



VANUATU VITAL STATISTICS REPORT 2012–2014

PREPARED BY:
VANUATU DEPARTMENT OF HEALTH AND DEPARTMENT OF STATISTICS



SUPPORTED BY THE BRISBANE ACCORD GROUP (BAG)



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Noumea, New Caledonia, 2018

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Original text: English

Pacific Community Cataloguing-in-publication data

Vanuatu vital statistics report: 2012-2014 / prepared by Vanuatu Department of Health and Department of Statistics

1. Vital statistics – Vanuatu.
2. Recording and registration – Vanuatu.
3. Registers of births, etc. – Vanuatu.

I. Title II. Vanuatu. Ministry and Department of Health III. Vanuatu. Department of Statistics

IV. Pacific Community

352.752099595

AACR2

ISBN: 978-982-00-1093-2

Acknowledgement:

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Work for this project was supported by the Brisbane Accord Group of agencies under the Pacific Vital Statistics Action Plan and the Pacific Ten-year Statistics Strategy. We recognise the contribution of Julia Fitzgerald of the Australian Bureau of Statistics, Hong Pum Chung of UNESCAP, Cecilia Fabrizio of Vital Strategies and Alison Culpin of SPC who facilitated different sessions of the data analysis and report writing workshop that led to the development of this report. The support from UNESCAP was made as part of a project to strengthen the National Capacity in Producing and Disseminating Vital Statistics funded by the Bloomberg Philanthropies Data for Health Initiative.

The authors would also like to acknowledge the Department of Civil Status for providing civil registration data, data which was used for the analysis.

Cover pictures: Connor Ashleigh for AusAID - Design: Gaelle Le Gall

Prepared for publication at SPC's headquarters,

B.P. 98848 Noumea Cedex, New Caledonia, 2018

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ACKNOWLEDGEMENT

This report was put together by a team of staff from the Health Department and the Vanuatu National Statistics Office (VNSO) during a data analysis and report writing workshop for civil registration-based vital statistics. The workshop was conducted by the Brisbane Accord Group (BAG) in Noumea in September 2016.

As part of the course, the team collaboratively worked on birth and death data sets from the Civil Registration Office, Port Vila Central Hospital and the Health Information Office. These data sets were cleaned, merged for tabulation and analysed. This was a great deal of work undertaken within very limited time. The team is proud to report that this is Vanuatu's first ever vital statistics report based on existing administrative records of births and deaths.

The Vanuatu team would like to convey their great appreciation to the civil registration and vital statistics (CRVS) team at the Pacific Community (SPC) for the informative training and continuous support during and after the workshop. The nature of the training was 'hands-on' which contributed immensely to building analytical skills for all participants, and also to broadening knowledge and levels of awareness on CRVS.

Our acknowledgement is also extended to the BAG for funding this very important training. We believe that this reflects the commitment of partners in the region to supporting development in Pacific countries. Your continuous support in this area is evidence of the value of births and deaths statistics to a country's socio-economic progress.

EXECUTIVE SUMMARY

Birth and death data provide crucial information for computation of numerous demographic and health indicators. The uses of the data and statistics extend across a broad range of socio-economic domains, including education, infrastructure, social security, identity management and child protection. In the health domain, national health programmes rely on these data to measure critical indicators relating to child and maternal health and life expectancy, and also to monitor disease burdens and the impact of critical health challenges, such as the current non-communicable disease (NCD) crisis. In general, population data are central the management of a country's political, social and economic growth in diverse sectors, as outlined in the recently endorsed Sustainable Development Goals (SDGs).

This report presents data and statistics on live births and deaths that occurred in Vanuatu in 2012, 2013 and 2014, drawn from civil registration and health records. The birth and death datasets analysed were 81% and 52% complete respectively. While some demographic rates and indicators were computed from the birth dataset (after adjustment), it was not possible to derive any from the death and cause-of-death datasets because the level of data completeness insufficient for computation of reliable estimates.

There was an average of 508 births per year over the three-year period, which translates to a crude birth rate of 28 births for 1,000 population. The sex ratio at birth was 107. Fertility was highest among women aged between 20 and 24 years, followed by those in the 25–29 age group. An average of three children were born per woman in her lifetime. There were 51 births for every 1,000 women aged 15–19 years.

Over the three-year period, 748 deaths were recorded per year. The highest number of deaths recorded occurred in the first five years of life. This dropped sharply in the 5–9 age group but began to rise gradually through the teens and early adulthood years and more rapidly, but irregularly, after age 40. The mortality pattern deviates significantly from the normal expected J curve, which is a reflection of severe underreporting of deaths.

Diseases of the circulatory system and neoplasms were the leading causes of death among men and women aged 15–59 years respectively, accounting for 29.9% and 30% of deaths respectively. Non-communicable diseases were responsible for 34% of all deaths among adults aged 15–59 years. Diseases of the circulatory system accounted for the greatest share of NCDs deaths (42%), followed by neoplasms (35%) and diabetes mellitus (18%). The highest burden of NCDs mortality occurred among adults aged 35–59 years; 23.1% of deaths among women and 35% of deaths among males. In the 15–34 age group, 12.5% of deaths among women were as a result of NCDs, compared to 19.2% of deaths among men.

The death and cause-of-death datasets analysed were highly incomplete and therefore could not be used to derive meaningful demographic analyses, such as crude death rates, age-specific and cause-specific mortality rates, and probability of dying. The recording of age, sex and cause of death of the deceased was particularly poor; with a number of records missing entries on these critical variables. There were 217 death records attributed to ill-defined causes or not assigned to any particular cause of death. Improving the quality and completeness of the birth, death and cause-of-death datasets is the primary recommendation of this study.

1. INTRODUCTION

A primary function of a government is to ensure that the population is provided with reliable, relevant and timely health care services. For such to be achieved, it is essential that governments understand the number, structure and characteristics of its population and, secondly the health status and health priorities of its population. Birth, death and cause-of-death data provide the primary means for a government to understand and hence manage the health needs of the population, including ensuring that emergency health services are delivered in a timely way and to the correct population group. Birth and death data are often sourced from census and survey collections that are undertaken periodically within a country. While these are important sources of data, they are limited by their inability to provide continuous data and are also quite expensive to undertake routinely. Administrative sources of data, primarily civil registration and health systems, provide more reliable sources of vital statistics. Civil registration systems are particularly recognised by the United Nations as being the most reliable sources of vital statistics.

This report is the first of its kind to provide vital statistics from Vanuatu's administrative datasets; namely the civil registration and health systems. The report provides data on live births and deaths that occurred in the country and that were recorded in either system in the years 2012 to 2014. The civil registration system in Vanuatu is run by the Department of Civil Status, which sits under the Ministry of Internal Affairs and is managed within the provisions of the Civil Status Act.¹ According to the act, every event of birth or death should be declared to the Registrar or Sub-registrar, along with corresponding characteristics of the event and civil status of the person(s) concerned within a time period prescribed by the ministry. While the act has existed for many decades, registration of vital events in Vanuatu is still incomplete and is limited by numerous challenges, among them the inaccessibility of registration services to the population, limited levels of knowledge and awareness on the need to register vital events, and the costs associated with registration.² The health system maintains records of the events of birth and death, but, unlike the civil registration system, its records are limited to only those events that occur within health facilities.

Since data from the civil registration system of Vanuatu were incomplete, it was found necessary to combine them with data from the health system in order to arrive at a more complete dataset during the analysis. The combined dataset was then used to tabulate birth and deaths by selected demographic and social variables. Fertility estimates such as the crude birth rate (CBR), the age-specific fertility rate, the teenage fertility rate and the sex ratio at birth were computed. The death dataset was found to be highly incomplete (at 52%) so it was not possible to compute any rates. However, the data are tabulated by absolute numbers and percentage distributions and cross-tabulated by selected variables where possible. Birth and death data were available for 2010 to 2015 but, due the workload of cleaning the data and the short time frame of the training, the team decided to analyse data for only the years 2012 to 2014. The analysis of cause-of-death data was limited to deaths that occurred and that were registered in 2014 to 2015.

The primary objective of this report is to present the status of Vanuatu's administrative data sources in the context of their potential role as a source of vital statistics. The report specifically aims to uncover the limitations of these data sets, in order to draw the attention of relevant stakeholders to their improvement. It should be noted that, owing to the incompleteness of the datasets, the indicators and data presented in this report are not nationally representative and should therefore be interpreted with caution.

This report was developed during a *Data Analysis and report writing workshop conducted* by the Brisbane Accord Group in September 2016. The workshop aimed at guiding selected Pacific Island countries to analyse their civil registration data and produce a vital statistics report, as prioritised

¹ *Civil Status (Registration) Act [CAP 61]* http://www.paclii.org/vu/legis/consol_act1988/csa308.rtf

² *Issues Paper No.01 of 2014 A Review of the Civil Status Registration [CAP 61]*

https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj0yqWT2qDTAhVH02MKHThzCDYQFqgYMAA&url=http%3A%2F%2Fwww.lawcommission.gov.vu%2Fimages%2Fpdf%2Fissues_Paper_Civil%2520Status_2014_FINAL.doc&usq=AFQjCNFx2nfKng9Paqqr9vBYikSvU6OWxQ&bvm=bv.152180690,d.dGc

within the Ten Year Pacific Statistics Strategy and the Pacific Vital Statistics Action plan. The workshop was attended by six Pacific Island countries: Kiribati, Tuvalu, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.

2. DATA AND METHODOLOGY

2.1 Data sources

The data used for this study were sourced from the civil registration system and the health information system. Since the two systems are incomplete (i.e. neither captures every event of birth and death in the country), data from the two sources were merged in order to arrive at a more complete dataset and this was used for the analysis.

2.2 Data quality

2.2.1 Data cleaning

The datasets obtained from the health and civil registration systems had a large number of duplicates. 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 to be a duplicate, the record was removed from the database. Other issues addressed through the cleaning process included standardising the format of reporting of all variables. For example, there were numerous cases where the sex variable was provided in full, i.e. Male and Female, but in other cases as M and F and in yet other cases as “m and Female” etc., which required standardisation. Still-birth records were removed from birth and death data. Missing variables were imputed from other available records (mainly census records). The cause-of-death data were also used to validate the appropriate allocation of sex and age for a deceased person, since people of different ages and sex die of different causes. In instances where it was not possible to impute missing data, such as unknown age and unknown sex, the records were proportionately redistributed during the analysis.

2.2.2 Coverage and completeness

The civil registration system is expected to capture births and deaths that occur in every province in the country, while the health information system is limited to recording events that occur within the health facility premises.

In order to estimate the level of completeness of the combined datasets, birth data recorded by both systems was divided by the number of births that are expected to have occurred in the country over the same period (2012–2014). This was estimated from Vanuatu’s CBR of 31.3 as recorded by the 2009 population and housing census analytical report. Similarly, deaths that were captured in both systems were divided by the total deaths that are expected to have occurred over the same period, as provided by the statistics office population estimates. The expected deaths were computed by applying the national crude death rate (5.4%) rate of the 2009 population census to the projected population for 2012 to 2015. Both estimates were expressed as a percentage.

Completeness of birth records

Following the above calculations, birth data were found to be 83.2 % complete, which shows that a significant number of events were still not yet recorded or had not been captured in either database, despite the mass registration campaign undertaken in the country.

Table 2.1: Completeness of birth records (%) by year, 2012–2014

Year	No of births*	Expected number of births [^]	Completeness (%)
2012	5,520	7,325	75.4
2013	5,994	7,325	81.8
2014	6,774	7,325	92.5
2012–2014	6,096	7,325	83.2

* Civil registration and health database

[^] Estimated from a crude birth rate of 31.3 recorded for the 2009 Population Census, Vanuatu National Statistics Office

Completeness of death records

Death data were found to be 52% complete for the period 2012 to 2014. There were considerable differences in the estimated level of completeness of death data across the years. The highest level of completeness was recorded in 2012 (62%), and the lowest in 2014 (42%). Table 2.2 provides the estimated level of completeness by year.

Table 2.2: Completeness of death records (%) by year, 2012–2014

Year	No of deaths*	Expected number of deaths [^]	Completeness (%)
2012	868	1,394	62
2013	764	1,429	53
2014	614	1,464	42
2012-2014	2,246	4,287	52

* Civil registration and health database

[^] Population projections, Vanuatu National Statistics Office

2.3 Data analysis

Birth and death data are presented in absolute numbers and percentages for the period 2012–2014. Where possible, the data are cross-tabulated by selected socio-demographic variables, mainly age, sex and region, in order to assess for possible differentials and reveal important patterns that could demand policy attention. The data are also used to compute a few fertility indicators (the definitions applied for each indicator are presented in Appendix 1). Causes of death are ranked by the World Health Organization General Mortality list 1 of the International Classification of Diseases version 10 (see Appendix 1). Due to the high level of incompleteness of the death and cause-of-death datasets, it was not possible to compute any mortality rates from them.

In order to minimise instability in the figures due to the small size of the population and subsequently the risk of misleading interpretation, data were aggregated over a three-year period (2012–2014) for calculation of all rates. The analysis included causes of death for deaths that occurred in 2014 and 2015 only. Confidence intervals are presented to highlight the uncertainty in the data. Due to the small number of events, these are calculated using Poisson distributions for all rates, except for CBRs, where the normal distribution of the binomial is applied.

2.4 Data limitations

The main limitations of the data were: (i) incompleteness (ii) erroneous recording (iii) omissions and (iv) mis-classification of causes of death. From the onset, the birth and death datasets from the civil registration and health systems were incomplete. For this reason, it was necessary to merge them in order to arrive at a more complete data set for the analysis. Even after merging data from the two sources, death records were only 52% complete and therefore could not be used to derive any mortality rates/ indicators.

The data collected by both systems were found to be inconsistently recorded. In many cases, entries such as names, dates of event and sex were not available and /or were erroneously recorded. In some instances, the characteristics of the mother were recorded in place of those of the child, and vice versa. A standard format of reporting between the two data sources and within each dataset was lacking, which made it difficult to merge the data sets. Foetal deaths had been combined with live birth and death data.

Causes of death were in many cases wrongly coded. Failure to record the age and sex of the deceased made it difficult to impute possible causes. The age of death was poorly recorded, particularly for child deaths. In a number of instances, the gestation of the pregnancy was recorded in place of the age of the child. In cases where there were mis-alignments found between the age of the deceased and the cause of death, the age of the deceased was considered to be more correctly recorded. For example, there were 17 deaths among children aged between 0 and 4 years that had been assigned a maternal

cause. These deaths were reclassified to child-related causes, based on the details provided on the conditions leading to the death. There were 31 deaths among babies whose age was recorded as '0 days'. For the analysis, it was assumed that these were babies that were born alive but that did not survive the first day of birth. These deaths were therefore treated as neonatal deaths. Records whose age was captured as 50+, and 40+ were grouped into the 35–59 age groups. Foetal deaths (including those marked as still-births and miscarriages) were excluded from the analysis.

In general, it should be noted that the data are of limited quality and should therefore be interpreted with caution due to mis-recording of critical variables, primarily the age and cause of death of the deceased.

3. BIRTHS AND FERTILITY

3.1 Recorded births by sex and year

Table 3.1 shows the total number of recorded³ births by year and sex for the period 2012 to 2014. There appears to be a steady increase in the number of births recorded over the three years; the most significant rise was in 2014, when 780 more births were recorded than in the previous year. The rise in numbers of recorded births could be associated with the introduction of hospital registration; a registry officer was stationed at the two main hospitals (Port-Vila and Luganville) to record and issue all births certificates to newborn babies. In the provinces, the doctors and nurses assist the mothers to fill in their forms and later send them to the provincial registry officer. This initiative was begun in 2014 by the Department of Health and the Civil Registration Office (CRO). Moreover, additional registration sites were opened in each of the six provinces, and these are presumed to have provided better access to civil registration services.

Table 3.1: Recorded births by sex and year, 2012–2014

Year	Sex		Total	Average birth per month
	Male	Female		
2012	2,596	2,924	5,520	460
2013	2,847	3,147	5,994	500
2014	3,372	3,402	6,774	565
Total	8,815	9,473	18,288	1,524
Average	2,938	3,158	6,096	508

Source: Civil Registration Office, Vanuatu

An average of 6,096 births was recorded per year in the period 2012–2014, which equates to an average of 508 births recorded every month over the same period.

3.2 Crude birth rate

The crude birth rate refers to the number of births per 1,000 population over a given period of time. CBRs are important because they tell us how much our population is growing, assuming mortality and migrations over the same period are equal to zero. Crude birth rates can also help us plan for the future by, for example, giving an indication of how many children will be entering school in the coming years, or how many adults will be entering the work force in the future. The 2012 to 2014 birth data were used to calculate the CBR and the adjusted CBR.

The average number of births over the three years (2012–2014) was 6,096 (Table 3.1). This total was then divided by the 2013 (mid-year population) derived from the statistics office.⁴ The CBR, based on the recorded number of births for the period 2012–2014 was 23.0 (Table 3.2). This means that in the years 2012–2014, there were 23 births out of every 1,000 population.

Table 3.2: Crude birth rate, 2012–2014

Period	Crude birth rate (95% CI)	Adjusted crude birth rate (95% CI)
2012–2014	23.0 (22.5-23.6)	27.7(27.1-28.3)

³ In this report, the term 'Recorded' is used to mean events that have been captured in either the Civil Registration Office database or in the health information system database

⁴ 2013 Mid-year population (264,652)

3.3 Adjusted crude birth rate

The CBR was adjusted⁵ in order to cater for the level of completeness of birth records, which was estimated at 83.2%. This equates to an adjusted CBR of 27.7, which means that in the years 2012–2014 there was an average of 28 births in every 1000 population. The adjusted CBR takes into account the under-reporting of births in the data. The adjustment enables us to report on the CBR estimate as it would have been if birth reporting was 100% complete.

3.4 Sex ratio at birth

Sex ratio is the ratio of males to females in a given population, expressed as the number of males for every 100 females. The sex ratio at birth refers to the number of males born per every 100 female babies born. The sex ratio at birth was calculated based on the births recorded to the CRO. The results show that for every 100 females born in the period 2012–2014, there were 107 males born. This ratio is just slightly higher than that estimated by the 2009 Vanuatu census, which was 104 males for every 100 females.

Table 3.3: Sex ratio at birth, 2012–2014

	Sex ratio
2012	113
2013	111
2014	101
Average	107

Source: Civil Registration Office

3.5 Recorded births by age of mother

Table 3.4 presents the distribution of births by the age of mother, categorised into five-year age groups.⁶ According to the recorded births, most births in the period 2012–2014 occurred to mothers in the 20–24 age group (29.8%) followed by the 25–29 age group (25.5%). The data show a high number of teenage births i.e. births to mothers aged 15–19 years, an average of 667 births per year. This finding is critical as it is likely to have health implications—young mothers are often associated with more risky births and high maternal mortality rates. It also points to a possible high number of school drop-outs, which is a significant development concern. There were few births (178) among women aged 50+, which is considered to be above child-bearing age. This could be due to informal adoptions; cases in which older mothers are taking care of children of their relatives and hence registering these babies as their own. Births occurring to teenage mothers are also possibly recorded as having occurred to their mothers.

Table 3.4: Percentage distribution of recorded births by age of mother, 2012–2014

Mother's age group	Number	Percentage
<15	65	0.4
15–19	2,001	10.9
20–24	5,453	29.8
25–29	4,670	25.5
30–34	3,380	18.5
35–39	1,771	9.7
40–44	605	3.3
45–49	166	0.9
50+	178	1.0

⁵ The adjusted CBR was calculated by dividing the CBR (23) by the calculated level of completeness (83.2%) and multiplying the fraction by 100.

⁶ There were 545 mothers whose ages were not provided, so the births were re-distributed into all age groups according to the proportion of mothers in each age group.

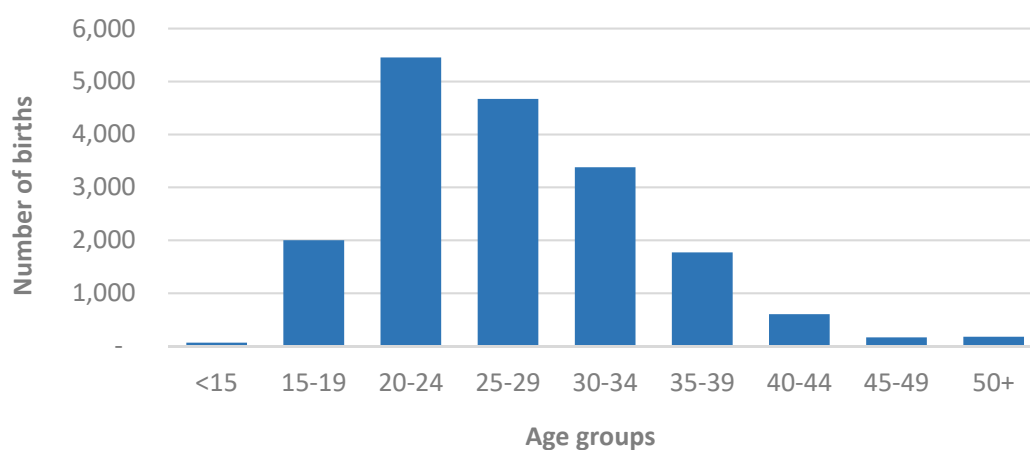


Figure 3.1: Distribution of recorded births by age of mother, 2012–2014

3.6 Age specific fertility rates

Fertility can be defined as the number of children born to a woman. Age-specific fertility refers to the number of children born to women in a particular age group and is a conventional measure of fertility. Age-specific fertility rates (ASFRs) are interpreted as the number of births occurring to women of a certain age group per 1,000 women in that age group in a given period of time. This is calculated for women in the reproductive years (15–49) years, and in five-year age groupings. Table 3.5 presents the age-specific fertility rates of women in Vanuatu, based on the recorded number of births.

Table 3.5: Age-specific fertility rates, 2012–2014

Mother's age-group	Age-specific fertility rates	Confidence intervals
15–19	51.22	47.4-55.0
20–24	141.00	134.9-147.0
25–29	142.14	135.6-148.7
30–34	126.96	120.0-133.8
35–39	74.15	68.4-79.9
40–44	28.14	24.3-31.9
45–49	9.40	7.0-13.3

Fertility peaks in the age-group 25–29 (at 142 births per 1,000 women), slightly declines to 126 births per 1,000 for women in the age-group 30–34, before steadily declining to a low of nine births per 1,000 women aged 45–49.

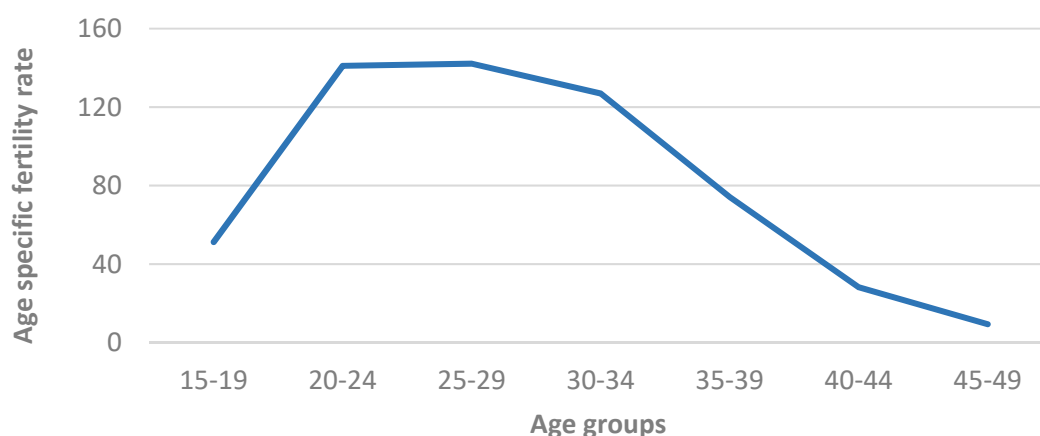


Figure 3.2: Age-specific fertility rate by mother's five-year age group, 2012–2014

3.7 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 childbearing years experiencing the present day age-specific fertility rates.

Based on the recorded number of births, the TFR for Vanuatu for the years 2012–2014 was 3.4 (3.4–3.5), following adjustment. This means that a woman in Vanuatu would give birth to an average of three children if she survived all her reproductive years experiencing the present day age-specific fertility rates.

Table 3.6: Total fertility rates (including 95% confidence intervals), 2012–2014

Period	Total fertility rate (95% CI)	Adjusted total fertility rate (95% CI)
2012–2014	2.87 (2.79–2.94)	3.4 (3.4–3.5)

3.8 Place of birth

Table 3.7 provides the distribution of recorded births by the province and year of occurrence. Shefa province had the highest number of recorded births, 7,805 (42.7%), followed by Tafea with 3,139 (17.2%) and Sanma with 2,813 (15.4%). Torba province had the lowest number of recorded births.

Table 3.7: Recorded births by province and year of occurrence, 2012–2014

Province	Number of births			Total	Percentage
	2012	2013	2014		
Shefa	1,849	2,531	3,425	7,805	42.7
Tafea	1,087	1,016	1,036	3,139	17.2
Sanma	960	941	912	2,813	15.4
Malampa	1,014	840	790	2,674	14.6
Penama	551	566	580	1,697	9.3
Torba	42	35	16	93	0.5
Unknown	17	35	15	67	0.4
Total	5,520	5,594	6,774	18,288	

Source: Civil Registration Office, 2012–2014

4. MORTALITY

4.1 Recorded deaths by sex and year

Mortality data and indicators are essential for accurate monitoring of population health, identifying health priorities and evaluating health programme impacts. Tables 4.1 and 4.2 show the total and average number of recorded deaths by year and sex for the period 2012 to 2014. An average of 748 deaths was recorded per year over the three years (2012–2014). The data further show an overall decline in the number of recorded deaths across the three years, from 868 events recorded in 2012 to 614 deaths in 2014. The two possible causes of the decline are: (i) under-reporting of deaths by the two data bases; or (ii) an actual decline in the number of deaths occurring in the country. However, comparing these data to those of the 2009 census of Vanuatu reveals that deaths were significantly under-recorded in both the civil registration and Health Information System across the three years; with the highest level of under-reporting likely to have occurred in 2014. The 2009 Vanuatu population census report estimated that there were 1,260 deaths in the country every year.

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

Year	Sex		Unknown	Total
	Male	Female		
2012	539	285	44	868
2013	441	284	39	764
2014	370	234	10	614
2,596	2,924	5,520	460	2,596
Average)	450	267	31	748

Source: Civil registration and health information system

There were more recorded deaths among males than among females. Ninety-three records had not been assigned a sex variable, which is a reflection of weaknesses in the data capturing process. These deaths were redistributed, based on the ratio of male to female deaths for each year. The redistributed numbers are shown in Table 4.2.

Table 4.2: Redistributed deaths by sex and year, 2012–2014

Year	Sex		Total
	Male	Female	
2012	566	301	868
2013	463	300	764
2014	376	237	614
Total	1,405	840	2,246
Average	468	280	748

Source: Civil registration and health information system

4.2 Recorded deaths by age and sex

Table 4.3 presents the distribution of recorded deaths by age and sex. The highest number of deaths was recorded to occur within the first five years of life. This number sharply declined and remained very low between 5–19 years. The numbers began rising gradually in early adult life (early twenties to late 30s). In the middle adulthood (40–65), age group 50–54 had the second highest level number of deaths. Mortality patterns in the highest age groups (65+) are irregular, which is usually associated with under-reporting of events. Usually, the number of deaths is expected to increase exponentially beyond age 35 years, without the significant fluctuations that are observed in these data. Mortality in the early adult years (early to late twenties) is often associated with accidents and injuries, more so among males than among females.

Table 4.3: Distribution of recorded deaths by sex, by five-year age groups, 2012–2014

Five-year age group	Males			Females			Total	Unknown sex			Total
	2012	2013	2014	2012	2013	2014		2012	2013	2014	
0-4	42	31	56	37	24	68	258	22	33	9	322
5-9	4	3	1	5	6	2	21	1			22
10-14	11	4	2	4	3	2	26	1			27
15-19	7	3	6	2	3	3	24				24
20-24	6	5	7	4	3	4	29				29
25-29	8	7	7	6	8	2	38				38
30-34	16	5	11	6	3	4	45				45
35-39	21	9	10	2	6	7	55				55
40-44	31	22	25	12	13	12	115		1		116
45-49	24	20	34	8	10	17	113				113
50-54	47	30	37	19	27	16	176				176
55-59	36	31	26	14	9	12	128				128
60-64	50	49	39	30	27	23	218		1		219
65-69	22	24	16	7	7	9	85				85
70-74	52	44	25	24	35	16	196	2			198
75-79	8	16	22	1	14	4	65				65
80+	80	62	26	43	38	15	264	1		1	266
Unknown	74	76	20	61	48	18	93	17	4		318
Total	539	441	370	285	284	234	1949	44	39	10	2246

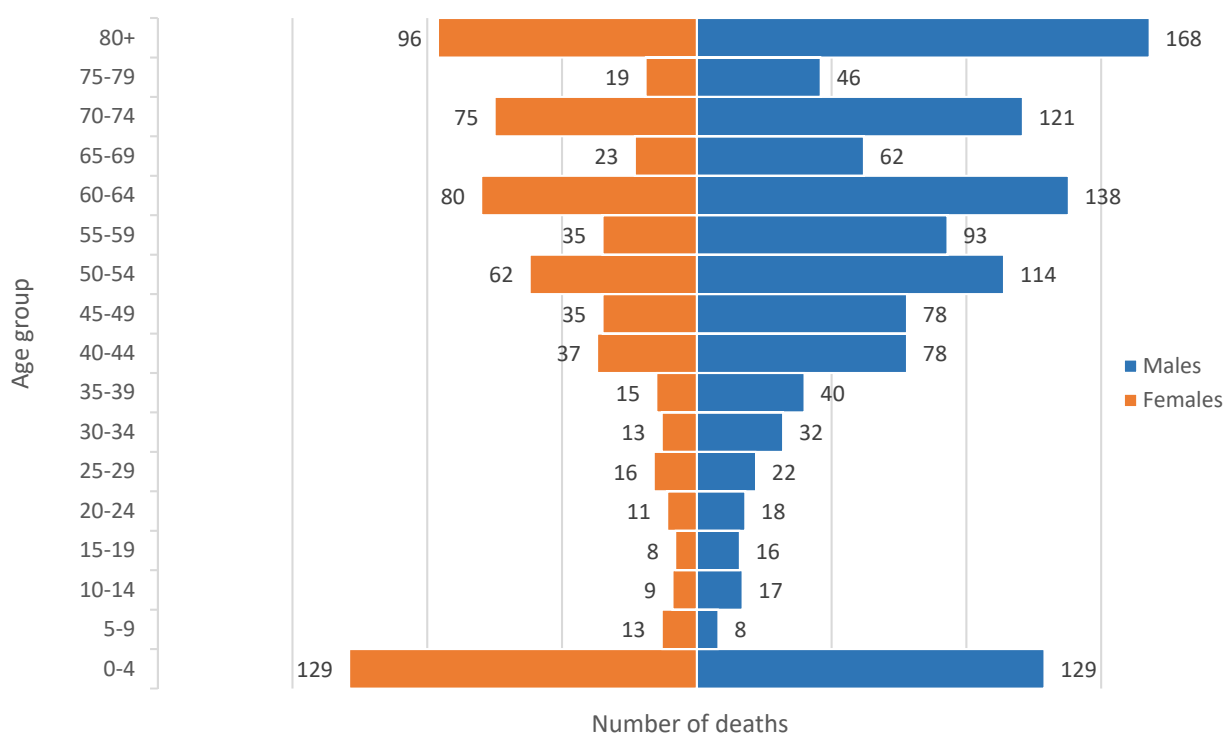


Figure 4.1: Distribution of recorded deaths by sex, by five-year age groups, 2012–2014

Figure 4.1 further demonstrates the distribution of deaths by sex and age of the deceased. It is evident that there is significant under-reporting of deaths in the age groups 30–34, 35–39, 55–59, 65–69 and in the other older age groups. Figure 4.1 also demonstrates that the bulk of child mortality deaths is in infancy (children aged below one year). More male than female infants appear to be dying. Generally, there were more deaths recorded among male infants and adults than among females.

4.3 Infant and child mortality

Due to incompleteness of the death dataset, it was not possible to compute any child or adult mortality rates or indicators. This section presents the absolute number of deaths that occurred among children aged below 28 days, below one year and below five years.

4.3.1 Neonatal mortality

There were a total of 172 deaths recorded among children aged below 28 days in the period 2012–2014. The highest number of neonatal deaths, 70 (40.7%), was recorded in 2014. As earlier noted, there is a high likelihood of under-reporting, especially for this age group. In general, death among young children tends to be highly under-reported, especially because they are often not associated with any potential benefits, such as inheritance, as would be the case with adult deaths.

Table 4.4: Neonatal, infant and child deaths, 2012–2014

Year	Deaths <28 days	Deaths <1 year	Deaths <5 years
2012	58	62	101
2013	44	45	88
2014	70	86	133
Total	172	193	322

4.3.2 Infant mortality

Infant deaths refer to deaths among children aged below one year. The dataset shows a decline followed by a sharp increase (almost double) in the number of recorded infant deaths between 2013 and 2014. The enormous fluctuation in the data is a pointer to under-reporting of deaths in some years. The 2009 population census estimated an infant mortality rate of 21 deaths per 1,000 live births.

4.3.3 Under five mortality

The number of recorded deaths across the three years followed a similar pattern as that of neonatal deaths and infant deaths; there was a decline in recorded deaths in 2013, which was followed by a sharp increase in 2014. There were more recorded deaths among males than among females in 2012 and 2013, and more recorded female deaths in 2014. The latter deviates from the usual pattern of mortality by sex and is most likely an indication of under-reporting of male deaths (Figure 4.2).

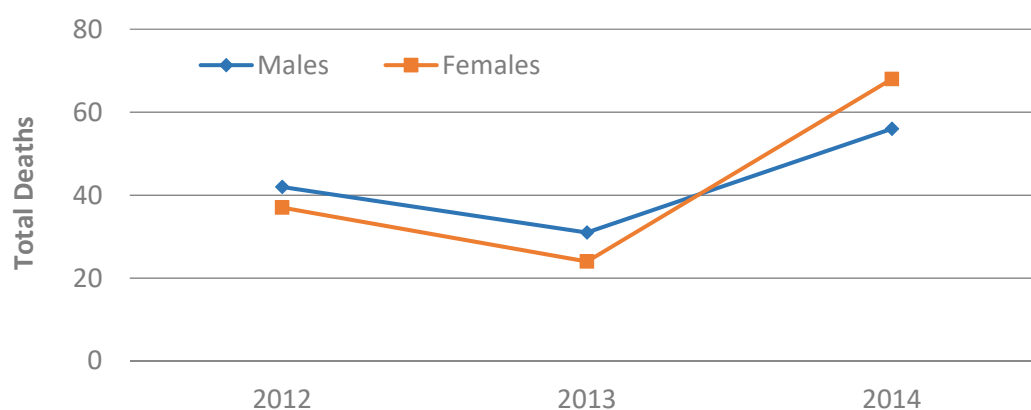


Figure 4.2: Under-five mortality by sex and year, 2012–2014

5. CAUSES OF DEATH

Cause-of-death data are vital to the monitoring of the health system of a country and in helping the government to prioritise and correctly deliver its health interventions. This section presents Vanuatu's cause-of-death data, disaggregated by age group and sex (where possible). A total of 217 deaths were ill-defined or not assigned any particular cause. These deaths are excluded from the total, while estimating the proportional distribution of deaths by cause.

Table 5.1 provides the proportional distribution of deaths of all ages and both sexes. The top three causes of death were diseases of the circulatory system (22.5%), neoplasms (13.1%) and endocrine, nutritional and metabolic diseases (10.3%). Diseases of the respiratory system and conditions originating in the perinatal period were responsible for 9.8% and 8.8% of all deaths.

Table 5.1: Ten leading causes of deaths (by ICD General Mortality List 1), 2014–2015

Cause	Number	Percentage
Diseases of the circulatory system	245	22.5 (20.4–24.6)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	217	—
Neoplasms	143	13.1 (11.5–14.9)
Endocrine, nutritional and metabolic diseases	112	10.3 (8.8–11.9)
Diseases of the respiratory system	107	9.8 (8.4–11.3)
Certain conditions originating in the perinatal period	96	8.8 (7.4–10.3)
Certain infectious and parasitic diseases	92	8.4 (7.7–9.8)
External causes of morbidity and mortality	58	5.3 (4.2–6.4)
Diseases of the digestive system	43	3.9 (3.0–5.0)
Diseases of the genito-urinary system	43	3.9 (3.0–5.0)
Congenital malformations, deformations and chromosomal abnormalities	17	1.6 (1.1–2.2)
Diseases of the nervous system	16	1.5 (0.9–2.1)
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	15	1.4 (0.8–2.0)
Diseases of the skin and subcutaneous tissue	11	1.0 (0.6–1.6)
Diseases of the musculoskeletal system and connective tissue	8	0.7 (0.4–1.2)
Pregnancy, childbirth and the puerperium	5	0.5 (0.2–0.8)
Mental and behavioural disorders	4	0.4 (0.1–0.7)
TOTAL	1,232	
TOTAL LESS ILL-DEFINED	1,089	

5.1 Causes of death by key age groups

5.1.1 Mortality in children aged 0–4 years

Children aged 0–4 years died mainly of conditions originating in the perinatal period; half of deaths in this age group were due to this. Diseases of the respiratory system; congenital malformations, deformations and chromosomal abnormalities; and infectious and parasitic diseases accounted for 13.8%, 9.4% and 7.5% of all deaths in this age group respectively. There were 29 deaths that were ill-defined and could therefore not be assigned to any specific cause.

Table 5.2: Causes of death among children aged 0–4 (both sexes combined), 2014–2015

ICD Chapter	Number	Percentage
Certain conditions originating in the perinatal period	81	50.6 (44.4–56.9)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	29	—
Diseases of the respiratory system	22	13.8 (9.4–18.1)
Congenital malformations, deformations and chromosomal abnormalities	15	9.4 (5.6–13.1)
Certain infectious and parasitic diseases	12	7.5 (4.4–11.3)
Diseases of the circulatory system	7	4.4 (1.9–6.9)
Endocrine, nutritional and metabolic diseases	6	3.8 (1.3–6.3)
Other causes	17	10.6 (6.9–15.0)
TOTAL	189	
TOTAL LESS ILL-DEFINED	160	

5.1.2 Mortality in children aged 5–14 years

Twenty-two deaths were recorded to have occurred among children aged 5–14 years. Eleven (50%) of these deaths were attributed to external causes of morbidity and mortality, while six deaths (27.3%) were due to neoplasms. Due to the small number of deaths, the deaths are not disaggregated by sex as with the other age groups.

Table 5.3: Causes of death among children aged 5–14 (both sexes combined), 2014–2015

ICD Chapter	Number	Percentage
External causes of Morbidity and Mortality	11	50.0 (31.8–68.2)
Neoplasms	6	27.3 (13.6–45.5)
Symptoms, signs and abnormal clinical and laboratory Findings, not elsewhere classified	3	—
Other causes	5	22.7 (9.1–36.4)
TOTAL	25	
TOTAL LESS ILL-DEFINED	22	

5.1.3 Mortality in children aged 15–59 years

Tables 5.4 and 5.5 provide the distribution of deaths among men and women aged 15–59 years respectively. Diseases of the circulatory system and ‘certain infectious and parasitic diseases’, were the leading causes of death among men in this age group; accounting for 29.9% and 13.3% of deaths respectively. Other significant causes of death were neoplasms, responsible for 12.5% of deaths and endocrine, nutritional and metabolic diseases, which accounted for 11.6% of deaths. Among women in this age group, neoplasms and diseases of the circulatory system were the leading causes of death, accounting for 30.0% and 13.1% respectively.

Table 5.4: Causes of death among males aged 15–59, 2014–2015

ICD Chapter	Number	Percentage
Diseases of the circulatory system	72	29.9 (24.9–34.9)
Certain infectious and parasitic diseases	32	13.3 (10.0–17.0)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	32	—
Neoplasms	30	12.5 (9.1–16.2)
Endocrine, nutritional and metabolic diseases	28	11.6 (8.3–14.9)
External causes of morbidity and mortality	22	9.1 (6.2–12.5)
Diseases of the digestive system	20	8.3 (5.4–11.2)

Diseases of the respiratory system	14	5.8 (3.3–8.3)
Diseases of the genito-urinary system	9	3.7 (1.7–5.8)
Other causes	14	5.8 (3.3–8.3)
TOTAL	273	
TOTAL LESS ILL-DEFINED	241	

Table 5.5: Causes of death among females aged 15–59, 2014–2015

ICD Chapter	Number	Percentage
Neoplasms	48	30.0 (24.4–36.3)
Diseases of the circulatory system	21	13.1 (8.6–17.5)
Certain infectious and parasitic diseases	16	10.0 (6.3–13.8)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	15	—
Endocrine, nutritional and metabolic diseases	14	8.8(5.0–12.5)
Diseases of the genitourinary system	10	6.3 (3.1–9.4)
Diseases of the respiratory system	9	5.6 (2.5–8.8)
External causes of morbidity and mortality	8	5.0 (2.5–8.1)
Other causes	18	11.3 (7.5–15.6)
TOTAL	175	
TOTAL LESS ILL-DEFINED	160	

5.1.4 Mortality in people aged 60+ years

Tables 5.6 and 5.7 provide the distribution of deaths among men and women aged 60+ years. Men in this age group mainly died from diseases of the circulatory system (38.8%), endocrine, nutritional and metabolic diseases (14.8%), and diseases of the respiratory system (13.4%). Women in this age group mainly died of diseases of the circulatory system (32.1%), neoplasms (20.1%) and diseases of the respiratory system (16.1%).

Table 5.6: Causes of death among men aged 60+, 2014–2015

ICD Chapter	Number	Percentage
Diseases of the circulatory system	81	38.8 (33.0–44.5)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	54	--
Endocrine, nutritional and metabolic diseases	31	14.8 (11.0–19.1)
Diseases of the respiratory system	28	13.4 (9.6–17.2)
Neoplasms	19	9.1 (5.7–12.4)
Certain infectious and parasitic diseases	13	6.2 (3.8–9.1)
Diseases of the genito-urinary system	13	6.2 (3.8–9.1)
Diseases of the digestive system	9	4.3 (1.9–6.7)
Diseases of the skin and subcutaneous tissue	5	2.4 (1.0–4.3)
Other causes	10	4.8 (2.4–7.2)
TOTAL	264	
TOTAL LESS ILL-DEFINED	209	

Table 5.7: Causes of death among women aged 60+, 2014–2015

ICD Chapter	Number	Percentage
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	67	—
Diseases of the circulatory system	43	32.1 (25.4–38.8)
Neoplasms	27	20.1 (14.9–26.1)
Diseases of the respiratory system	22	16.4 (11.2–21.6)
Endocrine, nutritional and metabolic diseases	22	16.4 (11.2–21.6)
Diseases of the genito-urinary system	5	3.7 (1.5–6.7)
Other causes	15	11.2 (6.7–15.7)
TOTAL	201	
TOTAL LESS ILL-DEFINED	134	

5.2 Adult mortality due to non-communicable diseases

Non-communicable diseases are a leading cause of death in the Pacific region, estimated to account for 75% of all deaths. Based on recorded deaths, NCDs (neoplasms, diabetes, diseases of the circulatory system and chronic lower respiratory diseases) were responsible for 34% of deaths among adults aged 15–59 years in the period 2014 to 2015. Diseases of the circulatory system were the leading NCD cause, responsible for 42% of all NCD deaths, followed by neoplasms (35%) and diabetes (18%).

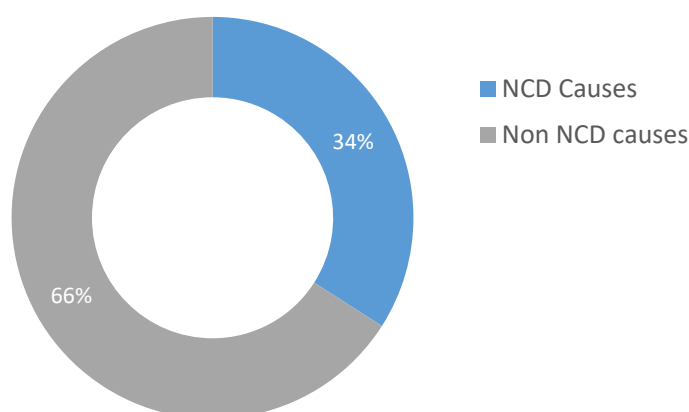


Figure 5.1: Mortality in adults aged 15–59 years from selected NCDs compared to all other causes, 2014–2015

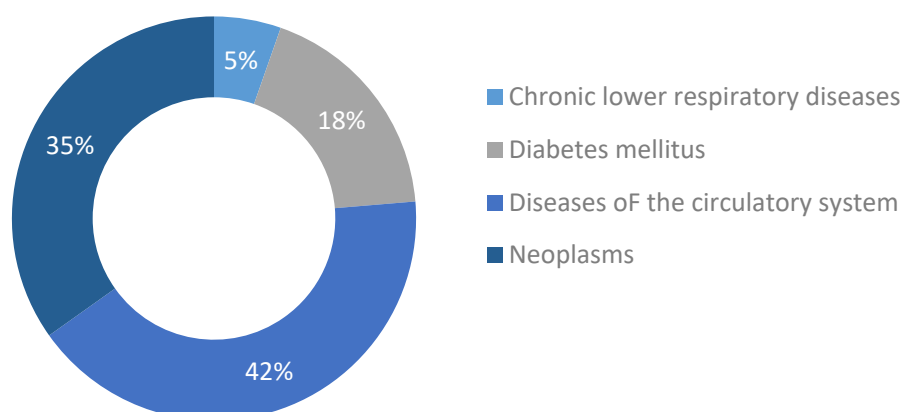


Figure 5.2: Distribution of NCD deaths by cause among adults aged 15–59 years, 2014–2015

The highest burden of NCD mortality occurred among adults aged 35–59 years: 23.1% of deaths among women compared to 35% of deaths among men. In the 15–34 year age group, 12.5% of deaths among women and 19.2% of deaths among men were a result of NCDs.

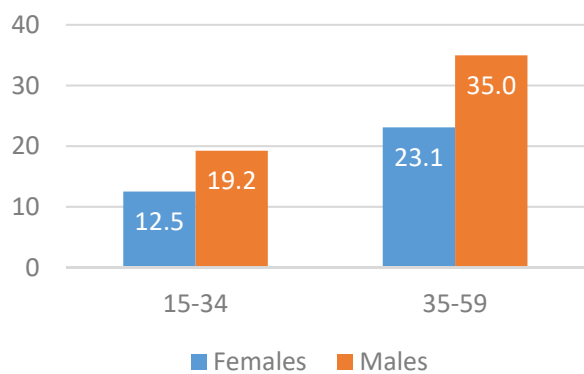


Figure 5.3: Percentage of deaths in adults aged 15–59 years due to NCDs by sex and age group, 2014–2015

6. CONCLUSION

This report provides important information on the status of the civil registration and Health Information System of Vanuatu with regard to recording the occurrence and characteristics of births and deaths. The findings demonstrate significant weaknesses in both datasets, primarily their inability to capture all events occurring within the country and, secondly, the inadequacy in the quality of the records maintained by both data sources. Neither data source provided data of sufficient completeness to facilitate a nationally representative analysis. Death records were the most incomplete; the dataset achieved only 52% completeness after merging records from both sources. The coding of causes of death and the quality of cause-of-death data were equally weak; 217 (17.5%) of records were ill-defined/not assigned to any particular cause.

While the data were of limited quality, the analysis demonstrated that administrative records can play a critical role in providing the country with vital statistics, when strengthened, to achieve universal completeness and a high standard. The following are some recommendations to be considered in strengthening the quality of data and completeness of these two data collection systems in Vanuatu.

1. Provide refresher training to doctors on how to complete the medical certificate of cause of death.
2. Provide refresher training to personnel responsible for coding causes of death.
3. Provide training on data quality to personnel responsible for data entry in the CRO and Ministry of Health (MoH).
4. Strengthen collaboration and sharing of information between the MoH and CRO. It would be useful to ensure that all events that occur in health facilities are notified to the CRO. The MoH can also support registration functions through sharing information on civil registration with families during child immunisation.
5. Establish a routine practice of publishing vital statistics from administrative records as a strategy for improving these data collection systems. Publish the level of completeness of the civil registration database at least annually.
6. Strengthen the civil registration and health data entry software to ensure that there is a standard format of entry of required variables. For example standardise the format of entry of the sex variable so that one can only enter "M" or "F" and not different formats.

In general, it is critical that the government continues to invest in improving these data collection systems. Vanuatu's National CRVS Improvement Plan (2015–2020) provides a systematic framework for the government to undertake such investments.

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

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.

Crude birth rate: The annual number of births occurring per 1000 mid-year populations.

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.

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

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.

APPENDIX 3: TABLES

Table A: Vanuatu projected population by five-year age groups

Female	Female population			Total
	2012	2013	2014	
<15	45,901	46,846	47,751	140,498
15-19	13,078	13,023	13,035	39,136
20-24	12,617	12,891	13,070	38,578
25-29	10,485	10,952	11,398	32,835
30-34	8,633	8,874	9,178	26,685
35-39	7,848	7,961	8,089	23,898
40-44	6,921	7,166	7,372	21,459
45-49	5,713	5,884	6,081	17,678
50+	15,153	15,885	16,639	47,677
Total	126,349	129,482	132,613	388,444

Source: Population Census, 2009

Table B: Redistribution of births of unknown age

Mother's age (Years)	Number of births				% of total excluding unknown age	Re-distributed births by age			Female mid-year population	Average number of births	Fertility Rate		
	2012	2013	2014	Total		2012	2013	2014					
<15	26	23	14	63	0	0	0	27	24	14	46,846	21.7	0.5
15-19	610	626	705	1,941	11	11	11	632	643	726	13,023	666.9	51.2
20-24	1,543	1,789	1,959	5,291	29	31	30	1,599	1,837	2,017	12,891	1,817.7	141.0
25-29	1,426	1,303	1,801	4,530	27	22	27	1,478	1,338	1,854	10,952	1,556.7	142.1
30-34	895	1,232	1,153	3,280	17	21	18	928	1,265	1,187	8,874	1,126.6	127.0
35-39	506	558	655	1,719	10	10	10	524	573	674	7,961	590.6	74.2
40-44	172	212	203	587	3	4	3	178	218	209	7,166	201.7	28.1
45-49	71	38	51	160	1	1	1	74	39	53	5,884	55.0	9.4
50+	77	56	39	172	1	1	1	80	58	40	15,885	59.2	3.7
Unknown	194	157	194	545								Sum	577.2
Total excluding unknown	5,326	5,837	6,580	17,743									
Total	5,520	5,994	6,774	18,288				5,520	5,994	6,774		Total TFR is	3

Source: Civil registration office, Vanuatu

