Tonga National Vital Statistics Report 2018-2020

Pacific Community
Communauté du Pacifique

Pacific CRVS
supported by Brisbane Accord Group

Tonga Statistics Department

Tonga National Vital Statistics Report
2018–2020

Pacific Community
Communauté du Pacifique

Noumea, New Caledonia
November 2023

Original text: English

Acknowledgment

This report was compiled by Mele Manitisa and Falemasiva Fonua from Tonga Statistics Department (TSD), Sioape Kupu from the Ministry of Health (MOH), Temaleti Manakovi Pahulu, Seniloli 'Inoke and Albert Cocker from the Ministry of Justice (MOJ).

We recognise the contribution of Carah Figueroa of the Pacific Community (SPC) and Vital Strategies who supported the Tonga team with data analysis and reviewing drafts of this report in the period leading up to, during and following the Workshop on data analysis and report writing for civil registration based vital statistics held in 30 January 2023, Nadi Fiji. This workshop was coordinated by the United Nations Economic and Social Commission of Asia and the Pacific with support from SPC, the Australian Bureau of Statistics, Vital Strategies, and Bloomberg Philanthropies Data for Health Initiative.

Table of Contents

Abbreviation

LE	Life expectancy
MOH	Ministry of Health
MOJ	Ministry of Justice
NCRVS	National Civil Registration and Vital Statistics Committee
TFR	Total Fertility Rate
TSD	Tonga Statistics Department

List of tables and figures

Main Indicators

Indicators	2018–2020	Unit
Fertility		
Total birth	**6,069**	
Average number of births	2,023	
Sex ratio at birth	110.2	male live births per 100 female live births
Total fertility rate	3.1	per woman
Crude birth rate	19.7	per 1,000 population
Adolescent birth rate	29.1	per 1,000 adolescent population
Mortality		
Total death	**1,758**	
Average number of deaths	586	
Crude death rate	5.7	per 1,000 population
Neonatal mortality rate	Not available	per 1,000 live births
Infant mortality rate	2.6	per 1,000 live births
Under-5 mortality rate	5.0	per 1,000 live births
LE at birth (both sexes)	70	years
LE at birth (male)	68.2	years
LE at birth (female)	71.9	years
Cause of death *Probability of dying from major non-communicable diseases between ages 30 and 70 years*		
Male	19.4	%
Female	10.8	%

Executive Summary

Civil registration and vital statistics are crucial to Tonga's development and growth. The information generated is essential to planning, policymaking and monitoring the Sustainable Development Goals, having direct links to Goal 3 focusing on reducing premature mortality and maternal and infant Mortality and Goal 16 on achieving universal birth registration. This report is the fourth for Tonga, the first being in 2003, the second in 2004, and the previous one covered the years 2013–2018 including comparison between 2013–2015 and 2016–2018. It is expected that after this report an annual analytical report will be compiled to provide continuous vital statistics in order to assess trends over time.

Data for three years 2018–2020 from the Health Planning and Information Section of the Ministry of Health, the office of the Registrar General of Ministry of Justice and the population denominators from the Tonga Department of Statistics were consolidated and used to develop this report. Data from the Reproductive Health Section of the Ministry of Health was not available at the time of data analysis.

For each year an average of 2,023 live births occurred during 2018–2020. Tonga's crude birth rate for 2018–2020 was 19.7 per 1,000 population. Most births occurred among women aged 25–29 years, followed by women aged 20–24 years.

The Total Fertility Rate in Tonga for 2018–2020 was 3.1, indicating that a woman of reproductive age would give birth to 3 children on average during her lifetime. The total number of live births to teen mothers was 489 in 2018–2020. The proportion of live births to teenage mothers from total live births was 8% in 2018–2020.

The life expectancy (LE) at birth for Tonga for 2018–2020 was 68 years old for men and 72 years old for women.

Estimates for total deaths, infant and child mortality rates presented in this report are limited by the absence of deaths reported in community nursing reports collected by the Reproductive Health Section of the Ministry of Health. The average annual deaths for in 2018–2020 was 586. For the under-5 mortality, the estimated rate for 2018–2020 was 5.0 deaths per 1,000 live births. The infant mortality rate for 2018–2020 was estimated to be at 2.6 deaths per 1,000 live births.

Introduction

Vital statistics for Tonga are collected and maintained by various ministries within its government. These statistics are used by the Government of Tonga and other government entities, to provide evidence to inform decisions on health policy and planning, and to evaluate the effectiveness of programs for the benefit of the people of Tonga.

This Vital Statistics Report covers the years 2018 to 2020 in Tonga. The National Civil Registration and Vital Statistics Committee (NCRVS), which consists of various government agencies[1] but mainly the Tonga Statistics Department (TSD), Ministry of Health (MOH) and Ministry of Justice (MOJ) compiled this report to assist with planning and legislating necessary health assistance programs for its people. Targeted programs could help address major causes of disease burden including infectious and non-communicable diseases and injuries that would reduce preventable or premature deaths.

Capturing information on births and deaths is important for two major reasons.

1. **To confer individual rights of identity and health services, property and status.**

   Birth Registration ensures access to key rights, such as education, citizenship and travel documents. Death registration facilitates legal processes for families, such as land titles and access to bank accounts, it is also critical from official government lists, such as electoral rolls. Live birth in the hospital ensures that the services required by individuals are provided accordingly.

2. **To provide crucial statistical information for planning and policy decisions.**

   The government of Tonga are required by policy to report on their relevant statistical indicators in the Tonga Strategic Development Framework (TSDF II) which allows the Kingdom of Tonga to monitor its development and report on the Sustainable Development Goals (SDG).

The Vital Statistics data is a compilation between the civil registry birth and death data of the MOJ, and the Live birth database and Death database of medical certificates of cause of death from the MOH. The creation of the unit records on births and deaths are initiated at the hospital after medical review for each event. These events are notified to the MOJ and citizens of Tonga are obliged by law to register both birth and deaths in the civil registry. Further information on the notification, reporting and registration processes for live births and deaths in Tonga are provided in Chapter 3. The vital records are forwarded to the TSD to conduct the data compilation and validation of both datasets. The TSD uses interpolated populations from data from Tonga 2016 and 2021 Population and Housing Censuses as denominator inputs for the vital statistics analysis.

Tonga is comprised of six island groups (Tongatapu, Vava'u, Ha'apai, 'Eua, Niuatoputapu, and Niuafo'ou) and in the Census 2021, had a population of 100,179. The majority of people live on the main island of Tongatapu (74%) and only slightly more than 1,000 (1.1%) reside in the islands of Niuafo'ou and Niuatoputapu.

With the main hospital located on Tongatapu, people are often compelled to relocate to Tongatapu for health services. Pregnant women from the outer islands also come to Tongatapu for medical care. Some pregnant women give birth in the outer islands. However, these births are eventually captured by MOH or the Civil Registry when the parents register their kids for a birth certificate to enrol in school as required by law.

[1] *The Committee is comprised of the Office of the Registrar General and the Judiciary (Ministry of Justice, which serves as the NCRVS Committee Secretariat), the Ministry of Health, the Ministry of Finance, the Ministry of Police, the Ministry of Education and Training, the Tonga Electoral Commission, the Tonga Statistics Department, the Ministry of Internal Affairs, the Information Department (Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications), the Immigration Department (Ministry of Foreign Affairs) and the National ID Office.*

Chapter 1. Births and Fertility

Number of Births

According to the consolidated data, Table 1 shows a total of 6,069 live births in Tonga between 2018 and 2020. The largest number of births took place in 2019, with 2,178 births and the lowest number of births in 2020, with 1,798 births. This highlights an apparent drop of 14% in live births over the three years. However, the relatively lower numbers of births reported in 2020 may be due to late registration and/or data availability constraint. That is, births toward the end of the year could not have been registered or captured by the MOJ and MOH, or not yet recorded in their respective databases.

Table 1. Total number of births by sex per year, 2018–2020

Year	Female		Male		TOTAL
2018	1,007	48.1%	1,086	51.9%	2,093
2019	1,049	48.2%	1,129	51.8%	2,178
2020	831	46.2%	967	53.8%	1,798
TOTAL	**2,887**	**47.6%**	**3,182**	**52.4%**	**6,069**

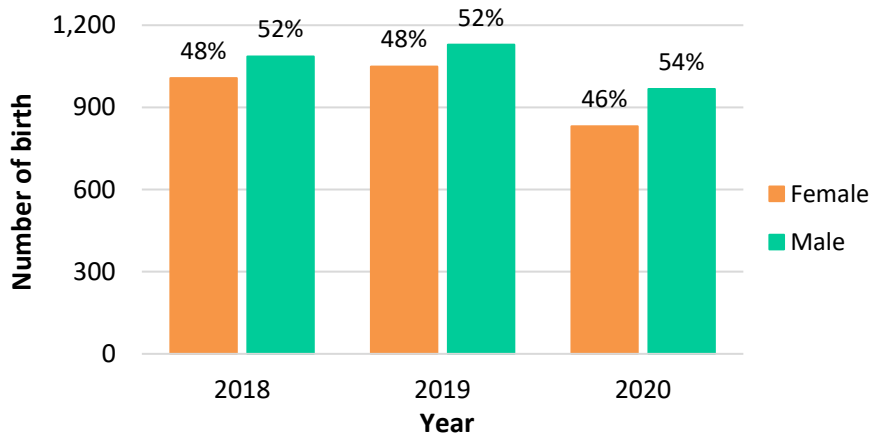
Table 2 shows that an average of 2,023 births occurred during 2018–2020; an average of 962 female live births and average of 1,061 male births. The sex ratio at birth for Tonga for the period 2018–2020 was 110.2. This means that for every 100 live female births, there were 110 male live births during 2018–2020.

Table 2. Average number of births by sex, by 3-year period, 2018–2020

Period	Female Average	Male Average	Total Average
2018–2020	**962**	**1,061**	**2,023**

Figure 1 shows that of births in 2018–2020, 52.4% were males and 47.6% were females, though the proportion varied from 51.8% male and 48.2% female during 2018–2020.

Figure 1. Number of births by percentage by sex, 2018–2020



Age of Mother

The age of the mother is an important variable for calculating age-specific fertility rates and Total Fertility Rates (TFR) and monitoring reproductive health. Childbearing age is generally considered to be from 15–49 years of age. Babies born to mothers outside this age range are possible but not common. Very young or older mothers are at higher risk of pregnancy complications. Newborns and infants of adolescent mothers are also at higher risk of low birth weight and mortality. High numbers of births in mothers at younger ages are associated with shorter periods between generations and more rapid population growth.

In the period 2018–2020, most births occurred among women aged 25–29 years, followed by women aged 20–24 years (Table 3 and Figure 2). The age-specific fertility rate is a better measure of the age pattern of fertility, that is,

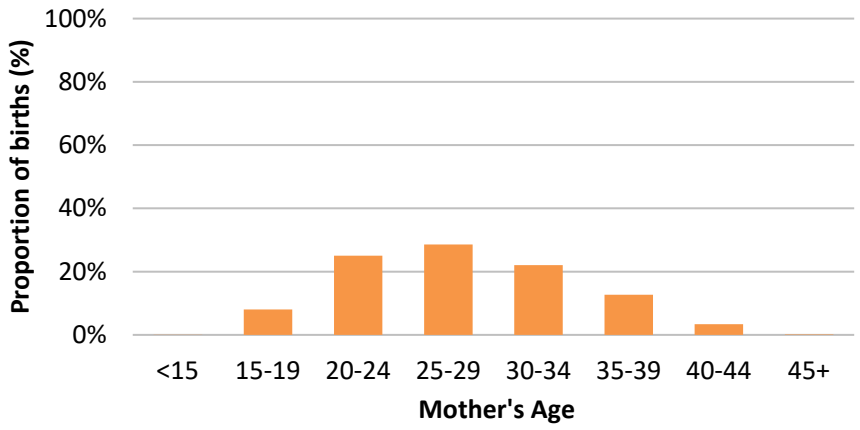
the relative frequency of births among women of different ages within the reproductive years, as it is not affected by differences in the age distribution among women of reproductive age. It should be noted that only the MOH provided data on the age of the mother.

Table 3. Percentage distribution of live births by age of mother, by 3-year period, 2018–2020

Mothers' Age-group[a]	2018–2020	
	Number	%
<15	1	0%
15–19	489	8%
20–24	1521	25%
25–29	1734	29%
30–34	1340	22%
35–39	769	13%
40–44	206	3%
45+	9	0%
TOTAL	6,069	100%

[a] *Data on the age of the mother was only available from the MoH data*

Figure 2. Percent distribution of births by age group of mothers, by 3-year period, 2018–2020



Teenage (or adolescent) Pregnancy

Teenage (or adolescent) pregnancy refers to births to women aged 15–19 years. The total number of live births to teen mothers was 489 in 2018–2020. The proportion of live births to teenage mothers from total live births varied from 8.0% to 8.2% over the period 2018–2020 (Table 4). Given the risks associated with childbearing at younger ages, the teenage fertility rate (see "Age-specific fertility rates" section) is an important indicator for determining sexual reproductive health services to young mothers and women and the effectiveness of programmes aimed at preventing unwanted teenage pregnancies.

Table 4. Teenage (aged 15–19 years) pregnancy (%), 2018–2020

Teen Pregnancy	2018	2019	2020	TOTAL
Mothers[a]	167	174	147	489
Total live births[b]	2,093	2,178	1,798	6,069
Mothers of unknown age	117	110	53	279
Total live births[c]	158	165	143	466
Proportion (%)[d]	8.0%	8.0%	8.2%	8.0%

[a] *Number of adolescent mothers aged 15–19 per year.*

[b] *Total live births to mothers of all ages (known and unknown) per year.*

[c] *Total live births to mothers of all known ages per year.*

[d] *Proportion of all live births per year which were to adolescent mothers aged 15–19 years.*

Place and island of birth

In this report, births that occurred in the hospital and the health centres are grouped into the 'Hospital/Health centre' category. The category 'Home' is for births in the community or at the mother's home. During 2018–2020, 99.3% of births occurred at a health facility. Most births (81.5%) occurred in Tongatapu and 17.8% took place in the outer islands (Table 5). Few mothers deliver outside a health facility with less than 0.5% in the largest island Tongatapu, 0.02–0.2% in other islands.

Children born overseas to a Tongan parent (mother and/or father) are sometimes registered with the MOJ when the parent(s) return to Tonga with the child. It is assumed that Tongan parents overseas find it easier for their child to have a Tongan passport to facilitate easy travel to and from the country. However, overseas-born children are excluded from this report.

Table 5. Distribution of births by place of occurrence and island, 2018–2020

Island	Hospital/Health centre		Community setting/Home		Total
	Number	Percentage	Number	Percentage	
Tongatapu	4,946	81.5%	25	0.41%	4,971
Vava'u	764	12.6%	13	0.21%	777
Ha'apai	193	3.2%	6	0.10%	199
Eua	121	2.0%	1	0.02%	122
Ongo Niua	*	*	*	*	*
Total	**6,024**	**99.3%**	**45**	**0.7%**	**6,069**

*The islands of Ongo Niua are not represented well by the MoH and MoJ databases. It is assumed that almost all mothers in the Niuas transfer to the main islands of Vava'u or Tongatapu to give birth due to the greater access to health services. The numbers shown in the table represent where the mother delivered her child, which is not necessarily her usual place of residence. * Means zero.*

Crude Birth Rate

The crude birth rate (CBR) is the number of births per 1,000 population over a given period. The CBR can tell us how much the population is growing or decreasing, when subtracted from the crude death rate, assuming there is no migration. The CBR is also useful for government planning infrastructure, transport, and provision of services, such as indicating how many children will be entering school in the coming years, or how many adults will be entering the workforce. The CBR is affected by changes in the population age structure over the period of interest.

The CBR for Tonga was 19.7 per 1,000 population during 2018–2020 (Table 6). The average number of births in the 2018–2020 period was divided by the mid-point population, the estimated 2019 population (n= 102,662).

Table 6. Crude birth rate (CBR), by 3-year period, 2018–2020

Period	CBR	Lower 95% CI	Upper 95% CI
2018–2020	19.7	18.86	20.56

95% confidence interval (CI) calculated using the normal approximation to the binomial.

Age-Specific Fertility Rates

Fertility among the age groups during the period 2018–2020 followed a similar pattern throughout the years. This highlights that the age trend for giving birth is still the same. Age-specific fertility rates (ASFR) are the number of live births occurring to mothers of a certain age group per 1,000 women in that age group in a given period. The ASFR is usually calculated for 5-year age groups of women of childbearing age.

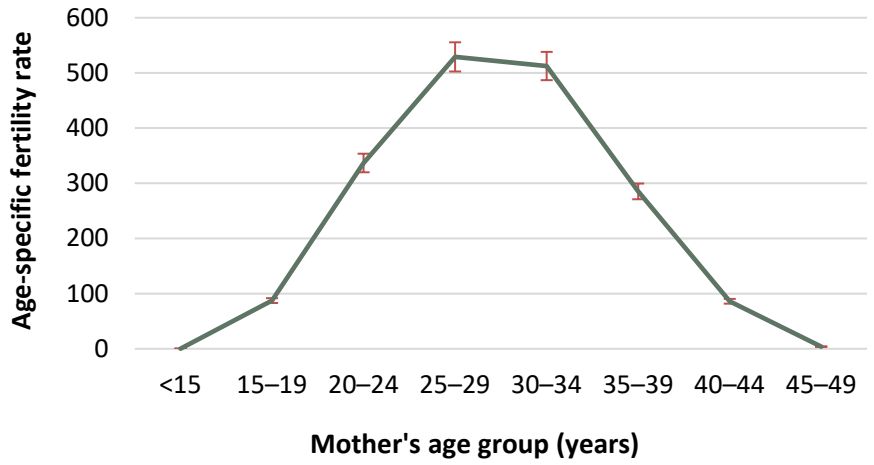
Births occur to mothers in Tonga predominantly between ages 20 and 34 years, with age group 25–29 representing the peak, as shown in Table 7 and Figure 3. The adolescent fertility rate (AFR) (live births per 1,000 women aged 15–19 years) for 2018–2020 was 29.1. Fertility rates increased rapidly after the teenage years to 112.3 births per 1,000 women aged 20–24. Rates peaked at 176.3 births per 1,000 women aged 25–29, before falling to 170.9 births per 1,000 women aged 30–34.

Table 7. Age-specific fertility rates, by period, 2018–2020

Mother's age group (years)	Rate (per 1,000 women)
<15	0.06
15–19	29.1
20–24	112.3
25–29	176.3
30–34	170.9
35–39	95.1
40–44	28.7
45–49	1.2

Calculated using the Fertility Calculation Tool (Taylor & Morrell 2015).

Figure 3. Age-specific fertility rates, by 3-year period, 2018–2020



The teenage fertility rates for both periods are considered 'moderate' (between 30 and 59 births per 1,000 women aged 15–19 years) based on trendline analyses of the available fertility data from Pacific Island countries and territories [Sorchik et al., 2019].

Total Fertility Rates

The total fertility rate is the average number of children a woman (or per 1,000 women) would give birth to during her lifetime if she were to pass through her childbearing years experiencing the prevailing age-specific fertility rates. The TFR is the most widely used fertility measure in program impact evaluations. Being derived from the age-specific fertility rates, it is unaffected by changes in the age-sex composition of the population.

For the period 2018–2020, based on reconciled live births from all sources, the TFR in Tonga was 3.1, which indicates that a woman of reproductive age would give birth to 3 children on average during her lifetime. The TFR is considered 'moderately high' (greater than or equal to 3.0 but less than 4.0) based on trendline analyses of the available fertility data from Pacific Island countries and territories [Sorchik et al., 2019].

The observed ASFR and TFR over 2018–2020 may reflect factors such as delayed marriage and childbearing, and out-migration of young women (particularly aged 20–34) pursuing work or higher education opportunities in Australia, New Zealand and the United States, among other countries.

Table 8. Total fertility rates, by 3-year period, 2018–2020

Period	TFR	Lower 95% CI	Upper 95% CI
2018–2020	3.1	2.99	3.14

95% confidence interval calculated using the Fertility Calculation Tool (Taylor & Morrell 2015).

Chapter 2. Mortality

Number of Deaths

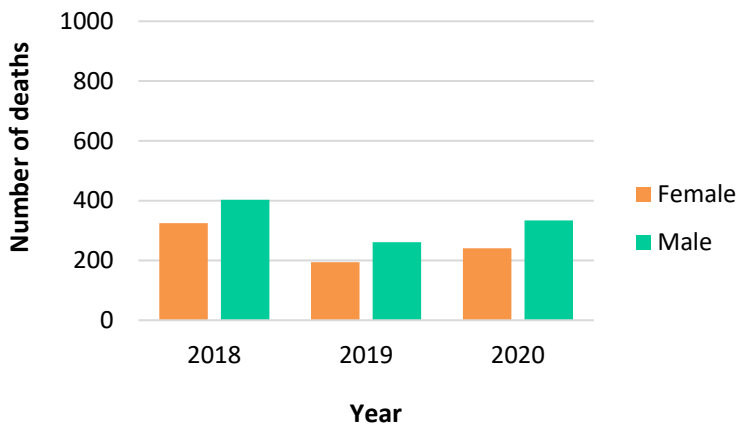
The archived records of deaths for Tonga were collected from the Civil registration and Medical death certificates. This resulted in a total of 1,758 deaths recorded for Tonga for 2018 to 2020, inclusive (Table 9). There were more male than female deaths across all years (Figure 4).

Table 9. Number of deaths recorded in each source, and when reconciled, 2018–2020[a]

Year	Civil registration	Medical death certificates	Reconciled[a]
2018	591	626	728
2019	365	411	455
2020	480	452	575
Total	**1,436**	**1,489**	**1,758**

[a] After deduplication. The figures for reconciled are likely an undercount of the number of deaths in 2018, 2019 and 2020 as Community nursing reports of deaths and the Hospital discharge records of deaths were not available at the time of data reconciliation. For the 2019 data, death records for months September, October, November and December were not available.

Figure 4. Number of deaths by year and sex, 2018–2020



The average number of deaths per year was 333 and 253 for male and female respectively in 2018–2020 periods. The average number of male deaths was higher than that of females in the 3-year period.

Table 10. Average number of deaths per year, by 3-year period, 2018–2020

Period	Male	Female	Total
2018–2020	332.7	253.3	586

Summary Measures of Mortality

Crude Death Rate and Directly Age Standardised Mortality Rate

Table 11 presents both the crude death rate (CDR) (deaths per 1,000 population) and the direct age-standardised mortality rate in Tonga. Age-standardised mortality rates are one country's age-specific death rates applied to a standard age distribution. Age-standardised rates allow the comparison of death rates over time or between different populations without the age structure of the populations influencing the death rates. This is important as a greater proportion of older people in the population structure (as health conditions improve and people live longer) would result in a higher number of deaths (as death is inevitable). Under identical health and social conditions, populations with a greater proportion of older people tend to have higher crude death rates than populations comprised of a greater proportion of younger people.

Data have been age-standardised to the most recent period shown using the WHO World Standard Population (Appendix 2), resulting in an age-standardised mortality rate for Tonga of 7 deaths per 1,000 population in 2018–2020.

Table 11. Crude death rate and directly age-standardised mortality rate (per,1,000 population), by 3-year period, 2018–2020

Period	Number of deaths	CDR	Directly age-standardised mortality rate
2018–2020	1,758	5.7	7.4

Crude death rates and directly age-standardised mortality rates have been calculated with the Direct age-standardisation calculation tool [Taylor & Morrell 2015] using the census populations as the denominator. Refer to Appendix 3 for population estimates.

Infant and Child Mortality

Infant Mortality

Infant deaths are deaths which occur before 1 year of age. There was a total of 19 infant deaths recorded in Tonga for the three years from 2018 to 2020. The highest number of infant deaths was recorded in 2018 with 9 deaths (Table 12), while 2 and 8 infant deaths were reported in 2019 and 2020 respectively. There were more male infant deaths than female infant deaths in general.

Table 12. Number of infant deaths (deaths in children under age 1 year), 2018–2020

Year	Male	Female	Unknown sex	Total
2018	5	4	-	9
2019	2	0	-	2
2020	4	4	-	8
Total	**11**	**8**	**-**	**19**

These figures are likely to be undercounts of the number of infant deaths in 2018–2020 due to unavailable death records in community nursing reports. These figures should be interpreted with caution.

The infant mortality rate (IMR) is the number of deaths in live-born infants during the first year of life per 1,000 live births, over a specified period. Table 13 shows the IMR for 2018–2020 as 2.6 deaths per 1,000 live births.

Table 13. Infant mortality rate (deaths in children under age 1 year per 1,000 live births), by 3-year period, 2018–2020

Period	IMR	Lower 95% CI	Upper 95% CI
2018–2020	2.6	1.5	3.8

95%CI calculated using the IMR and U5MR Calculation Tool [Taylor & Morrell 2015].

Under-5 Mortality

Under-5 mortality describes deaths which occur before a child reaches their fifth birthday. There was a total of 36 under-5 deaths recorded in Tonga for the 2018 to 2020 period. The highest number of these deaths occurred in 2018 with 16 deaths and the lowest in 2019 with 8 deaths. In general, there were more male under-5 deaths than female under-5 deaths, particularly from the year 2018 (Table 14).

Table 14. Number of deaths in children aged under-5, by sex, 2018–2020

Year	Male	Female	Unknown sex	Total
2018	10	6	-	16
2019	5	3	-	8
2020	6	6	-	12
Total	**21**	**15**	**-**	**36**

These figures are likely to be undercounts of the number of under-5 deaths in 2018–2020 due to unavailable death records in community nursing reports. These figures should be interpreted with caution.

The under-5 mortality rate (U5MR) is the number of deaths in live-born infants before their fifth birthday per 1,000 live births, over a specified period. The U5MR for Tonga for 2018–2020 is 5.0 deaths per 1,000 births (Table 15).

Table 15. Under-5 mortality rate (deaths in children under age 5 years per 1,000 live births), by 3-year period, 2018–2020

Period	U5MR	Lower 95% CI	Upper 95% CI
2018–2020	5.0	3.4	6.6

95%CI calculated using the IMR and U5MR Calculation Tool [Taylor & Morrell 2015]

Deaths by age and sex of the decedent

Table 16 below shows the distribution of deaths by age and sex of the deceased for 2018–2020 The highest number of deaths for both males and females occurred in the 75+ years age group.

Table 16. Deaths by age and sex of the deceased, by 3-year period, 2018–2020[a]

Age	2018–2020				
	Total deaths			(%)	
	Male	Female	Total	Male	Female
<1	11	8	19	1.1%	1.1%
1–4	10	7	17	1.0%	0.9%
5–9	1	3	4	0.1%	0.4%
10–14	4	5	9	0.4%	0.7%
15–19	8	6	14	0.8%	0.8%
20–24	11	9	20	1.1%	1.2%
25–29	8	9	17	0.8%	1.2%
30–34	16	11	27	1.6%	1.4%
35–39	32	19	51	3.2%	2.5%
40–44	42	28	70	4.2%	3.7%
45–49	59	46	105	5.9%	6.1%
50–54	101	59	160	10.1%	7.8%
55–59	88	65	153	8.8%	8.6%
60–64	93	49	142	9.3%	6.4%
65–69	86	52	138	8.6%	6.8%
70–74	119	85	204	11.9%	11.2%
75+	309	299	608	30.9%	39.3%
Total	**998**	**760**	**1,758**	**100.0%**	**100.0%**

[a] Deaths of unknown sex were redistributed across deaths for both sexes.

Age-Specific Mortality

An age-specific mortality rate is the number of deaths per 1,000 people for a specific age or age group, in a specific period. The age-specific mortality rates for males (Table 17) fluctuated in the younger ages up to around 30–40 years of age, after which age-specific mortality steadily increased with increasing age, peaking in the 75+ age group. For females (Table 18), age-specific mortality fluctuated in the younger ages up to around 30 years of age, after which age-specific mortality also steadily increased with increasing age, peeking in the 75+ age group.

Table 17. Male age-specific mortality rates (deaths per 1,000), by 3-year period, 2018–2020

Age (years)	2018–2020	
	Number of Deaths (Male)	Age-specific mortality rate (Male)
<1	11	2.9
1–4	10	0.6

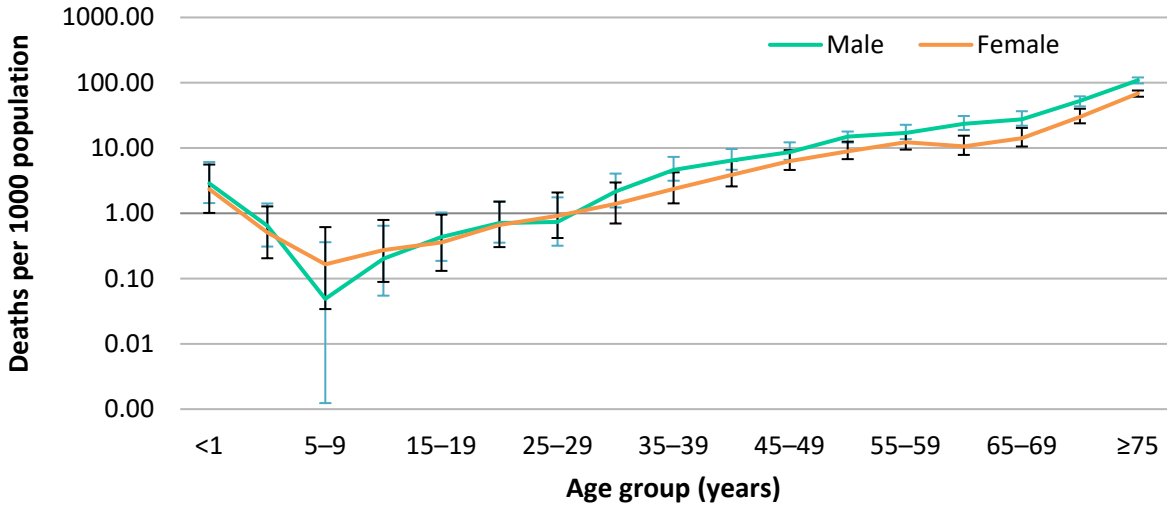
5–9	1	0.0
10–14	4	0.2
15–19	8	0.4
20–24	11	0.7
25–29	8	0.7
30–34	16	2.2
35–39	32	4.6
40–44	42	6.4
45–49	59	8.7
50–54	101	15.0
55–59	88	17.1
60–64	93	23.5
65–69	86	27.5
70–74	118	52.3
75+	309	109.0
Total	**998**	

Table 18. Female age-specific mortality rates (deaths per 1,000), by 3-year period, 2018–2020

Age (years)	2018–2020	
	Number of deaths (Female)	Age-specific mortality rate (Female)
<1	8	2.3
1–4	7	0.5
5–9	3	0.2
10–14	5	0.3
15–19	6	0.4
20–24	9	0.7
25–29	9	0.9
30–34	11	1.4
35–39	19	2.4
40–44	28	3.9
45–49	46	6.3
50–54	59	8.9
55–59	65	12.3
60–64	49	10.6
65–69	52	14.1
70–74	85	29.9
75+	299	68.5
Total	**760**	

Figure 5 shows the age-specific mortality rates of males and females between 2018 and 2020. The graph shows that for all ages 1 year and older, the age-specific mortality rate for males is higher than that for females in the same age category. For both males and females, age-specific mortality is relatively high in young infants under 1 year of age but decreases with age until reaching the lowest age-specific mortality rate in the 5–9 years age-group. From around 10 years onwards, mortality increases with increasing age.

Figure 5. Age-specific mortality rates by sex (deaths per 1,000 people), by 3-year period, 2018–2020



Life expectancy at Birth

Life expectancy at birth (LE_0) indicates the number of years a newborn would live, on average, if the current patterns of mortality at the time of its birth were to remain the same throughout its life.

The LE values for 2018–2020 in Table 19 are based on the <1 to ≥75 years life table with 5-year intervals over age 1 year. LE_0 for 2018–2020 for both sexes combined was 70.0 years. The LE_0 for females was approximately 72 which is higher than that for males at 68 years.

Table 19. Life expectancy at birth (LE_0), by 3-year period, 2018–2020

Period	Male	Female	Total
2018–2020	68.2	71.9	70.0

Calculated using the Life Table and Probability of Dying Calculation Tool [Taylor & Morrell, 2015]. Life expectancy calculations were based on the <1 to ≥75 years life table with 5-year intervals over age 1 year.

Premature Mortality

Adult Mortality (15–59 years)

Adult mortality is often characterised as the probability of dying between the ages of 15–59 years inclusive, or the probability of a 15-year-old dying before reaching the age of 60. Table 20 below shows that this risk of adult mortality during the period 2018–2020 was 24.3% for males and around 16.9% for females.

Table 20. Adult mortality (%), by sex and 3-year period, 2018–2020

Period	Male	Female	Total
2018–2020	24.3	16.9	20.7

Calculated using the Life Table and Probability of Dying Calculation Tool [Taylor & Morrell, 2015].

LE at age 40

LE at 40 years of age is also an indicative measure of premature mortality. This is the number of years a person aged 40 would be expected to live, on average, if they continued to experience current mortality rates. Table 21 below shows that LE at age 40 for the period 2018–2020 was approximately 30 for males and 34 for females. In other words, a male aged 40 during 2018–2020 could expect to live for another 30 years, whilst a female aged 40 could expect to live for another 34 years.

Table 21. Life expectancy at 40 (LE_{40}), by sex and 3-year period, 2018–2020

Period	Male	Female	Total
2018–2020	30.1	33.6	31.8

Calculated using the Life Table and Probability of Dying Calculation Tool (Taylor R 2015) NB LE calculations were based on the <1 to ≥85 years life table with 5-year intervals over 1 year [Taylor & Morrell, 2015].*

Maternal Mortality

Maternal death is defined by the WHO as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

The maternal mortality ratio (MMR) is the ratio of the number of maternal deaths during a given period per 100,000 live births during the same period. Live birth is defined by the WHO as the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life–e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles–whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.

Maternal deaths provide an important insight into healthcare, access to services, and service use. Most maternal deaths are largely preventable. The target indicator set out in the SDGs is to reduce maternal mortality ratio to less than 70 deaths per 100,000 live births by 2030. It is important to ensure all maternal deaths are captured and reported accurately.

Accurate estimates of the number of maternal deaths (and the maternal mortality ratio) for Tonga over 2018–2020 is not available for this report. Maternal deaths may be under-reported if the certifier is not aware of the pregnancy, or the pregnancy is not mentioned on the death certificate. There is also a need to clearly distinguish between deaths from pregnancy-related complications (direct maternal deaths) versus from existing conditions exacerbated by pregnancy (indirect maternal deaths).

Chapter 3. Causes of Death

All analyses in this chapter 3 are based on deaths for which a medical certificate of cause of death was issued (85% of the reported deaths in 2018–2020 shown in Table 9 in Chapter 2). Please note that errors in certification and coding of cause-of-death have not been corrected. Therefore, the causes of death presented here may not be based on accurate assignment of the underlying cause of death from among the conditions listed on the certificate.

Natural and non-natural causes of death

Natural deaths refer to deaths from natural causes such as disease progressing to organ failure. Non-natural deaths refer to deaths occurring due to accident, suicide, or homicide. Non-natural causes are classified in ICD-10 Chapter XX External causes of morbidity and mortality (codes V01-Y98); codes representing the nature of the injury are found in Chapter XIX, Injury, poisoning and certain other consequences of external causes (codes S00-T98). Natural causes are classified to all other valid codes for mortality in other ICD-10 chapters. Table 22 shows the annual natural and non-natural deaths with a medical certificate for the period 2018–2020; of the number of deaths with a medical certificate with a recorded cause-of-death (1,489 deaths), 97% of these were due to natural causes.

Table 22. Percentage distribution of natural and non-natural causes of death, 2018–2020

Period	Natural deaths		Non-natural deaths		Total *(excludes unknown cause)*	Unknown cause
	Number	%	Number	%	Number	Number
2018	600	96%	26	4%	626	2
2019	405	99%	6	1.5%	411	1
2020	442	98%	10	2.2%	452	110
Total	**1,447**	**97%**	**42**	**2.8%**	**1,489**	**113**

Source: Ministry of Health medical certificates of cause of death 2018–2020.

[a] This includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Leading underlying causes of death (all ages)

Based on deaths for which a medical death certificate was issued, the leading cause of death category in Tongan males in 2018–2020 was 'circulatory system diseases' (cardiovascular diseases) which accounted for 43% of all deaths in this period (Table 23). These include ischemic heart diseases (such as acute myocardial infarction (heart attack) and chronic ischemic diseases), hypertensive diseases and cerebrovascular diseases (stroke). It should be noted that 42% of cardiovascular deaths in males were assigned to non-specific causes including cardiac arrest, heart failure, or unspecified heart disease.

The second leading cause of death category in males was apparently respiratory diseases, accounting for 13% of male deaths over 2018–2020. Neoplasms (including cancers) was the third leading cause of death category, accounting for 11.5%. 'Endocrine, nutritional, and metabolic diseases' including diabetes apparently represented only 2.5% of male deaths over 2018–2020 although this is likely an underestimate (Table 23).

The leading cause of death category in females between 2018 and 2020 was reportedly circulatory system diseases (cardiovascular diseases) which accounted for 32% of all deaths during the period (Table 24). However, 48% of cardiovascular deaths in females were assigned to non-specific causes including cardiac arrest, heart failure, or unspecified heart disease. The second leading cause of death category in females was infectious diseases which apparently accounted for 17% of female deaths over 2018–2020. Endocrine, nutritional and metabolic diseases (predominantly diabetes) accounted for only 4% of all deaths over 2018–2020 although this is likely an underestimate (Table 24).

It is worth noting that leading causes of death for all ages is of limited use from a public health perspective as we are most interested in the causes of premature deaths. Causes of death by age groups are presented in the next section.

Table 23. Ten leading medically certified causes of deaths (by ICD chapter) in Males, by 3-year period, 2018–2020

List code[a]	Disease category	Number of deaths	%[b]
064	Circulatory system diseases	292	43.1%
072	Respiratory diseases	90	13.3%
026	Neoplasms	78	11.5%
001	Infectious and parasitic diseases	77	11.4%
084	Genitourinary diseases	41	6.1%
078	Digestive system diseases	35	5.2%
095	External causes[c]	28	4.1%
051	Endocrine, nutritional, and metabolic diseases	17	2.5%
083	Musculoskeletal diseases	2	0.3%
058	Nervous system diseases	9	1.3%
	All Other Causes	*8*	1.2%
094	*Ill-defined conditions[d]*	87	—
	Unknown cause	75	—
	Total	**839**	—
	Total minus ill-defined causes and unknown	**677**	**100%**

Source: Ministry of Health medical certificates of cause of death 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".

[d] includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Table 24. Ten leading medically certified causes of deaths (by ICD chapter) in Females, by 3-year periods, 2018–2020

List code[a]	Disease category	Number of deaths	%[b]
064	Circulatory system diseases	170	32.3%
001	Infectious and parasitic diseases	89	16.9%
026	Neoplasms	88	16.7%
072	Respiratory diseases	61	11.6%
084	Genitourinary diseases	37	7.0%
051	Endocrine, nutritional, and metabolic diseases	23	4.4%
078	Digestive system diseases	20	3.8%
095	External causes[c]	14	2.7%
082	Skin diseases	6	1.1%
048	Blood-and immune-related diseases	6	1.1%
	All Other Causes	*12*	2.3%
094	*Ill-defined conditions[d]*	86	—
	Unknown	38	—
	Total	**650**	—

	Total minus ill-defined and unknown causes	**526**	**100.0%**

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] Percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".

[d] Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Underlying causes of death by key age groups

Mortality in children aged 0–4 years

Deaths amongst children aged 0–4 years are highest among infants. Based on deaths with a medical death certificate, the leading cause of death among children under-5 years was reportedly conditions such as respiratory diseases, accounting for 27% of deaths (Table 25). Other leading causes of death in this age group were infectious diseases including sepsis at 15%, and perinatal conditions at 12%.

Table 25. Cause-specific proportional mortality by ICD-10 (Infant and child mortality list 3, deaths per 100,000 population), ages 0–4 years (both sexes combined), 2018–2020

List code[a]	Disease category	Number of deaths	%[b]
031	Respiratory diseases	7	26.9%
001	Infectious and parasitic diseases	4	15.4%
037	Perinatal conditions	3	11.5%
026	Nervous system diseases	3	11.5%
060	External causes[c]	4	15.4%
	All Other causes	5	19.2%
056	*Ill-defined conditions[d]*	3	—
	Unknown	3	—
	Total	**32**	—
	Total minus ill-defined and unknown causes	**26**	**100%**

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] Infant and child mortality list 3 code (Appendix 5).

[b] Percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".

[d] Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Mortality in children aged 5–14 years

Children aged between 5–14 years have the lowest age-specific death rates in Tonga. Still, deaths in this age group are often preventable (Table 26).

Table 26. Cause-specific proportional mortality by ICD-10 chapter, 5–14 years of age (both sexes combined), 2018–2020

List code[a]	Disease category	Number of deaths	%[b]
001	Infectious and parasitic diseases	2	25%
072	Respiratory diseases	2	25%

	All Other causes	4	50%
094	*Ill-defined conditions*[c]	2	—
	Total	**10**	—
	Total minus ill-defined causes	**8**	**100%**

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Mortality in adults aged 15–59 years

Based on deaths with a medically certified death certificate, the leading cause of death among men aged 15–59 years was circulatory system diseases (Table 27), which were responsible for 47% of the deaths in 2018–2020 at a crude rate of 202 deaths per 100,000 males. These are commonly known as cardiovascular diseases. It should be noted that 41% of cardiovascular deaths in men aged 15–59 years were assigned to non-specific causes including cardiac arrest, heart failure, or unspecified heart disease.

The second leading cause of death among men aged 15–59 years was reportedly neoplasms (mostly cancers) 10% (Table 27). Other leading causes of death in adult men shown in Table 27 were: external causes (injuries) and infectious diseases. 'Endocrine, nutritional and metabolic disorders' (predominantly diabetes) accounted for only 2% in 2018–2020, although this is likely underestimated.

Table 28 shows the leading causes of death for women aged 15–59 years. Based on medically certified deaths, the leading cause of death category in this group was reportedly circulatory diseases (30%) at a rate of 92 deaths per 100,000 females in 2018–2020. The second leading cause of death category was 'Neoplasms' (including malignancies such as breast cancer), which accounted for 25% of deaths in women in this age group, at a rate of 76 deaths per 100,000 females in the period. 'Endocrine, nutritional and metabolic diseases' (predominantly diabetes) appeared to account for only 5% or 16 deaths per adult women aged 15–59 years in 2018–2020. These figures are likely to be underestimated.

Table 27. Cause-specific proportional mortality and mortality rates for adult males aged 15–59 by ICD chapter (deaths per 100,000 male population), 2018–2020

List code[a]	Disease category	No.	%[b]	Crude rate[c]
064	Circulatory system diseases	124	46.8%	202.3
026	Neoplasms	27	10.2%	44.0
001	Infectious and parasitic diseases	26	9.8%	42.4
095	External causes[d]	23	8.7%	37.5
072	Respiratory diseases	20	7.5%	32.6
084	Genitourinary diseases	19	7.2%	31.0
078	Digestive system diseases	18	6.8%	29.4
051	Endocrine, nutritional, and metabolic diseases	5	1.9%	8.2
	All Other causes	3	1.1%	4.9
094	*Ill-defined conditions*[e]	19	—	
	Unknown	27	—	
	Total	**311**	—	
	Total minus ill-defined and unknown causes	**265**	**100.0%**	

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] *Percent distribution of deaths excludes ill-defined causes and unknown causes of death.*

[c] *To calculate the death rate for each cause, the number of deaths from each cause was first estimated by applying the proportional mortality by cause (percent distribution) to the total deaths in the age group (Table 17 in Chapter 2). This number was then divided by the population in the age-group–multiplied by 100,000. Population denominators for the calculation of the rates are in Appendix 3.*

[d] *Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".*

[e] *Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".*

Table 28. Cause-specific proportional mortality and mortality rates for adult Females aged 15–59 by ICD chapter (deaths per 100,000 female population), 2018–2020

List code[a]	Disease category	No.	%[b]	Crude rate[c]
064	Circulatory system diseases	57	30.0%	91.6
026	Neoplasms	47	24.7%	75.5
001	Infectious and parasitic diseases	29	15.3%	46.6
084	Genitourinary diseases	14	7.4%	22.5
072	Respiratory diseases	13	6.8%	20.9
051	Endocrine, nutritional, and metabolic diseases	10	5.3%	16.1
095	External causes[d]	9	4.7%	14.5
078	Digestive system diseases	3	1.6%	4.8
	All Other causes	8	4.2%	12.8
094	*Ill-defined conditions[e]*	17	—	
	Unknown	11	—	
	Total	**218**	—	
	Total minus ill-defined and unknown causes	**190**	**100.0%**	

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] *ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).*

[b] *Percent distribution of deaths excludes ill-defined causes and unknown causes of death.*

[c] *To calculate the death rate for each cause, the number of deaths from each cause was first estimated by applying the proportional mortality by cause (percent distribution) to the total deaths in the age group (Table 17 in Chapter 2). This number was then divided by the population in the age-group–multiplied by 100,000. Population denominators for the calculation of the rates are in Appendix 3.*

[d] *Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".*

[e] *Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".*

Mortality in older adults aged 60+ years

Table 29 and Table 30 show that the leading cause of death category among adults aged 60+ years were circulatory diseases (commonly ischemic heart diseases, cerebrovascular diseases and hypertensive diseases). Respiratory diseases were the second most significant cause of death in men, while it was the third for women. Neoplasms, predominantly malignancies was ranked the third leading cause of death in men, and the third in women (tied with respiratory diseases).

Table 29. Cause specific proportional mortality and mortality rates for adult Males aged 60+ by ICD-10 chapter (deaths per 100,000 male population), 2018–2020

List code[a]	Disease category	No.	%[b]	Crude rate[c]
064	Circulatory system diseases	167	42.2%	2097.0
072	Respiratory diseases	68	17.2%	853.9

026	Neoplasms	50	12.6%	627.8
001	Infectious and parasitic diseases	48	12.1%	602.7
084	Genitourinary diseases	22	5.6%	276.3
078	Digestive diseases	16	4.0%	200.9
051	Endocrine, nutritional, and metabolic diseases	12	3.0%	150.7
095	External causes[d]	4	1.0%	50.2
	All Other cause causes	9	2.3%	113.0
094	*Ill-defined conditions* [e]	64	—	
	Unknown	47	—	
	Total	**507**	—	
	Total minus ill-defined causes	**396**	**100.0%**	

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] Percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] To calculate the death rate for each cause, the number of deaths from each cause was first estimated by applying the proportional mortality by cause (percent distribution) to the total deaths in the age group (Table 17 in Chapter 2). This number was then divided by the population in the age-group–multiplied by 100,000. Population denominators for the calculation of the rates are in Appendix 3.

[d] Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".

[e] Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Table 30. Cause specific mortality in adult Females aged 60+ by ICD-10 chapter (deaths per 100,000 female population), in 2018–2020

List code[a]	Disease category	No.	%[b]	Crude rate[c]
064	Circulatory system diseases	112	35.2%	1100.9
001	Infectious and parasitic diseases	57	17.9%	560.3
026	Neoplasms	41	12.9%	403.0
072	Respiratory diseases	41	12.9%	403.0
084	Genitourinary diseases	23	7.2%	226.1
078	Digestive system diseases	17	5.3%	167.1
051	Endocrine, nutritional, and metabolic diseases	12	3.8%	118.0
	All Other causes	15	4.7%	147.4
094	*Ill-defined conditions*[d]	68	—	
	Unknown	25	—	
	Total	**411**	—	
	Total minus ill-defined causes	**318**	**100.0%**	

Source: Ministry of Health medical death certificates 2018–2020.

Dash (—), not applicable.

[a] ICD-10 General mortality List 1 (103 causes) codes (Appendix 4).

[b] Percent distribution of deaths excludes ill-defined causes and unknown causes of death.

[c] To calculate the death rate for each cause, the number of deaths from each cause was first estimated by applying the proportional mortality by cause (percent distribution) to the total deaths in the age group (Table 17 in Chapter 2). This number was then divided by the population in the age-group–multiplied by 100,000. Population denominators for the calculation of the rates are in Appendix 3.

[d] Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Underlying causes of death by Island group

Understanding the distribution of deaths by place of occurrence is useful for public health planning of available health infrastructure, resource allocation, and indicating regions that may require additional attention. Table 31 shows the leading causes of death by Island groups, based on medically certified cause of death certificates.

Table 31. The 10 leading causes of death by Island groups in both sexes, 2018–2020

List code[a]	Cause category	Tongatapu	Vava'u	Eua	Ha'apai	Total
064	Circulatory system diseases	340	73	19	30	462
051	Endocrine, nutritional, and metabolic diseases	29	3	4	4	40
026	Neoplasms	137	16	7	6	166
072	Respiratory diseases	112	23	10	6	151
095	External causes[b]	29	10	0	3	42
001	Infectious and parasitic diseases	139	21	3	3	166
078	Digestive system diseases	41	6	2	6	55
084	Genitourinary diseases	60	4	8	6	78
	All other causes	38	4	1	0	43
094	*Ill-defined conditions*[c]	144	12	12	5	173
	Unknown	81	19	11	2	113
	Total	**1,150**	**191**	**77**	**71**	**1,489**
	Total minus ill-defined and unknown causes	**925**	**160**	**54**	**64**	**1,203**

Source: Ministry of Health medical death certificates 2018–2020.

[a] ICD-10 General mortality List 1 code (Appendix 4).

[b] Includes deaths coded to "External causes of mortality" and "Injury, poisoning and certain other consequences of external causes".

[c] Includes deaths coded to "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and "Factors influencing health status and contact with health services".

Adult Mortality from Non-Communicable Diseases (NCDs)

Non-communicable diseases (NCDs) are the leading cause of death globally, and in the Pacific Islands region account for up to 75% of all deaths, most are premature (under 70 years of age). The World Health Organization recommends that countries monitor and report on the mortality from, and the associated risk factors of, four primary NCDs: Cardiovascular disease (ICD-10 codes I00-I99), Cancer (C00-C97), Diabetes (E10-E14), and Chronic respiratory disease (J40-J47). The WHO considers the risk of premature death from the target NCDs as an outcome indicator of the impact of NCDs on populations and it is calculated as the probability of dying between ages 30 and 70 years from these four NCDs. Estimates of mortality from any of these NCDs for this age group are reported here for comparison with international reporting. These are outlined in Table 32.

For men aged 30+ years, the probability of dying from either cardiovascular disease, cancer, diabetes, or chronic respiratory disease before reaching age 70 was 19% in 2018–2020. This was slightly lower in women, with a 30-year-old woman having 11% risk in 2018–2020.

Table 32. Probability of dying (%), with 95% confidence intervals, from selected NCDs between ages 30 and 69 years (inclusive), by sex, 2018–2020

Disease	Male	Female
Circulatory system diseases[a]	15.1 (13.0–17.5)	6.9 (5.4–8.5)
Diabetes mellitus[b]	0.56 (0.17–1.3)	0.9 (0.38–1.79)
Cancer[c]	2.9 (1.9–4.3)	3.2 (2.2–4.4)

Chronic lower respiratory diseases[d]	1.6 (0.88–2.7)	0.16 (-0.7–3.9)
Total	**19.4 (17.0–22.0)**	**10.8 (9.0–12.8)**

Source: Ministry of Health medical death certificates 2018–2020.

[a] *ICD-10 General Mortality List 1, code 064.*

[b] *ICD-10 General Mortality List 1, code 052.*

[c] *ICD-10 General Mortality List 1, codes 027 to 046.*

[d] *ICD-10 General Mortality List 1, code 076.*

Chapter 4. Methodology

A retrospective approach and analysis of existing data sources was used to generate the vital statistics for this report. The methodology involved four key steps.

1. Identify and compile the raw datasets of live births and deaths from relevant Line Ministry/Department data sources (that is, the MOJ and MOH).
2. "Clean" these datasets to remove duplicates and identify synchronous variables for consolidation in the next step.
3. Consolidate and validate the live births and death data with the MOJ and MOH staff.
4. Analyse the data and calculate vital statistics (fertility and mortality).

The data for this retrospective analysis is for the period 2018–2020.

Data sources

The dataset used for this report analysis is a compilation of datasets from three government entities. 1) The MOH's, their birth and death database. 2) The MOJ, with its birth and death registration database. 3) The TSD provides the Census database. All databases are properly secured and archived in the respective headquarters.

Ministry of Health

1. Live births database
2. Death database

Ministry of Justice

1. Live births database
2. Death database

Tonga Statistic Department

1. Census 2016 and 2021 Population Structure
2. Census 2016 and 2021 Population data
3. Census 2016 and 2021 Population Interpolation and Projections

Data Compilation

Duplicate birth and death records relating to the same individual within or between the MOH and MOJ birth and death datasets were identified using Excel functions such as V-LOOKUP and IF functions. The process was done manually and the dataset was split between the three ministries for cleaning. That is, the MOH was responsible for the 2018 data, MOJ for the 2019 data, and TSD for the 2020 data. After the individual ministry completed the cleaning process, the data was compiled by the Statistics Department using Microsoft Excel.

Matching variables

Matching variables are selected based on their consistency and completeness within a dataset. The matching variables used to deduplicate the Tonga birth datasets (each dataset, and when both sources were reconciled) were: name (first, middle, last, mother's name, father's name); sex; date of birth; 'Place of birth' and island group of birth. For the death datasets, the matching variables were: name (first, middle, last, mother's name); sex; date of birth; date of death; age; 'Place of death' and island group of death.

Dataset preparation

Variables used for matching in the MOH and MOJ datasets were cleaned and standardised prior to data deduplication. This included: formatting dates; removing commas, punctuation marks, and other special characters; and identifying missing names or invalid names (e.g. Rev., Jr.).

Dataset processing

Firstly, duplicate records were identified, reviewed, and removed where appropriate from the MOH birth and death datasets, and then the MOJ birth and death datasets. The deduplicated MOH and MOJ datasets were then compiled

for births and deaths to identify duplicate records across the two sources, e.g. an individual with a birth or death record in both the MOH and MOJ datasets.

For birth records of the same person found in both MOH and MOJ, the MOH record was retained because the MOH also collects information on mother's age (the MOJ does not) which is used for calculating age-specific fertility rates (Chapter 2). Medical records (hospital discharge) and Reproductive Nurses' database were not available.

Data Analysis

Following data consolidation, vital statistics on fertility and mortality were calculated as described in Chapter 1 and Chapter 2 of this report, using standard demographic methods. Calculation tools were also used–these are listed in the References.

Key agencies in vital statistics in Tonga

There are three main organisations in Tonga directly related to the compilation, collection and analysis of vital statistics:

1. The MOH has four databases used for the vital statistics, Firstly, the live births database there is one officer allocated to enter the data from the 'Certificate of Live Birth' into an electronic database. Secondly, the deaths database there is one medical mortality coder and one officer allocated to enter the data from the 'Medical Certificate of Cause of Death' into an electronic database. Thirdly, the medical records (hospital discharge) is entered by nurse in charge when a patient is being discharged. Lastly is the Reproductive Nurses' database which is used for the Vaiola hospital's Reproductive Health Nurse Report.
2. The MOJ (Civil Registry), has two databases for births and deaths. The Ministry of Justice Registry System Database (MOJRS) archives of both birth and death registrations is under the Vital Statistics Unit of the office of Registrar General. The MOJ is the Secretariat for the NCRVS Committee which oversees and monitors activities linked to national vital statistics like amnesty policies, national vital statistics indicators, etc.
3. The Statistics Department, being Tonga National Statistics office, they conduct census for every 5 years. These figures are also used to project future populations for the years that do not conduct surveys. The figures from these censuses and the population estimations and projections are used for denominators for not just the vital statistics analysis, but also the Gender Analysis, Sample designs and many others.

Limitations and Opportunities

Although Tonga's data collection and reporting processes and system are fairly simple and straightforward, there are still some gaps in reporting between the institutions within MOH and MOJ that need to be addressed in order to improve the current system. The merging of datasets for this report identified that not all live births and deaths in Tonga are being registered, despite being required by law[2]. For birth registration, the child's parents, or the town and district officers of the Ministry of Internal Affairs, are designated informants and must present to the local civil registration office with a copy of the live birth certificate issued by the health facility. For death registration, the family of the deceased is requested to present to the civil registry a copy of the Medical Certificate of Cause of Death certified by a medical practitioner and issued by the health facility. There is no legal requirement for death certification or registration before burial in Tonga. The processes of data collection, and interactions among the MOH and MOJ systems in Tonga are described further in the next section of this report.

The data collection and analysis conducted for this report also revealed some key quality issues that need to be addressed in order to improve the current CRVS system in Tonga. Duplicated records were also identified in both datasets and this issue should be addressed through conducting regular routine data validation checks during data entry in both MOJ and MOH offices.

[2] *Births, Deaths and Marriages Registration Act 1988 (Tonga).*

The NCRVS committee[3], meet annually to ensure effective and efficient integration and coordination among the multiple agencies. The Committee members are committed to ensure that the processes and information collected from NCRVS are accurate, precise and consistent. All members are fully aware of the critical need for and importance of ensuring quality of the information and their contributions to effectively minimize errors.

There were also data availability constraints for this present report. Unlike the previous report (2013–2018)[4], the data on deaths from the Community nursing reports could not be included in this present report (2018–2020). Consequently, the number of deaths reported in this document is slightly lower than the previous one. Furthermore, for the 2019 data, death records for months September, October, November and December were not available. However, the dataset will be revised in the next report to include more complete data for all years and from all available sources.

In this report, the analysis of the cause of death is limited by the quality of data. Further work is required such as validating the cause of death data and completing the missing data. Furthermore, due to data availability constraints, maternal mortality cannot be considered in this study, as well as neonatal mortality.

Data Collection Processes

Figure 6. Diagram of the reporting and registration processes for births

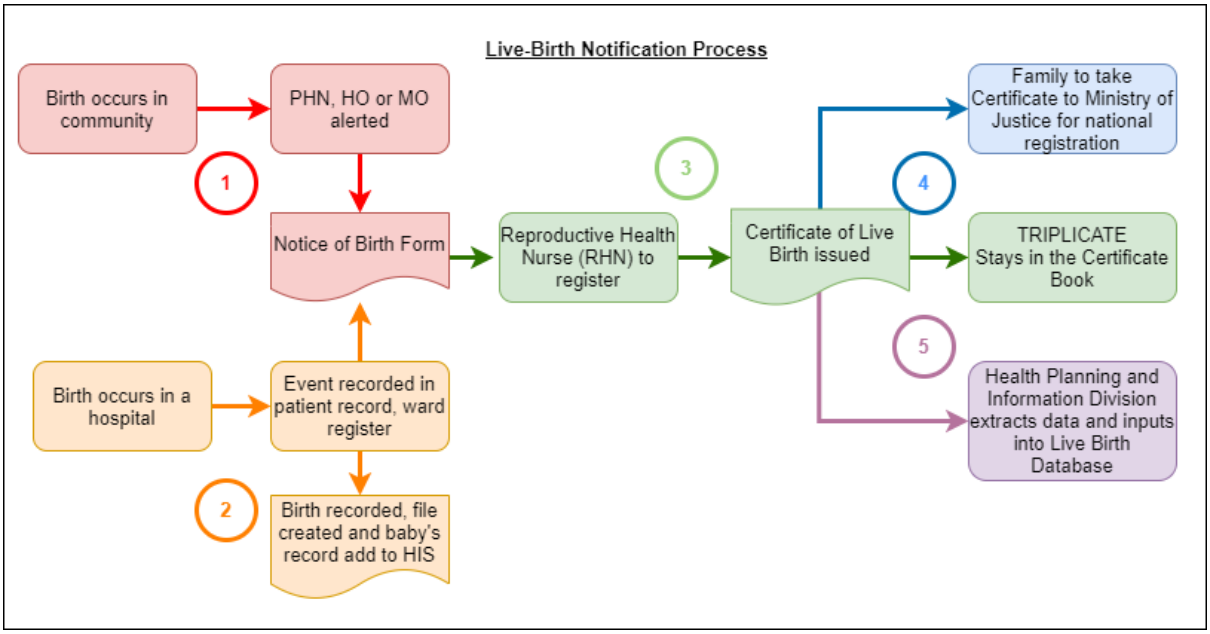


Figure 6 illustrates the reporting and registration processes for live births in Tonga. The registration process it divided into 5 key phases (numbers within the circles) correlating to the coloured arrows and boxes.

The reporting and registration process as illustrated in Figure 6 corresponds to the following:

1. **Births in the Community**

   When a birth occurs in the community, the Public Health Nurse or Community Health staff (Medical Officer or Health Officer) are alerted of the birth. The Community Health staff then either follow-up with the parent(s) or

[3] *The Committee is comprised of the Office of the Registrar General and the Judiciary (Ministry of Justice, which serves as the NCRVS Committee Secretariat), the Ministry of Health, the Ministry of Finance, the Ministry of Police, the Ministry of Education and Training, the Tonga Electoral Commission, the Tonga Statistics Department, the Ministry of Internal Affairs, the Information Department (Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications), the Immigration Department (Ministry of Foreign Affairs) and the National ID Office.*

[4] *Tonga Statistics Department (TDoS), Ministry of Justice (MoJ) Tonga, & Ministry of Health. (MoH) Tonga. (2021). Tonga national vital statistics report, 2013–2018. Available at: https://sdd.spc.int/news/2021/04/15/tonga-vital-statistics-report-2013-2018*

vice versa. Once confirmed, the Health Staff issue the Notification of Birth Certificate which is then sent to the Reproductive Health nurse section. The Reproductive Health nurse section then register the birth.

2. **Births in the Hospital**[5]

   Births within the wards get issued a notification of birth, which is then sent to the Reproductive Health nurses who register the birth. Legitimate cases of married couples require a married certificate, divorce certificate and mother's birth certificate to register their child at the hospital. Illegitimate cases can register with a mother's birth certificate only.

3. **Notification and Certification of Birth**

   The notification of live birth is used to issue a certificate of live birth. There are triplicate copies of the certificate produced. The original copy is given to the family of the child born; the duplicate is sent to the Health Planning and Information Division to enter into the live births database; and the triplicate is kept in the Live Birth Registry Book. Certificates of live birth are issued from the Hospital on Tuesdays and Thursdays every week. It should be noted that registration of births is free, however the issuance of the birth certificate costs 10 pa'anga. Reissuing live birth certificates is free of charge and a copy of the certificate is given with a note on the copy stating that it is a reissued copy.

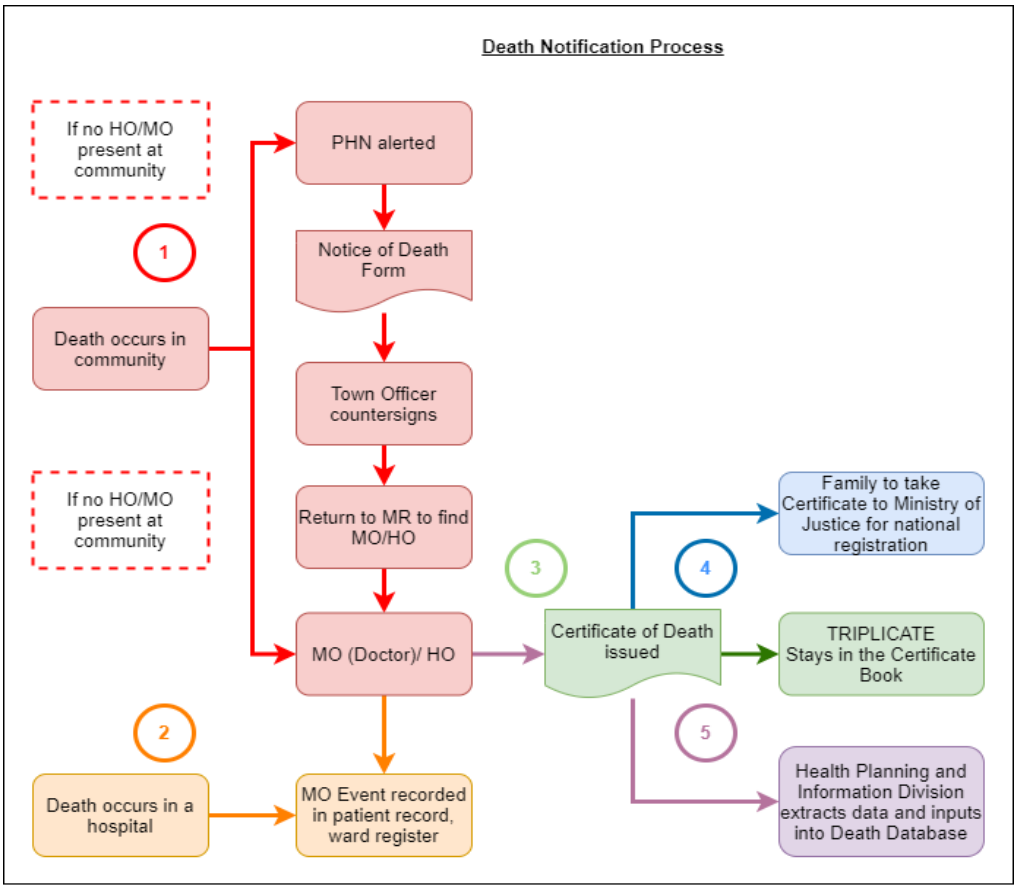
4. **Registration with the Civil Registry**

   During the issuing time of live birth certificates (Tuesday and Thursday) at the Hospital, a clerk from the MOJ is present to facilitate registration of births in the civil registry. Parents may also present directly to the Civil Registry to register their child's birth using the certificate of live birth issued from the hospital.

5. **Statistical Database / Health Planning and Information Division**

   The duplicate copy of the certificate of live birth is sent to the Health Planning and Information Division to enter the variables into the live births electronic database.

Figure 7. Diagram of the reporting and registration processes for deaths



[5] *Includes births occurring within an ambulance or vehicle headed for the Hospital or Health Facility*

Figure 7 illustrates the reporting and registration processes for deaths in Tonga. The registration process it divided into 5 key phases (numbers within the circles) correlating to the coloured arrows and boxes.

The reporting and registration processes as illustrated in Figure 7 correspond to the following:

1. **Deaths in the Community**

   When a death occurs in the community or at home, the Public Health Nurse, doctor or Health Office at the respective Community Health Centre is notified of the event. If a doctor or Health Officer is present, a death certificate can be completed and signed off. If there is no doctor or Health Officer present, the Public Health Nurse must issue a Notification of Death, which must be signed by the Town Officer of the district in which the deceased resided. The notification is then sent to the medical records office to locate a doctor or Health Officer to complete and sign off a Death Certificate for the notification.

2. **Deaths in the Hospital**

   For deaths that occur in a hospital, a death certificate should be completed and signed off by the attending doctor. It should be noted that deaths occurring within an ambulance or vehicle headed for a hospital or health facility are considered a death in the Hospital. The deceased is thus entered into the ward register, then discharged from the hospital as deceased.

3. **Notification and Certification of Death**

   Once a doctor or Health Officer has completed and signed off the death certificate, the original is given to the family, and a duplicate is sent to the Medical Records Office to be mortality coded and entered into the Health Information System, and then filed in a binder in the Medical Records Office. A copy of the duplicate is also sent to the Health Planning and Information Division.

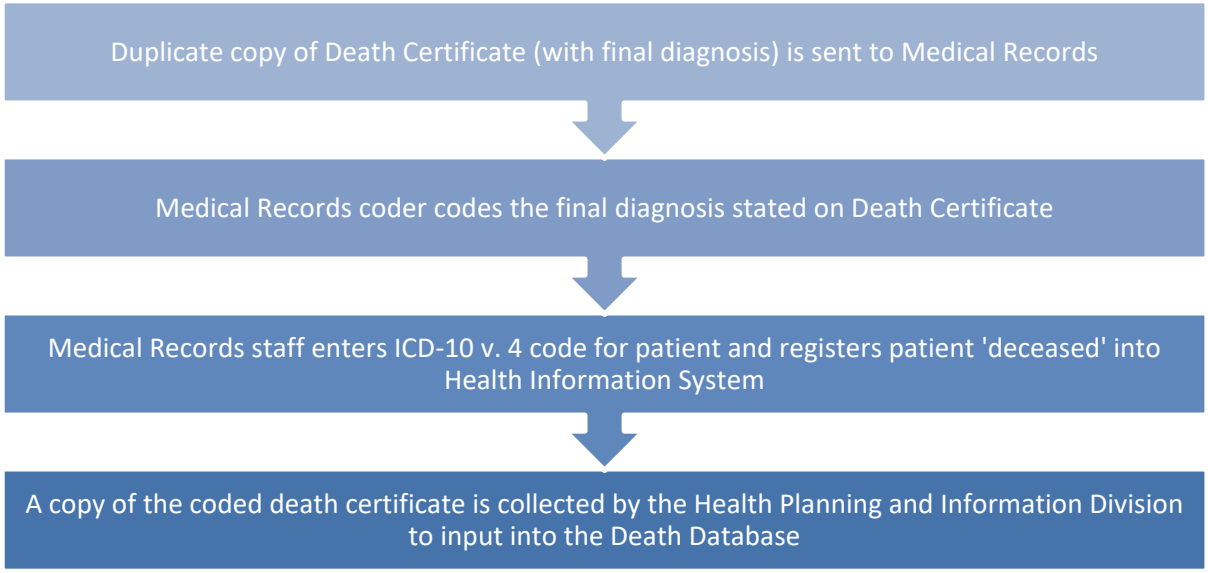
4. **Registration with the National Civil Registration**

   The original copy of the death certificate is taken by the family / next of kin and required to be presented to the Civil Registry to register the death.

5. **Statistical Database / Health Planning and Information Division**

   The duplicate copy from the Medical Records is again copied, which has the final diagnosis and the coded death. The ICD-10 coded death certificate is entered into the Health Information System. The coded copy of the death certificate is then collected by the Health Planning and Information Division to register the deceased with the variables in the certificate into the Death Database. The Health Planning and Information Division must periodically check-up with the Medical Records on a weekly to bi-weekly basis to collect the coded death certificates. This process is outlined in the Diagram below (Figure 8).

Figure 8. Diagram of the death registration and coding process in the Ministry of Health



Appendices

Appendix 1: Ministry of Justice Process for Issue of Birth Certificate

BIRTH

How do I register a Birth?

All parents should register the birth of their child within a 3-month period. Registrations are dealt with by the Vital Statistics Unit, within the Registrar General's Office of the MOJ. The cost is $10.00 TOP and a Certificate of Live Birth (provided by the hospital) is required. The Registry (Fale Lesisita Fa'ele, Pekia, Mali) is located at the corner of Lavinia and Kausela Roads and can be contacted on Telephone No: 7400-821 or 7400-817.

How do I register a Birth after the 3-month grace period?

Any registration made outside of the 3-month grace period will require an application for a Late Registration of Birth at the Registrar General's Office. Applications can be made any day of the week, during working hours (Monday to Friday 8.30am–12.30pm & 1.30pm–3.30pm).

Late registrations will require a fee of $16.00 for the Application, a Search Fee of $10.00 TOP and the following paperwork in support;

- Certificate of Live Birth from the hospital
- Marriage Certificate of the parents
- Letter of Application
- Affidavit of natural mother (in illegitimate cases) or either parent (in legitimate cases), including reasons for late registration

All affidavits must be sworn. To swear an affidavit at the Supreme and Magistrate Court Registry will cost $10.00 per affidavit.

What else do I need to know about Registering a Birth in Tonga?

- Births in the outer Islands of 'Eua, Ha'apai, Vava'u and the Niuas can be registered in sub-registries at local Fale Lesisita Fa'ele, Pekia, Mali. Grace period is one years and fees remain the same.
- If a Certificate of Live Birth is unavailable from the hospital, an affidavit from the midwife should be provided. Failing that, an affidavit should be provided from the owner of the premises on which the birth occurred, or from a relative, friend or neighbor who saw the mother and child shortly after the birth and can give a fair estimation of the date of birth.
- Further evidence for late registrations of older children can be supported by letters from the town officer, their school, or Church Minister.
- Further information can be provided from Registry Staff upon request.

Source: Tonga Ministry of Justice. 2023. Accessed 31 March 2023 from: http://www.justice.gov.to/birth/

Appendix 2: WHO World Standard Population Distribution

Table 4. WHO World Standard Population Distribution (%), based on world average population between 2000-2025	
Age group	World Average 2000-2025
0-4	8.86
5-9	8.69
10-14	8.60
15-19	8.47
20-24	8.22
25-29	7.93
30-34	7.61
35-39	7.15
40-44	6.59
45-49	6.04
50-54	5.37
55-59	4.55
60-64	3.72
65-69	2.96
70-74	2.21
75-79	1.52
80-84	0.91
85-89	0.44
90-94	0.15
95-99	0.04
100+	0.005
Total	100

Source: World Health Organization, AGE STANDARDIZATION OF RATES: A NEW WHO STANDARD, GPE Discussion Paper Series: No.31, EIP/GPE/EBD; 2011

Appendix 3: Population projections in 5-year age groups, 2018–2020

Age	2018			2019			2020		
Years	Male	Female	Total	Male	Female	Total	Male	Female	Total
0–4	6,563	5,823	12,386	6,439	5,713	12,152	6,333	5,618	11,950
5–9	6,879	6,124	13,003	6,833	6,056	12,887	6,745	5,962	12,708
10–14	6,603	6,097	12,700	6,636	6,090	12,725	6,673	6,075	12,748
15–19	6,135	5,525	11,660	6,166	5,597	11,763	6,193	5,660	11,853
20–24	5,098	4,511	9,608	5,163	4,517	9,680	5,221	4,534	9,755
25–29	3,432	3,174	6,606	3,614	3,277	6,891	3,795	3,385	7,180
30–34	2,561	2,819	5,380	2,468	2,614	5,080	2,411	2,439	4,852
35–39	2,377	2,702	5,079	2,315	2,697	5,013	2,245	2,661	4,905
40–44	2,227	2,458	4,685	2,172	2,399	4,574	2,121	2,355	4,475
45–49	2,388	2,495	4,883	2,273	2,435	4,708	2,159	2,368	4,526
50–54	2,200	2,138	4,339	2,255	2,223	4,478	2,283	2,290	4,574
55–59	1,659	1,757	3,416	1,718	1,764	3,482	1,779	1,784	3,563
60–64	1,312	1,519	2,831	1,319	1,542	2,861	1,333	1,563	2,897
65–69	1,026	1,197	2,222	1,044	1,229	2,273	1,062	1,262	2,324
70–74	753	945	1,698	752	946	1,696	752	951	1,704
75–79	530	699	1,229	522	712	1,233	514	722	1,236
80+	421	729	1,150	423	743	1,166	424	758	1,181
Total	**52,164**	**50,711**	**102,875**	**52,112**	**50,554**	**102,662**	**52,043**	**50,387**	**102,431**

Appendix 4: General mortality list 1: 103 causes

List code	Disease	ICD Codes
1-001	Certain infectious and parasitic diseases	A00–B99
1-002	Cholera	A00
1-003	Diarrhoea and gastroenteritis of presumed infectious origin	A09
1-004	Other intestinal infectious diseases	A01–A08
1-005	Respiratory tuberculosis	A15–A16
1-006	Other tuberculosis	A17–A19
1-007	Plague	A20
1-008	Tetanus	A33–A35
1-009	Diphtheria	A36
1-010	Whooping cough	A37
1-011	Meningococcal infection	A39
1-012	Septicaemia	A40–A41
1-013	Infections with a predominantly sexual mode of transmission	A50–A64
1-014	Acute poliomyelitis	A80
1-015	Rabies	A82
1-016	Yellow fever	A95
1-017	Other arthropod-borne viral fevers and viral haemorrhagic fevers	A90–A94, A96–A99
1-018	Measles	B05
1-019	Viral hepatitis	B15–B19
1-020	Human immunodeficiency virus [HIV] disease	B20–B24
1-021	Malaria	B50–B54
1-022	Leishmaniasis	B55
1-023	Trypanosomiasis	B56–B57
1-024	Schistosomiasis	B65
1-025	Remainder of certain infectious and parasitic diseases	A21–A32, A38, A42–A49, A65–A79, A81, A83–A89, B00–B04, B06–B09, B25–B49, B58–B64, B66–B94, B99
1-026	Neoplasms	C00–D48
1-027	Malignant neoplasm of lip, oral cavity and pharynx	C00–C14
1-028	Malignant neoplasm of oesophagus	C15
1-029	Malignant neoplasm of stomach	C16
1-030	Malignant neoplasm of colon, rectum and anus	C18–C21
1-031	Malignant neoplasm of liver and intrahepatic bile ducts	C22
1-032	Malignant neoplasm of pancreas	C25
1-033	Malignant neoplasm of larynx	C32
1-034	Malignant neoplasm of trachea, bronchus and lung	C33–C34
1-035	Malignant melanoma of skin	C43
1-036	Malignant neoplasm of breast	C50
1-037	Malignant neoplasm of cervix uteri	C53
1-038	Malignant neoplasm of other and unspecified parts of uterus	C54–C55
1-039	Malignant neoplasm of ovary	C56
1-040	Malignant neoplasm of prostate	C61
1-041	Malignant neoplasm of bladder	C67
1-042	Malignant neoplasm of meninges, brain and other parts of central nervous system	C70–C72
1-043	Non-Hodgkin's lymphoma	C82–C85

1-044	Multiple myeloma and malignant plasma cell neoplasms	C90
1-045	Leukaemia	C91–C95
1-046	Remainder of malignant neoplasms	C17, C23–C24, C26–C31, C37–C41, C44–C49, C51–C52, C57–C60, C62–C66, C68–C69, C73–C81, C88, C96–C97
1-047	Remainder of neoplasms	D00–D48
1-048	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50–D89
1-049	Anaemia	D50–D64
1-050	Remainder of diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D65–D89
1-051	Endocrine, nutritional and metabolic diseases	E00–E88
1-052	Diabetes mellitus	E10–E14
1-053	Malnutrition	E40–E46
1-054	Remainder of endocrine, nutritional and metabolic diseases	E00–E07, E15–E34, E50–E88
1-055	Mental and behavioural disorders	F01–F99
1-056	Mental & behavioural disorders due to psychoactive substance use	F10–F19
1-057	Remainder of mental and behavioural disorders	F01–F09, F20–F99
1-058	Diseases of the nervous system	G00–G98
1-059	Meningitis	G00, G03
1-060	Alzheimer's disease	G30
1-061	Remainder of diseases of the nervous system	G04–G25, G31–G98
1-062	Diseases of the eye and adnexa	H00–H59
1-063	Diseases of the ear and mastoid process	H60–H93
1-064	Diseases of the circulatory system	I00–I99
1-065	Acute rheumatic fever and chronic rheumatic heart diseases	I00–I09
1-066	Hypertensive diseases	I10–I13
1-067	Ischaemic heart diseases	I20–I25
1-068	Other heart diseases	I26–I51
1-069	Cerebrovascular diseases	I60–I69
1-070	Atherosclerosis	I70
1-071	Remainder of diseases of the circulatory system	I71–I99
1-072	Diseases of the respiratory system	J00–J98
1-073	Influenza	J10–J11
1-074	Pneumonia	J12–J18
1-075	Other acute lower respiratory infections	J20–J22
1-076	Chronic lower respiratory diseases	J40–J47
1-077	Remainder of diseases of the respiratory system	J00–J06, J30–J39, J60–J98
1-078	Diseases of the digestive system	K00–K92
1-079	Gastric and duodenal ulcer	K25–K27
1-080	Diseases of the liver	K70–K76
1-081	Remainder of diseases of the digestive system	K00–K22, K28–K66, K80–K92
1-082	Diseases of the skin and subcutaneous tissue	L00–L98
1-083	Diseases of the musculoskeletal system and connective tissue	M00–M99
1-084	Diseases of the genitourinary system	N00–N99
1-085	Glomerular and renal tubulointerstitial diseases	N00–N15
1-086	Remainder of diseases of the genitourinary system	N17–N98
1-087	Pregnancy, childbirth and the puerperium	O00–O99
1-088	Pregnancy with abortive outcome	O00–O07

1-089	Other direct obstetric deaths	O10–O92
1-090	Indirect obstetric deaths	O98–O99
1-091	Remainder of pregnancy, childbirth and the puerperium	O95–O97
1-092	Certain conditions originating in the perinatal period	P00–P96
1-093	Congenital malformations, deformations and chromosomal abnormalities	Q00–Q99
1-094	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00–R99
1-095	External causes of morbidity and mortality	V01–Y89
1-096	Transport accidents	V01–V99
1-097	Falls	W00–W19
1-098	Accidental drowning and submersion	W65–W74
1-099	Exposure to smoke, fire and flames	X00–X09
1-100	Accidental poisoning by and exposure to noxious substances	X40–X49
1-101	Intentional self-harm	X60–X84
1-102	Assault	X85–Y09
1-103	All other external causes	W20–W64, W75–W99, X10–X39, X50–X59, Y10–Y89
1-901	SARS	U04

Sourced from International Statistics Classification of Diseases and Related Health Problems, 10th Revision (ICD–10, 2010 edition).

Appendix 5: Infant and child mortality list 3 – 67 causes

List code	Disease	ICD Codes
3-001	Certain infectious and parasitic diseases	A00–B99
3-002	Diarrhoea and gastroenteritis of presumed infectious origin	A09
3-003	Other intestinal infectious diseases	A00–A08
3-004	Tuberculosis	A15–A19
3-005	Tetanus	A33–A35
3-006	Diphtheria	A36
3-007	Whooping cough	A37
3-008	Meningococcal infection	A39
3-009	Sepsis	A40–A41
3-010	Acute poliomyelitis	A80
3-011	Measles	B05
3-012	Human immunodeficiency virus [HIV] disease	B20–B24
3-013	Other viral diseases	A81–B04, B06–B19, B25–B34
3-014	Malaria	B50–B54
3-015	Remainder of certain infectious and parasitic diseases	A20–A32, A38, A42–A79, B35–B49, B55–B94, B99
3-016	Neoplasms	C00–D48
3-017	Leukaemia	C91–C95
3-018	Remainder of malignant neoplasms	C00–C90, C96–C97
3-019	Remainder of neoplasms	D00–D48
3-020	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50–D89
3-021	Anaemia	D50–D64
3-022	Remainder of diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D65–D89
3-023	Endocrine, nutritional and metabolic diseases	E00–E88
3-024	Malnutrition and other nutritional deficiencies	E40–E64
3-025	Remainder of endocrine, nutritional and metabolic diseases	E00–E34, E65–E88
3-026	Diseases of the nervous system	G00–G98
3-027	Meningitis	G00, G03
3-028	Remainder of diseases of the nervous system	G04–G98
3-029	Diseases of the ear and mastoid process	H60–H93
3-030	Diseases of the circulatory system	I00–I99
3-031	Diseases of the respiratory system	J00–J98
3-032	Pneumonia	J12–J18
3-033	Other acute lower respiratory infections	J00-J11, J20–J22
3-034	Remainder of diseases of the respiratory system	J30–J98
3-035	Diseases of the digestive system	K00–K92
3-036	Diseases of the genitourinary system	N00–N99
3-037	Certain conditions originating in the perinatal period	P00–P96
3-038	Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery	P00–P04
3-039	Disorders relating to length of gestation and fetal growth	P05–P08
3-040	Birth trauma	P10–P15
3-041	Intrauterine hypoxia and birth asphyxia	P20–P21
3-042	Respiratory distress of newborn	P22

3-043	Congenital pneumonia	P23
3-044	Other respiratory conditions of newborn	P24–P28
3-045	Bacterial sepsis of newborn	P36
3-046	Omphalitis of newborn with or without mild haemorrhage	P38
3-047	Haemorrhagic and haematological disorders of fetus and newborn	P50–P61
3-048	Remainder of perinatal conditions	P29, P35, P37, P39, P70–P96
3-049	Congenital malformations, deformations and chromosomal abnormalities	Q00–Q99
3-050	Congenital hydrocephalus and spina bifida	Q03, Q05
3-051	Other congenital malformations of the nervous system	Q00–Q02, Q04, Q06–Q07
3-052	Congenital malformations of the heart	Q20–Q24
3-053	Other congenital malformations of the circulatory system	Q25–Q28
3-054	Down syndrome and other chromosomal abnormalities	Q90–Q99
3-055	Other congenital malformations	Q10–Q18, Q30–Q89
3-056	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00–R99
3-057	Sudden infant death syndrome	R95
3-058	Other symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00–R94, R96–R99
3-059	All other diseases	F01–F99, H00–H59, L00–L98, M00–M99
3-060	External causes of morbidity and mortality	V01–Y89
3-061	Transport accidents	V01–V99
3-062	Accidental drowning and submersion	W65–W74
3-063	Other accidental threats to breathing	W75–W84
3-064	Exposure to smoke, fire and flames	X00–X09
3-065	Accidental poisoning by and exposure to noxious substances	X40–X49
3-066	Assault	X85–Y09
3-067	All other external causes	W00–W64, W85–W99, X10–X39, X50–X84, Y10–Y89
3-901	SARS	U04

Key Concepts and Definitions

Adult Mortality: The probability of dying between the ages of 15–59 inclusive, that is, the probability of a 15-year-old dying before reaching the age of 60, if subject to current age-specific mortality rates between those ages.

Age-specific fertility rates: The number of births occurring to mothers of a certain age group per 1,000 women in that age group in a given period of time.

Age Specific Mortality Rate: The number of deaths per 1,000 people of a given age group in a given time period.

Age Standardised Death Rates: The number of deaths that would occur if subject to the same age structure as the standard population and the age-specific rate; one country's age specific death rates applied to a standard age distribution.

Crude Birth Rate (CBR): The annual number of births occurring per 1,000 mid-year populations.

Crude Death Rate (CDR): The annual number of deaths occurring per 1,000 mid-year population

Infant Mortality Rate (IMR): The number of deaths in infants under age 1 per 1,000 live births in a given period.

LE: The average number of additional years a person could expect to live if current morality trends were to continue for the rest of that person's life.

Live birth: The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life–e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles–whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.

Maternal death: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

***Maternal mortality ratio (MMR)*:** The ratio of the number of maternal deaths during a given time period per 100,000 live births during the same time-period.

Neonatal mortality rate: The number of deaths in live-born infants aged less than 28 days per 1,000 live births over a specified time period.

Rate of Natural Increase: Rate at which a population grows (increase/decrease) during a given year, as the result of a surplus/deficit of births over deaths; expressed as a percentage of the base population.

Sex Ratio: Number of men per 100 women. Sex ratios over 100 indicate that there are more males than females, and sex ratios under 100 indicate more females than males.

Total Fertility Rate (TFR): The average number of children a woman would give birth to during her lifetime if she were to pass through her childbearing years experiencing the present-day age-specific fertility rates.

Under-5 Mortality Rate: The number of deaths in children under age 5 per 1,000 live births in a given period.

References

Hufanga S, Carter KL, Rao C, Lopez AD, Taylor R (2012). Mortality trends in Tonga: an assessment based on a synthesis of local data. Population Health Metrics. 2012 Aug 14;10(1):14. doi: 10.1186/1478-7954-10-14.

Sorchik, Renee, Than, Jennifer, Carter, Karen, Linhart, Christine, Haberkorn, Gerald, Taylor, Richard. Fertility trends in Pacific Island countries and territories. Noumea, New Caledonia: Pacific Community. 105 p. June 2019.

Taylor R, Morrell S. Fertility Calculation Tool. School of Public Health and Community Medicine (SPHCM), University of New South Wales, Sydney, NSW 2052, Australia. January 2015.

Taylor R, Morrell S. Direct Age-Standardisation Calculation Tool. School of Public Health and Community Medicine (SPHCM), University of New South Wales, Sydney, NSW 2052, Australia. January 2015.

Taylor R, Morrell S. IMR and U5MR Calculation Tool. School of Public Health and Community Medicine (SPHCM), University of New South Wales, Sydney, NSW 2052, Australia. January 2015

Taylor R, Morrell S. Life Table and Probability of Dying Calculation Tool. School of Public Health and Community Medicine (SPHCM), University of New South Wales, Sydney, NSW 2052, Australia. January 2015.

Tonga Statistics Department. Tonga 2021 census of population and housing. Volume 1: Basic tables and administrative report. Nuku'alofa, Tonga: Tonga Statistics Dept; 2022.

Tonga Statistics Department. Tonga 2016 census of population and housing. Volume 1: Basic tables and administrative report. Nuku'alofa, Tonga: Tonga Statistics Dept; 2017.

Tonga Statistics Department. Tonga 2011 census of population and housing. Volume 1: Basic tables and administrative report. Nuku'alofa, Tonga: Tonga Statistics Dept; 2013.