KIRIBATI
CIVIL REGISTRATION AND VITAL STATISTICS REPORT
2012–2014

PREPARED BY:
KIRIBATI NATIONAL STATISTICS OFFICE
KIRIBATI CIVIL REGISTRATION OFFICE
KIRIBATI HEALTH INFORMATION UNIT

SUPPORTED BY THE BRISBANE ACCORD GROUP (BAG)

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Cover picture from left to right: Kal Barrie and Chris Palethorpe

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ABBREVIATIONS

ASFR	age specific fertility rate
CBR	crude birth rate
CDR	crude death rate
CRO	Central Registration Office
CRVS	Civil Registration and Vital Statistics
NSDS	National Strategy for Development of Statistics
NSO	National Statistics Office
TFR	total fertility rate
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organization

SUMMARY OF MAIN INDICATORS

Indicator	Disaggregation	Source 2012–2014	
		HIU*	CRO*
Birth registration completeness	Total	93%	85%
Death registration completeness	Total	75.0%	74.8%
Total number of births	Total	7,218	7,839
Sex ratio at birth, M: F	Total	88	—
Crude birth rate (CBR)	Total	24 (23.1:24.9)	—
Total Fertility rate	Total	3.04 (3.1 –3.2)	—
Adolescent birth rate (per 1,000 females)	Total	34 (29.1–38.6)	
Total number of deaths	Total	1,878	1,882
Crude death rate (CDR)	Total	7.8 (7.3–8.3)	—
Under 5 mortality rate (per 1,000 live births)	Total	75.0 (64.9–85.1)	—
Infant mortality rate (per 1,000 live births)	Total	43.2 (35.4–51.0)	—
Neonatal mortality rate	Total	6.4 (3.6 –10.2)	—
Maternal deaths	NA	4	
Maternal mortality ratio (per 100,000 live births)	NA	47.9 (0.9–200.4)	
Life expectancy at birth	Total	61.6 (60.6–62.6)	
Life expectancy at birth	Male	59.3 (57.9–60.7)	
Life expectancy at birth	Female	63.9 (62.5–65.3)	
Adult mortality rate (45q15)	Total	54(49-59)	
Adult mortality rate (45q15)	Male	47(40-54)	
Adult mortality rate (45q15)	Female	60(53-68)	
Probability of 30–69 year-olds dying from a non-communicable disease	Total	24 (20–29)	
Probability of 30–69 year-olds dying from a non-communicable disease	Male	27 (20-34)	
Probability of 30–69 year-olds dying from a non-communicable disease	Female	22 (17–29)	
Proportion of ill-defined deaths	Total	334 (17.8%)	

**HIU–Health Information Unit, CRO–Civil Registration office*

EXECUTIVE SUMMARY

This report presents statistics on live births, deaths and the causes of death in Kiribati for 2012 to 2014. The statistics are based on administrative data provided by the Health Information Unit (HIU) of the Ministry of Health (MoH) and, in a few instances, the Civil Registration Office (CRO). The availability of statistical measures related to births and deaths enable decision-makers to acquire a detailed picture of the nation's current fertility and mortality situation. In Kiribati, these measures have been provided by census collections and through periodic surveys such as the Demographic and Health Survey. While these remain important primary collections for population data, this report underlines the potential role that administrative records play in supplementing this information, even where systems are not complete.

While data from both the CRO and HIU were available, this study only analysed birth data from the HIU because it had captured more births during the reference period than the CRO dataset. Birth registration completeness of the HIU records was estimated at 93%, compared to 83% for the CRO records, when compared with data from the census. Death registration completeness was 75% from both sources. However, only death data from HIU data were analysed, for purposes of consistency. It should be noted that these estimates of completeness do not account for differences in reporting across age or gender, and do not account for duplicate records which were not able to be matched (i.e. the same individual registering with different names), which would artificially inflate the completeness estimate. It is not possible to readily match or compare data sets at the individual level due to a lack of consistency in the data collected.

The analysis focused on cross-tabulation of births, deaths and cause-of-death data by selected demographic variables, primarily age and sex, and the computation of major summary demographic indicators, including proportions, rates, ratios and cause-specific mortality rates. Data were aggregated for stability, and confidence intervals are presented against each estimate to highlight the uncertainty in the data.

There was an average of 2613 births recorded each year in the HIU system over the years 2012 to 2014, making a crude birth rate of 24 births for every thousand people. Based on the recorded births (unadjusted for undercount), on average, each women in Kiribati will give birth to three children over her lifetime. Fertility was highest among women aged 25–29 years. The adolescent fertility rate was 34 births for every 1,000 women aged 15–19, which is below the global adolescent birth rate of 46 but slightly higher than the adolescent birth rate for the Oceania region (34 births per 1,000 women aged 15–19).[1] There were 18 births over this period to girls aged 10–14 years. Most births recorded by the HIU (64%) occurred in health facilities. A unique finding was that the HIU captured a higher number of community births than did the CRO database, revealing weaknesses in the recording of 'non–hospital' births by the civil registration system.

There was an average of 1878 and 1882 deaths recorded each year in the HIU and civil registration system over the years 2012–2014, making a crude death rate of seven deaths for every thousand people. Based on unadjusted reported deaths, the average life expectancy for Kiribati is 61.6 years. Women have a slightly higher life expectancy at birth (63.9 years) compared to men (59.3 years). Adjusting these calculations for under–reporting is difficult without further analysis to examine the distribution of the undercount by age. There were 43 reported infant deaths, six neonatal deaths out

[1] *United Nations, 2015. Word Fertility patterns, 2015.*
http://www.un.org/en/development/desa/population/publications/pdf/fertility/world-fertility-patterns-2015.pdf

of every 1,000 live births, and 75 deaths among children aged below five out of every 1,000 live births in the period 2012–2014. There were four maternal deaths during the three-year period.

Causes of death were coded according to the ICD and tabulated using the World Health Organization General Mortality list 1. 'Other heart diseases' and cerebro-vascular diseases were the leading causes of death among males of all ages recorded in the health data, while diabetes mellitus and 'Other heart diseases' were the leading causes of death recorded among females. At chapter level, diseases of the circulatory system were the leading causes of death among all adults (all ages, both sexes), responsible for 24% of all deaths, followed by infectious and parasitic diseases (16%) and endocrine nutritional and metabolic diseases (15.3%). Malnutrition, diarrhoea and gastroenteritis of presumed infectious origin were the leading causes of death among children aged 0–4 years. Non-communicable diseases (NCDs), primarily neoplasms, diseases of the circulatory system, chronic lower respiratory diseases and diabetes, were responsible for 51% of all recorded deaths among adults aged 15–59. Among NCD causes, diseases of the circulatory system contributed to the largest share of deaths (33%). The leading causes of death among men aged 60+ was 'Other heart diseases (21%), followed by cerebrovascular diseases (12%). Among women aged 60+, the leading causes of death were cerebrovascular diseases, responsible for 12% of all deaths, followed by diarrhoea and gastroenteritis of presumed infectious origin, responsible for 9.3% of all deaths.

There were 334 (17.8%) deaths that were ill-defined, indicating a weakness in collection (through medical certification and community reports) and coding of cause-of-death information and the need to build better capacity in this area. It is worth noting that the health system recorded a higher number of births during the three-year period, and particularly a higher number of community births, compared to the civil registration database. Strengthening links between the two sources could significantly improve the completeness of the civil registration system, and the quality of data across both sources. Priority should be given to establishing procedures to ensure events reported through the health system are shared directly with the civil registry office, and to establishing data collection standards and standardised fields to assist in data matching. Strong consideration should be given to the possibility of a personal identification number (PIN) or other unique identifiers to improve data linkage.

It should also be noted that the significant undercount in reported deaths and the data source used mean that there are likely to be significant biases in the causes of death recorded – with a higher representation of chronic illness where health care is likely to be sought, than the more sudden causes of death such as from injuries and suicide. This was noted in previous studies.[2]

In general, the study demonstrated the potential usefulness of administrative records as sources of vital statistics, and the importance of addressing system gaps to be able to generate reliable data, especially on mortality and causes of death. It is important that the government continues to invest in strengthening these sources, especially in the context of improving the capacity to meet data demands of the global sustainable development agenda.

[2] *Carter KL; Baiteke T; Teea T; Tabunga T; Itienang M; Rao C;Lopez AD;Taylor R, 2016, 'Mortality and life expectancy in Kiribati based on analysis of reported deaths', Population Health Metrics, vol. 14, http://dx.doi.org/10.1186/s12963–016–0072–6*

1. INTRODUCTION

Vital statistics refer to population data that relate to lifetime events such as births, deaths, marriage and divorce. Vital statistics pertaining to births and deaths are particularly critical for Kiribati in the provision of statistical measures that permit the Ministry of Health and other policy-makers to monitor and manage maternal and child health programmes, including the IMCI (Integrated Management of Child Illness) programme and community health programmes such as PEN (Package of Essential Non-communicable disease interventions). Statistics on the number and characteristics of births and deaths also provide useful information for broader national planning in multiple sectors, such as those dealing with education, youth, housing and road infrastructure.

The civil registration system and health records are globally recognised as important administrative sources of vital statistics. Civil registration refers the continuous, permanent, compulsory and universal registration of the occurrence and characteristics of vital events (births and deaths), in accordance with a decree or legal requirements of a country. The primary purpose of the system is to provide individuals with legal identity documents, i.e. birth certificates and death certificates, which are used for multiple purposes, including proof of age and identity during school enrolment, employment, access to pension, and proof of family relationships and eligibility for inheritance of a deceased's estates. The second primary and fundamental function of the civil registration system is to provide a routine source of vital statistics.

In Kiribati, the civil registration system has not been used in the past to provide vital statistics, primarily due to its under-registration of births and deaths, as well as data quality challenges. The government has, however, made numerous efforts to improve the completeness and efficiency of the system and to use it as a routine source of vital statistics. Among these efforts is the commitment to publish a vital statistics report, as a primary measure of assessing the performance of the system, and use the information captured by the system to guide policy on specific areas and measures of improving the system.

The health sector is also an important source of birth and death data. The majority of events (births and deaths) occur in health facilities, where they are administratively recorded. A major challenge is that the events are not always captured in both the civil registration and the health system. It would therefore be of great benefit for the country to establish a closer working relationship between the civil registration and national health departments, particularly to ensure that every event occurring in health facilities is notified to the civil registration office. It is also essential that the civil registration office works towards building strong incentives for registration of vital events among the public, especially to capture events that occur outside health facilities.

This report presents an analysis of birth and death data from Health Information Unit, as this health dataset is the more complete source of birth and death records. The state of completeness of the civil registration system is provided in the next chapter. In a few instances, tabulations of civil registration data are provided in chapter 3 for comparison purposes.

The objective of the report is to present an overview of the available data on live births, deaths and causes of death for 2012 to 2014, based on administrative data collected through the health and, partly, the civil registration system. The essence of compiling this report is to inform policy-makers of the current situation in Kiribati regarding vital statistics, in particular the completeness and accuracy of reporting vital statistics from existing administrative databases.

2. DATA AND METHODOLOGY

2.1 Data sources

The data analysed in this report are mainly derived from the Health Information Unit of the Ministry of Health. In a few instances, tabulations of birth data from the civil registration system are also provided. The Health Information Unit and the Civil Registration Office maintain administrative records of birth and death occurring within the country in varying degree. Civil registration records include births and deaths that occur in the entire country (both institutional and non-institutional events) reported by families as required under national legislation. The Health Information Unit largely maintains a record of births and deaths that occur within health facilities as collated by the staff of those units. The processes followed in the collection of these records by each institution are described in the following section.

The analysis also relies on the population data collected by the 2015 Population and Housing Census. The census findings are used to provide denominators for computation of most of the indicators presented in this report.

2.2 Birth and death registration process

The registration[3] of births and deaths in Kiribati is governed by the Civil Registration Act Cap 54, which requires that informants (the mother, father or relative of a child born, or of a deceased person) provide birth and death information to the civil registrar within ten days of occurrence of the event.[4] All events of birth and death are registered in the district in which they occurred (at the district registrar's office).

During the registration process in the outer islands, the informant is required to provide documentary evidence, such as a birth notification, from the nurse or a medical aide. A birth certificate is then completed and issued. This is free of charge for new born babies only. The same process applied for persons born outside hospital. For South Tarawa, the process is quite different. There are two civil registration officers permanently stationed within hospitals. These officers fill out the birth notification forms and issue birth certificates before the mother is discharged from the hospital. This process is undertaken free of charge.

Upon such reporting, the event is recorded by a registration clerk in a register; it is then submitted to a data entry clerk on a quarterly basis for electronic recording and thereafter to the national civil registration data base. If the child is registered late or after 12 months, the applicant is required to complete a late birth registration form in order to get birth certificate. The late birth registration application is evaluated by an assessor or magistrate for approval. There is a fee of AUD 11.00 if the application is approved. As part of this application, the applicant is required to bring evidence, such as a baptismal certificate or birth notification or vaccination card, to support the applicant identity. A similar process is applied in the outer islands.

Figure 2.1 provides a generic illustration of the process.

[3] *In this document, the term 'registration' is used to refer to civil registration. i.e. the legal processes through which a government keeps records of birth and death occurring within the population*

[4] *www.paclii.org/ki/legis/consol_act/bdamro436.rtf*

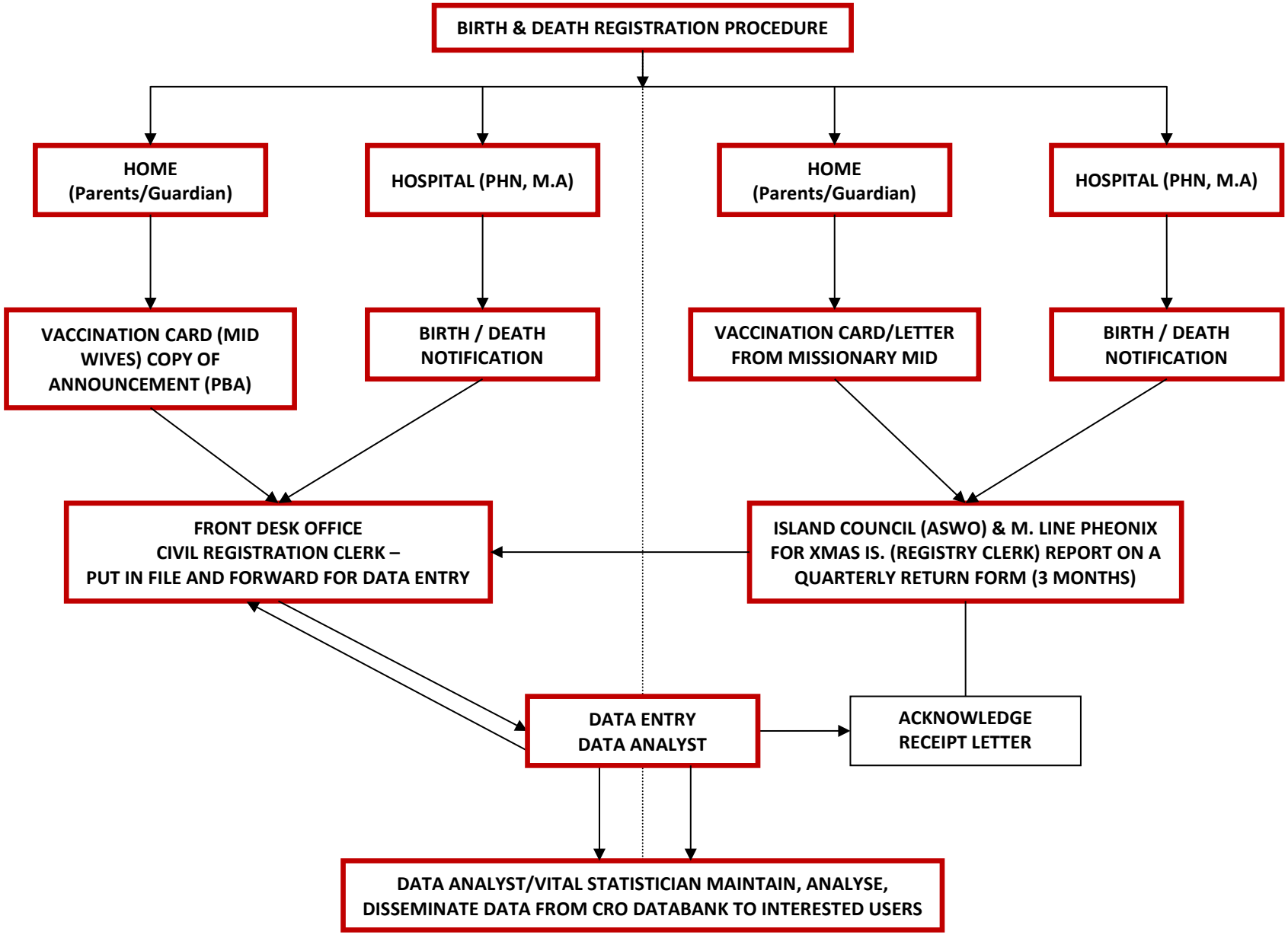

Figure 2.1: Diagram of the reporting and registration processes for births and deaths

2.3 Recording of births, deaths and cause-of-death data in the health sector[5]

The Heath Information Unit (HIU) collects vital event data through monthly returns from all clinics and the three hospitals, and separation forms from the main hospital in Tarawa. HIU collects birth data from two systems. One is the monthly consolidated statistical report (MS 1), a monthly report to HIU that is sent from all health centres, clinics and the three hospitals. The second is the Kiribati Health Information System (KHIS), used by the main hospital, Tungaru Central Hospital on South Tarawa; it has information on admissions, discharges and other important demographic information. Births occurring in the village outside the health facility also get reported by the nurse aides who work in the clinics. Hospitals and medical centres are meant to issue birth notifications following a new memorandum of understanding between the Ministry of Health and the Civil Registration Office.

Cause of death is mainly diagnosed by doctors in the hospitals, whereas in clinics and health facilities it is diagnosed by the Medical Assistants or the Public Health Nurses.

2.4 Data quality

Ensuring that the dataset used for analysis is of the highest possible quality is a fundamental principle of official statistics. In this regard, a comprehensive data cleaning exercise was conducted, which focussed on checking for and eliminating duplicates, imputing for missing data, standardising the records in terms of the nomenclature used to define different variables, and ensuring uniformity of the records.

The data sets obtained from the HIU and CRO databases had a significant number of duplicates, i.e. records of individuals that had been entered in the either system more than once. There were two types of duplicates: (i) identical duplicates, where all the variables entered were the same; and (ii) non-identical duplicates, where most information was identical except for a few variables. Where there was sufficient evidence to identify a record as a duplicate, the record was removed from the database. There is a significant possibility that a number of duplicates were not identified, and hence not removed, because individuals were recorded under different names (or with other details – such as the name of parents), given that many people in Kiribati use multiple names. There is no way to address this problem at the data cleaning stage and future system improvements should consider standards for key data fields as a priority for future system improvements.

Other issues addressed through the cleaning process included standardising the format of reporting variables. For example, there were numerous cases were the sex variable was given as 'Male and Female', in other cases as 'M and F', and in yet other cases as 'm and Female'.

Still-birth records were removed from birth and death data. Missing variables were imputed from other available records (mainly census records) where possible.[6] The cause-of-death data were used to validate the appropriate allocation of sex and age for a deceased, since people of different ages and sex die of different causes. In instances where it was not possible to impute for missing data, such as unknown age and unknown sex, the records were proportionately redistributed.

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[5] In this document, the term 'recording' is used to refer to the process in which the Ministry of health maintains records of events of births and deaths occurring within the country's health facilities

[6] Unit record data from the 2015 Census preliminary data file were also used to validate individual records from both databases during the data cleaning exercise.

2.5 Coverage and completeness of the health information and civil registration system

Coverage and completeness are important measures of the quality of vital event data; these measures provide guidance on the interpretation of vital statistics estimates and enable their comparability, nationally as well as internationally.

Coverage refers to the total geographical area covered by the system, based on the events that are included in the system. Completeness refers to the proportion of events that are recorded or registered in either system as a proportion of the total number of events that are expected to have been captured.

The civil registration system of Kiribati is expected to maintain a record of all births and deaths occurring within the entire country. These include events that occur at home, as well as those that occur in health facilities. The HIU, on the other hand, captures events that occur in hospital/health facilities, as well as those that occur at community level (collected by nurse aides). It is worth noting that this is unique to Kiribati; in most countries, the health information unit is limited to maintaining records of births and deaths that occur within health facilities only. Similar to the civil registration process, the public is still required to make contact with the health unit for such recording to be undertaken.

Birth registration completeness

A rough estimate of birth registration completeness was computed by dividing the total number of births that had been captured in the civil registration data base and health database in the years 2012–2014 by the number of births expected to have occurred over the same period. This approach assumes that the census itself is completely accurate. The expected number of births was derived from a projection of the 2015 population census count. The projected number of births for 2013 was applied, since it is the mid-year population for the period 2012–2014.

Table 2.1: Birth recording and registration completeness (%) by period, 2012–2014

Period	Estimated total number of births (census 2015)*	Number of registered births (Civil registration database)	Proportion of all births legally registered (CRO)*	Number of births recorded (HIU)*	Estimated proportion of all births recorded
2012–2014	8,447	7,218	85%	7,839	93%

** Health Information Unit and civil registration records*

The findings show that the HIU had a higher level of completeness (93%) than the CRO (85%). Therefore, it was found more useful to analyse data from this source. The lower level of completeness in the CRO is most likely related to late registrations; as there is little legal incentive for formal registration of births until enrolment for school much later on.

Death registration completeness

An estimate of death registration completeness was obtained by dividing the total number of deaths from each source by the expected number of deaths. The expected number of death was computed by multiplying the 2010 Census crude death rate (CDR) by the population projected for 2013.[7] Table

[7] *Population of 2013 was used as the mid-point population for years 2012–1014*

2.2 provides the completeness estimates of both the HIU and civil registration system with regard to the recording and registration of deaths.

Table 2.2: Death recording and registration completeness (%) by three-year period, 2012–2014

Period	Estimated total number of deaths*	Number of registered deaths (Civil registration database)	Proportion of all deaths legally registered	Number of deaths recorded (HIU)*	Estimated proportion of all deaths recorded
2012–2014	2,509	1,882	75.0	1,878	74.8

**Health Information Unit and civil registration records*

Death registration completeness for both the health information system and the civil registration database was estimated at 75%. The analysis also found significant differentials in the levels of completeness by age; reported deaths were compared to expected deaths by age group as documented by the 2015 Census. Under-five births were more completely registered in the health information database than in the civil registration database. On the other hand, deaths among older populations were more completely registered in the civil registration database than in the health database. These differentials are expected, as with older ages there is a greater incentive to legally register death because of the possibility of inheritance. The civil registration system is, therefore, expected to record a higher level of completeness in these older age groups. The health system would also be expected to capture a higher number of births, because a significant number of health programmes are targeted at children and infants. The incentive for legal registration of births at a young age is often associated with school enrolment, which occurs around 6–7 years of age.

To cater for the level of incompleteness, the mortality estimates derived were adjusted upwards by 25%. For purposes of consistency with the births and fertility section, the study analysed mortality data provided by the HIU.

Causes of death analysed are based on deaths that were recorded in the health system. All reported deaths had been assigned a cause of death, but there were 334 (17.8%) records that were assigned ill-defined causes. Coding (and correlation to General Mortality list 1) was checked by SPC and a substantive number of errors, where coding had been assigned to an intermediate or incorrect cause, particularly for childhood deaths, were corrected prior to analysis.

2.6 Data analysis

The data were analysed using Microsoft Access and Microsoft Excel. The analysis focused on: (i) cross tabulation of births, deaths and cause-of-death data by selected demographic variables, such as year, age, and sex; and (ii) the computation of major demographic indicators, including proportions, rates and ratios. The three measures of fertility computed were crude birth rate, age-specific fertility rate, and total fertility rate. Mortality measures included crude death rate, age-standardisation death rate, age-specific mortality rate, infant mortality rate, child mortality rate, neonatal mortality rate, and adult mortality rate. These estimates were adjusted upwards to cater for the incompleteness in the reporting of deaths. Cause-of-death data were analysed as proportions only, due to the undercount (and subsequent risk of applying this to population level data).

In order to minimise instability in the figures due to the small size of the population and subsequently the risk of misleading interpretation, data are aggregated over three-year periods for calculation of all rates. Confidence intervals are presented to highlight the uncertainty in the data. These are calculated

using Poisson distributions for all rates, except for crude birth and death rates, where confidence intervals are calculated using normal distributions, due to the small number of events.

Age-standardisation of mortality is done using WHO World Standard Population (See Appendix 3), in order to examine changes in mortality trends separately from any changes in the population age structure, and to present data that could be comparable to other countries.

Life tables are calculated from empirical data using the Chiang Method[8] and are also smoothed for missing data using Modmatch. Confidence intervals for life expectancy, based on the variance of probability of surviving, were also calculated using the Chiang Method.[9]

[8] *Chiang, C. L. (n.d.). Introduction to stochastic processes in Biostatistics. In The life table and its construction (pp. Chapter 9, 189.214). New York: John Wiley & Sons 1968*

[9] *Chiang, C. L. (1967). Vital Health Statistics 2. In C. L. Chiang, Variance and covariance of life table functions estimated from a sample of deaths (pp. 20:1 – 8).*

3. BIRTHS AND FERTILITY

3.1 Reported births by sex

Tables 3.1 and 3.2 provide the average and total number of births that were registered and recorded in the civil registration and HIU systems, categorised by the year of reporting and sex, for the period 2012 to 2014. According to the civil registration database, there was an average of 2,406 live births registered compared to an average of 2,613 births recorded by the HIU system. The higher number or reporting by the HIU confirms an under-registration of births in the civil registration database. As earlier noted, since the health database recorded a higher level of estimated completeness, the analysis in this section is based on data from the HIU, except in a few instances where a comparison of both sources is provided for information.

Table 3.1: Average number of births by three-years period, 2012–2014

Period	Average number of births	
	HIU System	CRO System
2012–2014	2,613	2,406

Source: Health Information Unit and Civil Registration Office

Table 3.3 provides the reported births, by year and sex of the population, proportionally redistributed to account for those missing data on sex. There was an average of 1,393 male births and 1,220 female births per year over the three-year period. The lowest number of reported births was recorded in 2013. There were 265 births that were not allotted a sex variable. These births were proportionately redistributed by sex across the three years.

Table 3.2: Reported^ births by year and by sex, 2012–2014

Year	Number of births by sex		
	Female	Male	Total
2012	1,420	1,223	2,643
2013	1,331	1,245	2,576
2014	1,427	1,193	2,620
Total	**4,178**	**3,661**	**7,839**
Average	**1,393**	**1,220**	**2,613**

^The table provides re–distributed births

Source: Health Information Unit

3.2 Sex ratio at birth

The sex ratio refers to the ratio of males to females in a given population, expressed as the number of males for every 100 females. In Kiribati, the sex ratio at birth was 88. This means that for every 100 live female births reported in the HIU system, there were 88 live male births. The global sex ratio at birth usually ranges between 106 and 107. This means that, at any given point, there is usually a higher number of male births than female births. The substantive variation of the sex ratio at birth from the global average (106 to 107) indicates a potential under-reporting of the male births in the HIU or data quality errors that may result in the sex of the child being mis-recorded – which should be further investigated.

3.3 Place of birth

Eighty-seven per cent of the births registered in the civil registration database are reported to have occurred in health facilities, while only 12.6% are reported to have occurred outside a health facility. The HIU recorded a higher proportion of births outside health facilities, 35.7%. The difference indicates a misalignment in reporting of births by place of occurrence, i.e. either the CR office recorded a lot more births in the health facility than the HIU (2093 compared with 1672), which suggests that not all the births in the health facilities are recorded, or that there was misreporting of place / differences in assigning place between the two. It could be that the CR office records any health evidence as a 'health facility' birth, even if it was a community birth reported to the health facility later.

This finding is unique to Kiribati, as often the civil registration system would be expected to capture a higher number of non-hospital births. The data reveal that there are weaknesses in the recording of non-hospital births by the civil registration system. The health system provides a reliable platform for reaching out to community births and hence improving registration completeness.

Table 3.3: Reported births by place of birth for three-year period, 2012–2014

Place of birth by health facility and home			
Period	**Hospital**	**Non–hospital**	**Total**
2012–2014 (CRO)	6,307 (87.4%)	911 (12.6%)	7,218
2012–2014 (HIU)	5,037 (64.2%)	2,802 (35.7%)	7,839

Source: Health Information Unit and Civil Registration Office

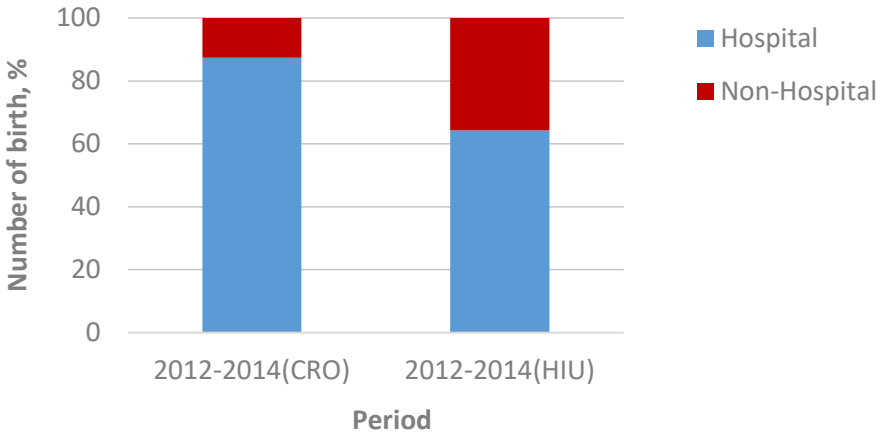


Figure 3.1: Percentage distribution of births by place of birth, 2012–2014

The civil registration database recorded a higher proportion of urban births than did the HIU, possibly reflecting the ease of access to the two systems, i.e. CR requires registration at an urban centre/civil registration office, which are mostly located in the urban areas, while health facilities are in the community.

Table 3.4: Reported births by place of birth (urban or rural area), 2012–2014

Place of birth by urban and rural region			
Period	**Urban**	**Rural area**	**Total**
2012–2014 (CRO)	5,409 (74.9%)	1,809 (25.0%)	7,218
2012–2014 (HIU)	5,156 (65.8%)	2,683 (34.2%)	7,839

Source: Health Information Unit and Civil Registration Office

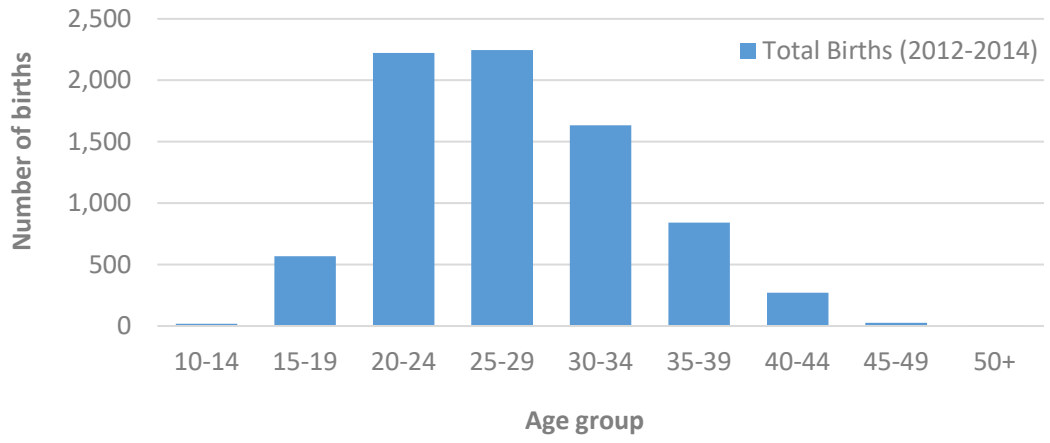
3.4 Births by age of mother

Child-bearing age is generally considered to be from 15 to 49 years of age. Babies born to mothers outside this age range are possible but not common. Table 3.6 shows the percentage distribution of births by age of mother for 2013 to 2015 as recorded by the HIU. Women aged 25–29 had the highest proportion of births (28.8%), followed closely by those aged 20–24 (28.5%). There were 18 births among women aged 10–14 and seven births reported to have occurred among women aged 50+. Women aged 15–19 were responsible for 7.3% of reported births. Two hundred and sixty-five births (3.4%) were not assigned age. These were redistributed. Figure 3.2 provides the redistribution of births recorded in the HIU by the age of the mother.

Table 3.5: Percentage distribution of births by age of mother, 2012–2014

Age group of mother, years	Number	Percentage
10–14	18	0.2
15–19	567	7.3
20–24	2,223	28.5
25–29	2,246	28.8
30–34	1635	20.9
35–39	842	10.8
40–44	271	3.5
45–49	26	0.3
50+	7	0.1

Source: Health Information Unit



Source: Health Information Unit

Figure 3.2: Redistributed recorded births by age of mother, 2012–2014

3.5 Birth by birth weight

A majority of births recorded in the HIU (88%) were in the normal weight range of 2.5 kg or higher. Birth weight statistics are important, as weight is considered to be a significant indicator of infant health and, generally, child survival. The World Health Organization[10] estimates that infants weighing less than 2,500 g are approximately 20 times more likely to die than heavier babies. More common in developing than developed countries, a birthweight below 2,500 g contributes to a range of poor

[10] *http://apps.who.int/iris/bitstream/10665/43184/1/9280638327.pdf*

health outcomes. 7.2% of recorded births were not assigned a birth weight, which indicates the need for better recording.

Table 3.6: Percentage distribution of births by birth weight category, 2012–2014

Period	Proportion of children (%) by birth weight			Total
	< 2.5 kg	2.5 kg or higher	Unknown	
2012–2014	4.76	88.02	7.22	100

Source: Health Information Unit

3.6 Crude birth rate

The crude birth rate (CBR) refers to the number of births per 1,000 population over a specific period of time. It is measured for the purpose of visualising how fast the population is growing or declining, assuming mortality and migration are insignificant. Such information is useful for economic and social development planning in multiple sectors such as education, employment and housing. To compute the CBR, the number of live births recorded in the HIU was divided by the total population (derived from the 2015 Census) and then multiplied by 1,000.

Table 3.7: Crude birth rate with 95% confidence intervals, 2012–2014

Period	Crude birth rate including 95% C.I
2012–2014 (HIU)	24 (23.1–24.9)

Based on the number or births records in the HIU, there was a total of 24 births for every thousand population. The 2010 census reported an average of 31 births out of every 1,000 population.

3.7 Age-specific fertility rates

Fertility rates by age of mother, or age-specific fertility rates, are 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.

Table 3.8: Age-specific fertility rates (ASFR), 2012–2014

Mother's age-group	Number of children	Number of women	Age-specific fertility rates including 95% C.I
15–19	189	5,573	34 (29.1–38.6)
20–24	741	5,343	139 (129.4–147.9)
25–29	749	4,532	165 (154.4–176.0)
30–34	545	3,648	149 (137.8–160.9)
35–39	281	3,069	91 (81.3–101.76)
40–44	90	3,345	27 (21.6–35.6)
45–49	9	2,831	3 (1.45–7.2)
Total	**2,605**	**28,341**	

Source: HIU System, denominator drawn from Census 2015 projection

As observed in Table 3.5, a small number of children were born to mothers below 15 years of age. However, for comparison purposes, the analysis used the globally recognised childbearing age group (15–49) years to estimate the age-specific fertility rates.

Based on the number of reported births, the adolescent fertility rate was 34 births for every 1,000 women aged between 15 and 19 years old. This estimate is higher than the United Nations teenage fertility estimate (2010–2015) for the Oceania and Micronesia regions, which was 30 births for every 1,000 women aged between 15 and 19 years old.[11] A high fertility rate among teenage mothers is expected to result in a higher number of births in the ongoing years. Births among teenage mothers are considered to be high risk births as they increase the chance of maternal death. Kiribati needs to continue to make concerted efforts towards realisation of Sustainable Development Goal 3 on 'significant reduction of the maternal mortality ratio'. Among these efforts is the need to monitor and reduce teenage pregnancies.

Fertility rates are highest amongst women aged 25–29 (165 births for every 1,000 women) and remain relatively high in the 30–34 age group before drastically declining in the 35–39 and 40–44 age groups.

3.8 Total fertility rate

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 child-bearing years experiencing the present-day age-specific fertility rates. The TFR is calculated by multiplying the total age specific fertility rate by five and then dividing the result by 1,000.

Table 3.9: Total fertility rates based on reported births, 2012–2014

Period	Total fertility rate (TFR) (95% CI)
2012–2014 HIU	3.04 (3.1 –3.2)

Based on the births recorded in the HIU, a woman from Kiribati gives birth to an average of three children during her reproductive lifespan. This estimate is lower than the findings of the previous census,[12] which reported that an average women in the country gives birth to four children[13] in her reproductive lifespan (TFR–3.9). Possible reasons for the difference could be that births are more under-reported than estimated here, or that there is an actual decline in fertility following the 2010 Census estimate, which, if it is the cause, is in line with the national population policy.

[11] *United Nations, Department of Economic and Social Affairs, Population Division (2015). World Fertility Patterns 2015 – Data Booklet (ST/ESA/ SER.A/370)*

http://www.un.org/en/development/desa/population/publications/pdf/fertility/world–fertility–patterns–2015.pdf.

[12] Kiribati. National Statistics Office. III. Secretariat of the Pacific Community (2012). Kiribati 2010 Census Volume 2: Analytical Report.

[13] *Rounded off to the nearest whole number*

4. DEATHS

4.1 Reported deaths by sex and year

There was an average of 626 deaths recorded in the HIU for the period 2012–2014. Of these, 1090 (58%) were male deaths. There were significant variations in the number of deaths reported by year. The highest level of reporting for both sexes was in 2014, when 370 and 290 deaths were recorded for males and females respectively. The variation in the annual number of reported deaths is evidence of irregularities in reporting/recording of deaths.

Table 4.1: Reported deaths by sex and year, 2012–2014

Year	Male	Female	Total
2012	412	282	694
2013	309	215	524
2014	370	290	660
Total	**1,090**	**786**	**1,878**
Average	**363**	**262**	**626**

Source: HIU system

To address the effect of under-registration, reported deaths were adjusted by the national crude death rate (7.8) as reported by the census and redistributed by sex. Table 4.2 provides for the adjusted deaths. An average of 836 deaths occurred every year during the period 2012–2014.

Table 4.2: Adjusted deaths by sex, 2012–2014

Period of death	Adjusted deaths		
	Male	Female	Total
2012–2014	1,457	1,051	2,508
Period average	**486**	**350**	**836**

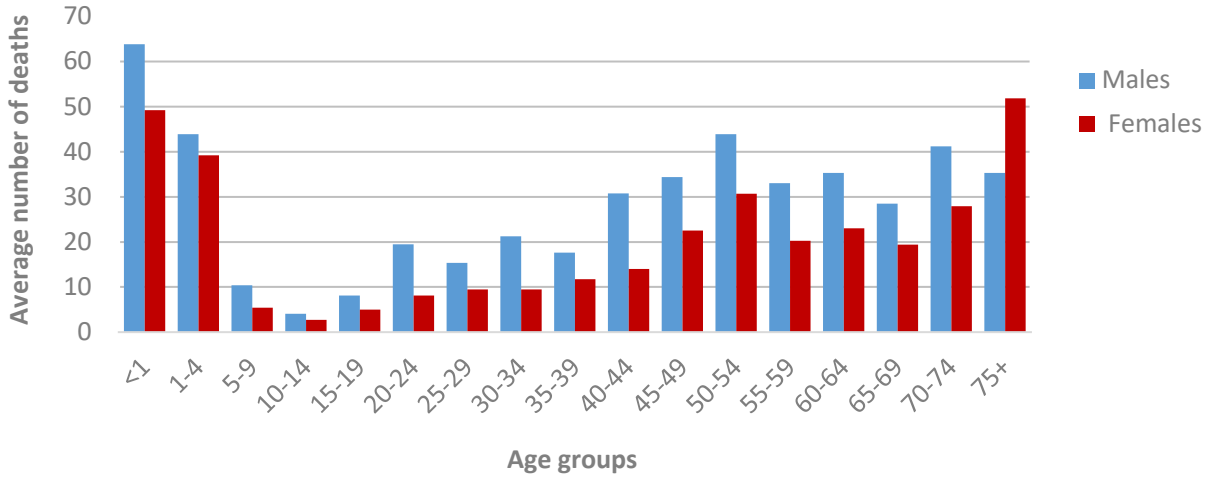
This readjustment assumes that under-reporting is consistent across all age groups and both sexes – and as such is a rough estimate only.

4.2 Deaths by age and sex

Table 4.2 and Figure 4.1 show the distribution of reported deaths by age and sex for the years 2012–2014. The lowest number of deaths was recorded in age group 10–14 (seven deaths). A majority of recorded deaths occurred in the infant and neonatal periods. Deaths of children below one year accounted for 13.5% of all deaths. Mortality was also high among children aged 1–4 years, and declined steadily in the early teenage age groups. There was a steady increase in the number of recorded deaths from the 40–44 age group. Most deaths occurred among males.

Table 4.3: Adjusted deaths by age and sex of the deceased, 2012–2014

Age group	Males	Females	Total	Percentage
<1	64	49	113	13.5
1–4	44	39	83	9.9
5–9	10	5	16	1.9
10–14	4	3	7	0.8
15–19	8	5	13	1.6
20–24	19	8	28	3.3
25–29	15	9	25	3.0
30–34	21	9	31	3.7
35–39	18	12	29	3.5
40–44	31	14	45	5.3
45–49	34	23	57	6.8
50–54	44	31	75	8.9
55–59	33	20	53	6.4
60–64	35	23	58	7.0
65–69	28	19	48	5.7
70–74	41	28	69	8.3
75+	35	52	87	10.4
TOTAL	**486**	**350**	**836**	



^ Adjusted for under–reporting

Figure 4.1: Reported^ deaths by age and sex of the deceased, 2012–2014

4.3 Deaths by island of occurrence

Understanding the distribution of deaths by place occurrence is useful for public health purposes, particularly in enabling health planners to know how to distribute available health infrastructure and resources and also in pointing out regions that may require additional attention. Table 4.3 shows the distribution of reported deaths by the island/place of death. Tungaru Central Hospital accounted for the highest proportion of deaths (37.8%). This was followed by Betio Town Council, which accounted for 8.6% of all deaths. Abaiang, Abemama and Kiritimati accounted for 4.4%, 4,1% and 3.7% of all deaths recorded, respectively.

Table 4.4: Reported^ deaths by island/place of death, 2012–2014

Island	Male deaths	Female deaths	Total	Average
Abaiang	79	32	111	37 (4.4%)
Abemama	65	36	102	34 (4.1%)
Aranuka	31	15	45	15 (1.8%)
Arorae	33	25	59	20 (2.3%)
Banaba	8	5	13	4 (0.5%)
Beru	35	24	59	20 (2.3%)
Betio Town Council	126	90	215	72 (8.6%)
Butaritari	52	32	84	28 (3.4%)
Kiritimati	45	47	92	31 (3.7%)
Kuria	24	12	36	12 (1.4%)
Maiana	21	9	31	10 (1.2%)
Makin	24	15	39	13 (1.5%
Marakei	51	40	91	30 (3.6%
Nikunau	47	13	60	20 (2.4%
Nonouti	39	36	75	25 (3.0%
Onotoa	25	19	44	15 (1.8%)
South Tarawa	5	11	16	5 (0.6%)
Tab North	38	27	65	21 (2.6%)
Tab South	19	5	24	8 (1.0%)
Tabuaeran	56	25	82	27 (3.3%)
Tamana	15	16	31	10 (1.2%)
Tarawa North	47	21	68	22 (2.7%)
Tungaru Central Hospital	500	449	949	316 (37.8%)
Teraina (Washington)	33	19	52	17 (2.1%)
Teinainano Urban Council	37	27	64	21 (2.6%)
Grand Total	**1,457**	**1,051**	**2,508**	**836**

^ Adjusted for under-reporting

4.4 Adjusted crude death rate and age-standardised mortality rate

Table 4.5 presents both the crude death rate (deaths per 1,000 population) and the age-standardised death rate. The crude death rate refers to number of deaths that occur in every 1,000 population in a given period of time. The age-standardised mortality rate (ASMR) is a country's age-specific death rate applied to a standard age distribution. Age-standardised rates allow the comparison of death rates over time or between two different populations without the age structure of the populations influencing the death rates. This is important, as a greater proportion of older people in the population structure (as health conditions improve and people live longer) would actually result in a higher number of deaths (as everyone must eventually die). Populations with a greater proportion of older people have higher crude death rates than populations comprised of young people under identical health and social conditions.

Table 4.5: adjusted crude death rate and age-standardised mortality rate, 2012–2014

Period	Crude death rate (95% C.I)	Age-standardised death rate (95% C.I)
2012–2014	7.8 (7.3–8.3)	11.3 (10.5–12.2)

Note: Data have been age-standardised to the most recent period shown using the WHO World Standard Population. C.I computed by normal approximation of the binomial.

Since death data were adjusted to the census death rate (in order to address the undercount), the crude death rate is drawn directly from the census estimate. The age structure of reported deaths indicates an ASMR of 11.3.

4.5 Age-specific mortality

The age-specific mortality rate refers to the number of deaths per 1,000 people of a given age group in a given time period. Table 4.5 provides the age-specific mortality rates based on recorded deaths for the years 2012–2014. Mortality was high among infants and children aged (0–4 years), then declined, reaching its lowest in age group 10–14, after which it began to rise gradually, and more steadily for persons aged 45+.

Table 4.6: Age-specific mortality rate^ (deaths per 1,000 people), 2012–2014

Age group	ASMR		
	Male	Female	Both sexes (95% C.I)
0–4	14.6	12.3	13.5 (11.6–15.3)
5–9	1.7	1.0	1.4 (0.8–2.5)
10–14	0.6	0.4	0.5(0.2–1.3)
15–19	1.4	0.9	1.2 (0.6–2.3)
20–24	3.6	1.5	2.6 (1.7–4.1)
25–29	3.6	2.1	2.8 (1.8—4.6)
30–34	6.4	2.6	4.4 (3.0–6.9)
35–39	6.3	3.8	5.0 (3.3–8.0)
40–44	10.2	4.2	7.0 (5.1–10.3)
45–49	13.1	8.0	10.4 (7.8–14.6)
50–54	23.3	14.1	18.4 (14.5–24.9)
55–59	23.6	12.3	17.5 (13.0–25.0)
60–64	37.0	20.7	28.2 (21.3–39.7)
65–69	42.7	21.2	30.3 (22.1–43.6)
70–74	92.6	39.4	59.9 (46.5–82.4)
75+	95.4	72.9	80.6 (64.5–107.2)

^ Deaths have been adjusted for under–reporting

There were fluctuations in mortality patterns, especially for age group 55–59, which showed a slight decline in the number of deaths recorded, deviating from the exponential rise that was recorded in the previous age-groups. In most populations, mortality rates start to increase exponentially beyond age 35 or so. The irregularities observed in the smoothness of the curve reflect data quality problems or incompleteness in the level of reporting. Mortality was higher among males than females across all age groups, except among children and in the 20–24, 30–34, and 40–44 age–groups.

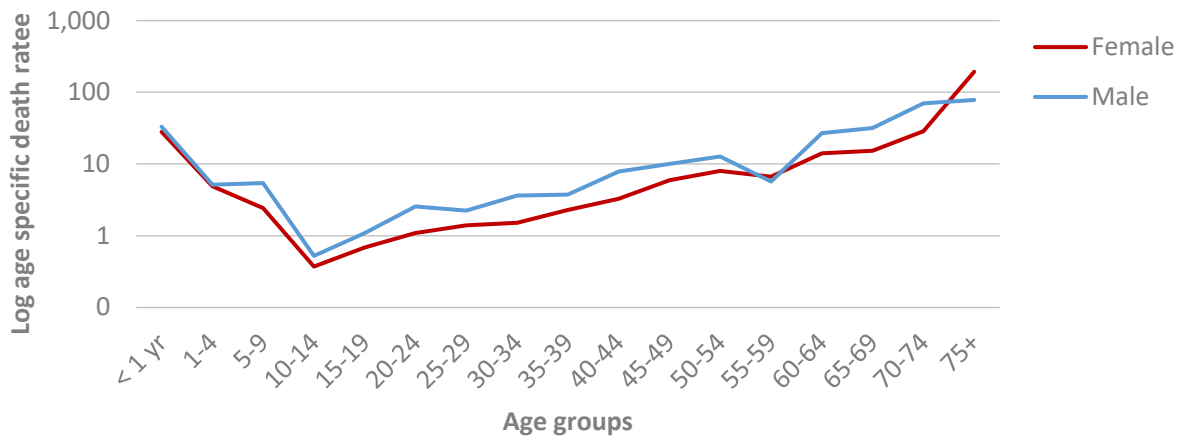


Figure 4.2: Age-specific mortality rates by sex, 2012–2014

4.6 Neonatal mortality

The neonatal mortality rate (NMR) is the number of deaths in live-born infants during the first 28 days of life per 1,000 live births over a specified time period. Mortality during the neonatal period (the first 28 days of life) accounts for a large proportion of child deaths, and is considered to be a useful indicator of maternal and newborn neonatal health and care.

Table 4.7: Neonatal mortality rate^ (95% C.I), 2012–2014

Period	NMR
2012–2014	6.4 (3.6 –10.2)

C.I computed using the Poisson distribution

^ Estimate adjusted upwards by 25% to cater for incompleteness of the data

Based on deaths recorded in the HIU, there were six neonatal deaths out of every 1,000 live births in the years 2012–2014.

4.7 Infant mortality

The infant mortality rate (IMR) shows the number of infant deaths (deaths in children under one year) a year, expressed per 1,000 live births for a given period. Based on deaths recorded in the HIU, there were 43 infant deaths out of every 1,000 live births in the years 2012–2014. The 2010 census reported an infant mortality of rate of 45.

Table 4.8: Infant mortality rate^ (95% C.I), 2012–2014

Period	IMR
2012–2014	43.2 (35.4–51.0)

C.I computed using normal approximation of binomial

^ Estimate adjusted upwards by 25% to cater for incompleteness of the data

4.8 Under five mortality rate

The under-five mortality rate (U5MR) is measured as the number of deaths in children under age five per 1,000 live births in a given period. Based on deaths recorded in the HIU, there were 75 deaths occurring to children aged below five years out of every 1,000 live births in the years 2012–2014. The 2010 census reported an under-five mortality of rate of 59.

Table 4.9: Under five mortality rate^ (95% C.I), 2012–2014

Period	U5MR
2012–2014	75.0 (64.9–85.1)

C.I computed using normal approximation of binomial

^ Estimate adjusted upwards by 25% to cater for incompleteness of the data

4.9 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 Kiribati, life expectancies were derived from life tables developed using the Chiang Method, and were smoothed for missing data using Modmatch. Confidence intervals for life expectancy were computed, based on the variance of probability of surviving. These were also calculated using the Chiang Method.

Table 4.8 presents life expectancy estimates by sex and for both sexes combined. Based on recorded deaths, men are expected to live for 59 years and women for 64 years. These estimates compare quite closely with those estimated by the 2010 Census, which were 59.7 and 67.5 years for men and women respectively. The census estimated life expectancy at birth for both sexes is 63.2 years.

Table 4.10: Life expectancy at birth, 2012–2014

Period	Men	Women	Both sexes
2010–2012	59.3 (57.9–60.7)	63.9 (62.5–65.3)	61.6 (60.6–62.6)

5. CAUSES OF DEATH

Tables 5.1 provides the distribution of causes of death among males and females of all ages, categorized by Chapter level of the ICD–10, General Mortality list 1. Diseases of the circularity system were the leading cause of death, contributing to 20% of all deaths, followed by 'Certain infectious and parasitic diseases' (13.2%) and 'Endocrine, nutritional and metabolic diseases' (12.7%). Three hundred and thirty-three deaths (17.8%) of all deaths were ill-defined and therefore could not be assigned to any particular cause. Ill-defined causes refer to causes where the real cause of death cannot be determined. This occurs when the certifying physician has insufficient knowledge of the disease(s) causing death, and/or has not completed the death certificate properly. Ill-defined causes are indicative of the quality of the cause-of-death data. In Kiribati's case, the high proportion of deaths due to this cause underlines the great need to improve cause-of-death certification in the country.

Table 5.1: Causes of death, all ages and both sexes, 2012–2014

Causes of death males and females all ages	**Total**	**%**
Diseases of the circulatory system	376	20.0
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	334	17.8
Certain infectious and parasitic diseases	248	13.2
Endocrine, nutritional and metabolic diseases	239	12.7
Diseases of the digestive system	150	8.0
Diseases of the respiratory system	133	7.1
External causes of morbidity and mortality	98	5.2
Neoplasms	96	5.1
Certain conditions originating in the perinatal period	66	3.5
Diseases of the nervous system	47	2.5
Diseases of the genitourinary system	43	2.3
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	28	1.5
Diseases of the skin and subcutaneous tissue	10	0.5
Congenital malformations, deformations and chromosomal abnormalities	4	0.2
Pregnancy, childbirth and the puerperium	4	0.2
Diseases of the musculo-skeletal system and connective tissue	2	0.1
TOTAL	**1,878**	
TOTAL LESS ILL-DEFINED CAUSES	**1,544**	

Males and females at different ages die from different causes. Tables 5.2 and 5.3 provide the distribution of the leading causes of death among males and females respectively. These causes are categorised by ICD–10 subchapter level. Among males, 'Other heart diseases' are responsible of a majority of deaths (12.1%), followed by 'Cerebrovascular diseases' (8.2%) and 'Diabetes mellitus' (5%). The greatest proportion of causes of death among males (18%) were ill-defined.

Table 5.2: Top ten causes of death, males all ages, 2012–2014

Causes of death among males	Total	%
Other heart diseases	132	12.1
Cerebrovascular diseases	89	8.2
Diabetes mellitus	54	5.0
Diseases of the liver	53	4.9
Diarrhoea and gastroenteritis of presumed infectious origin	41	3.8
Pneumonia	37	3.4
Malnutrition	35	3.2
Certain conditions originating in the perinatal period	33	3.0
Remainder of endocrine, nutritional and metabolic diseases	33	3.0
Hypertensive diseases	29	2.7
Remainder of diseases of the digestive system	29	2.7
Other causes	321	29.2
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	203	18.6
TOTAL	**1,089**	
TOTAL LESS ILL-DEFINED CAUSES	**886**	

'Diabetes mellitus', 'other heart diseases and cerebrovascular diseases were the leading causes of death among females. These causes were responsible for 7.4%, 6.9% and 5.8% of all deaths respectively. Similar to male deaths, most female deaths were attributed to ill-defined causes (16.6%), which limits their analytical usefulness. It is worth noting that non-communicable diseases are the leading cause of death for both males and females across all age–groups.

Table 5.3: Top ten causes of death, females all ages, 2012–2014

Causes of death among females	Total	%
Diabetes mellitus	58	7.4
Other heart diseases	54	6.9
Cerebrovascular diseases	46	5.8
Diarrhoea and gastroenteritis of presumed infectious origin	45	5.7
Pneumonia	38	4.8
Diseases of the liver	36	4.6
Malnutrition	32	4.1
Certain conditions originating in the perinatal period	31	3.9
Remainder of endocrine, nutritional and metabolic diseases	27	3.4
Septicaemia	27	3.4
Other causes	262	33.3
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	131	16.6
TOTAL	**787**	
TOTAL LESS ILL-DEFINED CAUSES	**657**	

5.1 Causes of death in children aged 0–4 years

Table 5.4 presents the leading causes of death among children 0–4 years, including the cause-specific mortality rates. Malnutrition was the leading cause of death among children in this age group, responsible for 17.6% of all deaths. This was followed by 'Diarrhoea and gastroenteritis of presumed infectious origin' and pneumonia, which were responsible for 15.5% and 11.6% of all deaths in this age group, respectively. Other significant causes of death were 'Remainder of endocrine, nutritional and metabolic diseases', 'Other intestinal infectious diseases' and 'Certain conditions originating in the perinatal period'.

Table 5.4: Cause-specific mortality by ICD General Mortality list 1 (deaths per 100,000 population, including 95% confidence intervals), 0–4 year olds (both sexes combined), 2012–2014

Causes of death among (0–4 year olds), both sexes	**Total**	**Proportional mortality (95% C.I)**	**Cause-specific mortality rate per 100,000 population (95% CI)**
Malnutrition	59	17.6 (14.3–21.1)	405.2 (308.5–522.7)
Diarrhoea and gastroenteritis of presumed infectious origin	52	15.5 (12.2–18.8)	357.2 (266.7–468.4)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	48	—	—
Pneumonia	39	11.6 (8.9–14.6)	267.9 (190.5–366.1)
Remainder of endocrine, nutritional and metabolic diseases	28	8.3 (6.0–11.0)	192.3 (127.8–277.9)
Other intestinal infectious diseases	26	7.7 (5.4–10.1)	178.6 (116.7–261.7)
Certain conditions originating in the perinatal period	25	7.4 (5.1–9.8)	171.7 (111.1–253.5)
Meningitis	17	5.1 (3.3–7.1)	
Septicaemia	11	3.3 (1.8–5.1)	
Accidental drowning and submersion	9	2.7 (1.2–4.2)	
Meningococcal infection	8	2.4 (1.2–3.9)	
All other external causes	7	2.1 (0.9–3.6)	
Anaemia	7	2.1 (0.9–3.6)	
Remainder of diseases of the digestive system	7	2.1 (0.9–3.6)	
All other causes	41		
TOTAL	**384**		
TOTAL LESS ILL-DEFINED CAUSES	**336**		

5.2 Mortality in children aged 5–14 years

Due to the small numbers, cause-specific mortality rates for this age group could not be computed. The proportional distribution of deaths by cause, however, indicates that 'Other heart diseases' and diseases of the nervous system were responsible for the majority of deaths in this age group (both 11.6%). These were followed by 'Diarrhoea and gastroenteritis of presumed infectious origin' and leukaemia, both responsible for 9.3% of deaths in this age group.

Table 5.5: Proportional mortality by ICD General Mortality list 1 (including 95% confidence intervals), 5–14 year olds (both sexes combined), 2012–2014

Causes of death among 5–14 years old, both sexes	Total	Proportional mortality (95% C.I)
Other heart diseases	5	11.6 (4.7–20.9)
Remainder of diseases of the nervous system	5	11.6 (4.7–20.9)
Diarrhoea and gastroenteritis of presumed infectious origin	4	9.3 (2.3–16.3)
Leukaemia	4	9.3 (2.3–16.3)
Accidental drowning and submersion	3	7.0 (2.3–14.0)
Respiratory tuberculosis	3	7.0 (2.3–14.0)
Malnutrition	2	4.7 (0–9.3)
Pneumonia	2	4.7 (0–9.3)
Remainder of malignant neoplasms	2	4.7 (0–9.3)
Transport accidents	2	4.7 (0–9.3)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	7	—
Other causes	11	
TOTAL	**43**	
TOTAL LESS ILL-DEFINED CAUSES	**36**	

5.3 Adult mortality

Adult mortality is the probability of dying between the ages of 15 and 59 inclusive, or the probability of a 15-year-old dying before reaching the age of 60. Table 5.6 shows adult mortality by sex. In general, there was 54% chance of persons aged 15 years dying before reaching age 60. Men had a 47% chance of dying before reaching age 60, compared to a 60% chance among women.

Table 5.6: Adult mortality (%) by sex and period, including 95% confidence intervals, 2012–2014

Period	Men ${}_{45}q_{15}$	Women ${}_{45}q_{15}$	Both sexes ${}_{45}q_{15}$
2012–2014	47 (40–54)	60 (53–68)	54 (49–59)

C.I calculated using Poisson (Dobson)

5.4 Life Expectancy at 40

Life expectancy (LE) at 40 years of age is also an indicative measure of premature mortality. This is the number of years a person aged 40 would be expected to live, on average, if they continued to experience current mortality rates. In Kiribati, on average, persons aged 40 were expected to live for 24 more years. Men have a longer life expectancy at 40 (23 years) than do women (20 years).

Table 5.7: Life expectancy at 40 (LE_{40}) by sex and period, including 95% confidence intervals, 2012–2014

Period	Men ${}_{45}q_{15}$	Women ${}_{45}q_{15}$	Both sexes ${}_{45}q_{15}$
2012–2014	23.2 (22.2–24.2)	20.4 (19.5–21.2)	24.0 (23.2–24.8)

5.5 Causes of death in adults aged 15–59 years

Figure 5.1 provides the percentage distribution of the leading causes of death among adults aged 15–59 years. Diseases of the circulatory system were responsible for the highest proportion of deaths (33%), followed by diseases of the digestive system (16%). Other significant illnesses were endocrine nutritional and metabolic diseases, and external causes of morbidity and mortality. These were responsible for12% and 10% of all deaths in this age group, respectively.

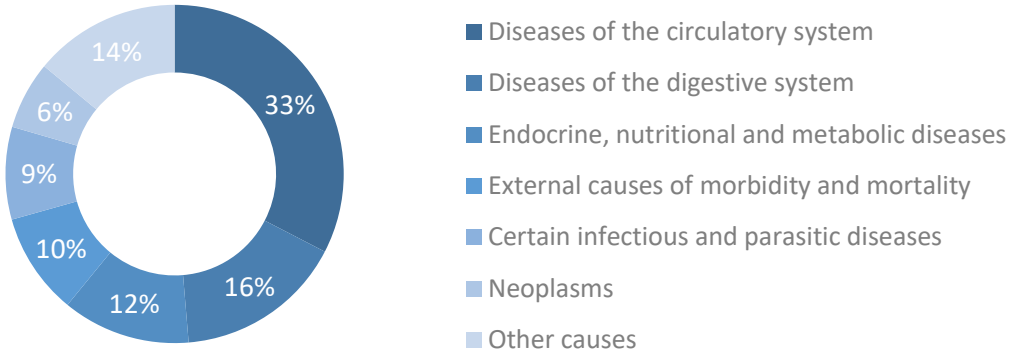


Figure 5.1: Percentage distribution of the leading causes of death in adults aged 15–59, 2012–2014

The distribution of deaths in this age group disaggregated by sex is provided in Tables 5.8 and 5.9. The leading causes of death for males in this age group were heart diseases (18.3%), cerebrovascular diseases (14.3%), diseases of the liver (10.2%) and diabetes mellitus (7.4%). The four leading causes of death among females were similar to those of males although they ranked differently. Diabetes mellitus and diseases of the liver were the two leading causes, followed by heart diseases and cerebrovascular diseases.

Table 5.8: Cause-specific mortality for adult men aged 15–59 years by ICD sub-chapter, General Mortality list 1 (deaths per 100,000 population, including 95% confidence intervals), 2012–2014

Cause of death among adult men (15–59)	Total	Percentage distribution of deaths by cause excluding ill-defined causes (95% CI)	Cause-specific mortality rate per 100,000 population (95% CI)
Other heart diseases	77	18.3 (15.2–21.4)	236.5 (186.7–295.6)
Cerebrovascular diseases	60	14.3 (11.4–17.1)	184.3 (140.7–237.2)
Diseases of the liver	43	10.2 (7.9–12.6)	132.1 (95.6–177.9)
Diabetes mellitus	31	7.4 (5.2–9.5)	95.2 (64.7–135.2)
Intentional self-harm	22	5.2 (3.6–7.1)	67.6 (42.4–102.3)
Remainder of diseases of the digestive system	17	4.0 (2.6–5.7)	52.2 (30.4–83.6)
Hypertensive diseases	15	3.6 (2.1–5.0)	46.1 (25.8–76.0)
All other external causes	12	2.9 (1.7–4.3)	
Chronic lower respiratory diseases	9	2.1 (1.0–3.3)	
Gastric and duodenal ulcer	9	2.1 (1.0–3.3)	
Remainder of diseases of the genito-urinary system	9	2.1 (1.0–3.3)	
Septicaemia	9	2.1 (1.0–3.3)	

Anaemia	8	1.9 (1.0–3.1)	
Ischaemic heart diseases	8	1.9 (1.0–3.1)	
Remainder of diseases of the respiratory system	8	1.9 (1.0–3.1)	
Respiratory tuberculosis	8	1.9 (1.0–.1)	
Transport accidents	7	1. 7(0.7–2.9)	
Viral hepatitis	7	1.7 (0.7–2.9)	
All other causes	61	14.5 (11.7–17.4)	
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	74	17.6	
TOTAL	**494**		
TOTAL LESS ILL-DEFINED	**420**		

Table 5.9: Cause-specific mortality for adult women aged 15–59 years by ICD sub-chapter, General Mortality list 1 (deaths per 100,000 population, including 95% confidence intervals), 2012–2014

Cause of death among adult women (15–59)	**Total**	**Percentage distribution of deaths by cause excluding ill-defined causes (95% CI)**	**Cause-specific mortality rate per 100,000 population (95% CI)**
Diabetes mellitus	42	16.3 (12.4–20.2)	131.2 (94.6–177.4)
Diseases of the liver	32	12.4 (9.3–15.9)	100.0 (68.4–141.1)
Other heart diseases	31	12.0 (8.9–15.5)	96.8 (65.8–137.5)
Cerebrovascular diseases	20	7.8 (5.0–10.5)	62.48 (38.1–96.5)
Malignant neoplasm of cervix uteri	13	5.0 (3.1–7.4)	
Remainder of diseases of the genitourinary system	13	5.0 (3.1–7.4)	
Septicaemia	12	4.7 (2.7–7.0)	
Respiratory tuberculosis	9	3.5 (1.6–5.4)	
Hypertensive diseases	7	2.7 (1.2–4.7)	
Anaemia	6	2.3 (0.8–3.9)	
Malignant neoplasm of breast	6	2.3 (0.8–3.9)	
All other external causes	5	1.9 (0.8–3.5)	
Pneumonia	5	1.9 (0.8–3.5)	
Leukaemia	4	1.6 (0.4–2.7)	
Meningitis	4	1.6 (0.4–2.7)	
Remainder of diseases of the digestive system	4	1.6 (0.4–2.7)	
All other causes	45	17.4 (13.6–21.3)	
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	34		
TOTAL	**292**		
TOTAL LESS ILL-DEFINED	**258**		

5.6 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 accidental or incidental causes. The maternal mortality ratio (MMR) is the ratio of the number of maternal deaths during a given time period per 100,000 live births[14] during the same time–period.

During the years 2012–2014, there were four maternal deaths reported, which is an average of one maternal death per year. The confidence intervals for the maternal deaths, as well as the maternal mortality ratio, are provided in Table 5.10. There were 47 maternal deaths out of every 100,000 live births. This estimate is significantly lower than the estimate published by the 2005 Census report for 2001–2004 inclusive: 158 deaths per 100,000. The differences could be attributed to under-reporting of maternal deaths within the health system.

Table 5.10: Number of maternal deaths, maternal mortality ratio, 2012–2014

Period	Number of maternal deaths	Maternal mortality ratio
2012–2014	1 (0–6)	47.9 (0.9–200.4)

5.7 Adult mortality from non-communicable diseases (NCDs)

Non-communicable diseases are the leading cause of death in the world and more so among Pacific Islands and territories. The World Health Organization recommends that countries monitor and report on the scale of mortality from four primary NCDs, namely: neoplasms, diabetes mellitus, diseases of the circulatory system and chronic lower respiratory diseases. These diseases are known to account for 82% of global deaths and 70–75% of deaths in the Pacific region.[15] In Kiribati, based on the number of deaths reported to the health system for the period 2012–2014, NCDs are estimated to have been responsible for more than half (51%) of all deaths among males and females in the 15–59 age group. Diseases of the circulatory system were responsible for most deaths (33%), followed by diabetes mellitus (11%) and neoplasms (6%). Figure 5.2 provides the proportional distribution of NCD deaths by cause.

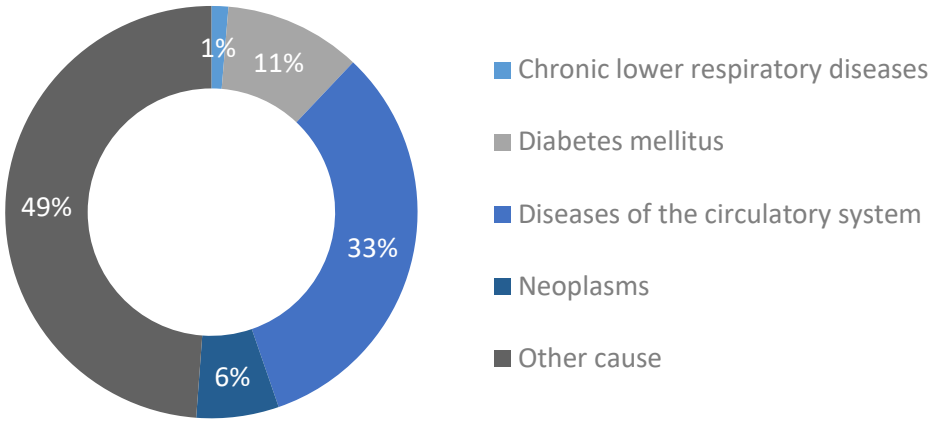


Figure 5.2: Percentage distribution of the leading causes of death in adults aged 15–59 (NCDs versus other causes), 2012–2014

[14] A live birth is defined by WHO as the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, e.g.

[15] http://www.worldbank.org/en/news/feature/2014/07/11/pacific-islands-non-communicable-disease-roadmap

5.8 The probability of dying among adults aged 30–69 years (inclusive) from designated NCDs

The probability of dying among adults aged 30–69 years (inclusive) from specific causes is an outcome indicator for the impact of NCDs. Estimates of mortality from selected non-communicable diseases for this age group are reported here for comparison with international reporting. These are outlined in Table 5.11.

The results indicate that men aged 30 had a little more than one in four (27%) chance of dying from one of the four main NCDs before reaching age 70. The probability of dying before reaching age 70 was slightly lower in women, with a 30-year-old woman having a 22% chance. For both sexes combined, a 30-year-old adult had a 24% chance of dying from the selected NCDs before reaching their 70th birthday, highlighting the effect of NCDs on adult mortality in Kiribati.

Table 5.11: Probability of dying from selected NCDs in 30–69 year-olds (inclusive) by sex, 2012–2014

Sex	Probability of dying (%) from selected NCDs in 30–69 year-olds (95% C.I)
Males	27 (20–34)
Females	22 (17–29)
Both sexes	24 (20–29)

5.9 Causes of death in older adults

Heart diseases, cerebrovascular diseases and diabetes mellitus were the leading causes of death among men aged above 60 years. These causes were responsible for 21.0%, 12.2% and 9.6% of deaths respectively. Cerebrovascular diseases were the leading cause of death among women aged 60+ (12.4%). Other significant causes of death in this age group were diarrhoea and gastroenteritis of presumed infectious origin, 'Other heart diseases' and diabetes mellitus.

Table 5.12: Cause-specific mortality in men aged 60+ by ICD sub–chapter, General Mortality list 1, deaths per 100,000 population, including 95% confidence intervals, 2012–2014

Cause of death among males 60+	Total	Percentage distribution of deaths by cause excluding ill-defined causes (95% CI)	Cause-specific mortality rate per 100,000 population (95% CI)
Other heart diseases	48	21.0 (16.6–25.3)	659.3 (376.8–1070.6)
Cerebrovascular diseases	28	12.2 (8.7–15.7)	384.6 (169.6–704.0)
Diabetes mellitus	22	9.6 (6.6–13.1)	302.2 (116.0–594.3)
Chronic lower respiratory diseases	15	6.6 (3.9–9.2)	
Hypertensive diseases	12	5.2 (3.1–7.9)	
Pneumonia	10	4.4 (2.2–6.6)	
Remainder of endocrine, nutritional and metabolic diseases	9	3.9 (1.7–6.1)	
Respiratory tuberculosis	9	3.9 (1.7–6.1)	
Diarrhoea and gastroenteritis of presumed infectious origin	8	3.5 (1.7–5.7)	
Diseases of the liver	8	3.5 (1.7–5.7)	

Remainder of diseases of the digestive system	8	3.5 (1.7–5.7)	
Septicaemia	8	3.5 (1.7–5.7)	
Remainder of diseases of the respiratory system	7	3.1 (1.3–5.2)	
Remainder of diseases of the genitourinary system	6	2.6 (0.9–4.4)	
All other causes	31	13.5 (10.0–17.5)	
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	81		
TOTAL	**310**		
TOTAL LESS ILL-DEFINED CAUSES	**229**	`	

Table 5.13: Cause-specific mortality in women aged 60+ by ICD sub–chapter, General Mortality list 1, deaths per 100,000 population, including 95% confidence intervals, 2012–2014

Cause of death among women 60+	**Total**	**Percentage distribution of deaths by cause excluding ill-defined causes (95% CI)**	**Cause-specific mortality rate per 100,000 population (95% CI)**
Cerebrovascular diseases	24	12.4 (8.8–16.5)	224.3 (96.9–442.0)
Diarrhoea and gastroenteritis of presumed infectious origin	18	9.3 (6.2–12.9)	168.3 (61.8–366.2)
Other heart diseases	18	9.3 (6.2–12.9)	168.3 (61.8–366.2)
Diabetes mellitus	15	7.7 (4.6–10.8)	140.2 (45.5–327.2)
Pneumonia	12	6.2 (3.6–9.3)	
Remainder of endocrine, nutritional and metabolic diseases	12	6.2 (3.6–9.3)	
Septicaemia	10	5.2 (2.6–7.7)	
Remainder of diseases of the genito-urinary system	8	4.1 (2.1–6.7)	
Malignant neoplasm of cervix uteri	7	3.6 (1.5–6.2)	
Malignant neoplasm of trachea, bronchus and lung	7	3.6 (1.5–6.2)	
Chronic lower respiratory diseases	6	3.1 (1.0–5.2)	
Malignant neoplasm of breast	6	3.1 (1.0–5.2)	
Anaemia	5	2.6 (1.0–4.6)	
Hypertensive diseases	5	2.6 (1.0–4.6)	
Other intestinal infectious diseases	4	2.1 (0.5–3.6)	
Respiratory tuberculosis	4	2.1 (0.5–3.6)	
All other causes	33	17.0 (12.9–21.6)	
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	77	`	
TOTAL	**271**		
TOTAL LESS ILL-DEFINED	**194**		

6. CONCLUSIONS

The analysis quantified the level of completeness of the health and civil registration system in capturing the occurrences of births and deaths. While the health system is often expected to capture a lower number of events (those occurring in health facilities), in Kiribati's case, for the years 2012–2014, the health system captured a higher number of community births than did the civil registration system. There is a need to strengthen the systems in order to achieve universal completeness; and more particularly to invest more in the civil registration system. The data reveals that most un-recorded births are those that occur outside hospitals/health facilities, hence the improvement initiatives would be best focussed on reaching out to these events.

The proportion of ill-defined causes of death was high and would require capacity-building among all persons engaged in the recording process. The data also revealed mis-recording of age in the registration processes. During the analysis, it was observed that, in many instances, the CRO system captured the name of the mother instead of the name of the baby. This is likely to have contributed to some errors in the recording of the sex of the baby, especially in instances where the sex of baby had not been originally recorded.

The analysis demonstrated the value of the administrative records of birth and death in providing the country with a credible source of vital statistics. Publishing data from these two sources is an important step in improving the performance of the systems; primarily because it helps to identify areas of weakness in the systems and hence to guide decision-makers on how best to invest. It is recommended that the country adopts a routine schedule of publishing statistics from the two sources.

APPENDIX 1: GENERAL MORTALITY LIST 1 - 103 CAUSE LIST

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

1–035	Malignant melanoma of skin	C43
1–036	Malignant neoplasm of breast	C50
1–037	Malignant neoplasm of cervix uteri	C53
1–038	Malignant neoplasm of other and unspecified parts of uterus	C54–C55
1–039	Malignant neoplasm of ovary	C56
1–040	Malignant neoplasm of prostate	C61
1–041	Malignant neoplasm of bladder	C67
1–042	Malignant neoplasm of meninges, brain and other parts of central nervous system	C70–C72
1–043	Non-Hodgkin's lymphoma	C82–C85
1–044	Multiple myeloma and malignant plasma cell neoplasms	C90
1–045	Leukaemia	C91–C95
1–046	Remainder of malignant neoplasms	C17, C23–C24, C26–C31, C37–C41, C44–C49, C51–C52, C57–C60, C62–C66, C68–C69, C73–C81, C88, C96–C97
1–047	Remainder of neoplasms	D00–D48
1–048	Diseases of the blood and blood–forming organs and certain disorders involving the immune mechanism	D50–D89
1–049	Anaemia	D50–D64
1–050	Remainder of diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D65–D89
1–051	Endocrine, nutritional and metabolic diseases	E00–E88
1–052	Diabetes mellitus	E10–E14
1–053	Malnutrition	E40–E46
1–054	Remainder of endocrine, nutritional and metabolic diseases	E00–E07, E15–E34, E50–E88
1–055	Mental and behavioural disorders	F01–F99
1–056	Mental & behavioural disorders due to psychoactive substance use	F10–F19
1–057	Remainder of mental and behavioural disorders	F01–F09, F20–F99
1–058	Diseases of the nervous system	G00–G98
1–059	Meningitis	G00, G03
1–060	Alzheimer's disease	G30
1–061	Remainder of diseases of the nervous system	G04–G25, G31–G98
1–062	Diseases of the eye and adnexa	H00–H59
1–063	Diseases of the ear and mastoid process	H60–H93
1–064	Diseases of the circulatory system	I00–I99
1–065	Acute rheumatic fever and chronic rheumatic heart diseases	I00–I09
1–066	Hypertensive diseases	I10–I13
1–067	Ischaemic heart diseases	I20–I25
1–068	Other heart diseases	I26–I51
1–069	Cerebrovascular diseases	I60–I69

1–070	Atherosclerosis	I70
1–071	Remainder of diseases of the circulatory system	I71–I99
1–072	Diseases of the respiratory system	J00–J98
1–073	Influenza	J10–J11
1–074	Pneumonia	J12–J18
1–075	Other acute lower respiratory infections	J20–J22
1–076	Chronic lower respiratory diseases	J40–J47
1–077	Remainder of diseases of the respiratory system	J00–J06, J30–J39, J60–J98
1–078	Diseases of the digestive system	K00–K92
1–079	Gastric and duodenal ulcer	K25–K27
1–080	Diseases of the liver	K70–K76
1–081	Remainder of diseases of the digestive system	K00–K22, K28–K66, K80–K92
1–082	Diseases of the skin and subcutaneous tissue	L00–L98
1–083	Diseases of the musculoskeletal system and connective tissue	M00–M99
1–084	Diseases of the genitourinary system	N00–N99
1–085	Glomerular and renal tubulointerstitial diseases	N00–N15
1–086	Remainder of diseases of the genitourinary system	N17–N98
1–087	Pregnancy, childbirth and the puerperium	O00–O99
1–088	Pregnancy with abortive outcome	O00–O07
1–089	Other direct obstetric deaths	O10–O92
1–090	Indirect obstetric deaths	O98–O99
1–091	Remainder of pregnancy, childbirth and the puerperium	O95–O97
1–092	Certain conditions originating in the perinatal period	P00–P96
1–093	Congenital malformations, deformations and chromosomal abnormalities	Q00–Q99
1–094	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00–R99
1–095	External causes of morbidity and mortality	V01–Y89
1–096	Transport accidents	V01–V99
1–097	Falls	W00–W19
1–098	Accidental drowning and submersion	W65–W74
1–099	Exposure to smoke, fire and flames	X00–X09
1–100	Accidental poisoning by and exposure to noxious substances	X40–X49
1–101	Intentional self–harm	X60–X84
1–102	Assault	X85–Y09
1–103	All other external causes	W20–W64, W75–W99, X10–X39, X50–X59, Y10–Y89
1–901	SARS	U04

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 rate: 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 rate: 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 1000 mid-year populations.

Crude death rate (CDR): The annual number of deaths occurring per 1000 mid-year population

Infant mortality rate (IMR): The number of deaths in infants under age 1 per 1000 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 child-bearing years experiencing the present day age-specific fertility rates.

Under 5 mortality rate: The number of deaths in children under age five 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

APPENDIX 4: LIFE TABLES

Life table for both sexes, 2012–2014

(years)		nx	ax	Nx	d(adj)	mx	qx	lx	dx	Lx	Tx	ex
<5	0	5	0.2	14,560	202	0.0139	0.0657	100,000	6,571	473,716	6,102,541	61.0
5–9	5	5	0.5	11,473	16	0.0014	0.0071	93,429	661	465,494	5,628,825	60.2
10–14	10	5	0.5	12,660	7	0.0006	0.0028	92,768	255	463,204	5,163,331	55.7
15–19	15	5	0.5	11,369	13	0.0012	0.0059	92,513	547	461,198	4,700,128	50.8
20–24	20	5	0.5	10,787	28	0.0026	0.0131	91,966	1,202	456,824	4,238,930	46.1
25–29	25	5	0.5	8,759	26	0.0029	0.0145	90,764	1,316	450,529	3,782,106	41.7
30–34	30	5	0.5	6,995	32	0.0045	0.0224	89,448	2,000	442,238	3,331,576	37.2
35–39	35	5	0.5	5,854	30	0.0052	0.0255	87,447	2,229	431,664	2,889,338	33.0
40–44	40	5	0.5	6,365	46	0.0072	0.0355	85,218	3,029	418,519	2,457,674	28.8
45–49	45	5	0.5	5,447	59	0.0108	0.0524	82,189	4,306	400,183	2,039,155	24.8
50–54	50	5	0.5	4,051	77	0.0189	0.0904	77,884	7,044	371,808	1,638,972	21.0
55–59	55	5	0.5	3,046	55	0.0180	0.0862	70,839	6,107	338,930	1,267,165	17.9
60–64	60	5	0.5	2,066	60	0.0290	0.1354	64,733	8,764	301,753	928,235	14.3
65–69	65	5	0.5	1,582	49	0.0312	0.1445	55,969	8,090	259,618	626,482	11.2
70–74	70	5	0.5	1,154	71	0.0617	0.2672	47,879	12,795	207,406	366,864	7.7
≥75	75	24.1	0.5	1,081	90	0.0830	1	35,084	35,084	159,458	159,458	4.5

Life table males, 2012–2014

(years)		nx	ax	Nx	d(adj)	mx	qx	lx	dx	Lx	Tx	ex
<5	0	5	0.2	7,400	123	0.0166	0.0778	100,000	7,778	468,887	5,930,704	59.3
5–9	5	5	0.5	5,960	7	0.0012	0.0062	92,222	572	459,679	5,461,818	59.2
10–14	10	5	0.5	6,436	4	0.0006	0.0029	91,650	264	457,590	5,002,139	54.6
15–19	15	5	0.5	5,797	7	0.0013	0.0064	91,386	583	455,474	4,544,549	49.7
20–24	20	5	0.5	5,444	11	0.0020	0.0102	90,804	923	451,710	4,089,075	45.0
25–29	25	5	0.5	4,227	13	0.0031	0.0152	89,881	1,369	445,980	3,637,364	40.5
30–34	30	5	0.5	3,347	13	0.0039	0.0192	88,511	1,699	438,308	3,191,385	36.1
35–39	35	5	0.5	2,785	17	0.0060	0.0295	86,812	2,562	427,655	2,753,076	31.7
40–44	40	5	0.5	3,020	19	0.0061	0.0302	84,250	2,547	414,884	2,325,421	27.6
45–49	45	5	0.5	2,616	32	0.0120	0.0585	81,703	4,778	396,573	1,910,537	23.4
50–54	50	5	0.5	1,883	43	0.0226	0.1072	76,926	8,244	364,020	1,513,964	19.7
55–59	55	5	0.5	1,401	28	0.0198	0.0946	68,682	6,494	327,175	1,149,944	16.7
60–64	60	5	0.5	954	32	0.0330	0.1525	62,188	9,485	287,228	822,769	13.2
65–69	65	5	0.5	667	28	0.0417	0.1888	52,703	9,953	238,634	535,541	10.2
70–74	70	5	0.5	444	39	0.0876	0.3593	42,750	15,359	175,354	296,907	6.9
≥75	75	10	0.5	370	72	0.1956	1	27,391	27,392	121,553	121,553	4.4

Life table for females, 2012–2014

(years)		nx	ax	Nx	d(adj)	mx	qx	lx	dx	Lx	Tx	ex
<5	0	5	0.2	7,160	78	0.0109	0.0522	100,000	5,220	479,121	6,387,250	63.9
5–9	5	5	0.5	5,513	8	0.0015	0.0072	94,780	685	472,189	5,908,129	62.3
10–14	10	5	0.5	6,223	3	0.0005	0.0024	94,095	227	469,910	5,435,940	57.8
15–19	15	5	0.5	5,573	6	0.0011	0.0054	93,869	504	468,083	4,966,030	52.9
20–24	20	5	0.5	5,343	14	0.0026	0.0130	93,365	1,215	463,786	4,497,947	48.2
25–29	25	5	0.5	4,532	11	0.0024	0.0121	92,150	1,112	457,969	4,034,161	43.8
30–34	30	5	0.5	3,648	15	0.0041	0.0204	91,038	1,853	450,558	3,576,193	39.3
35–39	35	5	0.5	3,069	13	0.0042	0.0210	89,185	1,869	441,253	3,125,635	35.0
40–44	40	5	0.5	3,345	22	0.0066	0.0324	87,316	2,825	429,518	2,684,382	30.7
45–49	45	5	0.5	2,831	25	0.0088	0.0432	84,491	3,650	413,332	2,254,864	26.7
50–54	50	5	0.5	2,168	32	0.0148	0.0712	80,841	5,754	389,822	1,841,532	22.8
55–59	55	5	0.5	1,646	24	0.0146	0.0704	75,088	5,283	362,230	1,451,709	19.3
60–64	60	5	0.5	1,112	25	0.0225	0.1065	69,804	7,432	330,443	1,089,480	15.6
65–69	65	5	0.5	916	20	0.0218	0.1036	62,373	6,460	295,715	759,037	12.2
70–74	70	5	0.5	709	30	0.0423	0.1913	55,913	10,696	252,825	463,322	8.3
≥75	75	57	0.5	711	25	0.0352	1	45,217	45,217	210,497	210,498	4.7