REPUBLIC OF FIJI VITAL STATISTICS REPORT

2012–2017

COMPILED BY:
FIJI BUREAU OF STATISTICS
REGISTRAR GENERAL'S OFFICE (MINISTRY OF JUSTICE)
MINISTRY OF HEALTH & MEDICAL SERVICES

Fiji Bureau of Statistics

MINISTRY *of* HEALTH & MEDICAL SERVICES
Shaping Fiji's Health

Births, Deaths & Marriages

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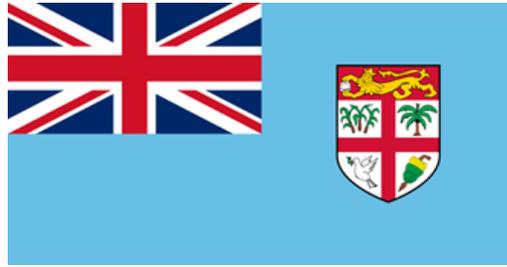
REPUBLIC OF FIJI
VITAL STATISTICS REPORT
2012-2017

FIJI BUREAU OF STATISTICS (FBoS)

REGISTRAR GENERAL'S OFFICE (MINISTRY OF JUSTICE, CRO)

MINISTRY OF HEALTH & MEDICAL SERVICES (MoHMS)

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LIST OF ABBREVIATIONS AND ACRONYMS

BR	Birth Registration
CBR	Crude Birth Rate
CDR	Crude Death Rate
CoD	Cause of Death
UCoD	Underlying Cause of Death
CR	Civil Registration
CRO	Civil Registration Office
CRVS	Civil Registration and Vital Statistics
FBoS	Fiji Bureau of Statistics
HIU	Health Information Unit
MCCoD	Medical Certificate of Cause of Death
MMR	Maternal Mortality Ratio
MoHMS	Ministry of Health and Medical Services
NoB	Notification of Birth
PATIS	Patient Information System
TFR	Total Fertility Rate
UNICEF	United Nations Children's fund
WHO	World Health Organization

ACKNOWLEDGEMENT

EXECUTIVE SUMMARY

This report provides statistics pertaining to births registered by the Civil Registration Office (CRO) of Fiji during period 2012-2017, and deaths recorded by the Ministry of Health and Medical Services (MoHMS) during years 2015-2017. The population denominators applied for estimation of different indicators are derived from Fiji population counts provided by FBoS for the years 2015-2017. Data on births is limited to registered live births and therefore does not include stillbirths.

For the period 2012-2017, CRO recorded an estimated 88.5% of births that occurred within Fiji. It should however be noted that this number includes partial registrations, which are events where the birth had been notified to the CRO but the registration process not concluded, mainly because the child's name had not been provided. Within the same period, CRO registered an estimated 93% of all deaths that occurred within Fiji.

The death data set maintained by MoHMS was used for the analysis and development of this report, as it was found to be more complete, when compared to CRO's death dataset, capturing an estimated 94% of deaths that occurred in the years 2015-2017.

There was an average of 19,787 births per year between 2012-2014 and 19,779 per year between 2015-2017, making the crude birth rate 22.8 per 1,000 population during the period 2012-2014 and 22.5 per 1,000 population during the period 2015-2017. Fertility was highest amongst women aged 25-29 followed by women aged 20-24 for periods 2012-2014 and 2015-2017. Total Fertility Rate (TFR) is estimated at 2.9 for periods 2012-2014 and 2015-2017.

There was an average of 7,169 annual deaths recorded by the MoHMS for the period 2015-2017. Life expectancy at birth for both sexes is estimated at 67 years for the period 2015-2017; 69 years for females and 65 years for males. The infant mortality rate is estimated at 12.5. The neonatal mortality rate is estimated at 8.2 for the period 2015-2017. There were a total of 14 maternal deaths recorded for the period (2015-2017).

Circulatory diseases, diabetes and cancers were the leading causes of death in Fiji over the three-year period for both males and females (all ages combined). Children aged 0-4 mainly died of conditions originating in the perinatal period such as prematurity and congenital malformations, deformations and chromosomal abnormalities, while external causes of morbidity and mortality (mainly transport accidents and accidental drowning and submersion) were the leading cause of death in those aged 5-14 years. External causes of morbidity and mortality were the leading causes of death among males and females aged 15-34. The top three causes of death among persons aged 35-59 were notably non-communicable diseases.

ABOUT FIJI ISLANDS

Fiji is situated in the Pacific Ocean midway between the equator and the South Pole and between longitudes 174°East and 178°West of Greenwich and latitudes 12°South and 22°South. Located in the heart of the South Pacific, Fiji has approximately 330 islands of which a third are inhabited. According to the last population and housing census conducted in 2017, Fiji's population is enumerated at 884,887 people. Almost three-quarters of the population live on the island of Viti Levu, which is also where the country's capital Suva is located. Spoken languages are English, iTaukei (Fijian) and Fiji Hindi. Fiji became independent in 1970 after nearly a century as a British colony. Today, Fiji is one the most developed countries in the Pacific Islands.

SUMMARY OF FIGURES AND MAIN INDICATORS

Indicator	Value/ Total	Male	Female
Population*	884,887	448,595	436,292
Total number of live births registered by MoJ (2012-2017)	106,886	55,336	51,550
Total number of live births recorded by MoHMS (2012-2017)	120,733	N/A	N/A
Birth registration completeness, MoJ (2012-2017) (%)	88.5	N/A	N/A
Total number of deaths registered by MoJ (2015-2017)	18,987	N/A	N/A
Total number of deaths recorded by MoHMS (2015-2017)	21,506	11,798	9,708
Death Registration completeness, MoJ (2015-2017) (%)	88.3	N/A	N/A
Death recording completeness, MoHMS (2015-2017) (%)	96.2		
Sex ratio at birth, M:F (2012-2017)	107.5	-	-
Crude Birth Rate (CBR) (2012-2014)	22.8	-	-
^Crude Birth Rate (CBR) (2015-2017)	22.5	-	-
Total Fertility rate (2012-2014)	2.9	-	-
^Total Fertility rate (2015-2017)	2.9	-	-
Adolescent birth rate (per 1,000 females) (2012-2014)	23.9	-	-
^Adolescent birth rate (per 1,000 females) (2015-2017)	23.1	-	-
Crude Death Rate (CDR) (2015-2017)	8.1	8.8	7.5
Under 5 mortality rate (per 1,000 live births) (2015-2017)	18.9	N/A	N/A
Infant mortality rate (per 1,000 live births) (2015-2017)	12.5	N/A	N/A
Neonatal mortality rate(per 1,000 live births) (2015-2017)	8.2	N/A	N/A
Maternal deaths (2015-2017)	14	-	-
Life expectancy at birth (2015-2017)	67	65	69
Life expectancy at age 40 (e/40) (2015-2017)	30	29	32
Adult mortality rate, (45q15) (2015-2017)	22.3	25.2	19.3
Proportion of ill-defined deaths (%)	713(3.3)	335(2.8)	378(3.9)

*Source: 2017 Fiji Population and Housing Census
^Adjusted for under-registration in 2015-2017
N/A- Not available

CHAPTER 1: INTRODUCTION AND METHODOLOGY

1.1. Introduction

Vital statistics constitute the collection of statistics on vital events in a lifetime of a person as well as the relevant characteristics of the events themselves and of the person and persons concerned (UN, 2014). There are ten primary vital events recognized by the United Nations for registration.[1] This report presents statistics pertaining to two vital events namely live births and deaths. The report also provides statistics on causes of death, recorded along with the characteristics of death.

Vital Statistics from administrative data sources provide a continuous picture of fertility and mortality trends in a country. These measures are fundamental for national planning across multiple sectors. Health planners and policy makers require them to track and monitor progress against key health indicators including evaluating the impact of key interventions targeted at improving the health and wellbeing of the population. For example, statistics on death and causes of death can help identify the extent and distribution of major diseases occurring in in the country. Generally, Pacific Island Countries (PIC) including Fiji are currently experiencing a transition from communicable to non-communicable diseases that now contribute to a significant amount of premature mortality and morbidity (Khaleghian 2003; Taylor, Bampton & Lopez 2005; Snowdon 2011). Monitoring deaths from these causes including for small areas is critical in supporting the government to develop and target the appropriate public health interventions effectively.

 Apart from the health sector, vital statistics on births can also assist the education sector to estimate the facilities that may be required in schools to accommodate for Fiji's growing population and to monitor school enrollment and school completion. Ministries dealing with infrastructure planning including transport, housing, water and land resources also depend on accurate population data, to plan for current and future populations. At a regional and international level, vital statistics are key in enabling Fiji to monitor and report on progress against a majority of the goals set out by the healthy islands development framework, and the sustainable development agenda.

Vital Statistics can be derived from periodic sources such as censuses and population surveys as well as from administrate sources i.e. health information and civil registration systems. Administrative sources hold a critical advantage over periodic collections, by providing data on a continuous basis. The United Nations specifically recognizes civil registration as the most reliable source of vital statistics, noting its critical features of continuity, permanence, compulsoriness, universality in addition to being legally backed. Civil registration systems also play a fundamental role of establishing legal identity for the population. It is critical that these data systems are strengthened, to ensure that they attain their optimal level of performance.

This is the first vital statistics report based on data from administrative records published by FBoS, in collaboration with the Registrar General's office and MoHMS. This report presents key demographic measures of fertility and mortality (including causes of death) for years 2012-2017 and 2015-2017 respectively, based on data collected by the Registrar General's office (also refered to as CRO) and MoHMS.

1.2. Data and Methodology

1.2.1. *Birth Data:*

The birth data analyzed is derived from Fiji's CRO. This office collects this data by receiving the notification of birth forms from the informant, which are issued by the health facility where a child is born. Identification details of a particular child, including the characteristics of birth and those of his/her parents (as captured on the notification of birth form) are entered into an electronic database upon verification by the informant. This is followed by the issuance of a legal document known as a birth certificate, which serves as proof of the occurrence of the event.

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[1] *Live birth, Death, Foetal death, Marriage, Divorce, Annulment, Separation, judicial, Adoption: Legitimation, Recognition*
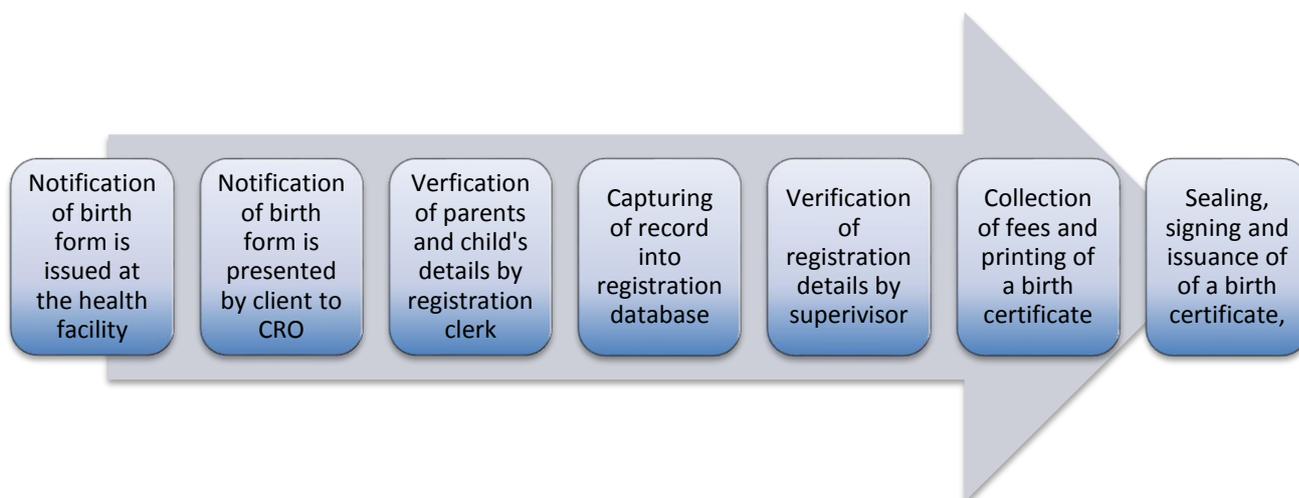
Figure 1: Process of reporting and registration of births[2]

1.2.2. *Death Data:*

The death data analyzed is derived from MoHMS. This source was preferred because it had a higher level of completeness i.e. higher number of events captured during the period of interest, as compared to the CRO data set. Information on the level of completeness of both data sources is provided in section 1.3.

All deaths that occur within the country are required by law to be reported to the nearest health facility. MoHMS captures the particulars of deaths into a death notification form. This information is also entered into an electronic database maintained by MoHMS. The notification form along with the birth certificate of the deceased are used to complete the medical certificate of cause of death, which is issued to the informant to facilitate burial of the deceased. These documents (the notification form and the MCCoD) are also crucial to the family in facilitating registration of death and succession matters. MoHMS sends a copy of the MCCoD to CRO, after which the event is registered and a certificate issued upon request by the family of the deceased.

The registration process for deaths that occur at hospital is similar to that of community deaths. However, deaths that occur in the health facility do not undergo police investigative processes except when they are considered suspicious/ to have occurred from unnatural causes.
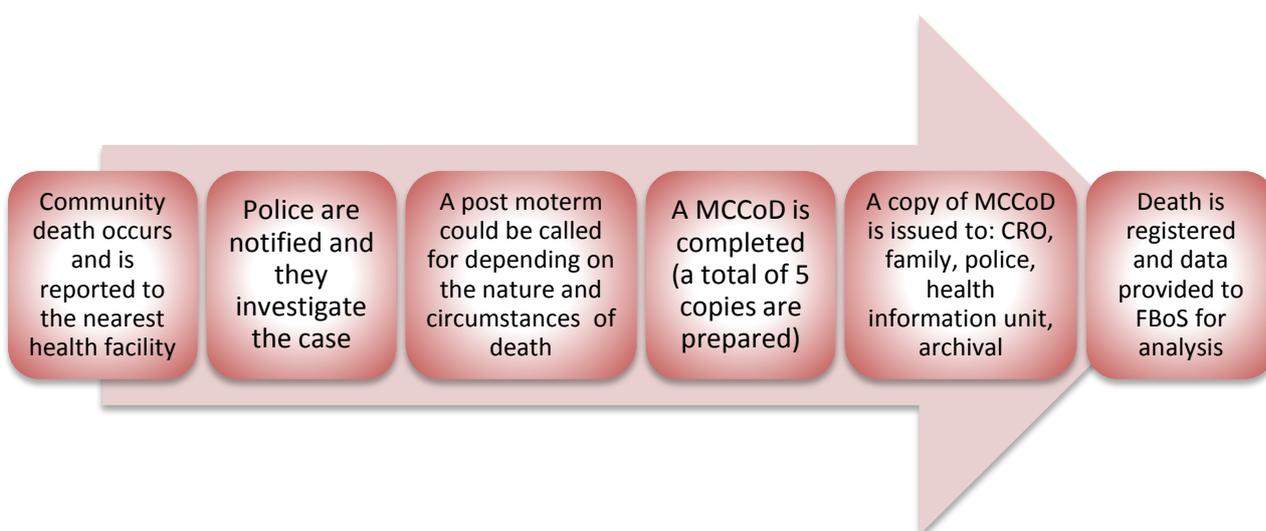
Figure 2: Process of reporting and registration of deaths

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[2] *Birth registration is undertaken free of charge for all events reported within a year of occurrence. However a fee (FJD 2.20) is required for the issuance of a birth certificate. A fee of FJD 10.90 is charged for all events registered above one year of occurrence.*

1.2.3. *Cause of death data:*

The CoD dataset analysed was derived from MoHMS. In Fiji, clinicians certify all deaths irrespective of the place of occurrence. For the outer islands, where doctors or medical officers may not be available, the health workers in the community inform the medical officer in the area who then completes the MCCoD. Once the form is completed, it is sent to MoHMS for data compilation. A copy is sent to the CRO while the other is given to the next of kin to present to the CRO.

All causes of death are entered into an electronic database known as the Patient Information System (PATIS Plus). Death data extracted from PATIS Plus is uploaded into IRIS[3] an automated coding software where all causes of death are coded according to the International Classification of Diseases 10th edition and an underlying cause of death (UCoD) is assigned[4]. Rejects from IRIS are coded manually and reloaded into the system. All causes of death including underlying causes are uploaded back into PATIS Plus and are made available for data analysis.

| CoD certificates are received at the Health information unit (MoHMS) | Data from CoD certificates is are entered into PATIS Plus | Death and CoD data is extracted from PATIS Plus and uploaded into IRIS | Causes of death are coded and the underlying cause assigned | Rejects from IRIS are coded manually. IRIS dictionary is updated (if necessary) | All data is uploaded back into PATIS plus and made available for analysis |

Figure 3: Process of coding of causes of death

1.3. Completeness of the datasets

Completeness refers to how well the two data sources performed in capturing events of birth and death that occurred in the country within the period of interest. In this regard, completeness was computed by expressing the number of vital events (births and deaths) captured by either system within a year of occurrence, as percentage of the expected number of events over the same period. The expected number of vital events for births and deaths was derived from data provided by the MoHMS and FBoS respectively. Only events that occurred within the boundaries of the country were included in this analysis.

1.3.1. *Birth Registration completeness*

Birth registration completeness was derived from dividing the total number of births captured by CRO (recorded within a year of occurrence) by the expected number of births (as recorded by MoHMS).

Around 94% and 83% of births that occurred in the years 2012-2014 and 2015-2017 respectively were captured by CRO. This number is inclusive of births where the registration was not yet complete, mainly because the child's name had not been provided. The discrepancy between MoHMS and CRO records can be explained by the fact that the CRO has access to electronic notification records from only one divisional hospital while MoHMS has access to data from all health facilities, including those that are manually captured. Events that are not sent to the Registrar general's office through MoHMS are still

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[3] *IRIS is an electronic system for coding of causes of death*

[4] *Coding is done according to the International Classification of Diseases (ICD 10)*

reported to the CRO by members of the public. These are however in many occasions reported late (are late registrations).

Table 1: Birth registration completeness (%), (2012-2017)

Period	Number of births registered per year (CRO)	Estimated total number of births per year* (MoHMS)	Proportion of all births registered
2012-2014	19,787	20,970	94.4
2015-2017	15,842	19,180	82.6
2012-2017	35,629	40,150	88.7

* **Note:** This number is derived from MoHMS annual records of live births

It is worth noting that for birth registration to be complete, members of the public are required to formally report the occurrences of birth to the CRO. This process is however constrained by a number of factors including but not limited to, limited awareness by members of the public on the importance of registration and the legal stipulated time for registration as well as limited accessibility of registration facilities in some parts of the country and to some population groups. In this regard, a number of events are reported to CRO late, often beyond one year of occurrence (late registrations). This explains the drop in the yearly number of births registered in the period 2012-2014 and 2015-2017.

Table 2: Birth registration completeness for children aged <1 year and <5 years by year

Year of birth	No. of births registered per year	No. of births recorded per year* (MoHMS)	Birth registration completeness by year (%)
2012	20,447	20,178	101.3
2013	20,682	20,970	98.6
2014	18,232	20,249	90.0
2015	17,882	20,510	87.2
2016	15,620	19,180	81.4
2017	14,023	19,646	71.4
TOTAL	106,886	120,733	88.5

As observed in Table 2, 88.5% of children aged below five years in 2017 (as recorded by MoHMS) had their births registered. Birth registration for this this age group appears complete (over 90%) when estimated against the denominator from FBoS (the number of children aged below 5 years in 2017), see Table 3.

Table 3: Birth registration completeness for children aged <5 years

Year	No. of children aged <5 whose births are registered	No. of children aged below 5 years* (FBoS)	Birth registration completeness by year (%)
2017	106,886	91,897	116.3%

1.3.2. *Death registration completeness*

Death registration completeness was computed by dividing the total number of deaths captured by CRO (recorded within a year of occurrence) by the expected number of deaths, which were derived from MoHMS. Around 97 % and 88 % of deaths that occurred in the years 2012-2014 and 2015-2017 as recorded by MoHMS were captured by CRO.

Table 4: Death registration completeness (%), (2012-2017)

Period	Number of deaths registered per year	Estimated total number of deaths per year* (MoHMS)	Proportion of all deaths registered
2012-2014	6,734	6,936	97.1
2015-2017	6,329	7,169	88.3
2012-2017	13,063	14,105	92.6

For this report, MoHMS death records were analysed. This is because these records are known to be more complete as compared to CRO records. As earlier noted, all deaths that occur within the country are reported to the nearest health facility. To further verify this (the level of completeness), the number of deaths recorded by MoHMS were compared to SPC projected estimate for yearly deaths[5] in Fiji, and were found to be 96% complete.

Table 5: Completeness of the MoHMS Death Datasets (%), (2015-2017)

Period	Number of deaths recorded by MoHMS per year	Estimated total number of deaths per year* (SPC)	Estimated proportion of all deaths recorded
2015-2017	7,169	7,456	96.2

Data source: SPC population estimate, Death Dataset from MOH 2015-2017

1.4. Analysis

Microsoft Excel, which is considered a standard piece of software in data analysis, was used for editing and tabulation of the data. In the first two chapters, birth and death data is tabulated by age, sex and geographical locality. The second section of each of the chapters presents key demographic indicators; the definitions for each indicator are available in Appendix 1. The section on causes of death provides the proportional distribution of leading causes of death (classified by underlying causes) and cause specific mortality rates.

In order to minimize instability in the figures, data was aggregated over three year periods for calculation of all rates. Confidence intervals are presented to highlight the uncertainty in the data. These were calculated using Poisson distributions for all rates, except crude birth and death rates where confidence intervals were calculated using the normal distribution of the binomial. Confidence intervals for life expectancy, based on the variance of probability of surviving, were calculated using the Chiang Method (Chiang, 1967).

In order to examine changes in mortality trends separately from any changes in the population age structure, age-standardization for mortality was done using the WHO World Standard Population.

1.5. Limitations of the Data

A number of limitations to the data set were observed. These mainly included duplicate registrations, incomplete registrations, missing variables, e.g. age of deceased, mother's age, facility name, and place of death. The underlying causes of death were not coded for a few deaths. There were also a number of records missing from the CRO birth data set for years 2015-2017 due to late registrations.

These limitations were addressed accordingly. Duplicate registrations were removed. Incomplete registrations and records with missing information were completed by imputation from other datasets where the required information was available. The records with un-coded causes of death were coded.

The issue of late registrations and their lack of inclusion in the dataset still stands. Although data was redistributed and adjusted where necessary, birth and death data for the most recent years is likely to increase in future as families complete the registration process. In this regard, data for these years (2015-2017) should be considered preliminary.

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[5] *Yearly deaths estimated from an estimated population of 867000 and a Crude death rate of 8.6. These estimates are derived from SPC population projections, which are based on country census data*

CHAPTER 2: BIRTHS AND FERTILITY

2.1. Birth by selected variables

2.1.1   Number of Births prior to adjustment for under registration

The total number of live births registered during the period 2012 to 2017 was 106,886, equating to an average of 17,814 being registered per year over the six year period. These figures are displayed annually by sex in Table 6. The highest number of births were registered in year 2013 (20,682). Male births registered were higher as compared to female births across all years.

A comparison of the births registered by year shows that a much lower number of births were registered in years 2016 and 2017 when compared births recorded by the MoHMS, which indicates under registration of births and/ or delayed registration practices (details on the level of completeness of registration by year are provided in Table 2). The births in Table 6 are unadjusted, and therefore do not take into account births that occurred in Fiji that were unregistered.

Table 6: Total Number of Registered Births by Sex and Year, (2012-2017)

Year of birth	Sex		Grand total
	Male	**Female**	
2012	10,492	9,955	20,447
2013	10,626	10,056	20,682
2014	9,468	8,764	18,232
2012-2014	*30,586*	*28,775*	*59,361*
2015	9,277	8,605	17,882
2016	8,171	7,449	15,620
2017	7,302	6,721	14,023
2015-2017	*24,750*	*22,775*	*47,525*
Grand total	**55,336**	**51,550**	**106,886**
Average (2012-2017)	*9,223*	*8,592*	***17,814***

2.1.2   Number of births after adjustment for under-registration

The number of births registered during the period 2012-2014 did not require adjustment prior to analysis; noting that the registration completeness for these births was equal to or above 90% for all years. However, the number of births registered for the period 2015-2017 were adjusted to account for the under-registration as outlined above.

The adjustment for underregistration in the 2015-2017 period was done by applying the the existing sex ratio (of birth registered), to the actual number of births that occurred within this period as recorded by MoHMS. After adjustment the number of births during the period 2015-2017 increased from 47,525 to 59,336, with 30,901 male babies and 28,435 female babies (see Table 7).

Table 7: Adjusted^ number of births by 3 year period, 2012-2017

Period of birth	Adjusted^ births			
	Male	**Female**	**Total**	**Average**
2012-2014	30,586	28,775	59,361	19,787
2015-2017^	30,901	28,435	59,336	19,779
Total	**61,487**	**57,210**	**118,697**	**39,566**

^Adjusted for under-registration in 2015-2017.

2.1.3   Births by Age of Mother

Childbearing is generally considered to occur between ages 15 and 49. Babies born to mothers outside this age range are possible but not common. In the period 2012-2017, the highest number of registered births are observed to have occurred among women aged 25 to 29, followed by women in age group 20 to 24. This pattern was consistent across the two periods i.e. 2012-2014 and 2015-2017. Over the

six-year period, 25 births are reported to have occurred among women aged <15 years whereas there were 45 births recorded among women aged 50+ years. The births occurring to women aged 50+ years were due to inter-family adoptions (a common cultural practice in the Pacific); the age of the foster mother is recorded during registration rather than the biological mother.

Births by age of mother follows the same distribution for the two periods.

Table 8: Percent distribution of births by age of mother, (2012-2017)

Age groups	2012-2014		2015-2017^		^2012-2017	
	Number	Percentage	Number	Percentage	Number	Percentage
<15	10	0.0	15	0.0	25	0.0
15-19	2762	4.7	2529	4.3	5291	4.5
20-24	17049	28.7	17008	28.7	34057	28.7
25-29	18105	30.5	17775	30.0	35880	30.2
30-34	12989	21.9	13201	22.2	26189	22.1
35-39	6421	10.8	6773	11.4	13194	11.1
40-44	1830	3.1	1873	3.2	3703	3.1
45-49	169	0.3	144	0.2	313	0.3
50+	26	0.0	19	0.0	45	0.0
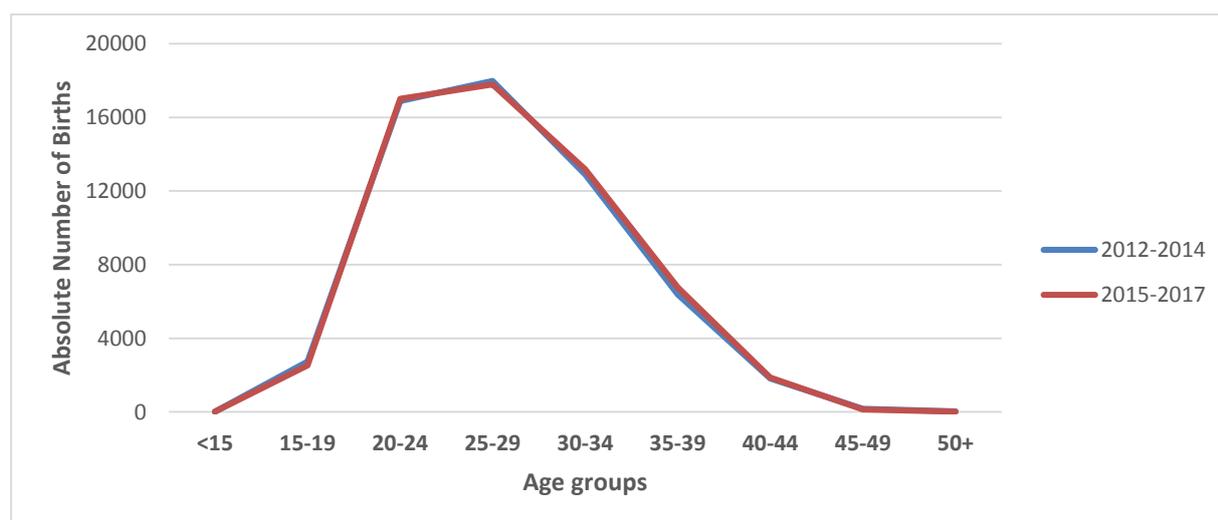
Figure 4: Births by age of mother

2.1.4 Place of Birth

Proportion of births attended by a skilled personal is one of the important indicators of the sustainable development agenda. All births that occur in the country, i.e. at the health facility or at home, are recorded by MoHMS and should be registered at CRO. In year 2012-2017, 118,134 (99.5%) births are reported to have occurred within health facilities and 475(0.4%) at home. There were 36 births for which the place of birth was not provided. The distribution of births by place of occurrence follows a consistent pattern over the two periods 2012-2014 and 2015-2017.

Table 9: Number of Births by Place of Birth, (2012-2017)

3 year period	Place of birth				Grand total
	Hospital	Home	Other*	Unknown	
2012-2014	59,002 (99.4)	313 (0.5)	31 (0.1)	15 (0.0)	59,361
2015-2017^	59,132 (99.7)	162 (0.3)	21 (0.0)	21 (0.0)	59,336
Grand total	**118,134 (99.5)**	**475 (0.4%)**	**52 (0.0%)**	**29 (0.0%)**	**118,687**

* Other refers to Births before arrival but excludes Births that occurred at home.

^Adjusted for under-registration in 2015-2017

2.1.5 Birth by birth weight

Baby's birth weight is an important indicator of a child's health status in the early years of life. Babies that weigh less than 2.5kgs at birth are observed to be at a higher risk of exposure to morbidity and mortality. The data estimates that 3.3% and 3.4% of births registered in both intervals weighed below 2.5kgs. Despite weight being one of the critical health variables collected at birth, a significant number of records did not include the baby's birth weight, which indicates weaknesses in the data collection processes.

Table 10: Percent Distribution of births by birth weight category, (2012-2017)

Period of Birth	% of children by Birth Weight			Grand Total
	< 2.5 kg	2.5 kg or higher	Unknown	
2012-2014	**3.3**	**39.0**	**57.5**	**100**
2015-2017^	3.4	48.6	48.0	**100**

^Adjusted for under-registration in 2015-2017

2.2. Key fertility indicators

2.2.1. *Crude Birth Rate*

Crude birth rate (CBR) is defined as the number of births per 1,000 population over a given period. It is an important indicator because it tells us whether the population is growing or declining. Moreover, the CBR enlightens the government in planning, such as by estimation of the number of children entering school or the number of people entering the workforce. The CBR for period 2012-2014 and 2015-2017 was 22.8 and 22.5 respectively.

Table 11: Crude Birth Rate with 95% Confidence Intervals, (2012-2017)

Period	Crude birth rate
2012-2014	22.8 (22.5-23.1)
2015-2017^	22.5 (22.2-22.8)

^Adjusted for under-registration in 2015-2017

2.2.2. *The sex ratio at birth*

For the period 2012-2017, the sex ratio at birth was 107.5. This means that for every 100 live female births, there were about 108 live male births over the same time period.

Table 12: Sex Ratio at birth, (2012-2017)

Period of birth	Adjusted^ births		
	Male	Female	Sex Ratio
2012-2014	30,586	28,775	106.3
2015-2017^	30,901	28,435	108.7
2012-2017	**61,487**	**57,210**	**107.5**

^Adjusted for under-registration in 2015-2017

2.2.3. *Age-Specific Fertility Rates*

Age-specific fertility rates are the number of births occurring to mothers per 1,000 women of a certain age group in a given period. Fertility was highest amongst women aged 25-29 followed by women aged 20-24 for both periods. Fertility follows a consistent pattern over the two periods. Teenage fertility was at 23.9 and 23.1 for years 2012-2014 and 2015-2017 respectively. Teenage fertility is critical because it is associated with a higher risk pregnancies and maternal mortality. Children that are pregnant at this age are also likely to discontinue their education, which could negatively affect Fiji's progress towards realization of SDG3 on Maternal Health and SDG4 on achieving Universal Education.

Age Specific Fertility Rates*		
Age group	2012-2014	^2015-2017
10-14	0.2 (0.0-0.7)	0.0 (0.0-0.1)
15-19	23.9 (22.4-25.5)	23.1 (21.6-24.6)
20-24	157.4 (153.7-161.2)	154.5 (150.8-158.2)
25-29	170.0 (166.1-173.9)	175.9 (171.8-179.9)
30-34	128.1 (124.5-131.7)	130.2 (126.6-133.8)
35-39	73.1 (70.1-76.0)	72.4 (69.5-75.3)
40-44	23.3 (21.5-25.1)	23.2 (21.4-25.0)
45-49	2.1 (1.6-3.0)	1.9 (1.4-2.7)

*Births to Mothers Aged 50+ are redistributed to age group 15-49

^Adjusted for under-registration in 2015-2017
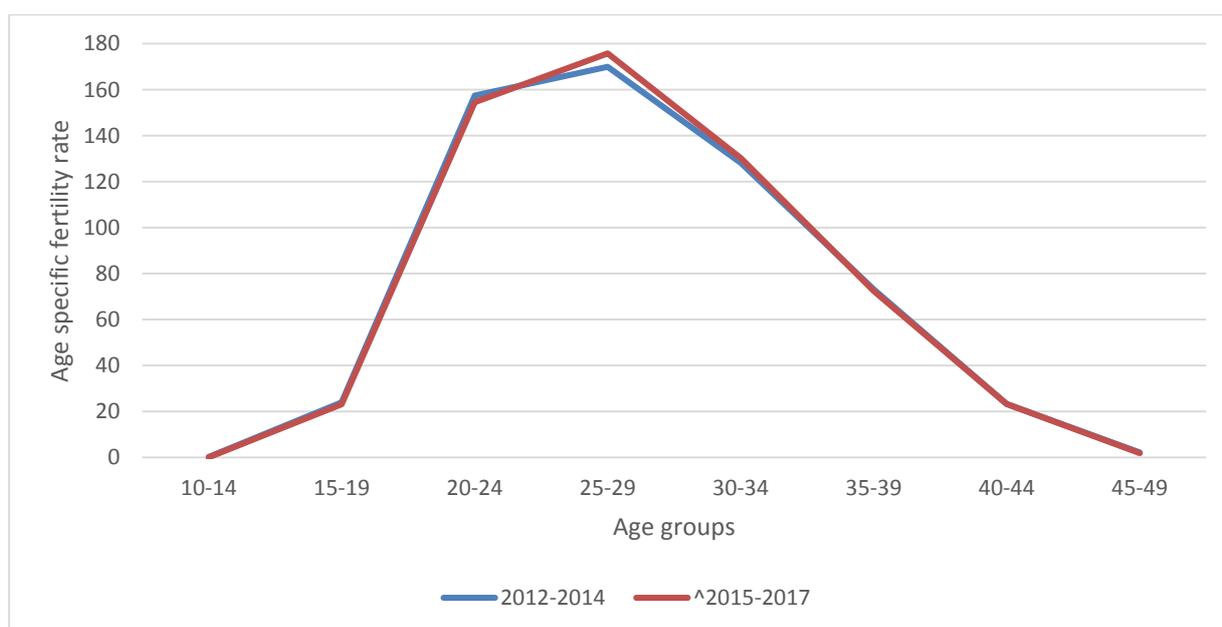
Figure 5: Age specific fertility rates, (2012-2017)

2.2.4. *Total Fertility Rates*

The total fertility rate (TFR) is 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.

Table 14: Total Fertility Rates (including 95% Confidence Intervals), (2012-2017)

Period	Total Fertility Rate	Confidence interval range
2012-2014	2.9	(2.9-2.9)
2015-2017^	2.9	(2.9-3.0)
2012-2017^	2.9	(2.9-2.9)

For the period 2012-2017, based on registered births, the TFR in Fiji was 2.9, which indicates that a woman in reproductive age would bear an average of three children in her lifetime.

CHAPTER 3: MORTALITY

3.1. Deaths by selected variables

3.1.1. *Number of Deaths*

There were 21,506 deaths that were recorded by the MoHMS for the period 2015-2017. There were more males' deaths recorded as compared to females across all years. The highest number of deaths was recorded in 2016 (7,476) followed by year 2015 (7,038).

Table 15: Total Number of Deaths by Sex and Year, (2015-2017)

Year	Male	Female	Total
2015	3,894	3,144	7,038
2016	4,138	3,338	7,476
2017	3,766	3,226	6,992
Total	**11,798**	**9,708**	**21,506**
Average	**3,933**	**3,236**	**7,169**

	2015	2016	2017
■ Male	3894	4138	3766
■ Female	3144	3338	3226
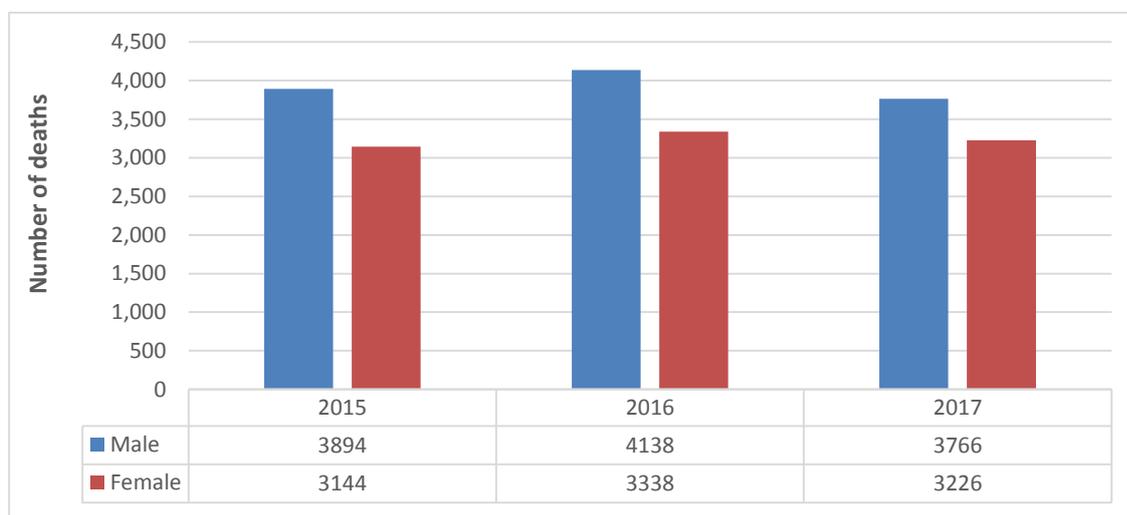
Figure 6: Deaths by sex, and year (2015-2017)

Based on recorded deaths, the average annual number of deaths for the period 2015-2017, was 7169 (average males 3933; average females 3236).

3.1.2. *Deaths by age and sex of deceased*

Table 16 shows the percentage distribution of deaths by the age and sex of the deceased. Mortality was high among children within the neonatal period (aged below 28 days) (2.3%). This declined significantly in the older age groups to a low of 0.6% among children aged 5 to 14 years. Mortality began rising steadily from ages 20 to 24 and more sharply from ages 45+ for both males and females. There were a higher number of male deaths recorded across all age groups except in ages 75+.

Table 16: Deaths by age and sex of the deceased, (2015-2017)

Age Group	Male (%)	Female (%)	Total (%)
<28 days	300 (2.5)	189 (1.9)	**489 (2.3)**
28 days to <1Year	149 (1.3)	104 (1.1)	**253 (1.2)**
1-4	214 (1.8)	167 (1.7)	**381 (1.8)**
5-9	68 (0.6)	58 (0.6)	**126 (0.6)**
10-14	70 (0.6)	60 (0.6)	**130 (0.6)**
15-19	81 (0.7)	75 (0.8)	**156 (0.7)**
20-24	162 (1.4)	118 (1.2)	**280 (1.3)**

25-29	193 (1.6)	132 (1.4)	**325 (1.5)**
30-34	243 (2.1)	167 (1.7)	**410 (1.9)**
35-39	297(2.5)	242 (2.5)	**539 (2.5)**
40-44	415 (3.5)	310 (3.2)	**725 (3.4)**
45-49	638 (5.4)	457 (4.7)	**1,095 (5.1)**
50-54	1,058 (9.0)	758 (7.8)	**1,816 (8.4)**
55-59	1,408 (11.9)	1,001 (10.3)	**2,409 (11.2)**
60-64	1,508 (12.8)	1,056 (10.9)	**2,564 (11.9)**
65-69	1,423 (12.1)	1,066 (11.0)	**2,489 (11.6)**
70-74	1,310 (11.1)	1,125 (11.6)	**2,435 (11.3)**
75+	2,261 (19.2)	2,623 (27.0)	**4,884 (22.7)**
Grand Total	**11,798 (100.0)**	**9,708 (100.0)**	**21,506 (100.0)**

3.1.3. *Deaths by sub division of occurrence and sex of decedent*

Table 17 shows the distribution of deaths by place of usual residence/occurrence categorized by sub divisions. The highest number of deaths were reported from Suva sub division (25.6%) which is inclusive of the two major hospitals and other health centers allocated for this sub division.

Table 17: Deaths by usual residence and sex of decedent, (2015-2017)

Sub-division	Male	%	Female	%	Total	%
Suva	2,907	24.6	2,598	26.8	5,505	**25.6**
Lautoka/Yasawa	1,421	12.0	1,193	12.3	2,614	**12.2**
Nadi	1,171	9.9	948	9.8	2,119	**9.9**
Rewa	1,060	9.0	845	8.7	1,905	**8.9**
Macuata	1,047	8.9	775	8.0	1,822	**8.5**
Nadroga/Navosa	693	5.9	565	5.8	1,258	**5.8**
Ba	591	5.0	484	5.0	1,075	**5.0**
Cakaudrove	443	3.8	350	3.6	793	**3.7**
Ra	392	3.3	335	3.5	727	**3.4**
Tavua	346	2.9	284	2.9	630	**2.9**
Serua/Namosi	338	2.9	284	2.9	622	**2.9**
Tailevu	329	2.8	268	2.8	597	**2.8**
Bua	226	1.9	180	1.9	406	**1.9**
Naitasiri	218	1.8	170	1.8	388	**1.8**
Taveuni	182	1.5	148	1.5	330	**1.5**
Lomaiviti	134	1.1	102	1.1	236	**1.1**
Kadavu	111	0.9	93	1.0	204	**0.9**
Overseas	82	0.7	24	0.2	106	**0.5**
Lakeba	60	0.5	45	0.5	105	**0.5**
Lomaloma	41	0.3	15	0.2	56	**0.3**
Rotuma	6	0.1	2	0.0	8	**0.0**
Grand Total	**11,798**		**9,708**		**21,506**	

3.2. Summary Measures of Mortality

3.2.1. *Crude Death Rate and Age-Standardised Mortality Rate*

Crude death rate (CDR) refers to deaths per 1,000 population. Based on recorded deaths the CDR for the period 2015-2017 was estimated at 8.1. This is slightly lower than the SPC[6,7] 2015 Estimate (8.6) for period 2012-2015.

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[6] *SPC 2015, Pocket Statistical Summary* www.spc.int/sdd/

7 *SPC estimates are based on country census population data collated over the years*

To allow for comparisons with death rates for other countries, age-standardized mortality rates (ASMR) were also computed. Age standardized death rates refer to a country's age specific death rates applied to a standard age distribution. For the standardization, the WHO World Standard Population was used (refer to appendix 2). The ASMR was 9.9 deaths per 100,000.

Table 18: Crude death rate and Age-standardised Mortality Rate, (2015-2017)

Period	Total Number of deaths	Average deaths per year	Crude death rate (95% CI)	Age-standardized Mortality Rate (95% CI)
2015-2017	21,506	7,169	8.14 (7.9-8.3)	9.9 (9.7-10.1)

3.2.2. *Life Expectancy at Birth*

Life expectancy at birth indicates the average number of years a newborn infant would live if the current patterns of mortality at the time of its birth were to remain the same throughout its life. For a male child, the life expectancy at birth is 65 years, which is lesser than that of females (69 years) for the period 2015-2017. Life expectancy at birth for both sexes is 67 years for the period 2015-2017.

Table 19: Life Expectancy at Birth (LE0), (2015-2017)

Periods	Male	Female	Both
2015-2017	65.4 (65.0-65.8)	68.5 (68.1-68.9)	66.9 (66.6-67.2)

3.3. Infant and Child Mortality

3.3.1. *Infant Mortality*

Infant mortality rate is one of the key indicators for monitoring of childhood health, which is a priority under the global Sustainable Development Goals. Infant Mortality Rate shows the number of infant deaths (deaths in children under age 1) in a year per 1,000 live births for a given period. The infant mortality rate is estimated at 12.5 per 1,000 live births for the period 2015-2017.

Table 20: Infant Mortality Rates (including 95% Confidence Intervals), (2015-2017)

Period	No of infant deaths per year	IMR
2015-2017	247	12.5 (11.6-13.4)

3.3.2. *Neonatal Mortality*

The neonatal mortality rate is the number of deaths among live-born infants during the first 28 days of life per 1,000 live births over a specified time. Mortality during the neonatal period (the first 28 days of life) accounts for a large proportion of child deaths, and is considered an important indicator of maternal and newborn neonatal health and care. The neonatal mortality rate is at 8.2 per 1,000 live births for the period 2015-2017.

Table 21: Neonatal Mortality Rates (including 95% Confidence Intervals), (2015-2017)

Period	No. of neonatal deaths	NMR
2015-2017	163	8.2 (7.5-9.0)

3.3.3. *Under 5 Mortality Rate*

The Under 5 Mortality Rate (U5M) is measured as the number of deaths in children under aged below 5 years per 1,000 live births in a given period. The U5M rate is estimated at 18.9 per 1,000 live births for the period 2015-2017.

Table 22: Under 5 Mortality Rates (including 95% Confidence Intervals), (2015-2017)

Period	No. of < 5 deaths (per year	U5MR
2015-2017	374	18.9 (17.8-20.0)

3.3.4. *Age Specific Mortality*

Age specific mortality rate is the number of deaths per 1,000 people of a given age group in given time. Based on recorded deaths, mortality was high among children aged in the 0-4 with an age specific mortality rate of 4.7, this declined significantly in the age groups 5-9 (0.5) and 10-14 (0.5). There is a notable rise in the mortality rate in the age group 25-29, followed by an exponential rise from ages 45+. There was a higher rate of death among male in all age groups for the period 2015-2017 as compared to females except for age groups 5-9 and 15-19 where there is parity across the sexes. The mortality pattern follows a typical J shaped curve (see figure 7).

Table 23: Age Specific Mortality Rate (deaths per 1,000 people) by Sex and period, (2015-2017)

Age Specific Death Rate*			
Age Group	**Males**	**Females**	**Total**
0-4	5.4	3.9	**4.7**
5-9	0.5	0.5	**0.5**
10-14	0.6	0.5	**0.5**
15-19	0.7	0.7	**0.7**
20-24	1.4	1.1	**1.2**
25-29	1.8	1.3	**1.6**
30-34	2.2	1.6	**2.0**
35-39	3.0	2.6	**2.8**
40-44	4.8	3.8	**4.4**
45-49	8.3	6.0	**7.2**
50-54	13.9	10.1	**12.0**
55-59	21.8	15.7	**18.8**
60-64	32.0	21.5	**26.7**
65-69	42.7	29.6	**35.9**
70-74	61.5	44.1	**51.7**
75+	129.9	98.2	**110.0**

Data source MOH dataset 2015-2017

*denominator sourced from the FBOS midyear population for the 2015-2017
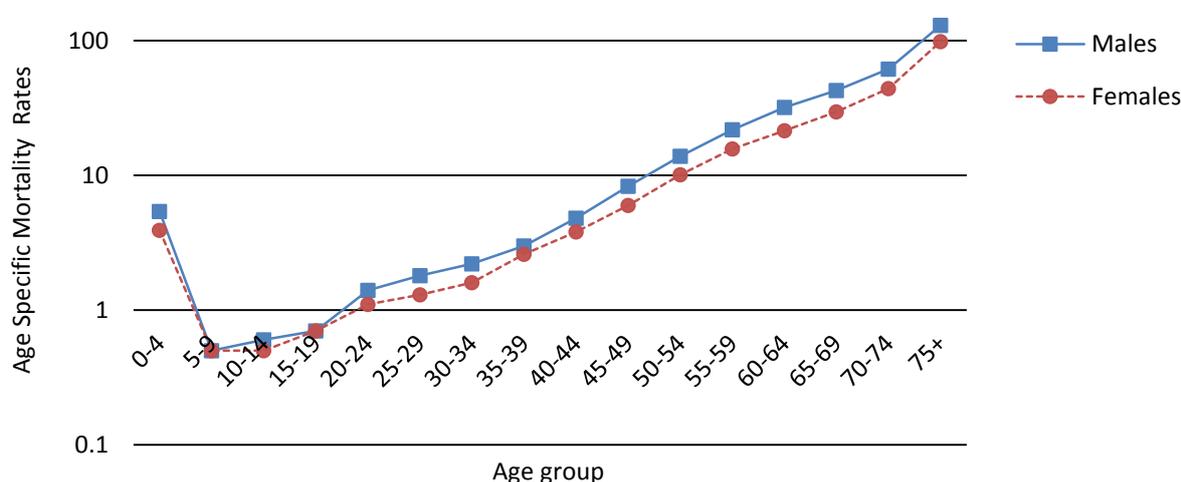
Figure 7: Age Specific Mortality Rates by period, (2015-2017)

3.3.5. *Maternal Mortality*

A 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 incidental causes. There were 14 maternal deaths recorded in the period 2015-2017.

Of the 14-recorded maternal deaths over this time period, the majority were due to pregnancy related complications including pre-eclampsia, ruptured ectopic pregnancy and placental conditions. Fatalities of this nature are referred to as direct maternal deaths.

There were a very small number of deaths of women in Fiji where an existing health condition was exacerbated by pregnancy which in turn led to death. These are known as indirect maternal deaths. Although there are a very small number of indirect maternal deaths recorded in Fiji between 2015-2017 (less than 1 death per year on average), this figure should be treated with caution. Indirect maternal deaths can be under-reported for many reasons, including lack of knowledge of the pregnancy by the certifier and omission of the pregnancy from the death certificate.

Maternal deaths provide an important insight into healthcare, access to services, and service use. Many maternal deaths are largely preventable. The target indicator set out in the Sustainable Development Goals is to reduce maternal mortality ratio to less than 70 deaths per 100,000 live births by 2030. Although Fiji currently has a recorded maternal mortality ratio much less than this at 23.6 deaths per 100,000 live births, it is important focus is placed on improving the reporting and capture of maternal deaths in future. Improving the capture of maternal deaths, particularly those defined as indirect maternal deaths, may provide greater insights into maternal health service requirements for Fiji in the future. Maternal deaths are largely preventable, there is need for Fiji to strive had towards 0 maternal deaths in the near future.

Table 24: Maternal Deaths, Maternal Mortality Ratio, (including 95% Confidence Intervals), (2015-2017)

Period	Number of Maternal Deaths	Maternal Mortality Ratio
2015-2017	14 (8-23)	23.6 (12.9-39.6)

3.3.6. *Adult Mortality*

Adult mortality is the probability of dying between the ages of 15 to 59 inclusive, or the probability of a 15-year-old dying before reaching the age of 60. The table below shows adult mortality by sex for the period 2015-2017. The estimate shows that a person aged 15 years has a 22% chance of dying before reaching age 60. The probability of dying between these ages is higher for males (25.2%) as compared to females (19.3%). The difference by sex is statistically significant.

Table 25: Adult Mortality (%) by sex and period (including 95% Confidence Intervals), (2015-2017)

Period	Male $_{45}q_{15}$	Female $_{45}q_{15}$	Both sexes $_{45}q_{15}$
2015-2017	25.2 (23.8-26.6)	19.3 (18.1-20.6)	22.3 (21.6-23.1)

3.3.7. *Life Expectancy at 40 (LE$_{40}$)*

Life expectancy 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. The life expectancy estimate for males is 29 years, lower than that of females which is 32 years. The difference by sex is statistically significant. For the period 2015-2017 the life expectancy at 40 for both sexes is 30 years.

Table 26: Life Expectancy at 40 (LE$_{40}$) by sex and period (including 95% Confidence Intervals), (2015-2017)

Period	Male LE$_{40}$	Female LE$_{40}$	Both Sexes LE$_{40}$
2015-2017	29.2 (28.9-29.5)	31.6 (31.3-31.9)	30.4 (30.1-30.6)

CHAPTER 4: CAUSES OF DEATH

4.1. Natural and non-natural causes of death

Natural deaths refer to deaths occurring in the course of nature and from natural causes (such as disease progressing to organ failure) as opposed to accident or violence[8]. These deaths are assigned code A00 – R99 of the ICD-10 codebook while non- natural causes are assigned codes V01-Y98.Table 27 shows the actual number of natural and non- natural deaths for period 2015-2017; 1247 (5.8%) of all deaths that occurred during this period was due to non-natural causes. Fiji experienced cyclone "Winston" in the year 2016, which contributed to the number of non-natural deaths recorded.

Table 27: Number of natural and non-natural deaths, (2015-2017)

Period	Number of Natural Deaths (%)	Number of Non-Natural Deaths* (%)	Total
2015-2017	20,259 (94.2%)	1,247 (5.8%)	21,506 (100.0%)

4.2. Leading underlying causes of Death (all ages)

The leading cause of death (CoD) in Fiji for the period 2015-2017 was circulatory diseases, which includes ischaemic heart disease, cerebrovascular diseases and hypertension. Diabetes, cancers, chronic lower respiratory diseases and infectious diseases round out the top 5 leading CoD.
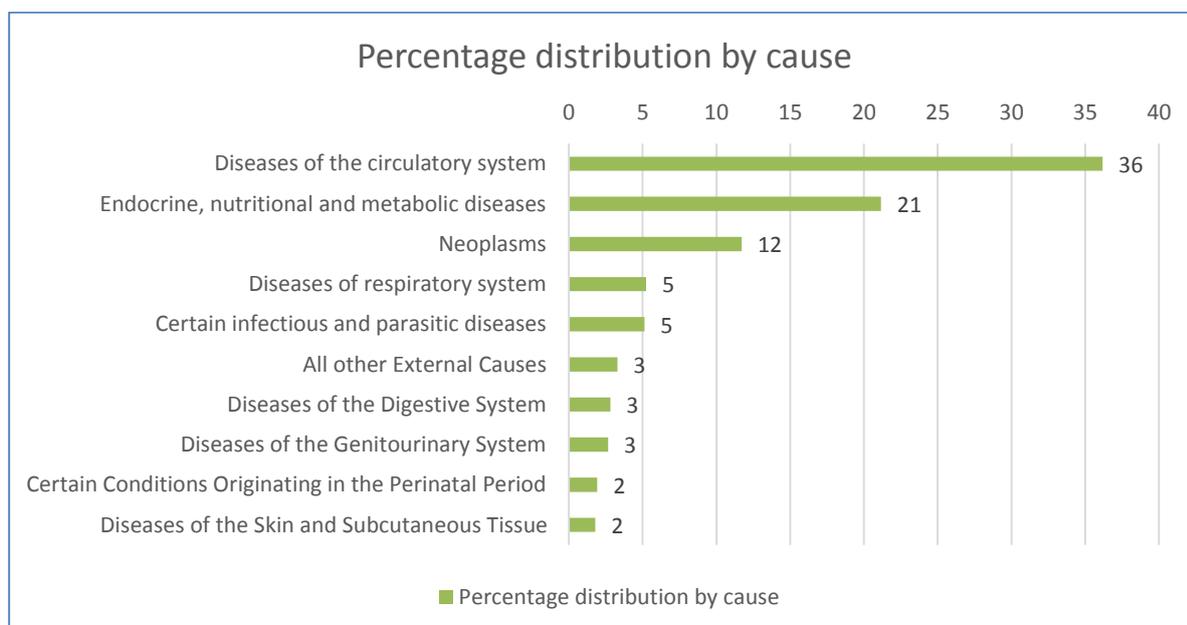
Figure 8: Top ten leading causes of death, all ages and both sexes combined, (2015-2017)

Table 28 provides the proportional distribution of the top ten leading causes of death among males of all ages for the period 2015-2017 with the corresponding Age Standardized Death Rates presented as deaths per 100,000 people. Diseases of the Circulatory system, Endocrine, nutritional and metabolic diseases and neoplasms accounted for the highest proportion of deaths with 39.2%, 18.2% and 8.0% respectively. Females share the top three leading causes of death with proportional distributions accounting for 29.8%, 23.2% and 15.3% of all female deaths respectively (refer to Table 29).

Table 28: Ten Leading Causes of Deaths for males of all ages, (2015-2017)

List Code	Diseases	Male	Percentage distribution of deaths by cause	Standardized Death Rates
I00-I99	Diseases of the circulatory system	4,626	39.2	462
E00-E88	Endocrine, nutritional and metabolic diseases	2,148	18.2	210
C00-D48	Neoplasms	946	8.0	90

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[8] *Definition natural deaths-https://www.merriam-webster.com/dictionary/non%20natural%20death*

J00-J98	Diseases of respiratory system	690	5.8	71
A00-B99	Certain infectious and parasitic diseases	565	4.8	57
K00-K92	Diseases of the Digestive System	371	3.1	35
N00-N99	Diseases of the Genitourinary System	307	2.6	33
P00-P96	Certain Conditions Originating in the Perinatal Period	238	2.0	17
G00-G98	Disease of Nervous System	187	1.6	15
Q00-Q99	Congenital Malformations, Deformation and Chromosomal Abnormalities	143	1.2	11

Note: The totals do not end up to a 100 percent as the table only covers the top ten causes. The ill-defined causes of death and external causes are excluded.

The standardized death rates – Direct Age Standardized Calculation UNSW.

Table 29: Ten Leading Causes of Deaths for females of all ages, (2015-2017)

List Code	Diseases	Female	Percentage distribution of deaths by cause	Standardized Death Rates
I00-I99	Diseases of the circulatory system	2,896	29.8	263
E00-E88	Endocrine, nutritional and metabolic diseases	2,252	23.2	194
C00-D48	Neoplasms	1,487	15.3	121
A00-B99	Certain infectious and parasitic diseases	501	5.2	45
J00-J98	Diseases of respiratory system	399	4.1	35
N00-N99	Diseases of the Genitourinary System	245	2.5	21
K00-K92	Diseases of the Digestive System	214	2.2	19
L00-L98	Diseases of the Skin and Subcutaneous Tissue	202	2.1	12
P00-P96	Certain Conditions Originating in the Perinatal Period	161	1.7	12
G00-G98	Disease of Nervous System	151	1.6	8

Note: The totals do not end up to a 100 percent as the table only covers the top ten causes. The ill-defined causes of death and external causes are excluded.

4.3. Underlying causes of death by key age groups

4.3.1. *Mortality in Children Aged 0-4 years*

Deaths amongst infants, specifically those within the neonatal period have the highest rate of death amongst those aged 0-4 years. Accordingly, the leading cause of death among children aged 0-4 years was "Certain conditions originating in the perinatal period" accounting for 35.3% of deaths at a rate of 14.6 per 100,000 people. Common perinatal conditions included prematurity and neonatal sepsis. "Congenital Malformations, Deformations and Chromosomal Abnormalities" which includes conditions such as congenital heart diseases was the second leading cause of death accounting for 18.1% of deaths in the 0-4 age group, occurring at a rate of 7.5 per 100,000 people. External causes of morbidity and mortality were the third leading CoD among children in this age group; and accounted for close to 10% of deaths. Respiratory illness (namely pneumonia) is also a key contributor to mortality in this age group.

Table 30: Cause specific Mortality for 0-4 year olds (both sexes combined) by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
P00-P96	Certain Conditions Originating in the Perinatal Period	396	35.3	14.6
Q00-Q99	Congenital Malformations, Deformation and Chromosomal Abnormalities	203	18.1	7.5
V01-Y89	External Causes of Morbidity and Mortality	111	9.9	4.1
J00-J98	Diseases of respiratory system	110	9.8	4.1
A00-B99	Certain infectious and parasitic diseases	97	8.6	3.6
G00-G98	Disease of Nervous System	44	3.9	1.6
I00-I99	Diseases of the circulatory system	37	3.3	1.4
E00-E88	Endocrine, nutritional and metabolic diseases	32	2.8	1.2

ICD Codes	Disease			
K00-K92	Diseases of the Digestive System	28	2.5	1.0
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified (Includes SIDS)	23	2.0	0.8
C00-D48	Neoplasms	20	1.8	0.7
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	10	0.9	0.4
	Other Causes	12	1.1	0.4
	Total	**1,123**	**100.0**	**41.5**

4.3.2. *Mortality in Children Aged 5-14 years*

Children aged between 5-14 have the lowest age-specific rates of death in Fiji. Although numbers of death are comparatively low, it is important to understand that CoD in this age group as deaths are often preventable.

External causes of death were the leading cause of death in this age group with 86 deaths occurring between 2015-2017. Specifically, deaths of an accidental nature, including transport accidents and drowning were the leading CoD. These were followed by "Neoplasms", namely leukaemia and "Certain infectious and parasitic diseases", (mainly dengue). Figure 8 and 9 provide the percentage distribution of deaths due to external causes and neoplasms for children in this age group.

Table 31: Cause specific Mortality for 5-14 year olds (both sexes combined) by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
V01-Y89	External Causes of Morbidity and Mortality	86	33.6	7.0
C00-D48	Neoplasms	38	14.8	3.1
A00-B99	Certain infectious and parasitic diseases	26	10.2	2.1
G00-G98	Disease of Nervous System	21	8.2	1.7
I00-I99	Diseases of the circulatory system	21	8.2	1.7
J00-J98	Diseases of respiratory system	13	5.1	1.1
Q00-Q99	Congenital Malformations, Deformation and Chromosomal Abnormalities	12	4.7	1.0
E00-E88	Endocrine, nutritional and metabolic diseases	10	3.9	0.8
K00-K92	Diseases of the Digestive System	8	3.1	0.7
N00-N99	Diseases of the Genitourinary System	6	2.3	0.5
	Other Causes	15	5.9	1.2
	Total	**256**	**100.0**	**20.9**
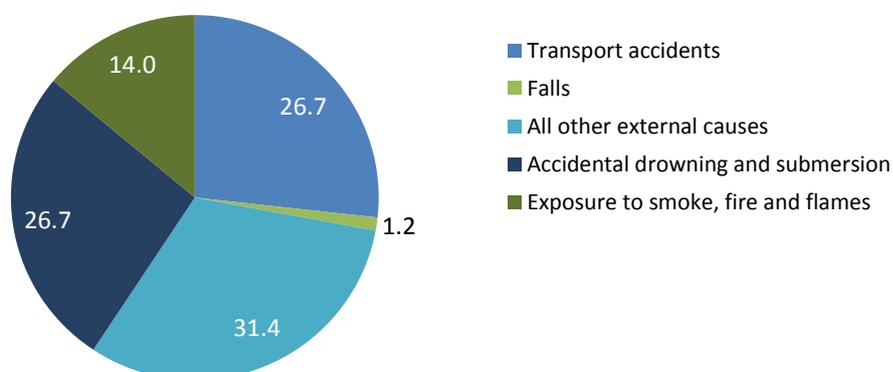
Figure 9: Percent Distribution of external causes of death among children aged 5-14 years
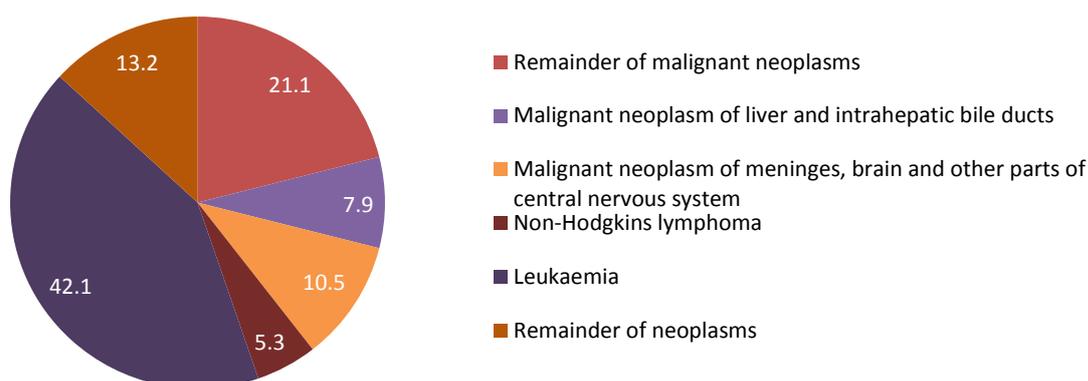
Figure 10: Percent Distribution of Neoplasm deaths among children aged 5-14 years

4.3.3. *Causes of death in Adults Aged 15-34 years*

External causes of morbidity and mortality were the leading cause of deaths in males aged 15-34 between 2015-2017 in Fiji occurring at a rate of 60.4 deaths per 100,000 people. Transport accidents and accidental drowning and submersion, were the leading external causes of death, accounting for 20.5% and 9.9% of deaths from external causes. Diseases of the circulatory system (mainly Ischaemic heart diseases) were the second leading cause of death comprising of a rate of 24.3 per 100,000 population, followed by neoplasms at a rate of 14.2.

Table 32: Cause specific Mortality for adult males aged 15-34 years by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of male deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
V01-Y99	External Causes of Morbidity and Mortality	273	40.2	60.4
I00-I99	Diseases of the circulatory system	110	16.2	24.3
C00-D48	Neoplasms	64	9.4	14.2
A00-B99	Certain infectious and parasitic diseases	44	6.5	9.7
J00-J98	Diseases of respiratory system	43	6.3	9.5
G00-G98	Disease of Nervous System	39	5.7	8.6
K00-K92	Diseases of the Digestive System	23	3.4	5.1
E00-E88	Endocrine, nutritional and metabolic diseases	17	2.5	3.8
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	15	2.2	3.3
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	15	2.2	3.3
N00-N99	Diseases of the Genitourinary System	10	1.5	2.2
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	8	1.2	1.8
Q00-Q99	Congenital Malformations, Deformation and Chromosomal Abnormalities	8	1.2	1.8
L00-L98	Diseases of the Skin and Subcutaneous Tissue	7	1.0	1.5
	Other Causes	3	0.4	0.7
	Grand Total	**679**	**100.0**	**150.3**
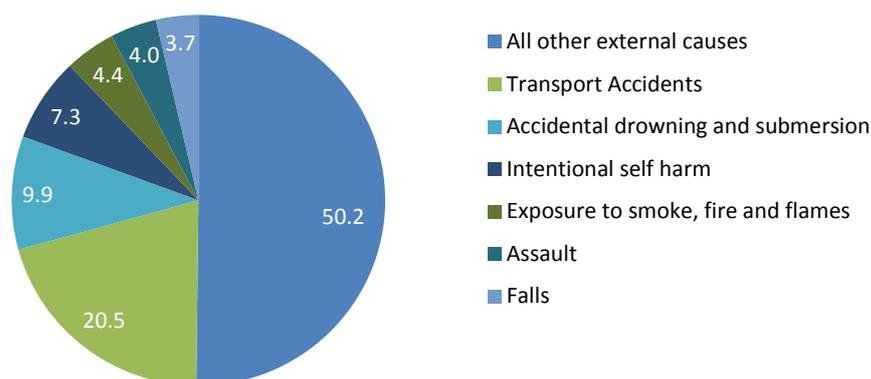
Figure 11: Percent Distribution of external causes of death among males aged1 5-34 years

Note: All other external causes includes deaths due to Accidental poisoning by and exposure to noxious substances

The mortality rate for females aged 15-34 years in Fiji was 116.6 per 100,000 population (compared with males in this age group who recorded 150.3 deaths per 100,000). Similar to males External Causes of Morbidity and Mortality was the leading CoD in females, which accounted for 22.8% of deaths in this age group at a rate of 26.5 per 100,000 people. Exposure to smoke, fire and flames was the most common external CoD, followed by transport accidents. The second leading CoD was Neoplasms with cause specific rate of 22.0 per 100,000 population. Malignant neoplasms of the breast were the most common type of cancer for females of this age group. The third leading CoD was Diseases of the Circulatory System (namely ischaemic heart diseases) with a mortality rate of 19.0 per 100,000 population.

Table 33: Cause specific Mortality for adult females aged 15-34 years by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of female deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
V01-Y99	External Causes of Morbidity and Mortality	112	22.8	26.5
C00-D48	Neoplasms	93	18.9	22.0
I00-I99	Diseases of the circulatory system	80	16.3	19.0
A00-B99	Certain infectious and parasitic diseases	42	8.5	10.0
G00-G98	Disease of Nervous System	30	6.1	7.1
J00-J98	Diseases of respiratory system	24	4.9	5.7
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	21	4.3	5.0
E00-E88	Endocrine, nutritional and metabolic diseases	21	4.3	5.0
N00-N99	Diseases of the Genitourinary System	20	4.1	4.7
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	10	2.0	2.4
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	10	2.0	2.4
O00-O99	Pregnancy, Childbirth and the Pueperium	9	1.8	2.1
K00-K92	Diseases of the Digestive System	8	1.6	1.9
L00-L98	Diseases of the Skin and Subcutaneous Tissue	6	1.2	1.4
	Other Causes	6	1.2	1.4
	Grand Total	**492**	**100.0**	**116.6**
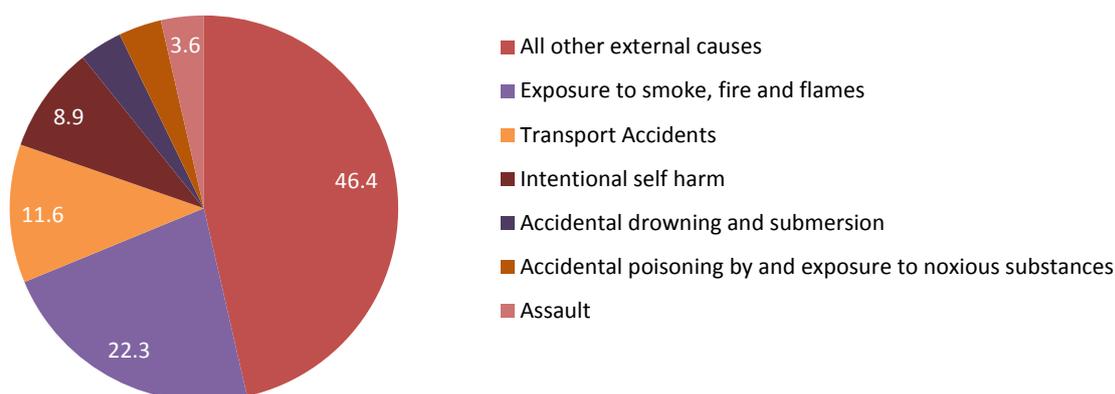
Figure 12: Percent Distribution of external causes of death among females aged 15-34

Note: All other external causes includes deaths due to falls

4.3.4. *Causes of death in Adults Aged 35-59 years*

This age group represents a key change in leading cause of cause for Fijians: excluding infants, the leading cause of death has been external causes of death. For males and females in the 35 and over age groups, non-communicable diseases are the most common causes of death.

Males aged 35-59 years had Diseases of the Circulatory System as the leading CoD which accounted for a rate of 423.4 per 100,000 population followed by the Endocrine, Nutritional and Metabolic diseases at a rate of 191.4 per 100,000 population.

Table 34: Cause specific Mortality for adult males aged 35-59 years by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of male deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
I00-I99	Diseases of the circulatory system	1,697	44.5	423.4
E00-E88	Endocrine, nutritional and metabolic diseases	767	20.1	191.4
C00-D48	Neoplasms	311	8.1	77.6
V01-Y99	External Causes of Morbidity and Mortality	268	7.0	66.9
J00-J98	Diseases of respiratory system	179	4.7	44.7
A00-B99	Certain infectious and parasitic diseases	148	3.9	36.9
K00-K92	Diseases of the Digestive System	126	3.3	31.4
N00-N99	Diseases of the Genitourinary System	89	2.3	22.2
G00-G98	Disease of Nervous System	70	1.8	17.5
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	40	1.0	10.0
L00-L98	Diseases of the Skin and Subcutaneous Tissue	39	1.0	9.7
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	36	0.9	9.0
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	34	0.9	8.5
	Other Causes	12	0.3	3.0
	Grand Total	**3,816**	**100.0**	**952.1**

The average mortality rate for females aged 35-59 years in Fiji was 711.4 per 100,000 population. Endocrine, nutritional and metabolic diseases was the leading CoD in females, which accounted for a rate of 182.7 per 100,000 population in this age group. The second leading CoD was Neoplasms with a cause specific rate of 179.1 per 100,000 population. The third leading CoD was Diseases of the circulatory system with a rate of 177.8 per 100,000 population.

Table 35: Cause specific Mortality for adult females aged 35-59 years by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of female deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
E00-E88	Endocrine, nutritional and metabolic diseases	711	25.7	182.7
C00-D48	Neoplasms	697	25.2	179.1
I00-I99	Diseases of the circulatory system	692	25.0	177.8
A00-B99	Certain infectious and parasitic diseases	107	3.9	27.5
J00-J98	Diseases of respiratory system	100	3.6	25.7
V01-Y99	External Causes of Morbidity and Mortality	89	3.2	22.9
N00-N99	Diseases of the Genitourinary System	79	2.9	20.3
K00-K92	Diseases of the Digestive System	65	2.3	16.7
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	52	1.9	13.4
L00-L98	Diseases of the Skin and Subcutaneous Tissue	51	1.8	13.1
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	46	1.7	11.8
G00-G98	Disease of Nervous System	45	1.6	11.6
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	14	0.5	3.6
Q00-Q99	Congenital Malformations, Deformation and Chromosomal Abnormalities	7	0.3	1.8
	Other Causes	13	0.5	3.3
	Grand Total	**2,768**	**100.0**	**711.4**

4.3.5. *Mortality in Older Adults (Aged 60+ Years)*

Between 2015 and 2017, the average mortality rate for males aged over 60 years in Fiji was 5459.3 per 100,000 population. The leading CoD was circulatory conditions, which were responsible for approximately 43% of deaths in this age group. Specifically, ischemic heart diseases, cerebrovascular conditions and hypertensive diseases were the three most common types of circulatory causes with 1,440, 594 and 408 deaths respectively.

The second leading CoD was endocrine, nutritional and metabolic disorders with a cause-specific rate of 1125.9 deaths per 100,000 population. Deaths in this category were overwhelmingly due to diabetes and its complications, which accounted for approximately 93% of the total.

The third, fourth and fifth leading causes of death were neoplasms, respiratory conditions and infectious diseases recording mortality rates of 450.0, 339.2 and 251.0 per 100,000 population respectively.

The top four causes of deaths for males and females aged 35-59 (see Table 36 and Table 37) and over 60 years between the years 2015 and 2017 are non-communicable diseases (NCDs).

Table 36: Cause specific Mortality in Adult Males Aged 60 and Older by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (Years)

ICD Codes	Disease	Number of male deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
I00-I99	Diseases of the circulatory system	**2,789**	42.9	2,341.7
E00-E88	Endocrine, nutritional and metabolic diseases	**1,341**	20.6	1,125.9
C00-D48	Neoplasms	**536**	8.2	450.0
J00-J98	Diseases of respiratory system	**404**	6.2	339.2
A00-B99	Certain infectious and parasitic diseases	**299**	4.6	251.0
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	**274**	4.2	230.1

N00-N99	Diseases of the Genitourinary System	**204**	3.1	171.3
K00-K92	Diseases of the Digestive System	**197**	3.0	165.4
V01-Y889	Transport Accidents	**166**	2.6	139.4
L00-L98	Diseases of the Skin and Subcutaneous Tissue	**119**	1.8	99.9
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	**50**	0.8	42.0
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	**49**	0.8	41.1
G00-G98	Disease of Nervous System	**43**	0.7	36.1
F00-F99	Mental and Behavioral disorders	**20**	0.3	16.8
	Other Causes	**11**	0.2	9.2
	Grand Total	**6,502**	100.0	5,459.3

The average mortality rate of females aged over 60 years in Fiji was 4272.2 per 100,000 population. The leading CoD was Diseases of the circulatory system with 35.7% of deaths in this age group. Endocrine, nutritional and metabolic diseases was the second leading CoD with a cause-specific rate of 1092.4 deaths per 100,000 population. The third leading CoD was Neoplasms with a mortality rate of 490.5 per 100,000 population.

Table 37: Cause specific Mortality in Females Aged 60 and Older by ICD {chapter or General mortality list 1} (deaths per 100,000 population, including 95% Confidence Intervals), (2015-2017)

ICD Codes	Disease	Number of female deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
I00-I99	Diseases of the circulatory system	2,096	35.7	1,525.5
E00-E88	Endocrine, nutritional and metabolic diseases	1,501	25.6	1,092.4
C00-D48	Neoplasms	674	11.5	490.5
R00-R99	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	341	5.8	248.2
A00-B99	Certain infectious and parasitic diseases	303	5.2	220.5
J00-J98	Diseases of respiratory system	216	3.7	157.2
V01-Y99	Transport Accidents	142	2.4	103.3
N00-N99	Diseases of the Genitourinary System	140	2.4	101.9
L00-L98	Diseases of the Skin and Subcutaneous Tissue	139	2.4	101.2
K00-K92	Diseases of the Digestive System	130	2.2	94.6
D50-D89	Disease of the Blood and Blood-Forming organs and certain disorders involving the immune mechanism	61	1.0	44.4
M00-M99	Diseases of the Musculoskeletal System and Connective Tissue	61	1.0	44.4
G00-G98	Disease of Nervous System	46	0.8	33.5
F00-F99	Mental and Behavioral disorders	13	0.2	9.5
	Other Causes	7	0.1	5.1
	Grand Total	**5,870**	**100.0**	**4,272.2**

4.4. Adult Mortality from Non-Communicable Diseases

NCDs are the leading CoD in Pacific Islands and territories. A number of NCD-related indicators can be used to measure progress against NCD-related mortality including cause-specific proportional mortality (% of deaths due to selected NCDs), cause-specific mortality rates from selected NCDs and age standardized mortality rates from NCDs. These are provided below.

4.4.1. *Cause-specific proportional mortality*

Cause-specific proportional mortality for adults aged 15-59 years from specific groups of NCDs (1-026 – Neoplasms, 1-052 – Diabetes, 1-064 Diseases of the Circulatory System, 1-076 – Chronic Lower respiratory Disease, 1-080 – Diseases of the Liver) shows the proportion of deaths due to these diseases. NCDs contributed to 44% of deaths among persons aged 15-34. This proportion increased to

75% among adults aged 35-59. For both age groups, diseases of the circulatory system contributed to the greatest proportion of deaths from these causes.
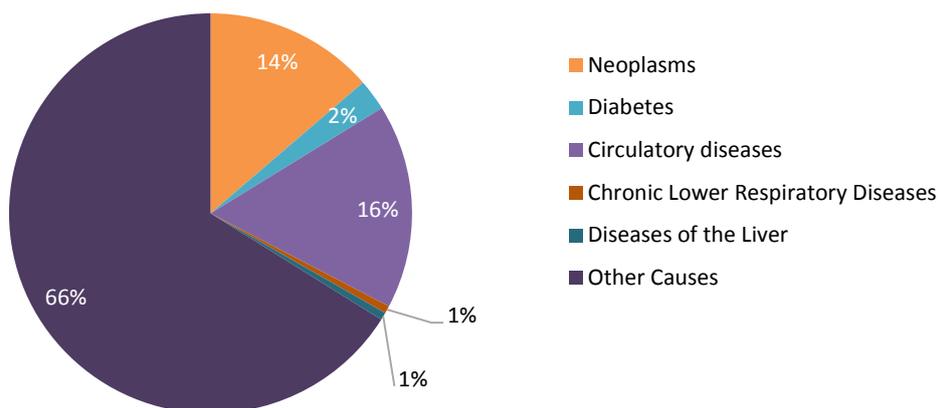
Figure 13: Percent Distribution of the leading causes of death in adults aged 15-34
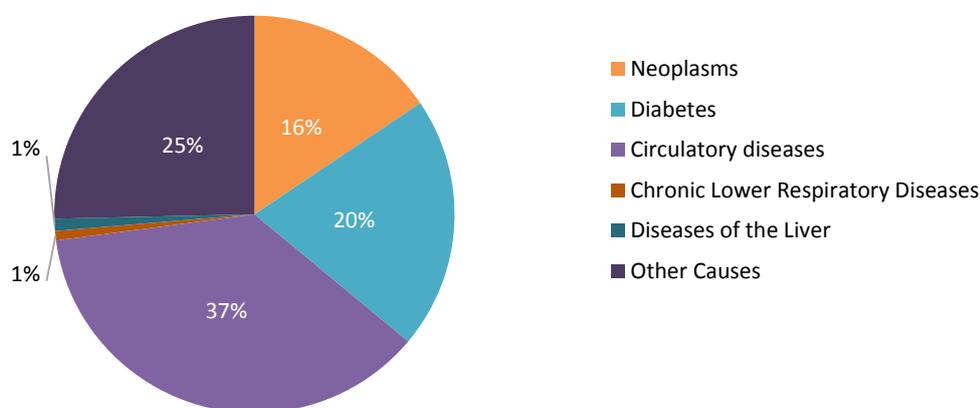
Figure 14: Percent Distribution of the leading causes of death in adults aged 35-59

4.4.2. *Cause-specific mortality rates from selected NCD's*

While proportional mortality shows the relative burden from NCDs compared to other causes of death and is easy to measure, it does not provide a measure of the overall impact of NCD related deaths and therefore does not paint a complete picture. Cause-specific mortality rates provide a direct measure of the overall impact of NCD-related deaths on the population. While these rates cannot be used to provide a comparison either between countries or over time as they will be affected by the age structure of the population, rates for 15-34 and 35-59 year olds can be useful in providing more detailed information for targeting specific NCD-related interventions.

For males aged between 15-59, the most common cause of NCD death is due to circulatory diseases (such as ischaemic heart diseases and strokes)with 1,807 deaths in 2015-2017.. The most common cause of NCD death for females in the same age group was neoplasms with 790 deaths occurring over the same period .

When looking at NCD deaths at different age groups, the leading NCD cause is the same for those aged 15-34 and 35-59, but the number and rate of death are significantly lower in the younger age group. Deaths due to diabetes are rare in those aged between 15-34, however, from aged 35-59, diabetes is the second leading cause of NCD death for males and third for females with 667 and 663 deaths respectively.

Table 38 to

Table 41 provide the cause specific mortality rate for NCDSs, disaggregated by different age groups and sex.

Table 38: Cause Specific Mortality for Selected NCD's for Male 15-34 year age group (2015-2017)

ICD Codes	Disease	Number of Deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
I00-I99	Circulatory Diseases	110	16.2	24.3
C00-D48	Neoplasms	64	9.4	14.2
J40 - J47	Chronic Lower Respiratory Disease	18	2.7	4.0
E10-E14	Diabetes	11	1.6	2.4
K70 - K76	Diseases of The Liver	4	0.6	0.9
	Other Causes	472	69.5	104.5
	Grand Total	**679**	**100.0**	**147.2**

Table 39: Cause Specific Mortality for Selected NCD's for Female 15-34 year age group (2015-2017)

ICD Codes	Disease	Number of Deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
C00-D48	Neoplasms	93	18.9	22.0
I00-I99	Circulatory Diseases	80	16.3	19.0
E10-E14	Diabetes	18	3.7	4.3
J40 - J47	Chronic Lower Respiratory Disease	10	2.0	2.4
K70 - K76	Diseases Of The Liver	3	0.6	0.7
	Other Causes	288	58.5	68.2
	Grand Total	**492**	**100.0**	**114.9**

Table 40: Cause Specific Mortality for Selected NCD's for Male 35-59 year age group (2015-2017)

ICD Codes	Disease	Number of Deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
I00-I99	Circulatory Diseases	1,697	44.5	423.4
E10-E14	Diabetes	667	17.5	166.4
C00-D48	Neoplasms	311	8.1	77.6
J40 - J47	Chronic Lower Respiratory Disease	99	2.6	24.7
K70 - K76	Diseases Of The Liver	41	1.1	10.2
	Other Causes	1,001	26.2	249.8
	Grand Total	**3,816**	**100.0**	**952.1**

Table 41: Cause Specific Mortality for Selected NCD's for Female 35-59 year age group (2015-2017)

ICD Codes	Disease	Number of Deaths	Percentage distribution of deaths by cause	Cause specific Mortality Rate per 100,000 population
C00-D48	Neoplasms	697	25.2	179.1
I00-I99	Circulatory Diseases	692	25.0	177.8
E10-E14	Diabetes	663	24.0	170.4
J40 - J47	Chronic Lower Respiratory Disease	50	1.8	12.9
K70 - K76	Diseases of the Liver	23	0.8	5.9
	Other Causes	643	23.2	165.3
	Grand Total	**2,768**	**100.0**	**711.4**

4.4.3. *Age-standardised mortality from NCD's*

For comparison over time and across countries, age standardised rates for the selected NCD's should be used. Table 42 shows age-standardized death rates for NCD's, using the WHO World Standard

Population. Using this standardization, for every 100,000 adults aged 15-59, 153 would die in a given year from diseases of the circulatory system, 80 would die from Diabetes and 69 from Neoplasms. The distribution by sex shows that more males than females would die within a given year from Circulatory diseases, while a higher number of females than males would die from Neoplasms and Diabetes.

Table 42: Age-standardized cause-specific mortality rates for adults aged 15-59 years for selected NCDs by sex (deaths per 100,000 populations), (2015-2017)

Selected NCDs	Male	Female	Total
Circulatory Diseases	212.0	93.0	153.0
Diabetes	79.0	81.0	80.0
Neoplasms	44.0	96.0	69.0
Chronic lower respiratory diseases	15.0	7.0	10.0
Diseases of the Liver	5.0	3.0	4.0

4.4.4. *The probability of dying among adults aged 30-69 years (inclusive) from designated NCDs – WHO Indicator*

The probability of dying among adults aged 30-69 years (inclusive) from specific causes has recently been introduced by WHO as an outcome indicator for the impact of NCDs. As such, estimates of mortality from selected NCDs for this age group are reported here for comparison with international reporting. These are outlined in Table 43. This indicator does not include deaths from Diseases of the Liver (1-080), which are included in the earlier indicators as most deaths in these categories will be due to chronic diseases that are occurring in the Pacific region. NCDs are the leading cause of mortality in the world and the Pacific.

Table 43: Selected non-communicable diseases (NCDs) for reporting against international targets by ICD General Mortality List 1

List code	Disease	ICD Codes
1-026	Neoplasms	C00–D48
1-053	Diabetes mellitus	E10–E14
1-064	Diseases of the circulatory system	I00–I99
1-076	Chronic lower respiratory diseases	J40–J47

Table 44: Total Deaths from selected NCDs in 30-69 year olds (inclusive) by sex, (2015-2017)

CODE	Diseases	Males	Females	Total
1-064	Diseases of the circulatory system	3,064	1,376	4,440
1-053	Diabetes mellitus	1,307	1,320	2,627
1-026	Neoplasms	591	1,105	1,696
1-076	Chronic lower respiratory diseases	220	91	311

The probability of dying from these diseases is calculated using life table methods, and is noted below. This is the probability that a person aged 30 will die from the selected disease before their 70th birthday. The results in Table 45 indicate that males aged 30 had a 39% chance of dying from a Non-communicable disease before reaching age 70. The probability of dying was lower in females, with a 30-year-old woman having a 30% percent chance of dying before her 70th birthday from selected NCDs. For both sexes combined, a 30-year-old adult had a 34 percent chance of dying from the selected NCDs before reaching their 70th birthday. The probability of dying before attaining 70 years was highest among persons with diseases of the circulatory system (19%) followed by those with Diabetes mellitus (12%).

Table 45: Probability of dying (%) from selected NCDs in 30-69 year olds (inclusive) by sex, (2015-2017)

CODE	Diseases	Males	Females	Total
1-064	Diseases of the circulatory system	24.9	12.1	18.5
1-053	Diabetes mellitus	12.0	11.8	11.9
1-026	Neoplasms	5.6	8.8	7.2
1-076	Chronic lower respiratory diseases	2.1	0.8	1.5
TOTAL		38.8	29.9	34.4

CONCLUSION RECOMMENDATIONS AND POLICY IMPLICATIONS

Data collection systems

Despite the recognized importance of civil registration as a national source of vital statistics, birth and death registration in Fiji is still incomplete i.e. falls below the 90% threshold recommended by United Nations for universal completeness. The data analysed in this report shows a systematic decline in the number of births registered from years 2015-2017, which is, attributed to late registrations i.e. parents or guardians delaying to register a birth. Demand for birth registration is strongly driven by the need for a birth certificate for use for alternative purposes. This situation is likely to change with the implementation of the Baby grant in 2018 under the Parenthood Assistance Payment scheme, which is linked to birth registration and possession of a birth certificate.

Adult deaths are more likely to be registered if they have a will or provident fund from which their families and relatives can benefit from. There are currently no incentives in place for registration of children deaths and so they are less likely to be reported and registered. In general, there is need to build incentives that encourage early registration of both births and deaths and a review of existing business processes to encourage data sharing with the institutions where such missing data may be made available.

It should be noted that early registration (registration within at least the first year of occurrence of a vital event) is critical for the timely production of vital statistics. At present the Fiji Bureau of Statistics estimates mortality through indirect methods; a set of questions concerning mortality is included in the Census interview schedule and is collected every ten years. These estimates can be greatly improved through systematic, complete and universal counts of deaths and births from the civil registry. Though it is out of scope of routine registry operations, it may also be worth considering maintaining a record of deaths of Fiji citizens that occur overseas, as it could give health professionals a better picture of certain illnesses that could be increasing in the country but are not recorded since they occur overseas. In addition to completeness of data collection, it is critical that attention is given to improving the quality and completeness of the data collected from both systems.

Births

Fertility indicators show a similar distribution for the two periods, 2012-2014 and 2015-2017 with a total fertility rate of 2.9. A few births (45) were recorded among woman aged 50+; these were later identified to be children adopted hence the age provided was that the adoptive parents rather than the biological parents. Future analysis should endeavor to apply the age of the biological parents, it is also critical that this data is made available by the registry when data is required for analytical purposes. The baby's birth weight, a critical indicator for assessment of maternal and child health was not provided for 57.5% and 48.1% of birth records analyzed in periods 2014-2015 and 2015-2017 respectively. It is important that data collection for this variable is strengthened.

Deaths

Crude death rate, 2015–2017, was at 8 deaths per 1,000 population. The age specific mortality follows a typical pattern with a high risk of death among children especially those below 1 year. Noting the there are no specific incentives for registration of child deaths these deaths are likely to be unreported and hence the need to strengthen data collection processes for this age group. It is also pertinent to ensure that all live births are registered including those that die immediately after birth as these count for vital statistics reporting. Infant mortality was at 12.5, which is a slight decline from that reported by FBoS in 2013 (15.9). Strengthening of infant and child health programmes (including immunisation) is critical. There were 14 maternal deaths recorded over the period (2015-2017). Noting that maternal mortality is largely preventable, there is great scope for Fiji to make improvements in this area. There is also need to strengthen capacity in maternal death certification, to ensure that these deaths are well monitored and that appropriate public health initiatives are put in place.

Life expectancy remains low compared to the neighboring countries such as Australia and New Zealand, and is largely affected by the premature mortality associated to non-communicable diseases.

Causes of death

There is as significant burden of NCDs on both male and female mortality; observed in the younger age groups 15-34 through to the older ages. The top four causes of death in Fiji are NCD related with diseases of circulatory system leading the mortality (death) tally. Diabetes, Cancer and Chronic lower respiratory diseases also add to the important causes of death in country. The risk of NCDs in the Pacific is widely recognised. Key risk factors for NCDs include smoking, obesity, raised blood pressure, low levels of physical activity and diet consisting of servings of less than 5 fruit and vegetables per day. The Fiji STEPS report from 2002 identified males in the 60-64 age group to be at heightened risk of living with one or more NCDs when three or more of these risk factors are present. The Fiji STEPS Survey report 2011 highlighted the worsening of the NCD situation in Fiji. Fiji is in the grip of an NCD crisis, along with the rest of the countries in the Pacific region and a considerable intensification of efforts to tackle NCDs is vital. Identification, prevention and control of the related risk factors is still considered to be the mainstay of addressing the NCD crisis (Dr. Wendy Snowdon and Dr. Ilisapeci Kubuabola (Pacific Research Centre of Prevention of Obesity and NCD (C-POND), 2011).

According to the World Health Organization (WHO), strategies to ensure tackling of this NCD crisis include (World Health Organization, 2018):

- Building healthy public policies - While certain policies have been implemented to curb the rise in NCDs through certain fiscal interventions such as excise taxes, there could be other policies adopted. One of these could be developing an incentive or recognition programme for sellers/restaurants to offer healthy options at an affordable value which creates an environment for consumers to make the right choices. Additional incentives include making healthy choices a cheaper choice for consumers. Increasing excise tax on sugar sweetened beverages, alcohol, carbohydrates dense foods, cigarettes, oils and fats.
- Creating supportive environments – this includes having a multi-pronged approach to tackling the crisis based on the evidence for early intervention. An example is building infrastructure that promotes and enhances of physical activity.
- Re-orienting health services – this includes having an integrated approach to interventions. For example, include tackling NCDs where there has been no development of risk factors which extends to Ante-Natal clinics and pre-education era (Birth – 5yrs).
- Develop personal skills – this includes provides avenues for the public and stakeholders to access much needed knowledge and application of this knowledge to practice. Essentially, this is about empowering the people.

Whilst these strategies exist and are demonstrable, they require key evidence to support specific interventions and to monitor and evaluate these interventions. Information is the key element in effecting change and affecting enhanced population health outcomes, hence the need to invest in strengthening the relevant data collection systems and processes.

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APPENDICES

Appendix 1: Statistical Tables

POPULATION ESTIMATES

Table 46: Population Estimates by sex and specific age groups, 2016 mid-point

Age	Males	Females	Total
0	41,200	39,200	80,400
5	41,500	39,200	80,700
10	41,000	38,100	79,100
15	39,300	36,500	75,800
20	39,100	36,700	75,800
25	36,100	33,700	69,800
30	36,100	33,800	69,900
35	32,500	31,200	63,700
40	28,600	26,900	55,500
45	25,700	25,300	51,000
50	25,300	25,000	50,300
55	21,500	21,300	42,800
60	15,700	16,400	32,100
65	11,100	12,000	23,100
70	7,100	8,500	15,600
75+	5,800	8,900	14,700
Total	**447,600**	**432,700**	**880,300**

Source: FBOS

BIRTHS

Table 47: Total Number of Births by Age of Mothers in Age Groups, 2012–2017 before adjustment

5 Yr Age Grp	2012 F	2012 M	2013 F	2013 M	2014 F	2014 M	2015 F	2015 M	2016 F	2016 M	2017 F	2017 M
> 15	3	0	1	4	2	0	2	3	2	1	3	1
15-19	505	546	410	502	381	417	401	381	313	336	278	316
20-24	2860	3050	2881	3052	2546	2651	2510	2683	2119	2338	1867	2103
25-29	3062	3190	3081	3227	2650	2886	2517	2754	2254	2420	2108	2181
30-34	2169	2282	2182	2310	1910	2129	1909	2064	1650	1865	1465	1618
35-39	983	1089	1154	1170	967	1055	965	1054	852	955	760	838
40-44	322	288	317	325	279	298	279	299	239	232	224	227
45-49	34	36	23	30	22	24	16	32	17	19	16	15
50+	7	4	4	1	4	6	5	3	1	4	0	2
NS	10	7	3	5	3	2	1	4	2	1	0	1
TOTAL	**9955**	**10492**	**10056**	**10626**	**8764**	**9468**	**8605**	**9277**	**7449**	**8171**	**6721**	**7302**

DEATHS

Table 48: Total Number of Deaths by Sex and Specific Age groups, 2012–2017

Age Group	2015 Female	2015 Male	2016 Female	2016 Male	2017 Female	2017 Male
<28 days	51	96	45	83	93	121
28 days to <1Year	33	46	34	54	37	49
1-4	50	67	57	73	60	74
5-9	18	19	16	24	24	25
10-14	18	25	14	27	28	18
15-19	27	34	20	25	28	22
20-24	41	54	38	55	39	53
25-29	41	69	46	61	45	63

30-34	35	90	63	82	69	71
35-39	71	76	89	112	82	109
40-44	90	140	99	132	121	143
45-49	155	227	147	214	155	197
50-54	267	352	244	361	247	345
55-59	331	453	364	505	306	450
60-64	335	505	372	522	349	481
65-69	334	499	374	530	358	394
70-74	385	448	397	469	343	393
75-79	340	313	357	382	329	358
80-84	274	214	292	253	259	231
85+	248	167	270	174	254	169
Grand Total	**3144**	**3894**	**3338**	**4138**	**3226**	**3766**

Table 49: Life tables; Total population, 2015-2017

Age interval	Lower age interval value (x)	Years in interval	Linearity Adjustment	Reported pop/ births	Adjusted deaths	Mortality rate	Probability of dying	Probability of surviving	Pop surviving (expected)	Deaths (expected)	Years lived in interval	Cumulative yrs lived in interval	LE: Life Expectancy	CIs for Life Expectancy Normal Approx Binom	
(years)		nx	ax	Nx	d(adj)	mx	qx	px	lx	dx	Lx	Tx	ex	L 95% CI	U 95% CI
<5	0	5	0.2	80,400	374.3	0.004656	0.022854	0.977146	100,000.00	2,285.4	490,858.5	6,688,660.8	66.9	66.6	67.2
5-9	5	5	0.5	80,700	42.0	0.000520	0.002599	0.997401	97,714.62	253.9	487,938.2	6,197,802.3	63.4	63.2	63.7
10-14	10	5	0.5	79,100	43.3	0.000548	0.002735	0.997265	97,460.67	266.6	486,636.9	5,709,864.1	58.6	58.3	58.8
15-19	15	5	0.5	75,800	52.0	0.000686	0.003424	0.996576	97,194.08	332.8	485,138.4	5,223,227.2	53.7	53.5	54.0
20-24	20	5	0.5	75,800	93.3	0.001231	0.006138	0.993862	96,861.27	594.5	482,820.1	4,738,088.9	48.9	48.7	49.2
25-29	25	5	0.5	69,800	108.3	0.001552	0.007730	0.992270	96,266.76	744.2	479,473.4	4,255,268.8	44.2	44.0	44.4
30-34	30	5	0.5	69,900	136.7	0.001955	0.009728	0.990272	95,522.60	929.3	475,289.8	3,775,795.4	39.5	39.3	39.8
35-39	35	5	0.5	63,600	179.7	0.002825	0.014026	0.985974	94,593.32	1,326.7	469,649.8	3,300,505.6	34.9	34.7	35.1
40-44	40	5	0.5	55,500	241.7	0.004354	0.021537	0.978463	93,266.59	2,008.7	461,311.1	2,830,855.8	30.4	30.1	30.6
45-49	45	5	0.5	51,000	365.0	0.007157	0.035155	0.964845	91,257.87	3,208.2	448,268.9	2,369,544.7	26.0	25.8	26.2
50-54	50	5	0.5	50,400	605.3	0.012011	0.058302	0.941698	88,049.67	5,133.5	427,414.6	1,921,275.8	21.8	21.6	22.0
55-59	55	5	0.5	42,800	803.0	0.018762	0.089606	0.910394	82,916.18	7,429.7	396,006.5	1,493,861.2	18.0	17.8	18.2
60-64	60	5	0.5	32,000	854.7	0.026708	0.125183	0.874817	75,486.43	9,449.6	353,808.1	1,097,854.7	14.5	14.4	14.7
65-69	65	5	0.5	23,100	829.7	0.035916	0.164785	0.835215	66,036.80	10,881.9	302,979.3	744,046.6	11.3	11.1	11.4
70-74	70	5	0.5	15,700	811.7	0.051699	0.228907	0.771093	55,154.91	12,625.4	244,211.2	441,067.3	8.0	7.9	8.1
≥75	75	18.18182	0.5	14,800	1,628.0	0.110000	1.000000	0.000000	42,529.55	42,529.6	196,856.2	196,856.2	4.6		

Table 50: Life tables; Male population, 2015-2017

Age interval	Lower age interval value (x)	Years in interval	Linearity Adjustment	Reported pop/ births	Adjusted deaths	Mortality rate	Probability of dying	Probability of surviving	Pop surviving (expected)	Deaths (expected)	Years lived in interval	Cumulative yrs lived in interval	LE: Life Expectancy	CIs for Life Expectancy Normal Approx Binom	
(years)		nx	ax	Nx	d(adj)	mx	qx	px	lx	dx	Lx	Tx	ex	L 95% CI	U 95% CI
<5	0	5	0.2	41,200	221.0	0.005364	0.026257	0.973743	100,000.00	2,625.7	489,497.2	6,537,677.1	65.4	65.0	65.8
5-9	5	5	0.5	41,500	22.7	0.000546	0.002727	0.997273	97,374.30	265.6	486,207.6	6,048,179.9	62.1	61.8	62.5
10-14	10	5	0.5	41,000	23.3	0.000569	0.002841	0.997159	97,108.74	275.9	484,853.9	5,561,972.3	57.3	56.9	57.6
15-19	15	5	0.5	39,300	27.0	0.000687	0.003429	0.996571	96,832.81	332.1	483,333.9	5,077,118.5	52.4	52.1	52.8
20-24	20	5	0.5	39,100	54.0	0.001381	0.006882	0.993118	96,500.75	664.1	480,843.5	4,593,784.6	47.6	47.3	47.9
25-29	25	5	0.5	36,100	64.3	0.001782	0.008871	0.991129	95,836.66	850.2	477,057.9	4,112,941.1	42.9	42.6	43.2
30-34	30	5	0.5	36,100	81.0	0.002244	0.011156	0.988844	94,986.51	1,059.7	472,283.3	3,635,883.1	38.3	38.0	38.6
35-39	35	5	0.5	32,500	99.0	0.003046	0.015116	0.984884	93,926.81	1,419.8	466,084.6	3,163,599.8	33.7	33.4	34.0
40-44	40	5	0.5	28,600	138.3	0.004837	0.023895	0.976105	92,507.05	2,210.5	457,009.0	2,697,515.2	29.2	28.9	29.5
45-49	45	5	0.5	25,700	212.7	0.008275	0.040536	0.959464	90,296.57	3,660.3	442,332.1	2,240,506.1	24.8	24.5	25.1
50-54	50	5	0.5	25,300	352.7	0.013939	0.067350	0.93265	86,636.29	5,834.9	418,594.1	1,798,174.0	20.8	20.5	21.0
55-59	55	5	0.5	21,500	469.3	0.021829	0.103499	0.896501	80,801.34	8,362.9	383,099.6	1,379,579.9	17.1	16.8	17.3
60-64	60	5	0.5	15,700	502.7	0.032017	0.148221	0.851779	72,438.48	10,736.9	335,350.2	996,480.4	13.8	13.5	14.0
65-69	65	5	0.5	11,100	474.3	0.042733	0.193041	0.806959	61,701.58	11,910.9	278,730.6	661,130.2	10.7	10.5	10.9
70-74	70	5	0.5	7,100	436.7	0.061502	0.266531	0.733469	49,790.66	13,270.8	215,776.4	382,399.6	7.7	7.5	7.8
≥75	75	15.39142	0.5	5,800	753.7	0.129943	1.000000	0.000000	36,519.91	36,519.9	166,623.2	166,623.2	4.6		

Table 51: Life tables, Female population, 2015-2017

Age interval	Lower age interval value (x)	Years in interval	Linearity Adjustment	Reported pop/ births	Adjusted deaths	Mortality rate	Probability of dying	Probability of surviving	Pop surviving (expected)	Deaths (expected)	Years lived in interval	Cumulative yrs lived in interval	LE: Life Expectancy	CIs for Life Expectancy Normal Approx Binom	
(years)		nx	ax	Nx	d(adj)	mx	qx	px	lx	dx	Lx	Tx	ex	L 95% CI	U 95% CI
<5	0	5	0.2	39,200	153.3	0.003912	0.019257	0.980743	100,000.00	1,925.7	492,297.4	6,849,781.5	68.5	68.1	68.9
5-9	5	5	0.5	39,200	19.3	0.000493	0.002463	0.997537	98,074.35	241.6	489,767.9	6,357,484.1	64.8	64.5	65.2
10-14	10	5	0.5	38,100	20.0	0.000525	0.002621	0.997379	97,832.79	256.4	488,522.9	5,867,716.3	60.0	59.6	60.3
15-19	15	5	0.5	36,500	25.0	0.000685	0.003419	0.996581	97,576.35	333.6	487,047.8	5,379,193.4	55.1	54.8	55.5
20-24	20	5	0.5	36,700	39.3	0.001072	0.005344	0.994656	97,242.76	519.7	484,914.5	4,892,145.6	50.3	50.0	50.6
25-29	25	5	0.5	33,700	44.0	0.001306	0.006507	0.993493	96,723.05	629.4	482,041.8	4,407,231.1	45.6	45.2	45.9
30-34	30	5	0.5	33,800	55.7	0.001647	0.008201	0.991799	96,093.68	788.1	478,498.2	3,925,189.3	40.8	40.5	41.2
35-39	35	5	0.5	31,200	80.7	0.002585	0.012844	0.987156	95,305.62	1,224.1	473,467.7	3,446,691.0	36.2	35.9	36.5
40-44	40	5	0.5	26,900	103.3	0.003841	0.019024	0.980976	94,081.48	1,789.8	465,932.8	2,973,223.3	31.6	31.3	31.9
45-49	45	5	0.5	25,300	152.3	0.006021	0.029659	0.970341	92,291.65	2,737.3	454,615.1	2,507,290.5	27.2	26.9	27.4
50-54	50	5	0.5	25,000	252.7	0.010107	0.049288	0.950712	89,554.38	4,414.0	436,737.0	2,052,675.4	22.9	22.7	23.2
55-59	55	5	0.5	21,300	333.7	0.015665	0.075374	0.924626	85,140.42	6,417.3	409,658.8	1,615,938.4	19.0	18.7	19.2
60-64	60	5	0.5	16,400	352.0	0.021463	0.101852	0.898148	78,723.08	8,018.1	373,570.2	1,206,279.6	15.3	15.1	15.5
65-69	65	5	0.5	12,000	355.3	0.029611	0.137851	0.862149	70,704.99	9,746.7	329,158.1	832,709.5	11.8	11.6	12.0
70-74	70	5	0.5	8,500	375.0	0.044118	0.198675	0.801325	60,958.25	12,110.9	274,514.0	503,551.4	8.3	8.1	8.4
≥75	75	20.35837	0.5	8,900	874.3	0.098240	1.000000	0.000000	48,847.34	48,847.3	229,037.4	229,037.4	4.7		

Appendix 2: 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.

Life Expectancy: 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.

Appendix 3: WHO World Standard Population Distribution

From: AGE STANDARDIZATION OF RATES: A NEW WHO STANDARD, GPE Discussion Paper Series: No.31, EIP/GPE/EBD, World Health Organization 2001

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