999	Model life table systems	1960-1961, 1964-1965, 1967-1971, 1975, 1977, 1980-1991, 1996-2014
JPN	Japan	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1950-2018
JOR	Jordan	Jordan Demographic and Health Survey 1997, 2002, 2007 Jordan Interim Demographic and Health Survey 2009 Jordan Demographic and Health Survey 2012 Jordan Vital Registration - Deaths 2004-2006 WHO Mortality Database Jordan Causes of Death and Population 2013	Model life table systems	1959-1960, 1962-1966, 1968, 1970-1975, 1978-1979, 2003-2004, 2008-2013, 2015
KAZ	Kazakhstan	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2015, 2017
KEN	Kenya	Kenya Welfare Monitoring Survey II 1994 Kenya Demographic and Health Survey 1993, 1998, 2003, 2008-2009, 2014 Kenya Population and Housing Census 1999, 2009 Kenya Multiple Indicator Cluster Survey 2000 Kenya Integrated Household Budget Survey 2005-2006 Kenya Malaria Indicator Survey 2007 Kenya Performance Monitoring and Accountability 2020 Survey, Round 3 2015 Kenya Malaria Indicator Survey 2015 Kenya AIDS Indicator Survey 2007	Model life table systems	

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
KIR	Kiribati	Kiribati Population and Housing Census 2005, 2010 WHO Mortality Database Kiribati Demographic and Health Survey 2009 United Nations Demographic Yearbook 2014	Model life table systems	1991-2001
KWT	Kuwait	Kuwait Family Health Survey 1996 WHO Mortality Database Kuwait Annual Bulletin for Vital Statistics - Births and Deaths 2015	Model life table systems	1972, 1975-1989, 1991-2017
KGZ	Kyrgyzstan	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2016
LAO	Lao People's Democratic Republic	United Nations Demographic Yearbook Special Census Topic, 2000 Round Laos Multiple Indicator Cluster Survey 2011-2012 Laos Reproductive Health Survey 2005	Model life table systems	1995
LVA	Latvia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2018
LBN	Lebanon	Lebanon Maternal and Child Health Survey 1996 Lebanon Family Health Survey 2004 Lebanon Multiple Indicator Cluster Survey 2000, 2009 Lebanon Registered and Reported Deaths 2004 Lebanon Vital Registration - Deaths 2009-2015	Model life table systems	2017-2019
LSO	Lesotho	Lesotho Multiple Indicator Cluster Survey 2000 Lesotho Demographic and Health Survey 2004-2005, 2009-2010, 2014 Lesotho Demographic Survey 2001, 2011	Model life table systems	
LBR	Liberia	Liberia Demographic and Health Survey 2006-2007, 2013 Liberia Census 2008 Liberia Malaria Indicator Survey 2008-2009, 2011, 2016	Model life table systems	
LBY	Libya	Libya Maternal and Child Health Survey 1995 Libya Family Health Survey 2007 United Nations Demographic Yearbook Libya Multiple Indicator Cluster Survey 2003 Libya Vital Statistics 2006-2011	Model life table systems	1981, 2016-2017
LTU	Lithuania	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2018
LUX	Luxembourg	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-1962, 1965-2017
MDG	Madagascar	Madagascar Demographic and Health Survey 1992, 1997, 2003-2004, 2008-2009 Madagascar Multiple Indicator Cluster Survey 2000, 2011 Madagascar Malaria Indicator Survey 1995, 2013 Madagascar - South Multiple Indicator Cluster Survey 2012 United Nations Demographic Yearbook	Model life table systems	

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
MWI	Malawi	Malawi Demographic and Health Survey 1992, 2000, 2004-2005, 2010, 2015-2016 United Nations Demographic Yearbook Malawi Population and Housing Census 1998, 2008 Malawi Diffusion and Ideational Change Project (MDICP) 1998 Malawi Diffusion and Ideational Change Project (MDICP) 2001 Malawi Multiple Indicator Cluster Survey 1995 2006, 2013-2014 Malawi Malaria Indicator Survey 2012, 2014, 2017 Malawi Global Fund Household Health Coverage Survey 2007-2008	Model life table systems	1987, 1998
MYS	Malaysia	United Nations Demographic Yearbook Country Mortality Data 1980-1999 Malaysia Vital Registration - Deaths 2010, 2011, 2013 ICD10	Model life table systems	1990-2014
MDV	Maldives	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1984-2017
MLI	Mali	Mali Demographic and Health Survey 1995-1996, 2001, 2006, 2012-2013 Mali General Population and Housing Census 1998 - IPUMS United Nations Demographic Yearbook - Historical Supplement 1997 Mali Census 2009 Mali Multiple Indicator Cluster Survey 2015 Mali Malaria Indicator Survey 2015	Model life table systems	1987
MLT	Malta	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2017
MRT	Mauritania	Mauritania Demographic and Health Survey 2000-2001 Mauritania Multiple Indicator Cluster Survey 1996, 2007, 2011, 2015	Model life table systems	1988
MUS	Mauritius	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1957-2019
MEX	Mexico	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2017
FSM	Micronesia (Federated States of)	United Nations Demographic Yearbook	Model life table systems	
MNG	Mongolia	United Nations Demographic Yearbook Mongolia Multiple Indicator Cluster Survey 2000, 2005, 2010, 2013 Mongolia Reproductive Health Survey 1998, 2003, 2008 WHO Mortality Database Mongolia Statistical Yearbook 2001-2005	Model life table systems	1991-2010, 2016
MNE	Montenegro	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1985-2010
MAR	Morocco	Morocco Special Demographic and Health Survey 1995 Morocco Demographic and Health Survey 1992, 2003-2004 Morocco Population and Housing Census 1994, 2004 Morocco Maternal and Child Health Survey 1996-1997 United Nations Demographic Yearbook Morocco National Survey on Population and Family Health 2010-2011	Model life table systems	1991-1998, 2000-2004, 2007-2016

	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
ISO3				
MOZ	Mozambique	Mozambique Demographic and Health Survey 1997,2003-2004, 2011 Mozambique Population and Housing Census 1997 Mozambique Multiple Indicator Cluster Survey 1995, 2008-2009 Mozambique Census 2007 - IPUMS Mozambique AIDS Indicator Survey 2009 United Nations Demographic Yearbook	Model life table systems	
MMR	Myanmar	Myanmar Demographic and Health Survey 2015-2016 Myanmar Population and Housing Census 2014 United Nations Demographic Yearbook Myanmar Multiple Indicator Cluster Survey 2009-2010	Model life table systems	1977-1978, 2013-2014
NAM	Namibia	Namibia Demographic and Health Survey 1992, 2000, 2006-2007, 2013 United Nations Demographic Yearbook Namibia Population and Housing Census 2011	Model life table systems	
NPL	Nepal	Nepal Demographic and Health Survey 1996, 2001, 2006, 2011, 2016-2017 Nepal Fertility, Family Planning, and Health Survey 1991-1992 United Nations Demographic Yearbook 2009-2010 Nepal National Population Census 2001 - IPUMS Nepal Multiple Indicator Cluster Survey 2014	Model life table systems	1981, 1991
NLD	Netherlands	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1950-2018
NZL	New Zealand	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1950-2016
NIC	Nicaragua	Nicaragua Socio-Demographic Survey 1985-1986 Nicaragua Living Standards Measurement Survey 1993, 2001, 2005 Nicaragua Demographic and Health Survey 1997-1998, 2001,2011-2012 Nicaragua Population and Housing Census 1995, 2005 Nicaragua Reproductive Health Survey 2006-2007 WHO Mortality Database Nicaragua Vital Registration - Deaths 2014, 2015 ICD10	Model life table systems	1959, 1961-1965, 1968-1969, 1973-1978, 1987-1994, 1996-2018

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
NER	Niger	Niger Demographic and Health Survey 1992, 1998, 2006, 2012 Niger Multiple Indicator Cluster Survey 1996, 2000	Model life table systems	
NGA	Nigeria	Nigeria Demographic and Health Survey 1990, 2003, 2008, 2013 Nigeria Multiple Indicator Cluster Survey 1999, 2007, 2011 Nigeria Living Standards Survey 2003-2004, 2008-2010 Nigeria General Household Survey 2007, 2008 Nigeria Malaria Indicator Survey 2010, 2015 Nigeria Multiple Indicator Cluster Survey with National Immunization Coverage Survey Supplement 2016-2017 Nigeria Report of Livebirths, Deaths and Stillbirths 1994-2007	Model life table systems	
NOR	Norway	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2016
OMN	Oman	Oman Family Health Survey 1995 Oman General Census of Population, Housing, and Establishments 1993 Oman Multiple Indicator Cluster Survey 2014 United Nations Demographic Yearbook WHO Mortality Database Oman Vital Registration - Deaths 2014 ICD10	Model life table systems	2009-2010, 2014, 2016- 2017
PAK	Pakistan	United Nations Demographic Yearbook Pakistan Integrated Household Survey/ Household Integrated Economic Survey 1998-1999, 2001-2002 Pakistan Social and Living Standards Measurement Survey/ Household Integrated Economic Survey 2005-2006, 2007-2008, 2008-2009 Pakistan Demographic and Health Survey 2006-2007, 2012-2013 Pakistan Demographic Survey 1995-1996, 1999, 2005, 2006	Model life table systems	1984-1993
PAN	Panama	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1954-2017
PNG	Papua New Guinea	Papua New Guinea Demographic and Health Survey 1996-1997, 2006-2007 WHO Mortality Database Papua New Guinea Census 2000	Model life table systems	1977, 1980, 1987-1998
PRY	Paraguay	Paraguay Demographic and Health Survey 1990 Paraguay Population and Housing Census 1992,2002 Paraguay Reproductive Health Survey 1995-1996 Paraguay Integrated Household Survey 1997-1998, 2000-2001 WHO Mortality Database Paraguay Multiple Indicator Cluster Survey 2016	Model life table systems	1961-1963, 1965-1992, 1994-2017
PER	Peru	Peru Demographic and Health Survey 1991-1992, 1996, 2000 WHO Mortality Database Peru National Population and Housing Census 1993, 2007 Peru Living Standards Measurement Survey 1994 Peru Continuous Demographic and Health Survey 2003-2008, 2009-2014 Peru Demographic and Family Health Survey 2015 Peru Demographic and Family Health Survey 2016 Peru Vital Registration - Deaths 2015 ICD10	Model life table systems	1966-1973, 1977-1978, 1980-1992, 1994-2017

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
PHL	Philippines	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1963-1978, 1980-2011, 2014
POL	Poland	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1959-2017
PRT	Portugal	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2018
PRI	Puerto Rico	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-1966, 1969-1977, 1979-2017
QAT	Qatar	United Nations Demographic Yearbook Qatar Vital Statistics Annual Bulletin 1991, 1998, 2000, 2002, 2003 WHO Mortality Database Version November 2015 Qatar Vital Registration - Deaths 2015, 2016 ICD10	Model life table systems	1981-1983, 1985-2017
KOR	Republic of Korea	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2019
MDA	Republic of Moldova	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2018
ROU	Romania	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1959-1978, 1980-2018
RUS	Russian Federation	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1980-2019
RWA	Rwanda	Rwanda Population and Housing Census 1991, 2002, 2012 Rwanda Demographic and Health Survey 1992, 2000, 2005, 2010-2011, 2014-2015 Rwanda Integrated Living Conditions Survey 2005-2006 Rwanda Interim Demographic and Health Survey 2007-2008 Rwanda Malaria Indicator Survey 2013	Model life table systems	
LCA	Saint Lucia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1968-2006, 2008-2015
VCT	Saint Vincent and the Grenadines	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1970-1972, 1974, 1977-2017
WSM	Samoa	Samoa Demographic and Health Survey 2009, 2014 Samoa Demographic and Health Survey 2014	Model life table systems	1980, 1992-1993
STP	Sao Tome and Principe	Sao Tome and Principe Multiple Indicator Cluster Survey 2000, 2006, 2014 WHO Mortality Database Sao Tome and Principe Demographic and Health Survey 2008-2009	Model life table systems	1984-1985, 1987
SAU	Saudi Arabia	Saudi Arabia Family Health Survey 1996-1997 Saudi Arabia Vital Registration - Deaths 1996-2012 United Nations Demographic Yearbook Saudi Arabia Demographic Research Bulletin 2007 WHO Mortality Database	Model life table systems	2009, 2012

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
SEN	Senegal	Senegal Demographic and Health Survey 1992-1993, 1997, 2005,2010-2011 Senegal General Population and Housing Census 2002 - IPUMS Senegal Malaria Indicator Survey 2006, 2008-2009 Senegal Continuous Demographic and Health Survey 2012-2017	Model life table systems	
SRB	Serbia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1985-2017
SYC	Seychelles	United Nations Demographic Yearbook Seychelles Population and Housing Census 1960 WHO Mortality Database Seychelles Statistical Bulletin: Population and Vital Statistics December 2016	Model life table systems	1980-2015
SLE	Sierra Leone	Sierra Leone Multiple Indicator Cluster Survey 2000, 2005, 2010 Sierra Leone Population and Housing Census 2004 - IPUMS Sierra Leone Demographic and Health Survey 2008, 2013 Sierra Leone Demographic and Health Survey 2013 Sierra Leone Statistical Digest 2007-2013	Model life table systems	
SGP	Singapore	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2017, 2019
SVK	Slovakia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2014
SVN	Slovenia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2019
SLB	Solomon Islands	Solomon Islands Population and Housing Census 1999, 2009 Solomon Islands Demographic and Health Survey 2006-2007, 2015	Model life table systems	2017-2018
SOM	Somalia	Somalia Multiple Indicator Cluster Survey 1999, 2006	Model life table systems	
ZAF	South Africa	South Africa Living Standards Measurement Study 1993 South Africa Demographic and Health Survey 1998, 2016 South Africa Census 1996, 2001 Country Mortality Data 1980-1999 South Africa Community Survey 2007, 2016 South Africa October Household Survey 1993, 1995-1998 WHO Mortality Database South Africa Vital Registration - Causes of Death 1997-2015 South Africa National Income Dynamics Study - Wave 2 2010-2011 South Africa Rapid Mortality Surveillance Report 2012 South Africa Population and Housing Census 2011 United Nations Demographic Yearbook	Model life table systems	1980-1982, 1984-2015
SSD	South Sudan	Sudan - South Sudan Population and Housing Census 2008 Sudan - South Multiple Indicator Cluster Survey 2010 United Nations Demographic Yearbook	Model life table systems	
ESP	Spain	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2017

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
LKA	Sri Lanka	Sri Lanka Demographic and Health Survey 1993, 2000, 2006-2007, 2016 WHO Mortality Database Sri Lanka Population and Housing Census 2001 Sri Lanka Vital Statistics - Deaths 1993, 2004-2005, 2007, 2009, 2010, 2013 United Nations Demographic Yearbook	Model life table systems	1950-1968, 1977, 1980- 2007, 2009- 2014
SDN	Sudan	Sudan Maternal and Child Health Survey 1992-1993 United Nations Demographic Yearbook Sudan Multiple Indicator Cluster Survey 2000, 2014 Sudan Population and Housing Census 2008 - IPUMS Sudan Household Health Survey Report 2010 Sudan Family Health Survey 2006	Model life table systems	
SUR	Suriname	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1963-1966, 1971-1973, 1975-2014
SWZ	Swaziland	Swaziland Multiple Indicator Cluster Survey 2000, 2010, 2014 Swaziland Demographic and Health Survey 2006-2007 United Nations Demographic Yearbook	Model life table systems	
SWE	Sweden	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2017
CHE	Switzerland	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2017
SYR	Syrian Arab Republic	Syria Maternal and Child Health Survey 1993 WHO Mortality Database Syria Family Health Survey 2001, 2009 United Nations Demographic Yearbook Palestinians in Syria Multiple Indicator Cluster Survey 2006 Syria Multiple Indicator Cluster Survey 2006	Model life table systems	1973-1978, 1980-1981, 1983-1985, 1998-2010
TWN	Taiwan, China	Taiwan Human Mortality Database Deaths Period Data Taiwan Vital Registration - Deaths 1990-2016	Model life table systems	
TJK	Tajikistan	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-1982, 1985-2005, 2007-2009, 2016
THA	Thailand	United Nations Demographic Yearbook WHO Mortality Database Thailand Population and Housing Census 1990, 2000 Thailand Multiple Indicator Cluster Survey 2005-2006, 2012 Thailand Vital Registration - Deaths 1990, 1991 ICD9 Thailand Survey of Population Change 2005-2006 Thailand Vital Registration - Deaths 2015,2016 ICD10	Model life table systems	1955-2019

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
MKD	North Macedonia	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1982-2013
TLS	Timor-Leste	Timor-Leste Living Standards and Measurement Survey 2001 Timor-Leste Demographic and Health Survey 2003,2009-2010, 2016 Timor-Leste Population and Housing Census 2004	Model life table systems	
TGO	Togo	Togo Demographic and Health Survey 1998, 2013-2014 Togo Multiple Indicator Cluster Survey 2006, 2610 Togo Population and Housing Census 2010	Model life table systems	
TON	Tonga	United Nations Demographic Yearbook Tonga Demographic and Health Survey 2012	Model life table systems	1992-2003
TTO	Trinidad and Tobago	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1951-2012
TUN	Tunisia	United Nations Demographic Yearbook Tunisia Demographic and Health Survey 1988 Tunisia Maternal and Child Health Survey 1994-1995 Tunisia Family Health Survey 2001 Tunisia Multiple Indicator Cluster Survey 2011-2012	Model life table systems	1980, 1987-1989, 1991-2000, 2009, 2013
TUR	Turkey	Turkey Demographic and Health Survey 1993, 1998, 2003-2004, 2008, 2013-2014 United Nations Demographic Yearbook Turkey Demographic Survey 1989 Turkey Population Census 2000 WHO Mortality Database Version Turkey Vital Registration - Deaths by Age and Sex 2016	Model life table systems	1978-1979, 1981-1984, 1987-2016, 2019
TKM	Turkmenistan	Total number of deaths officially reported to vital registrations, by age and sex , extracted from the WHO Mortality Database.	VR	1981-1982, 1985-2015
UGA	Uganda	Uganda Population and Housing Census 1991, 2002 - IPUMS Uganda Integrated Household Survey 1992-1993 Uganda Demographic and Health Survey 1995, 2000-2001, 2006, 2011, 2016 Uganda Malaria Indicator Survey 2009-2010, 2014-2015 Uganda Living Standards Measurement Survey - Integrated Survey on Agriculture 2009-2010 Uganda AIDS Indicator Survey 2004-2005,2011 Uganda Performance Monitoring and Accountability 2020 Survey, Round 3 2015	Model life table systems	
UKR	Ukraine	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2012, 2014-2015, 2017-2019
ARE	United Arab Emirates	United Arab Emirates Family Health Survey 1995 United Arab Emirates Vital Statistics - Deaths 1995-2005 United Arab Emirates Statistical Abstract 1999-2005, 2007 United Arab Emirates Annual Statistical Report 2006, 2007 WHO Mortality Database	Model life table systems	2003, 2005-2010, 2012, 2016, 2019

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
GBR	United Kingdom	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-2016
TZA	United Republic of Tanzania	Tanzania Demographic and Health Survey 1991-1992 Tanzania Population Census 1988 - IPUMS Tanzania Population and Housing Census 1967 Tanzania Living Standards Measurement Study 1993-1994 Tanzania Demographic and Health Survey 1996, 1999, 2004-2005, 2009-2010, 2015-2016 Tanzania Knowledge, Attitudes, and Practices Survey 1994 Tanzania Population Census 2002 - IPUMS Tanzania HIV/AIDS and Malaria Indicator Survey 2007-2008 Tanzania AIDS Indicator Survey 2003-2004, 2011-2012 Tanzania National Panel Survey 2008-2009	Model life table systems	1988
USA	United States of America	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1950-2017
URY	Uruguay	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-1960, 1963-1978, 1980-2010, 2012-2019
UZB	Uzbekistan	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1981-2005, 2009-2016
VUT	Vanuatu	Vanuatu Multiple Indicator Cluster Survey 2007-2008 Vanuatu Population and Housing Census 2009 Vanuatu Demographic and Health Survey 2013	Model life table systems	
VEN	Venezuela (Bolivarian Republic of)	Total number of deaths officially reported to vital registrations, by age and sex, extracted from the WHO Mortality Database.	VR	1955-2014
VNM	Viet Nam	Vietnam Intercensal Demographic Survey 1994 Vietnam Demographic and Health Survey 1997, 2002 Vietnam Population and Housing Census 1999, 2009 Vietnam Multiple Indicator Cluster Survey 2000, 2006, 2010-2011, 2013-2014 Vietnam AIDS Indicator Survey 2005 Vietnam Population Change and Family Planning Survey 2007, 2008, 2010, 2011, 2013 Vietnam National Health Survey 2001-2002	Model life table systems	
PSE	West Bank and Gaza Strip	Palestine - West Bank and Gaza Strip Multiple Indicator Cluster Survey 2000 Palestine Multiple Indicator Cluster Survey 2010, 2014 Palestine Demographic and Health Survey 2004 Palestine Population, Housing, and Establishment Census 1997, 2007 Palestine Demographic Survey 1995 United Nations Demographic Yearbook Palestine Family Health Survey 2006-2007 WHO Mortality Database Palestine - West Bank and Gaza Strip Vital Registration - Deaths 2010 ICD10	Model life table systems	2008-2016

ISO3	Member State	Main data inputs for estimation of age-specific mortality rates	GHE2019 lifetable method	WHO MBD VR years available for life tables
YEM	Yemen	Yemen Demographic and Health Survey 1991-1992, 1997, 2013 Yemen Family Health Survey 2003 United Nations Demographic Yearbook Special Census Topic, 2000 Round Yemen Multiple Indicator Cluster Survey 2006 Yemen Annual Statistical Health Report 2006	Model life table systems	
ZMB	Zambia	Zambia Demographic and Health Survey 1992 Zambia Census 1990 - IPUMS Zambia Demographic and Health Survey 1996-1997 Zambia Demographic and Health Survey 2001-2002 Zambia Census 2000, 2010 Zambia Demographic and Health Survey 2007, 2013-2014 Zambia Demographic and Health Survey 2018-2019 Zambia Malaria Indicator Survey 2006, 2012 Zambia Living Conditions Monitoring Survey 1998, 2006, 2010 Zambia Household Health Coverage Survey 2008	Model life table systems	
ZWE	Zimbabwe	Zimbabwe Demographic and Health Survey 1994, 1999, 2005-2006, 2010-2011, 2015 Zimbabwe Multiple Indicator Monitoring Survey 2009, 2014 Zimbabwe Vital Registration - Deaths 1990 ICD9 Zimbabwe Population and Housing Census 2012 United Nations Demographic Yearbook	Model life table systems	1982, 1986, 1990-1996, 1998, 2002

* Total registered deaths reported to WHO Mortality Database or from other available sources. This may include registered deaths for which cause of death was not recorded for some countries.

Annex B: Estimated completeness* of death registration data for most recent year

Country	Year	Completeness (%)	Country	Year	Completeness (%)
Albania	2015	100	Kyrgyzstan	2016	100
Antigua and Barbuda	2017	100	Latvia	2018	100
Argentina	2018	100	Lithuania	2018	100
Armenia	2018	100	Luxembourg	2017	100
Australia	2018	100	Maldives	2017	100
Austria	2019	100	Malta	2017	100
Azerbaijan	2011	88	Mauritius	2019	100
Bahrain	2014	80	Mexico	2017	100
Belarus	2018	100	Montenegro	2010	89
Belgium	2016	100	Netherlands	2018	100
Bosnia and Herzegovina	2016	100	New Zealand	2016	100
Brazil	2017	100	North Macedonia	2013	84
Brunei Darussalam	2019	82	Norway	2016	100
Bulgaria	2018	100	Panama	2017	100
Canada	2017	100	Philippines	2014	100
Chile	2018	100	Poland	2017	100
Colombia	2017	100	Portugal	2018	100
Costa Rica	2017	100	Puerto Rico	2017	100
Croatia	2017	100	Republic of Korea	2019	100
Cuba	2017	100	Republic of Moldova	2018	100
Cyprus	2018	98	Romania	2018	100
Czechia	2019	100	Russian Federation	2019	100
Denmark	2018	100	Saint Lucia	2015	100
Ecuador	2017	86	Saint Vincent and the Grenadines	2017	100
Egypt	2019	100	Serbia	2017	100
Estonia	2019	100	Singapore	2019	100
Finland	2018	100	Slovakia	2014	100
France	2016	100	Slovenia	2019	100
Georgia	2019	87	Spain	2017	100
Germany	2018	100	Suriname	2014	90
Greece	2017	100	Sweden	2017	100
Grenada	2018	100	Switzerland	2017	100
Guatemala	2017	87	Tajikistan	2016	91
Guyana	2014	84	Trinidad and Tobago	2012	100
Hungary	2019	100	Turkmenistan	2015	91
Iceland	2019	100	Ukraine	2019	100
Ireland	2015	100	United Kingdom	2016	100
Israel	2019	100	United States of America	2017	100
Italy	2017	100	Uruguay	2019	100
Japan	2018	100	Uzbekistan	2016	90
Kazakhstan	2017	100	Venezuela (Bolivarian Republic of)	2014	100

* Completeness for ages 15 and over estimated for total registered deaths reported to WHO Mortality Database or from other available sources. This may include registered deaths for which cause of death was not recorded for some countries. Hence the completeness shown here may be greater than that for cause of death datasets included in the WHO Mortality Database.