Timor-Leste
Population and Housing Census 2022

Thematic Report Mortality

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Preface

The population and Housing Census 2022, conducted by the Timor-Leste National Institute of Statistics (INETL) from 5 September to 5 October 2022, underscored our continuing commitment to decision-making grounded in robust data analysis. Utilizing modern technology in the form of tablets for data collection, the census laid the foundation for a comprehensive understanding of our nation's demographic landscape. Initial census basic tablets were released in the latter part of 2023, enriching our understanding of the demographic intricacies captured during the 2022 Population and Housing Census.

This publication, is one of several detailed thematic census reports, addressing crucial areas such as fertility and nuptiality, mortality, migration, population projection, household and housing conditions, labour force and economic activity, disability, youth, gender, and a comprehensive census atlas, that will provide nuanced insights into specific demographic dimensions.

This volume provides a detailed analysis of mortality in Timor-Leste. Encompassing critical areas such as infant mortality, under five mortality, life expectancy, age specific mortality rates and maternal mortality, we expect this report to serve as a cornerstone for informed policymaking.

At this juncture, I would like to acknowledge the collective dedication of the INETL staff and the multi-stakeholder Census Technical Committee, led by Mr. Elias dos Santos Ferreira, President of INETL, I.P., in the successful completion of this Census. Their tireless efforts steered the census process from its initiation to the release of this report. Gratitude is also extended to our development partners from the UN System, among them, the UNFPA, UNICEF, UNDP, UN Women, and WFP, whose invaluable contributions have significantly enriched the census endeavour. Similarly, the support that we received from the Australian Bureau of Statistics (ABS) throughout the census process is also duly recognized.

On behalf of the Ministry of Finance, I would like to invite to all individuals with a keen interest in demographics and statistical data to leverage the insights presented in this publication. It is our hope that this compilation shall serve as reliable resource for informed discourse and evidence-based decision-making in the realm of our country's national development.

Thank you.

MINISTRA DAS FINANÇAS
RDTL

Santina JRF Viegas Cardoso
Minister of Finance, RDTL

Acknowledgements

The Timor-Leste National Institute of Statistics (INETL), formerly the General Directorate of Statistics, implemented the Population and Housing Census 2022 under the slogan 'Our census, our future be part of it'.

The census was largely financed by the Government of Timor-Leste through the Ministry of Finance. Additional financial and material support in form of tablets and power banks, was provided by UNFPA, UN Women, UNDP, UNICEF and WFP. I would like to express my sincere gratitude for the unwavering support towards the census.

I would like to acknowledge the invaluable technical support provided by UNFPA throughout the census process. The support provided during field staff training by UN Women is also acknowledged.

Let me also thank a team of independent international monitors from the Australian Bureau of Statistics, who worked with us throughout the enumeration period, their feedback from the field was valuable and timely.

I would like to further express my appreciation to all members of the Census Technical Committee for their advice and guidance in the census. The Census Publication Commission led a successful implementation of the census publicity campaign to ensure that the stakeholders, including the general public, were informed about the census.

Special thanks go to each and every enumerator and supervisor who worked tirelessly, visiting households across the country to collect the census information. They worked for long hours and also at odd hours in trying to collect the information.

Finally, I would like to commend the work of all staff from INETL headquarters and municipality offices, who continue to work for the success of the 2022 census project. I am grateful to the people of Timor-Leste for their cooperation, without which a successful census would not have been possible.

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Abbreviations

ASMMR	Age specific maternal mortality ratio
CMR	Child mortality rate
CEB	Children ever born
CS	Children surviving
CRVS	Civil registration and vital system
CRVSS	Civil registration and vital statistics system
CAPI	Computer-assisted personal interviewing
DHS	Demographic and Health Surveys
EA	Enumeration Area
GIS	Geographic Information System
GDS	General Directorate of Statistics
GGB	Growth Balance Method
IMR	Infant mortality rate
ISIC	International Standard Industrial Classification of All Economic Activities
ISCED	International Standard Classification of Education, Fields of education and training
LTRDMC	Lifetime risk of dying due to maternal causes
MMEIAG	Maternal Mortality Estimation Inter-Agency Group
MMR	Maternal Mortality rate
MICS	Multiple-Indicator Cluster Surveys
INETL	National Statistical Institute of Timor-Leste
PES	Post-Enumeration Survey
SDG	Sustainable Development Goal
TFR	Total fertility rate
U5MR	Under-Five mortality rate
UN	United Nations
WPP	World Population Prospects

Executive Summary

This mortality thematic report provides in-depth analysis of the level, trends and pattern of mortality in Timor-Leste. Specifically, it analyses and provides information on infant, child, under-five, adult and maternal mortality indicators using data from the 2022 Population and Housing Census. Where data allows, comparisons are made with estimates from previous censuses, other sources as well as with regional comparisons. The information is presented at national level then disaggregated by the municipalities of Timor-Leste, rural-urban location, and socio-economic characteristics. The estimated values of mortality were derived using indirect techniques. This is because household deaths reported in Timor-Leste's census, like many other developing countries, are affected by under-reporting and thus cannot be used without evaluation and adjustment.

In general, the analysis presented in this report shows that there was a decline in mortality as compared to the previous censuses. The report has employed demographic indirect techniques used by the previous census for consistency and comparability. Moreso, because household deaths reported in Timor-Leste's census, like many other developing countries, are affected by under-reporting and thus cannot be used without evaluation and adjustment.

The estimated levels of mortality were derived using indirect techniques.

The three indicators for measuring early childhood mortality are Infant mortality rate (IMR) which refers to the number of children per 1,000 live births who died before their first birthday, Child mortality rate (CMR) which refers to the number of children per 1,000 live births who died between first and fifth birthday and Under-Five mortality rate (U5MR) – that is the number of children per 1,000 live births who died before their first birthday

Following application of the necessary adjustments, the findings shows that infant mortality rate for Timor-Leste is at 42.4 deaths per 1000 live births. This implies that about four in every 100 new-borns die before reaching their first birthdays. IMR was higher for males at 46.3 deaths compared to females at 38.3 deaths per 1000 live births.

The child mortality rate for Timor-Leste is at 7.5 deaths per 1000 live births for both sexes. The results show that the Under-five mortality is at 54.5 deaths per 1000 live births. The results also show that under-five mortality has been declining in Timor-Leste.

Child mortality rates by municipalities

The child mortality rates for both sexes show that by municipality, the range is from 6.1 deaths to 14.1deaths per 1000 live births. Covalima has the highest child mortality rates while the lowest is observed in Oe-cusse. Child mortality for males in Covalima is 14.6 deaths , that is higher than 13.5 deaths for females per 1000 live births. The gender gap is narrow for all the municipalities – the difference between the between male and female in child mortality rates is nearly 2 deaths.

Under-five mortality rate

The highest under-five mortality rates are observed in Covalima (97 deaths per 1000 live births) followed by Manatuto (83 deaths per 1000 live births) and Baucau (73 deaths per 1000 live births). A similar trend is observed for infant and child mortality. While both male and female children have experienced declines in early-age mortality levels, girls have always maintained lower mortality levels than boys.

Variation in IMR, CMR and U5MR

While demographic and social factors exert significant influence in mortality at younger ages, the 2022 census data show inconsistent results contrary to what is generally observed including in Timor-Leste based on existing evidence from 2016 Demographic and Health Survey (DHS) and previous studies. Further examination of the raw data is suggested.

Adult mortality

The data show the age pattern of mortality has not changed over the past decade. However, it shows a dramatic decline of infant and child mortality during the intercensal period. It also reveals that the mortality level has not changed much between age 45 and 55 and increased slightly for ages 55 and above.

Life expectancy at birth

Life expectancy in Timor-Leste has improved since 2000s. In 2004, the male life expectancy at birth was 57.4 years which has increased to 65.1 years in 2022. Between 2004 and 2022, female life expectancy increased from 58.9 years to 69.2 years.

Maternal Mortality rate (MMR)

The MMR has declined from 426 maternal deaths per 100,000 live births in 2015 to 413 maternal deaths per 100,000 live births in 2022. The estimated levels of maternal mortality differ according to data sources and estimation methods. The estimates from both the censuses and demographic health surveys indicate that the level of maternal mortality in the country is declining.

Policy Implication

While there have been significant improvements in under five mortality rate and infant mortality rate, there is still a need to do more to minimise the number of children who die in Timor-Leste. Findings of the Timor-Leste Demographic and Health Survey in 2016 and other recent surveys highlight the enormity of the problem of malnutrition in young children and women in particular. For children almost 45 percent are underweight-for-age; 15 percent are severely underweight-for-age; Almost 58 percent of children under five years are stunted, and 33 percent are severely stunted. This requires adequate nutrition in the first years of life that is essential for children's physical and mental growth. There is also need to expand and maintain the quality and coverage of preventive and curative services to newborns, infants and children in order to reduce infant and child mortality.

SDG 3.1 sets out that by 2030, the global maternal mortality ratio (MMR) should be reduced to less than 70 maternal deaths per 100,000 live births, and no country should have an MMR of more than 140 per 100,000 live births. The results show that the 2022 census data shows that MMR remains high in Timor-Leste. Further reduction efforts in MMR should focus on increasing access to quality healthcare including addressing human resource shortages.

Policy recommendations

This report provided an overview of patterns, trends and differentials in mortality and life expectancy based on the analysis of the 2022 Population and Housing Census data from Timor-Leste. The analysis preceded by a systematic evaluation of the census data on mortality by age and sex demonstrated evidence of under-reporting of births and deaths particularly in rural areas. The following recommendations should be considered:

- High mortality among male children highlights the urgent need to further accelerate progress in preventing child deaths
- Strengthen coverage of quality antenatal care, skilled care at birth, post-natal care for mothers and baby
- Access to life saving interventions is critical to ensuring steady mortality decline in municipalities experiencing high under-five mortality
- Delivery care, postnatal care, vaccinations, and early childhood preventative and curative services to address these causes is critical
- Strategies should be implemented that enhance access to diagnostic and treatment services.
- Attention should be given to the municipalities where mortality rates are highest across all ages and where population increase continues
- Undertaking research to collect relevant baseline data and monitoring the efficacy of interventions in local contexts.

1 Timor-Leste Population and Housing Census

1.1 Background and Context

The analysis on mortality in this report uses data from the 2022 Population and Housing census that was conducted by the then General Directorate of Statistics (GDS), later known as National Statistical Institute of Timor-Leste (INETL). The census was conducted from September to October 2022. Timor-Leste regained its independence in 2002 from Indonesian rule after 27 years. Previously the country was a Portuguese colony until 1975 when it got its independence. The 2022 census was the fourth to be conducted in Timor-Leste since the restoration of independence. Previous censuses were conducted in 2004, 2010 and 2015, that is approximately every five years.

1.2 Objectives of the Census

The objectives of the Timor-Leste Population and Housing Census 2022 were the following:

- Produce reliable statistical information on the size, composition, characteristics and spatial distribution of the resident population of Timor-Leste, as well as on the size, characteristics and spatial distribution of the country's housing stock, and more specifically on
  - levels of fertility, mortality and migration
  - the educational attainment level of the population
  - the size and characteristics of the labour force
  - the participation of the population in agricultural production
  - the prevalence of disability by type
  - the rate and patterns of urbanisation
  - housing conditions and availability of amenities and assets.
- Produce a sampling frame for household- and housing surveys in the ten years following the 2022 census.
- Produce the baseline for population projections.
- Providing the base for Timor-Leste's Geographical Information System.

1.3 Census methodology

1.3.1 Census planning

Preparations for the census started in 2018 with development of a census project document which contained the complete census plan and the estimated cost of the whole census project. The document was crucial for resource mobilization from both the Government and development partners. Work on questionnaire development also started early with stakeholder consultation on topics and questions to be included in the census. This work built on topics that are recommended internationally to be included in the census.

1.3.2 Census mapping

Update of census maps was one of the key activities in the pre-enumeration period, starting from 2018. The mapping programme for the 2022 census adopted a digital approach, based on an integrated system composed of Geographic Information System (GIS) tools, Global Navigation

Satellite Systems, high-resolution Earth Observation satellite images and tablets. The mapping field work was aimed at updating the census frame with new buildings that did not exist in 2015 census. The process was aimed at producing accurate maps to be used in the census enumeration process. Enumeration Area (EA) maps were delineated based on the number of households, a criterion that was set to determine a reasonable workload for enumerators during the enumeration process. Each building was geo-tagged, building on the existing geo-coded census frame. The mapping data was verified and office EA delineation was completed in 2022, resulting in 2,384 EAs.

1.3.3 Census Publicity

The success of the census depends on the quality of the information provided by the public. INETL updated the 2022 census publicity plan in February 2022 after the government approved the establishment of the census administrative structure. The campaign strategy identified four main target groups: government ministries and departments, traditional leaders, the media and the general public. A series of key messages were developed, including information about the census date, duration and importance. There were several census materials developed to promote census awareness. These included radio and TV adverts, a census jingle, stickers, leaflets, posters, banners, T-shirts, bags, umbrellas, hand fans, pens and notepads.

The INETL communication and public relations unit designed a census logo as well as developing a slogan and a census mascot. The slogan for the census was ‘Our census, our future be part of it’.

1.3.4 Field staff training

Due to their large numbers, the training of census field staff was implemented with a cascade approach, involving three levels of training:

From August 2022, census training started with 26 master trainers in Dili who later trained 180 field staff trainers in six parallel classes, also in Dili. Finally, decentralized trainings of 2,345 enumerators, 623 census supervisors and other local census staff ware conducted across all 14 municipalities. Each of the trainings took at least 7 days. Apart from the master trainers who were all permanent civil servants, the majority of the other field staff were recruited for as temporary staff for the census enumeration phase. The training was standardized using a power point version of the instruction manuals for enumerators and supervisors that were developed as guidelines for the census fieldwork.

1.3.5 Census enumeration

The 2022 census data was collected through a traditional approach where households were visited by enumerators across the whole country to collect information on all individuals by asking pre-defined questions to the respondents. Enumeration was conducted in regular households as well as collective living quarter. The information collected was on a de jure population meaning that the people enumerated were usual household members as of the night of 4 September, 2023 (census night). The census enumeration period was from 5 September to 5 October, 2023, and was followed by a sweeping exercise to enumerate households that were missed out during the official enumeration period.

The information from the regular household population was collected through a long questionnaire that had all the census questions while a short questionnaire with only a few selected questions was used for the collective living quarters.

1.3.6 Post-Enumeration Survey

In accordance with international recommendation, a Post-Enumeration Survey (PES) was conducted to evaluate the quality of the census, mainly under-coverage or over-coverage of the population in 2022.

The Timor-Leste 2022 PES tools that included the questionnaire and the tablet computer application were developed as part of the census pilot phase. A full pilot PES was conducted in April 2002 immediately following the pilot census to test these tools but also the training and enumeration procedures and initial matching procedures.

The PES sample a nationally representative sample stratified by municipality and urban-rural location. There were 16 thousand households in 149 EAs selected for a complete re-enumeration. The actual sample was drawn with probability-proportionate-to-size in late September 2022, strategically scheduled not to affect or influence completion of the main census enumeration. Other measures to preserve the independence between the census and the PES included the condition that PES field staff did not work in EAs where they were engaged in the census.

The training of the PES enumerators by INETL staff and a member of the technical assistance team was conducted from 4 to 5 November 2022. The three-week PES data collection period started on 7 November, which implies a relatively small period between the census and PES enumeration.

Though the PES data collection was conducted timely towards the end of 2023, the commencement of matching and analysis of the PES was postponed from mid-2023 to mid-2024.

1.3.7 Data processing and analysis

Computer-assisted personal interviewing (CAPI) using tablets was used in the census, which was for the first time to use such electronic data collection in a census. The CAPI application, developed in CSPro integrated digital maps of EAs that were used as a base for geo-referencing both the households and the housing units and to organise the work of the enumerators. Daily data synchronisation to the server managed at Census head office, enabled effective monitoring of the enumeration process including generating reports for the census management team.

This technological innovation enabled the data to be captured electronically during the enumeration phase but also to be transferred to the census head office therefore making it possible to monitor the data collection progress in real time. A census dashboard developed before enumeration, was used to produce daily reports and visualization of the progress by municipality and Administrative-Post level.

Data editing to correct inconsistencies in the data started took place from November 2022 to April 2023. A significant improvement in the quality of the data collected was observed due to the use of CAPI data collection. There was a set of editing rules developed, which showed that that less than 5 percent of the records violated at least one skipping rule, that no implausible values were recorded for gender and that just few cases had missing or implausible values in the age.

The 2022 census collected some information that required coding after the enumeration – information such as field of study, occupation and industry. For the information on industry, the International Standard Industrial Classification of All Economic Activities (ISIC, rev 4) (United Nations, 2008) was used for response coding. The information on occupation was coded based on the International Standard Classification of Occupations (ISCO-08) (International Labour Office, 2012). The information on field of study was be coded on the basis of the International Standard Classification of Education, Fields of education and training (ISCED-F 2013) (UNESCO, 2015).

The census coding process started in December 2022 with manual coding by a team of ten coders and three supervisors from the pool of census secretariat staff. For the manual coding there was an existing code list in Tetum that was developed for the 2019 Timor-Leste Labour Force Survey. The manual coding process was time consuming, therefore later from February 2023, automated coding was attempted to match census information on occupation and industry using the partially coded census data. More efforts were made to finalise the coding later in 2023.

1.3.8 Census dissemination

Preliminary census results were released in November 2022 which was within six weeks of completion of census enumeration. There was a national dissemination seminar held in Dili with several Government officials and Development partners, where the report was shared. The census main report was released in May 2023, at a national dissemination workshop, also held in Dili. In a similar manner like the preliminary report release, the participants were from both the Government and Development agencies. In October 2023, selected indicators were compiled into a wall chart and disseminated. The indicators were presented at national, urban -rural, municipality and administrative post level. All the census reports and the wall chart were also published on the INETL for easy access by the public.

1.3.9 Organization of the thematic report

The report starts with the background information, mortality levels and trends around the world and in Timor-Leste. Chapter two presents a methodological discussion on measures of mortality: infant, child and under-five mortality. The third chapter discusses the results on adult mortality and methodological problems associated with estimation of adult mortality . The fourth chapter consists of an analysis of maternal mortality. The final chapter five summarizes the conclusions and key recommendations resulting from the findings for policy and program action.

2 Methods of Analysis of Mortality

2.1 Rationale

Through population censuses, demographic surveys and other data collection systems, national governments collect data on various aspects of the population including death. Data on deaths are classified by sex, age, cause of deaths and socio-economic population groups. Such data are important in the realm of public health. Accurate mortality statistics are a basis for the formulation of health plans and policies to prevent or reduce premature mortality and improve the quality of life of populations.

Analyses of trends in mortality indicators help countries to assess whether progress is made towards mortality reduction. Mortality data by cause of death is helpful in identifying leading or emerging causes of deaths in a country, thereby pointing out priority areas for preventive and curative efforts. In addition, mortality measures by location and socio-economic population groups reveal living conditions or inequalities in access to health services in a country. Such information is useful to policy makers to make decisions on allocation of public resources to address heathy needs of different regions or population groups. Mortality indicators are also an important input into preparation of population projections. The aim of this report is to provide analyses of mortality in Timor-Leste with the following specific objectives:

-To analyse the mortality level and patterns

-To assess trends of mortality between 2015 and 2022

-To assess differentials in mortality by location including urban-rural residence, geographical variation, woman's socioeconomic status

-To draw policy recommendations from the findings of mortality analyses

2.2 Definitions and measures of mortality

Concepts	Definition
Death (mortality)	Mortality refers to the occurrence of deaths in a population. A death is a complete absence of any signs of life at any time after a live birth has occurred.
Infant Mortality Rate	Is the probability that a new-born will die before reaching his/her first birthday. It is expressed per 1,000 live births occurring during a specified reference period. In the case of the present census, it is the 12 months' period preceding the 2022 census
Child Mortality Rate	Is the probability for a child aged 1 to die before reaching exact age 5. It is expressed per 1,000 live births occurring during a specified reference period, in this case taken to be one year prior to the census. It is usually denoted by CMR or the life table notation (4q1).
Under-Five Mortality Rate	Is the probability for a new-born to die before his/her fifth birthday It is expressed per 1,000 live births occurring during a specified reference period, in this case taken to be one year prior to the census. It is usually denoted U5MR or by the life table notation (5q0).
Age-Specific Death Rate	The number of deaths in a population of a given age and sex (or age-sex group) in a given year divided by the estimated mid-year population in that age (age-group), expressed per 1,000 population.
Life Expectancy at Birth (e_0)	Average number of years a hypothetical cohort of people born in a specific year could expect to live if they were subject to the current mortality level at each age throughout their life. Life expectancy at a specific age is the number of additional years a person could expect to live if she or he was subject to the current mortality at each age for the rest of his/her life.
Maternal mortality ratio	The number of maternal deaths per 100,000 live births
Age specific maternal mortality ratio	The number of maternal deaths in an age group per 100,000 live births in the same age group
Deaths due to maternal cause	Percentage of deaths of childbearing women who die due to maternal cause
Lifetime risk	The probability that a 15-year old woman will die from maternal cause during childbearing period

2.3 Sources of mortality data

2.3.1 Child mortality data

Information on child mortality is collected from censuses, major household surveys such as Demographic and Health Surveys (DHS) and Multiple-Indicator Cluster Surveys (MICS), and also from registration of vital events.

Child mortality rates are computed from information on children ever born and also children that are still alive or dead. From censuses, summarized birth histories are collected about the total number of children ever born to women of reproductive age and the number of children who are still alive.

The birth histories in most DHS surveys appear to be of excellent quality, although several surveys do show symptoms of omission, displacement, or both. A full birth history is a complete list of all children the woman has ever given birth to including their date of birth, sex, survival status, age (if alive), and age at death (if died). This is the form of birth history found in the majority of DHS surveys. The birth histories are the source of the age-specific fertility rates, the total fertility rate (TFR), and the under 5 mortality rates that are widely used to describe levels, differentials, and trends in fertility and child mortality in developing countries.

However, survey data suffer from omission and are subject to reporting errors. In some cases, the birth information is incomplete with age or date-related information missing. This has the potential to impact the level of fertility and mortality. Systematic omission of births will cause the fertility rates to be artificially low, whereas omission concern the children who die, then the childhood mortality will also be artificially low (Pullum and Becker ,2014). Depending on the seriousness of error of omission, this impact conclusions made on comparability on levels of mortality trends. A particular problem associated with such omission is that it may be challenging to compare change over time in the mortality indicators, especially when comparing subgroups.

2.3.2 Mortality data in Timor Leste

Well-functioning civil registration and vital statistics (CRVS) systems generate, as a by-product of administration, the much-desired population-based vital statistics in a continuous and on real time basis. As early as 2010, the Ministry of Health of Timor-Leste carried out an assessment of the existing vital registration system with support from the World Health Organisation. The assessment revealed low coverage of deaths compared to births. This problem is not limited to Timor-Leste, but to many developing countries. In many cases, suffice to mention that civil registration and vital statistics systems are weak or non-existent. As a result, key demographic, fertility and mortality statistics are not available on a continuous basis and in many cases the Civil Registration System do not cover large segments of the population.

As an administrative system, civil registration generates birth and death data that can be combined with information on migration from a census or a population register to provide governments with up-to-date statistics on population size, growth and distribution. Vital registrations also provide mortality information but just as is the case in many developing countries, the data from vital registrations are usually insufficient.

A complete civil registration and vital statistics system (CRVSS) ensures that individuals have legal documentation to exercise their right to identity, that policy makers have the necessary data and the international community has evidence to monitor development progress (Hartnett, 2000). However, in many developing countries CRVSS are dysfunctional, requiring improvements in all areas (Nichols et al., 2015). A well developed and functioning civil registration system ensures the registration of all vital events including births, marriages and deaths and issues relevant certificates as proof of such registration. Civil registration promotes efficient government planning, effective use of resources and aid, and more accurate monitoring of progress towards achieving the Sustainable Development Goals and other indicators (Mills et al, 2017).

The main sources of mortality data in the country are population censuses and surveys. Four population censuses have been so far starting from 2004, 2010, 2015 and the latest being in 2022. In addition to the population censuses, the country has collected mortality data through three DHSs conducted in 2003, 2009-2010 and 2016 and one (MICS) conducted in 2003. While surveys provide data pertaining to sampled population, censuses cover the entire population thereby providing much comprehensive data at both national and subnational levels. Census data are prone to errors since censuses are big operations and use less trained enumerators, compared to surveys which are small undertakings and use well trained enumerators who are closely supervised.

Another important source of mortality data in Timor-Leste is the World Population Prospects (WPP). The WPP is a comprehensive set of demographic statistics on all countries of the world compiled the United Nations Population Division. The publication is revised every two years. The latest publication is the 2022 revision.

2.4 Period and Cohort Measures of mortality

Children ever born by a woman through out her reproductive life may also be referred to as lifetime fertility. Data on children ever born for successive age groups of women of post-reproductive age (aged 45 or over) provide information about trends in completed cohort fertility to the extent that the women providing the information are not very different in their fertility behaviour from the original birth cohort (that is, provided that death and migration have a minor effect on the estimates), and provided that omission of children who have died is not a serious problem. Therefore, period measures of child mortality represent hypothetical cohorts reflecting mortality conditions for a specific reference period.

2.5 Data and quality

The quality of reporting of data on children ever born was appraised using various methods. The number of children ever born to women in a given age group was divided by the number of women in the same age group to obtain mean children ever born, also known as mean parities. Other things being equal, the mean parities are expected to increase with age. Figure 2.1 presents the mean parities of women by urban and rural areas and Figure 2.2 presents mean parities by municipality.

Figure 2.1: Mean parities by urban and rural areas, 2022 census

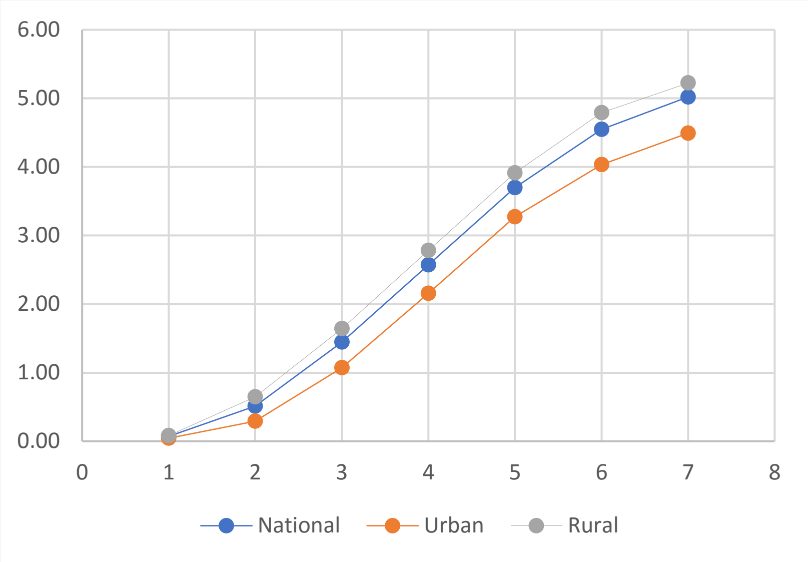
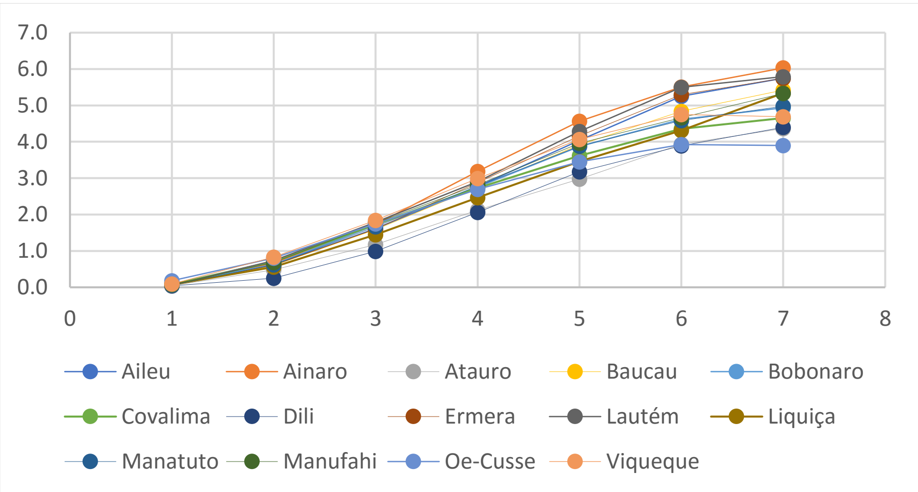


Figure 2.2: Mean parities by municipalities, 2022 census



Generally, the mean parities at national and subnational level show the expected trend as the mean parities do increase with increasing age of women. However, it is observed that in some subnational areas the mean parities are decreasing with woman's age especially at ages 35 and over. The decline in mean parities with woman's age is common phenomenon among old women who tend to omit their children who either died in the distant past or are grown up children and are living elsewhere.

Another criterion for assessing the quality of children ever born data is the proportion of women that are childless. The older a woman is, the less likely she is without a child. On this basis, the proportion of women who are childless should sharply decrease with woman's age. A proportion of childless women of equal to or less than 10percent in the oldest age group has no material effect on the quality of children ever born data (Moultrie at. al. 2013). Table 2.1 shows proportion of childless women by age at national level. On the basis of this criterion, the quality of data on children ever born is acceptable.

Quality of data on children ever born is also assessed by examining cases of implausible parities. A woman's parity is considered implausible if she reports that she has the number of children exceeding the number children she can biologically have depending on her current age. As a rule of thumb, a woman who is 12 years and over is capable of giving birth every 18 months (Moultrie at. al. 2013). Using this rule, the maximum number of children born by the oldest woman in each age group in the reproductive age span was calculated and used to assess the quality of reported parity data by age. The assessment revealed that women in all age groups had plausible parities except those in age groups 15-19 and 20-24 whose maximum parities are 5 and 8 children respectively, as shown in Table 2.1. The number of women with implausible parities in each of the two youngest age group were put in the missing category.

Table 2.1: Distribution of women by age and parity, 2022 census

	Age Group						
Parity	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**
0	73378	46194	20639	8919	4844	2617	2484
1	2673	9842	9540	5401	2569	1285	1211
2	801	6511	12199	9119	4542	1983	1710
3	188	1924	7500	9415	6573	2851	2382
4	110	572	3241	7114	7377	4022	3212
5	6	173	1110	3762	5941	4088	3728
6	0	85	381	1893	4050	3470	3520
7	0	52	112	785	2209	2426	2744
8	0	30	52	312	1095	1593	2061
9+	0	0	80	231	965	1810	3087
Missing	27	62	0	0	0	0	0
Women	77183	65445	54854	46951	40165	26145	26139
Children Ever Born	5495	33571	79400	120816	148602	118926	131242
Mean Parity	0.1	0.5	1.4	2.6	3.7	4.5	5.0
Percentage of childless women	95.1	70.6	37.6	19.0	12.1	10.0	9.5
Percentage Missing	0.0	0.1	0.0	0.0	0.0	0.0	0.0

2.6 Methods of analysis

The indirect method to estimate child mortality indices using data on children ever born and children surviving or dead was first developed by Brass and Coale (1968) and was later reformulated by Sullivan (1972), Trussell (1975), Feeney (1980), Palloni-Helligman (1986) and Moultrie et.al (2013). In the estimation process, the proportions of children dead out of those ever born alive are converted into infant mortality rate (1q0), child mortality rate(4q1) and under five mortality rate (5q0).

Estimates of childhood mortality rates will be obtained by multiplying the proportions of children dead by coefficients that have been developed for each of the families of Princeton model lifetables or United Nations (UN) model lifetables for developing countries. The Princeton model lifetables are divided into four regions namely North, South, West and East while the UN 1982 model lifetables consists of regions labelled as follows :Latin American, Chilean, Far Eastern, South Asian and General. Each region represents a given age pattern of mortality.

The estimation of childhood mortality will be based on the Moultrie at.al version of the Brass method and Princeton East model lifetable, similar approach as in 2015 census analysis. The spreadsheet provided by Moultrie et al will be used to produce unadjusted estimates of infant, child and under five mortality rates for Timor Leste in 2022 at national and subnational levels.

3 Mortality Levels and Trends

3.1 Infant mortality rates

Infant mortality rates were calculated using indirect estimation techniques as indicated in the previous section. Table 3.1 presents the infant mortality rates by sex, both adjusted and unadjusted for the various time reference periods.

Indirect estimation for infant mortality shows that in the 12 months-period before the census, 42.4 children died per 1000 live births before reaching their first birthday in Timor-Leste. By sex, 46.3 male children died per 1000 live births while 38.2 female children died per 1000 live births before reaching their first birthday. The estimate is from the most recent time period of June 2021.

Table 3.1: Unadjusted and adjusted estimates of Infant mortality rates by sex at national level, 2022 census

	Unadjusted IMR			Adjusted IMR		
Time Reference	**Both sexes**	**Male**	**Female**	**Both sexes**	**Male**	**Female**
June 2021	71.2	77.7	64.4	42.4	46.3	38.3
May 2020	56.6	62.3	50.0	45.0	49.5	39.7
January 2019	44.6	49.7	38.8	41.7	46.5	36.3
March 2017	40.5	45.8	34.7	24.1	27.2	20.7
March 2015	42.4	48.3	35.9	42.4	48.3	35.9
August 2012	46.5	51.4	41.1	46.5	51.4	41.1
June 2009	55.6	61.3	49.2	55.6	61.3	49.2

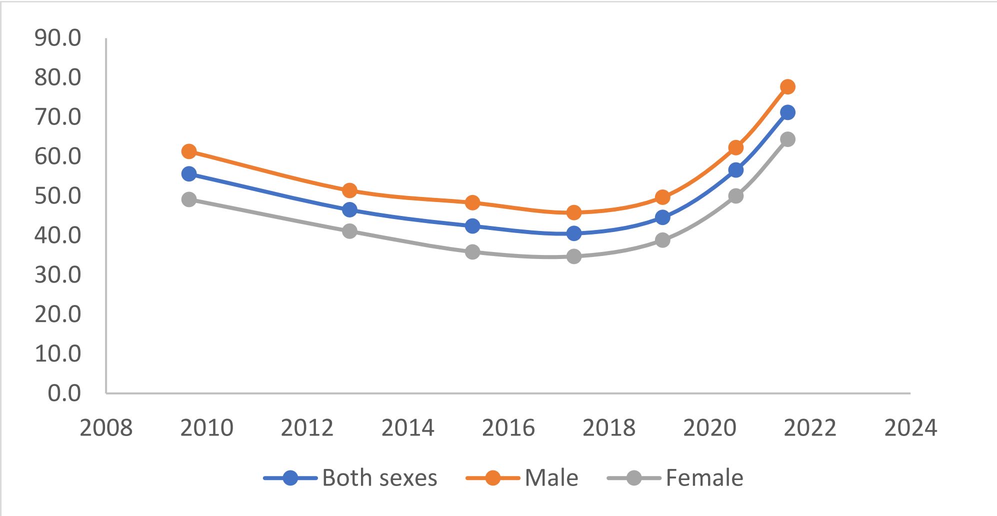
It has to be noted that the estimate corresponding to each year is produced entirely from the data corresponding to the child survival experience of a particular age group of women. For example, the estimate corresponding to June 2021 is produced from the data on children ever born and children surviving among women aged 15-19 at the time of the census; that corresponding to May 2020 are produced from the data on children ever born and surviving among women aged 20-24 at the time of the census.

Previous analysis of child mortality from the 2010 census, it was observed that childhood mortality estimates in Timor- Leste based on the 15-19 age group were 68 percent higher; estimates based on 20-24 age group were 26 percent higher, while estimates based on 25-29 and 30-34 age groups were 7 percent higher. In 2015, model estimates of childhood mortality were adjusted based on these observations. The adjustment multipliers from the previous census that were also used inIMR calculation are presented in Table 3.2.

Table 3.2: Adjustment Multipliers for child mortality

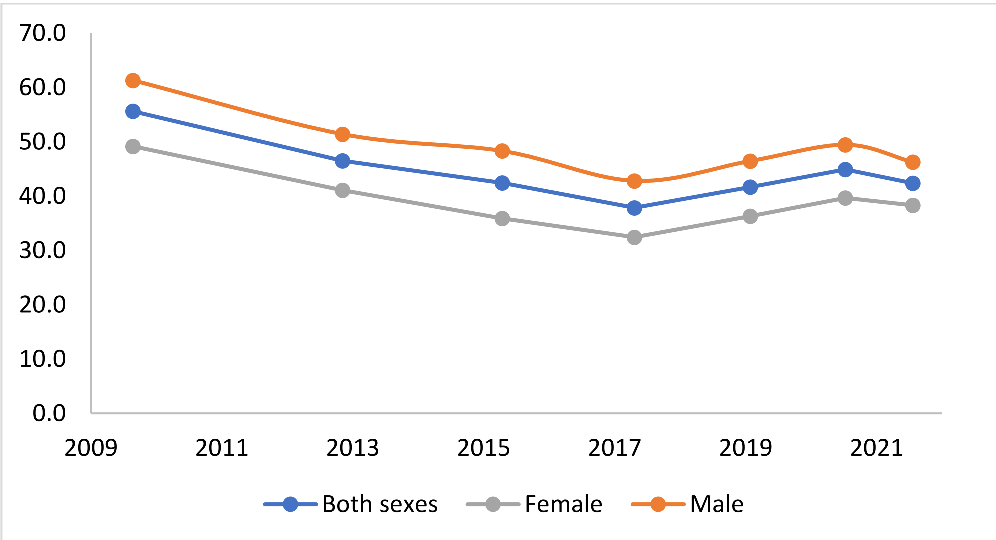
Age group	Overreporting (percent)	Adjustment Factor
15-19	68.0	0.5952
20-24	26.0	0.7937
25-29	7.0	0.9346
30-34	7.0	0.9346
35-39	0.0	1.0000
40-44	0.0	1.0000
45-49	0.0	1.0000

Figure 3.1: Trends in infant mortality rates by sex, Timor-Leste, 2022 census



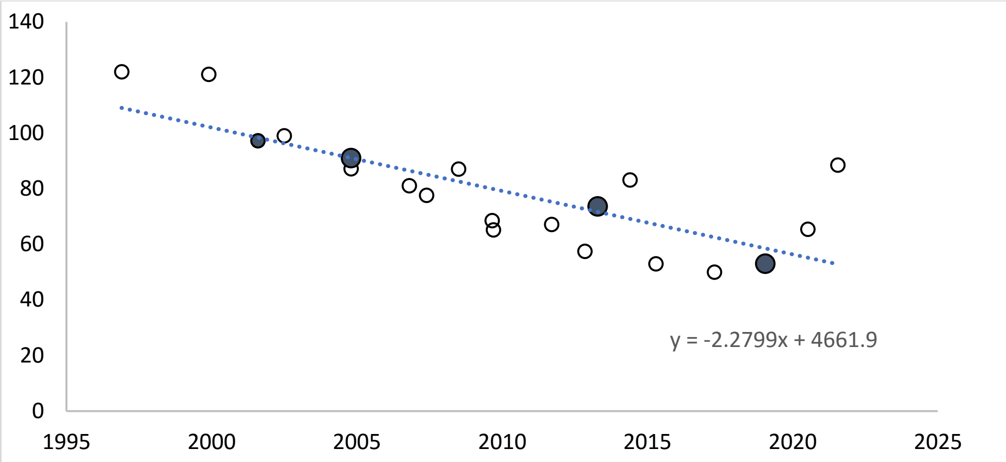
The period of 2008 to 2020 shows a decline in infant mortality from the period 2009-2019 except the younger age group 15-19 years where there is an increase. The calculation of infant mortality rates is based on children ever born (CEB) and children surviving (CS) by the age of the other (in the reproductive age range – 15-49 years). The adjusted infant mortality confirms the decline in IMR. The results indicate that there was higher mortality among males than females.

Figure 3.2: Adjusted infant mortality rate by sex, Timor-Leste, 2022 Census



Mortality trends can be examined by comparing mortality rates for census using time references obtained from various census. However, comparisons between census should be interpreted with caution because of variations in quality of data, time references, and coverage. Figure 3.3 which plots 2010, 2015 and 2022 censuses show that infant mortality has been declining. The trend line shows that it is at 50 deaths per 1000 live births, which is slightly above the estimate from the 2022 census.

Figure 3.3: Trends in Infant Mortality in Timor-Leste, 1995-2022



3.2 Child mortality rates

Results in Table 3.3 show the child mortality rate for Timor-Leste is 7.5. The estimates have been computed after adjusting the 15–19-year age following the 2015 census groups and using South Asian Model. The results also show that under-five mortality has been declining in Timor-Leste.

Table 3.3: Unadjusted and adjusted estimates of child mortality rates by sex at national level, 2022 census

	Unadjusted CMR			Adjusted CMR		
Time reference	**Both sexes**	**Male**	**Female**	**Both sexes**	**Male**	**Female**
June 2021	12.6	13.7	11.4	7.5	8.1	6.8
May 2020	13.6	15.0	12.1	8.1	8.9	7.2
January 2019	12.8	14.3	11.2	7.6	8.5	6.7
March 2017	7.3	8.2	6.3	4.4	4.9	3.7
March 2015	13.1	14.9	11.1	7.8	8.9	6.6
August 2012	14.3	15.8	12.7	8.5	9.4	7.6
June 2009	17.1	18.8	15.1	10.2	11.2	9.0

3.3 Under 5 mortality rates

Table 3.4 presents the adjusted and unadjusted under-five mortality rate for Timor-Leste at different reference time periods. The estimates have been computed after adjusting the 15–19-year age following the 2015 census groups and using South Asian Model. This yielded under-five mortality of 54.5 deaths per 1000 live births. The table also shows that under-five mortality has been declining in Timor-Leste.

Table 3.4: Unadjusted and adjusted Under 5 Mortality, rates at national level, 2022 census

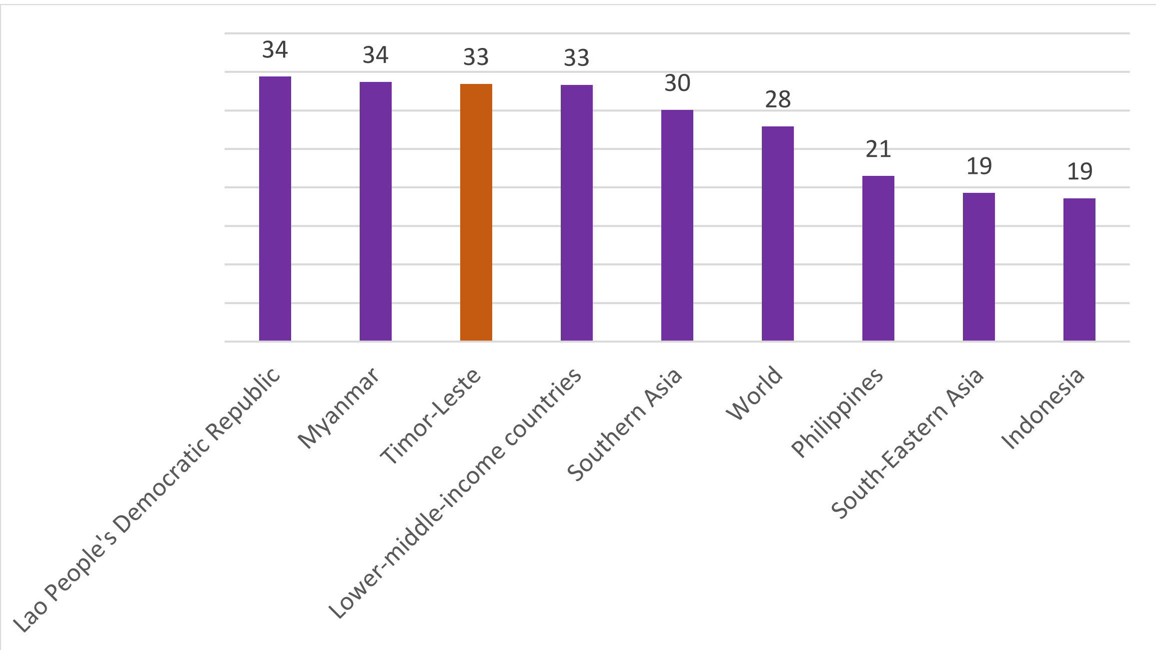
	Unadjusted U5MR			Adjusted U5MR		
Time reference	**Both sexes**	**Male**	**Female**	**Both sexes**	**Male**	**Female**
June 2021	91.5	99.6	82.8	54.5	59.3	49.3
May 2020	73.1	80.3	64.6	58.0	63.7	51.3
January 2019	57.8	64.3	50.4	54.0	60.1	47.1
March 2017	52.6	59.2	45.1	31.3	35.3	26.8
March 2015	54.9	62.5	46.6	54.9	62.5	46.6
August 2012	60.1	66.4	53.3	60.1	66.4	53.3
June 2009	71.7	79.0	63.6	71.7	79.0	63.6

3.4 International comparison of infant and Under-five mortality, 2022

United Nations Department of Economic and Social Affairs (UNDESA) World Population Prospects 2022 estimated infant mortality (IMR) for Timor-Leste IMR to be 33 deaths per 1000 live births. Data as presented in Figure 3.4 show that in general, the mortality among infants in Timor-Leste is higher than in some countries in Southern East Asian region. At 33 deaths per 1000 live births, infant mortality for Timor-Leste is above Indonesia (19), SEA (19), ESEA (22) and is six points from the global average infant mortality (28 deaths per 1000 live births).

The infant mortality rate for Timor-Leste is close to Myanmar and Laos, where the infant mortality rate is 34 deaths per 1,000 births. Timor-Leste IMR matches with that of low and medium income countries. The lowest IMR is observed in Indonesia and Southern East Asia estimated at 19 deaths per 1000 live births respectively.

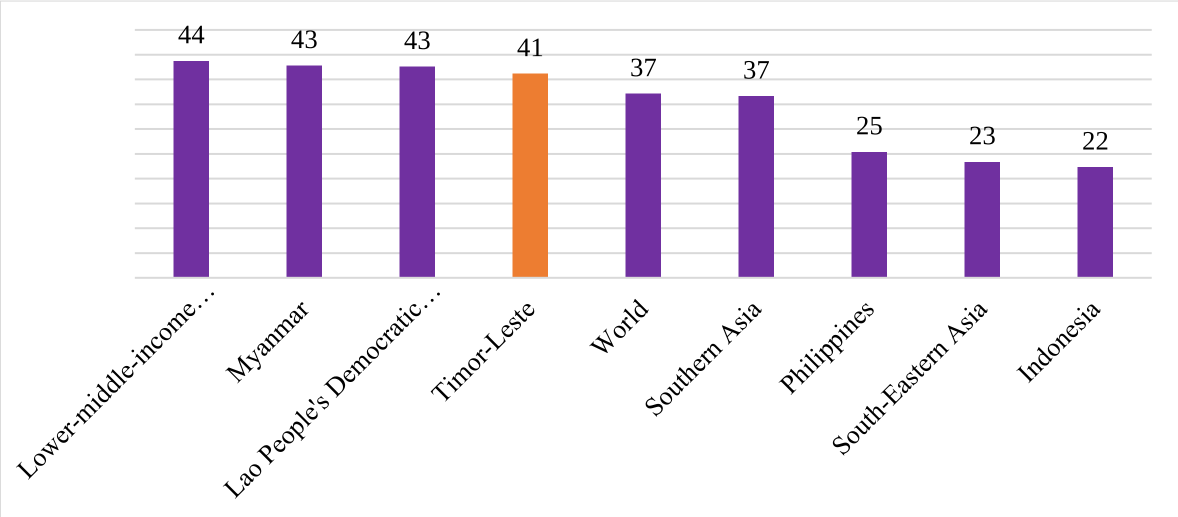
Figure 3.4: Regional comparison in infant mortality, World Population Prospects, 2022



Source: UNDESA, World Population Prospects 2022

Data presented in Figure 3.5 from 2022 WPP show that in general, the under five mortality in Timor-Leste is higher than some countries in Southern East Asian region. At 41 under five deaths per 1000 live births according to 2022 WPP , U5MR for Timor-Leste is above Indonesia (22), South Eastern Asia (23), Southern Asia (37) is four points from the global average U5MR (37 deaths per 1000 live births).

Figure 3.5: Regional comparison in under-five mortality, World Population Prospects, 2022



These newly published WPP estimate show that the country's under-five mortality rate of 41 deaths per 1000 live births is also much lower compared to the estimate from Timor-Leste 2022 census (54.5 deaths per 1000 live births). As mentioned before, the difference lies in the sources of data as well as the methods employed to compute the indicators.

3.5 Child mortality differentials

Analyses of mortality measures are useful in identifying promising directions for health and nutrition programmes and improving child survival efforts in Timor-Leste. Disaggregation of mortality measures by socioeconomic, demographic and location helps to identify differentials in population subgroups and target high-risk groups for effective programmes, especially for a country undergoing decentralisation. Furthermore, the level of child mortality has the largest single year contribution to life expectancy at birth and therefore gives an indication of the health status of a population.

3.5.1 Infant mortality rates by place of residence

Correction factors used in 2015 census analysis on child mortality were applied to the unadjusted trend for urban and rural data. Tables 3.5 presents the unadjusted and adjusted infant mortality rates for urban and rural areas. The data clearly indicates that in rural areas, early-age mortality levels are higher than in urban areas.

The analysis finds that a child's chance of celebrating their first birthday stands at 33.7 deaths for every 1000 births in the urban, while for the rural areas it is 47.5 deaths per 1000 live births. As with previous trends, male children have a higher mortality than females regardless of place of residence: 37.1 deaths versus 30.1 deaths per 1000 births in urban areas compared with 43.2 deaths versus 51.6 deaths per 1000 births in rural areas.

Table 3.5: Adjusted infant mortality rate by sex, 2009 to 2021, urban and rural areas, 2022 Census

Year	Both sexes		Male		Female	
	Urban	Rural	Urban	Rural	Urban	Rural
June 2021	33.7	47.5	37.1	51.6	30.1	43.2
May 2020	33.9	49.8	39.9	53.5	26.8	45.4
January 2019	35.1	45.8	40.2	50.4	29.2	40.7
March 2017	30.5	43.5	35.9	48.0	24.5	38.5
March 2015	34.9	48.7	41.2	54.3	27.8	42.5
August 2012	37.0	54.4	41.0	60.0	32.6	48.3
June 2009	46.4	63.5	51.3	70.1	41.0	56.2

3.5.2 Child mortality rates by place of residence

Table 3.6 presents estimates of child mortality rates by sex and urban and rural areas. There are disparities in child mortality rates between urban and rural location. For example, child mortality is two points lower in the urban (6 deaths per 1000 live births) compared to the rural areas (8.3 deaths per 1000 live births).

Mortality between age 1 and 4 is lower for females than for male children. However, the gender gap is narrower, for child mortality compared to the infant mortality as summarised in Table 3.6.

Table 3.6: Adjusted Child mortality by sex and place of residence, 2009 to 2021

	Both sexes		Male		Female	
Time reference	Urban	Rural	Urban	Rural	Urban	Rural
June 2021	6.0	8.3	6.6	9.0	5.4	7.6
May 2020	8.2	12.0	9.6	12.8	6.5	10.9
January 2019	10.1	13.1	11.6	14.4	8.4	11.7
March 2017	8.8	12.5	10.3	13.8	7.1	11.1
March 2015	10.8	15.0	12.7	16.7	8.6	13.1
August 2012	11.4	16.7	12.7	18.4	10.1	14.9
June 2009	14.3	19.5	15.8	21.4	12.7	17.3

3.5.3 Under five mortality rates by place of residence

Table 3.7 shows that Under-five mortality rates, both adjusted and unadjusted in urban and rural areas by sex at different time references. The results continue to show higher under five mortality in rural areas. For example, in rural areas, there are 70 under five deaths per 1000 live births as compared to 44 under five deaths per 1000 live births in urban areas. Similar to the other child mortality indices, under five mortality is also higher for males than females in both urban and rural areas.

Table 3.7: Adjusted Under-five mortality by by sex, 2009 to 2021

	Both sexes		Male		Female	
Time reference	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**
June 2021	43.5	60.9	47.8	66.0	38.9	55.4
May 2020	43.9	64.1	51.6	68.8	34.8	58.5
January 2019	45.5	59.2	52.1	65.0	38.0	52.7
March 2017	39.6	56.3	46.5	62.1	31.8	49.9
March 2015	45.3	63.0	53.4	70.1	36.2	55.0
August 2012	48.0	70.2	53.2	77.3	42.4	62.4
June 2009	60.1	81.7	66.3	90.0	53.1	72.5

3.5.4 Infant mortality rates by municipality

Differences child mortality indicators are very sensitive to health interventions thus very useful in terms of monitoring and evaluating the health programs at municipality level.

Figure 3.6 shows the variations in infant mortality by municipality for both sexes (male and female). Covalima ranks highest with 72 deaths of children under the age of one for every 1000 births, followed by Manatuto (60 deaths per 1000 births). The lowest number is observed in Oe-Cusse (29 deaths deaths per 1000 births) and Dili (34 deaths per 1000 births).

Figure 3.6: Infant mortality rates for both sexes by municipality, 2022 census

Figure 3.7 shows that Dili and Oe-Cusse with 34 deaths and 29 deaths per 1000 live births respectively, are the two municipalities with the lowest number of male children dying before reaching their first birthday. Male infant mortality rate is highest in Covalima (74 deaths per 1000 live births), and Manatuto (63 deaths per 1000 live births).

Figure 3.7: Infant mortality rates, males, by municipality, 2022 census

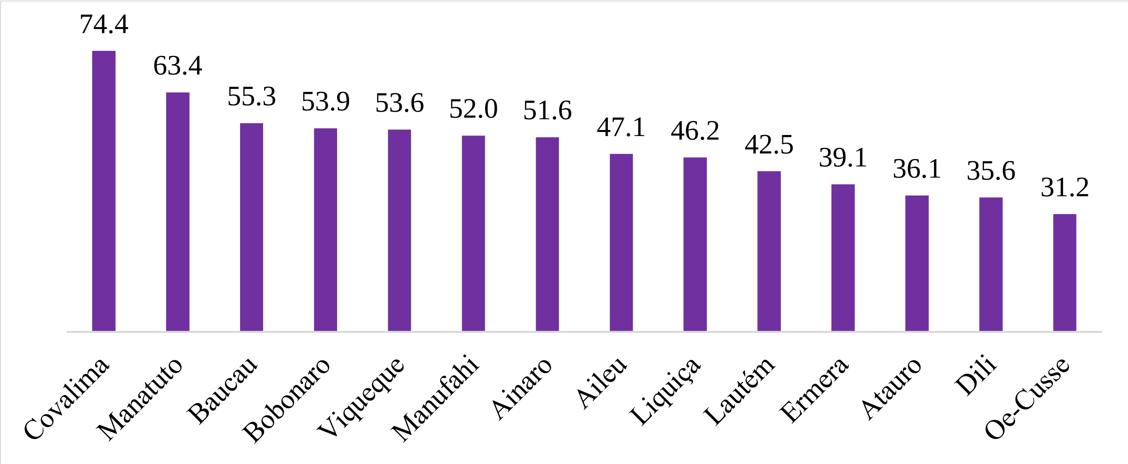
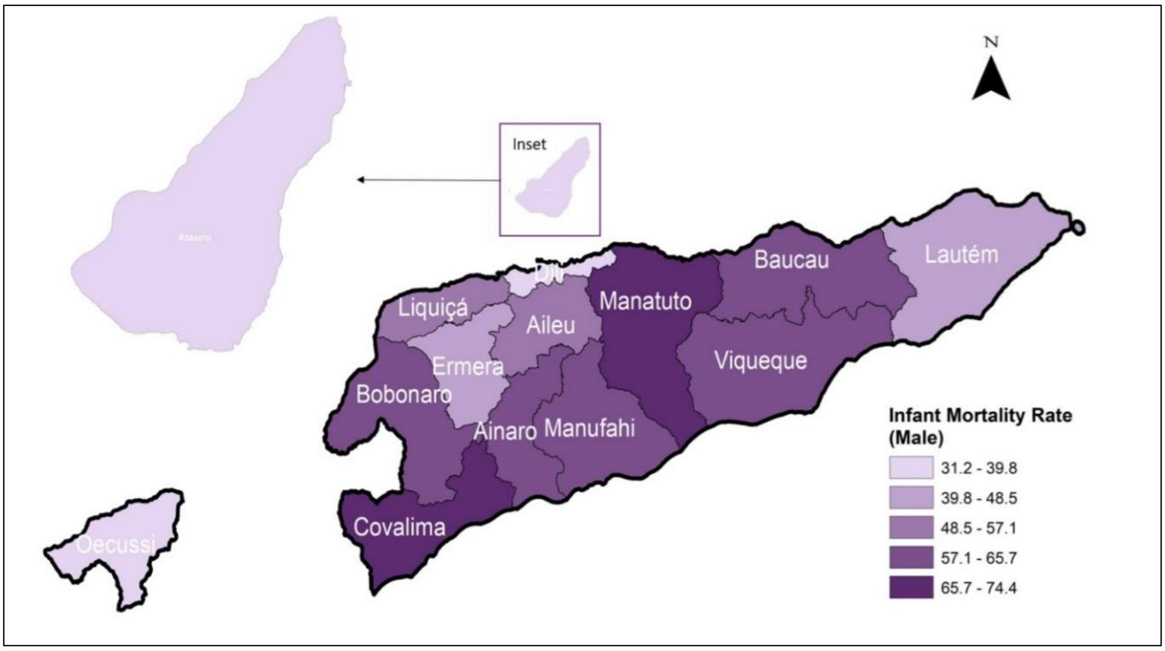


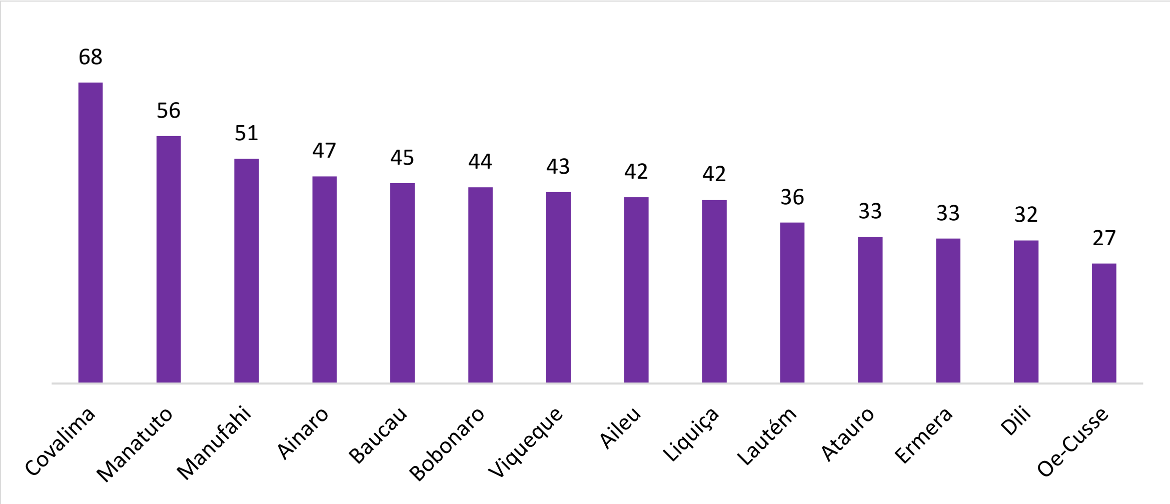
Figure 10 shows the spatial variations in IMR by municipality for the males.

Figure 3.8: Infant mortality rates, males, by municipality, 2022 Census



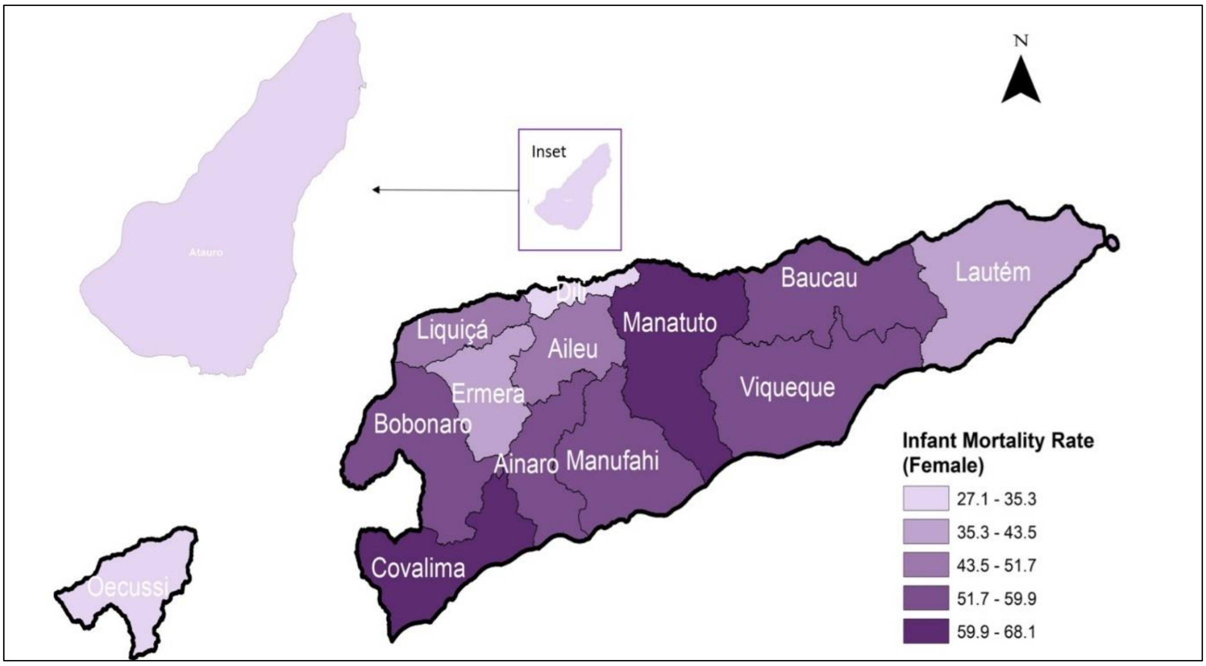
IMR for females presented in Figure 3.9 also shows that the highest IMR mortality rates for females were in Covalima – 68 deaths per 1,000 live births; Manatuto – 56 deaths; and Manufahi – 51 deaths. The lowest female rate was in Oe-Cusse (27 deaths per 1,000 live births), followed by Dili (32 deaths per 1,000 live births), and Ermera and Atauro (33 deaths per 1,000 live births each). The range between the highest and lowest male rates was 42 points. Further, it is noted that Lautem is within the national range of female IMR rate of 38.2 deaths per 1000 live births.

Figure 3.9: Infant mortality rates , females, by municipality, 2022 census



The spatial variation in IMR mortality rates for females is depicted in Figure 3.10. Higher rates are evident in the extreme south east where the shading is darker, followed by the central part (Manatuto). With exception of Ermera, lower rates are also evident in south west – Viqueque and Lautem in the west.

Figure 3.10: Infant mortality rates, females, by municipality, 2022 census



3.5.5 Child mortality rates by municipality

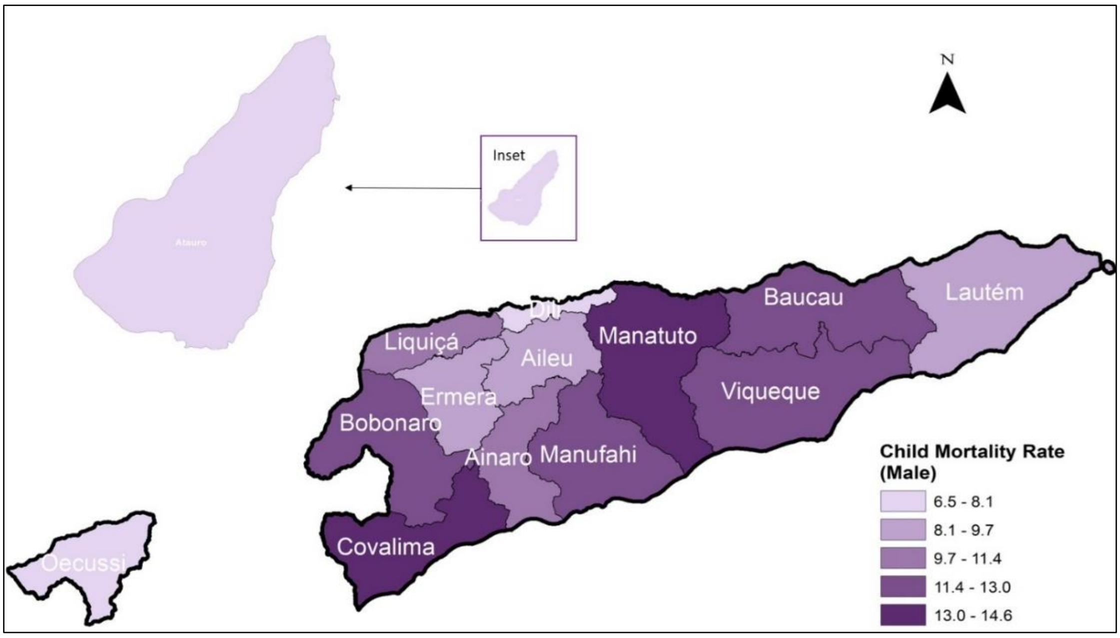
The child mortality rates by municipality presented in Table 3.8, presented show that the range is from 6.1 deaths to 14.1 deaths per 1000 live births. Covalima has the highest child mortality rates while the lowest is observed in Oe-Cusse. By sex, as already observed, Covalima has the highest child mortality rates 14.6 deaths for males and 13.5 deaths for females per 1000 live births. The gender gap is minimal for all the municipalities.

Table 3.8: Child mortality rates by Municipality, by sex, 2022 census

Municipalities	Both sexes	Male	Female
Aileu	7.9	8.3	7.4
Ainaro	8.7	9.0	8.2
Atauro	7.4	8.5	7.0
Baucau	10.2	11.2	9.3
Bobonaro	10.0	10.9	9.1
Covalima	14.1	14.6	13.5
Dili	7.1	7.4	6.7
Ermera	7.5	8.1	6.8
Lautém	6.8	8.7	7.5
Liquiça	9.0	9.4	8.5
Manatuto	12.0	12.7	11.3
Manufahi	10.4	10.5	10.3
Oe-Cusse	6.1	6.5	5.7
Viqueque	9.9	10.8	8.9

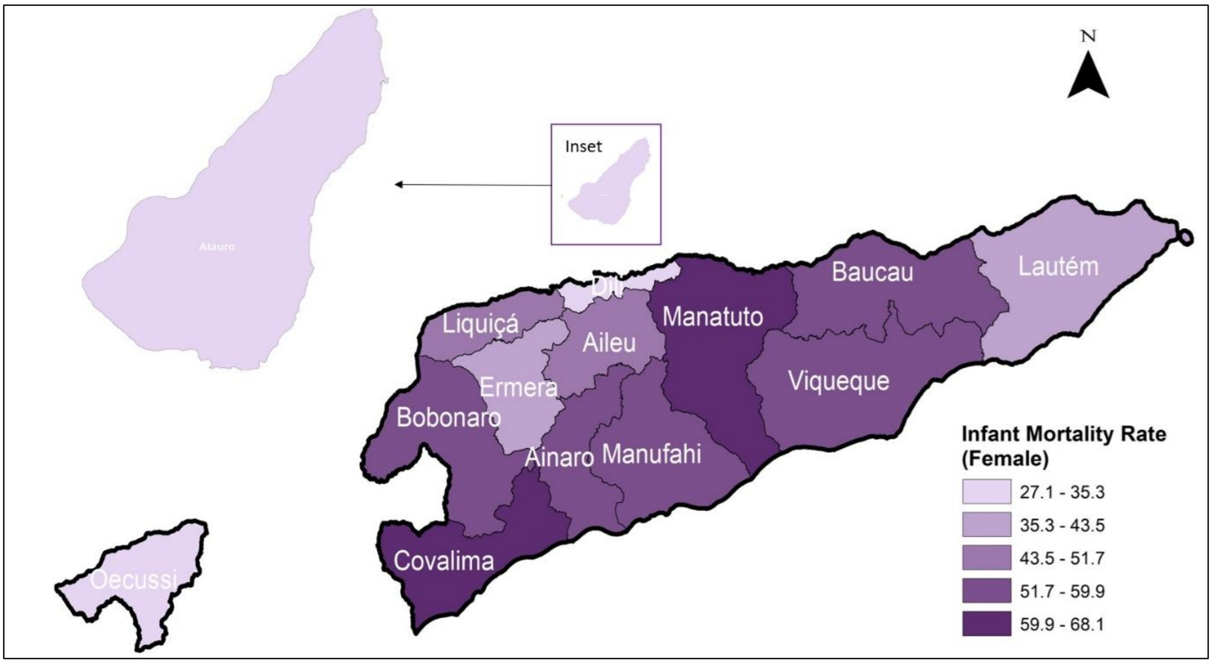
Figure 3.11 presents child mortality rates for males by municipality. Higher rates are observed in the extreme south west in Covalima and the central municipality of Manatuto. The municipalities adjacent to those with highest child mortality rates tend to have lower rates, which could suggest variations in the health interventions adopted by the municipalities.

Figure 3.11: Child mortality rates, males, by municipality, 2022 census



A similar geographical presentation of female child mortality rates are shown in Figure 3.12, showing a similar pattern to male child mortality.

Figure 3.12: Child mortality rates, females, by municipality, 2022 census



3.5.6 Under five mortality rates by municipality

Table 3.9 presents the under-five mortality rates per 1000 live births by municipality. These estimates show similar mortality patterns observed under infant and child mortality. However, the table depicts variations in under five mortalities by sex; the highest under-five mortality rates are observed in Covalima (97 deaths) seconded by Manatuto (83 deaths) and Bauca (73 deaths). A similar trend is observed in the cases of infant and child mortality. While both male and female children have experienced declines in early-age mortality levels, girls have always maintained lower mortality levels than boys.

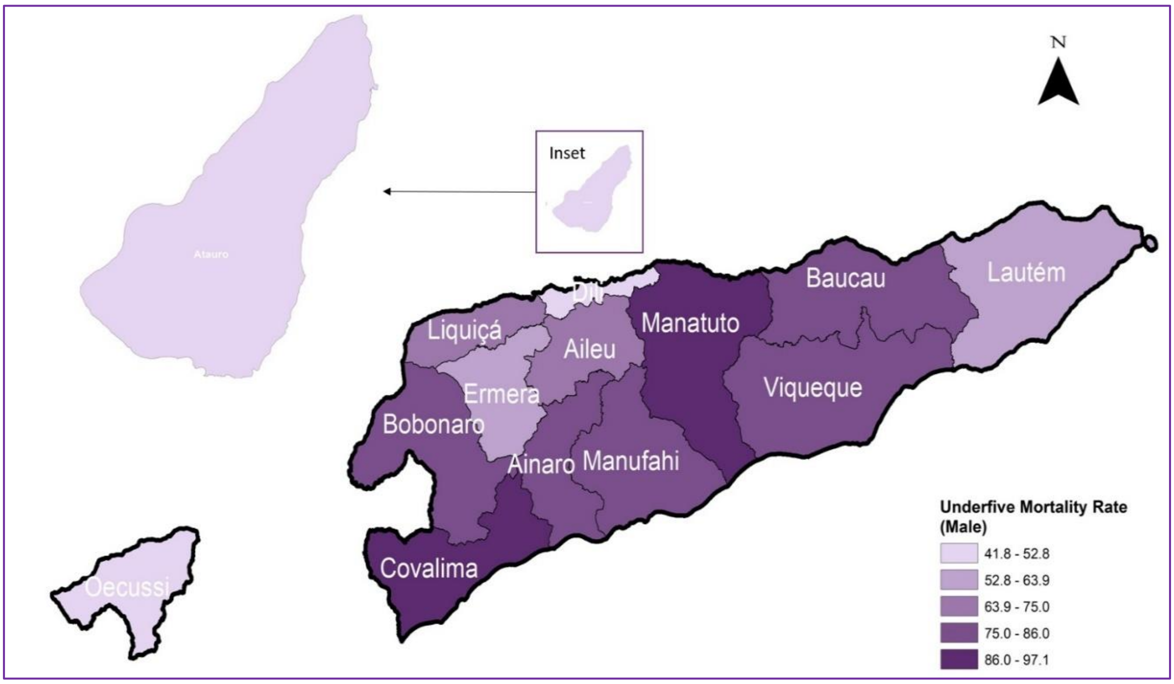
Table 3.9:Under-five mortality rates, by sex and municipality, 2022 census

	Both Sexes	Male	Female
Aileu	57.4	60.4	54.1
Ainaro	63.4	65.9	60.1
Atauro	47.0	49.0	44.8
Baucau	66.7	73.0	60.2
Bobonaro	65.1	71.3	59.0
Covalima	93.5	97.1	89.3
Dili	45.5	47.5	43.4
Ermera	48.2	52.1	43.9
Lautém	49.3	56.6	48.7
Liquiça	58.4	61.3	55.3
Manatuto	78.7	83.3	73.9
Manufahi	68.1	68.8	67.3
Oe-Cusse	39.3	41.8	36.4
Viqueque	64.7	70.8	57.6

Furthermore, there is a gender gap in under-five mortality by municipality with Viqueque municipality depicting the highest (13 deaths). The second highest municipalities are Baucau and Bobonaro with 12 deaths per 1000 live births.

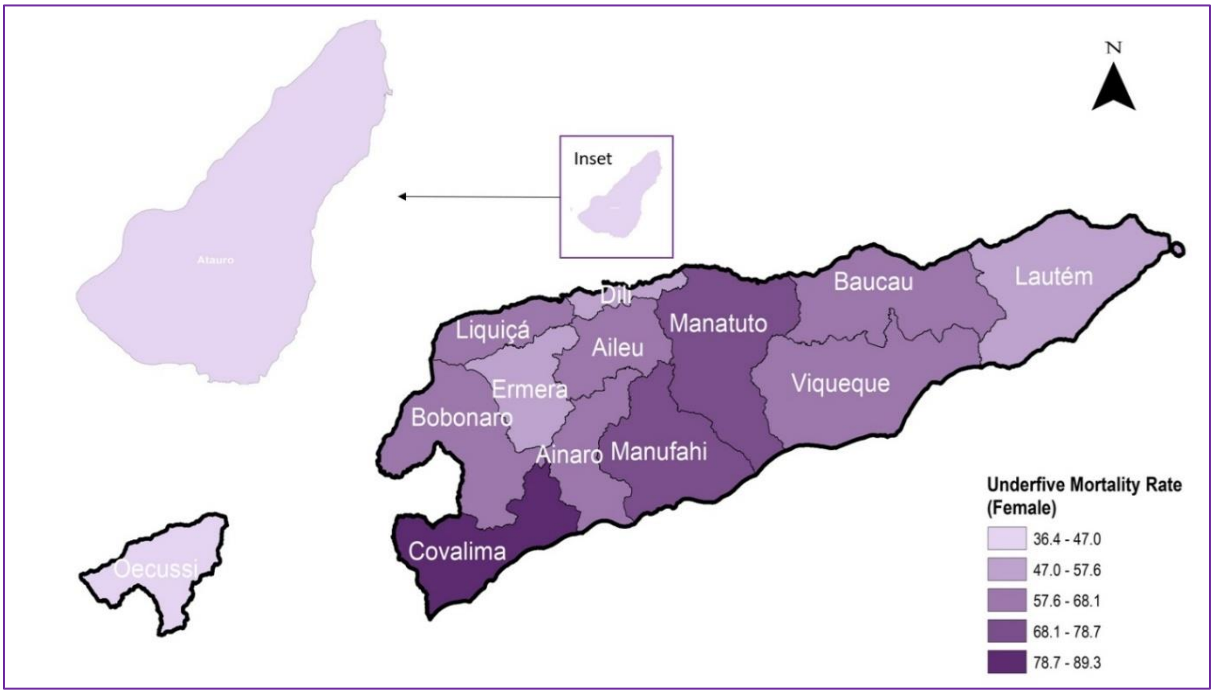
Figures 3.13 and 3.14 present spatial distribution of under-five mortality rates for males and female by municipality.

Figure 3.13: Under-five mortality rates, males, by municipality, 2022 census



Higher rates are observed in the extreme south west in Covalima and the central municipality of Manatuto. The municipalities adjacent to those with highest child mortality rates tend to have lower rates, which could suggest variations in the health interventions adopted by the municipalities.

Figure 3.14: Under-five mortality rates, females by municipality, 2022 census



3.5.7 Child mortality by education of mother

There is plethora of evidence on the influential role of education in lowering the risks of infant and child mortality. Generally, an inverse relationship is found between women's education and child mortality. Women with more years of schooling experience are also likely to seek health care, delay marriage, use contraception for spacing and limiting births, practice exclusive breastfeeding and seek immunisation services.

As discussed in the background section, demographic and social factors exert significant influence in mortality at younger ages. This section presents the demographic and social differentials in infant, child and under-five mortality rates. Table 12 displays the differences by level of education of the mother. Table 3.10 presents the IMR, CMR and U5MRs disaggregated by demographic and socioeconomic characteristics of women aged 12 years and over.

The 2022 census data show inconsistent results contrary to what is generally observed including in Timor-Leste based on existing evidence from 2016 DHS and previous studies. Further examination of the raw data is suggested. It is possible that mortality is severely under-reported by household members with little or no formal education experience.

Table 3.10: Infant mortality rate, child mortality rate and Under 5 mortality rate by sex and level of education of the mother, 2022 census

	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Level of education	**IMR**	**IMR**	**IMR**	**CMR**	**CMR**	**CMR**	**U5MR**	**U5MR**	**U5MR**
None	42.0	47.4	36.1	12.8	12.1	12.9	43.4	36.1	48.6
Primary	65.9	69.2	62.7	19.9	17.4	22.1	72.1	62.7	83.4
Secondary	47.1	57.7	35.5	14.3	14.6	12.6	40.3	35.5	47.7
Tertiary	43.3	48.0	38.5	13.2	12.2	13.7	44.2	38.5	51.7

3.5.8 Child mortality by marital status of mother

Children born in households with both father and mother in marital union are generally more likely to survive than those born in households with a single parent. This is partly explained by the care provision and family environment where children have better opportunities for cognitive development and physical growth. It is important to note that union status is a function of an individual's biological age. Women usually experience widowhood during old ages. On the other hand, young women are vulnerable to marital dissolution through divorce or separation which can affect the mental and physical development of young children.

The analysis shown in Table 3.11 reveal that child mortality is highest among women that have never been married, followed by women that are widowed, as shown in Table 13. For example, under5 mortality among never-married women is 85.6 deaths per 1000 births and among widowed women, it is 73.5 deaths per 1000 births compared with 45.5 deaths per 1000 births for married women. The pattern is similar for infant and child mortality rates.

The results further show that significant variation by sex. Female under 5 mortality rate among married women is 79 deaths per 1000 live births compared with that for males at 85.5 deaths per 1000 live births.

Table 3.11: Infant mortality rate, child mortality rate and Under 5 mortality rate by sex and marital status of the mother, 2022 census

	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Marital status	**Infant Mortality Rate**			**Child Mortality Rate**			**Under5 Mortality Rate**		
Never married	64.4	69.3	59.4	19.4	17.4	20.9	82.6	85.5	79.0
Married	35.1	40.2	29.7	10.8	10.3	10.7	45.5	50.1	40.0
Widowed	57.2	66.1	47.5	17.3	16.7	16.8	73.5	81.6	63.6
Divorced/Separated	40.0	42.8	37.3	12.2	10.9	13.2	51.8	53.3	50.0

3.5.9 Child mortality by employment status of mother

Women’s employment status is an effective socioeconomic indicator of autonomy, empowerment and access to financial resources. The analysis of 2022 census shows a slight effect of employment on child mortality as shown in Table 3.12 . For example, women who were employed showed Under 5 mortality that is lower (56.4 deaths per 1000 births) compared with women who are not employed (60.1 deaths per 1000 births).

Table 3.12: Infant mortality rate, child mortality rate and Under 5 mortality rate by sex and employment status of the mother, 2022 census

	Both sexes	**Male**	**Female**	**Both sexes**	**Male**	**Female**	**Both sexes**	**Male**	**Female**
Employment status	**Infant Mortality Rate**			**Child Mortality Rate**			**Under 5 Mortality Rate**		
Employed	43.7	50.5	36.5	13.3	12.8	13.0	56.4	62.7	49.0
Unemployed	46.6	44.6	48.7	14.2	11.4	17.3	60.1	55.5	65.2
Outside the labour force	44.9	50.3	39.1	13.7	12.8	13.9	57.9	62.4	52.4

4 Adult mortality and lifetables

As a summary measure of mortality, life tables show the mortality experience by age. It gives the probability of dying at a particular age and the life expectancy. Information collected in a census on recent deaths is useful in the computation of these synthetic measures of adult mortality.

4.1 Quality of adult mortality data

Data on the number of deaths in households disaggregated by age and sex is useful for estimating life expectancy, defined as the number of years a person of a given exact age is expected to live assuming prevailing mortality risks remain unchanged. In the 2022 population census, information on household deaths was collected by asking household heads whether someone died in their households in the 12-month period preceding the census. Statistics on household deaths are prone to coverage and content errors. Coverage errors arise when information about the death is not collected at all. On the other hand, content errors are introduced in data when the death is recorded but its relevant characteristics are misreported.

Misunderstanding of the reference by respondents may lead to omission or inclusion of death statistics. Information on deaths is missed when enumerators are not able to visit households due to inaccessibility of enumeration areas. In addition, some respondents may deliberately omit reporting about deaths because there are no sanctions associated with nonreporting of the deaths or the deaths invoke sad memories.

Content errors in death statistics may result from missing information on the death notification. Such may include age or sex. In some instances, details about the deceased persons may be available but are distorted due to lack of correct knowledge by the informants. For example, informants may not know the true age or cause of the deceased of their siblings. Accurate information say age of deceased old persons is hard to get because many old persons do not have birth certificates or have low education Accuracy of allocation of deaths by places is subject to question when place of death is different from place of usual residence of the deceased.

Accurate mortality statistics are important for estimation of reliable mortality indicators, hence the need to assess and adjust it. There are several methods that are used to assess the completeness in the reporting of death statistics, the notable one being the (generalized) growth balance method (GGB). In its initial formulation by Brass (1975) the method required that a population has a stable age structure. The method has been reformulated to remove the limitation that it can only be applied to stable population. The reformulated method, known as the generalised growth balance (GGB) can be used to assess and adjust mortality data in populations with non- stable age structure which are closed to migration or that migration is known so that the population structure can be adjusted for it. The GGB method is based on comparison of deaths by age and sex that occurred between two successive censuses with the change of population sizes by age and sex. The GGB method assumes that the age structure of the number of deaths by sex is correct, but that the level should be adjusted by comparing the populations by age and sex in the two censuses. As a by-product, the GGB method yields an estimate of the relative under-count of the second census with respect to the first or vice versa.

4.2 Life expectancy

A number of approaches were employed to estimate life expectancy for Timor-Leste for 2022 before adopting the lifetables including WHO, UNIGME, the World Prospectus Population, Demographic and Health surveys, Multiple Indicator Surveys and past census.

The preliminary analyses showed that there was a disparity in the average completeness of deaths; reporting of deaths under five was biased downwards leading to implausible life expectancy for both sexes. Additionally, the reporting of deaths of those 60 years and over among males was negligible while female deaths was heavily biased in this age group.

Furthermore, the number of deaths reported in the 2010 and 2015 census was higher than those reported in the second census. For example, the 2015 census indicated that there were 9,209 deaths (NSD and UNFPA, 2018) while the 2022 census recorded 8,279 deaths – a difference of 930. This magnitude of deaths is very unlikely in a period of 7 years.

Although this can be caused by an improvement in living and health conditions and not necessarily on under-reporting, using the GGB method yielded implausible life expectancies for the infant and child mortality estimates. Given this difference, it was not possible to use the GGB method that as the number of deaths as the two censuses did not meet the stringent requirement of the method.

To construct the life table, an attempt was first made to use child mortality estimates from the 2016 DHS, however this was also showing low life expectancy. The one census method was used at national, urban-rural and municipality level. This was in consideration of the under-reporting that appeared when used with the GGB method that employs two censuses. Because of this, we utilised the Moultrie Excel spreadsheets that accommodate single census to adjust the direct estimate of age specific mortality rates of the reported household deaths. Unlike the conventional GGB which compares inter-censal deaths estimated from two census age distributions with inter-censal deaths estimated from household deaths reported during the 12 months prior in each census to estimate under reporting of the latter.

The results in Tables 4.1 and 4.2 show that the estimated life expectancy at birth is 69.3 years for females and 65.1 years for males. The differentials in expectation of life at birth have been attributed to by some studies to genetic reasons, which suggest that male infants may be biologically more vulnerable to certain health conditions or infections, leading to slightly higher mortality rates in the early years of life than their counterparts. In some societies, there may be a preference for female children, leading to differential care and attention, which can result in neglect of male children, affecting their health and survival. Furthermore, because of the differential in treatment of children, in countries where malnutrition is prevalent, such biological differences may also expose vulnerability. Given this underlying condition, where maternal mortality rates are higher, it can indirectly impact child mortality rates. The death of a mother may lead to increased vulnerability for the surviving children.

Table 4.1: Life table, males, 2022 census[1]

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)	a(x,n)
0	0.0487	0.0469	100000	4686	96145	0.9271	6507513	65.1	0.18
1	0.0152	0.0585	95314	5572	367393	0.9621	6411368	67.3	1.51
5	0.0024	0.0121	89742	1088	445992	0.9904	6043975	67.3	2.50
10	0.0014	0.0071	88655	628	441704	0.9917	55979383	63.1	2.50
15	0.0020	0.0101	88027	888	438029	0.9883	5156279	58.6	2.63
20	0.0027	0.0132	87139	1153	432901	0.9859	4718250	54.1	2.58
25	0.0030	0.0148	85986	1274	426802	0.9842	4285349	49.8	2.54
30	0.0034	0.0168	84712	1423	420075	0.9819	3858547	45.5	2.55
35	0.0039	0.0195	83289	1625	412477	0.9789	3438472	41.3	2.56
40	0.0046	0.0229	81664	1870	403786	0.9744	3025996	37.1	2.57
45	0.0059	0.0290	79795	2314	393437	0.9659	2622210	32.9	2.61
50	0.0082	0.0402	77481	3118	380024	0.9511	2228773	28.8	2.63
55	0.0121	0.0587	74363	4365	361449	0.9304	1848748	24.9	2.63
60	0.0169	0.0812	69998	5684	336276	0.9079	1487300	21.2	2.59
65	0.0218	0.1033	64314	6641	305302	0.8865	1151023	17.9	2.55
70	0.0267	0.1255	57673	7236	270640	0.8563	845722	14.7	2.55
75	0.0362	0.1663	50437	8389	231760	0.8088	575082	11.4	2.57
80	0.0526	0.2345	42047	9858	187455	0.4540	343321	8.2	2.69
85	0.2065	...	32189	32189	155866	...	155866	4.8	4.84

[1] m(x,n) Age specific death rates; ${}_nq_x$ Proportion of persons alive at the beginning of the age interval who die during the age interval; l_x Of the starting number of new-borns in the life table (called the radix of the life table, usually set at 100,000); ${}_nd_x$ The number of persons in the cohort who die in the age interval *(x, x+ n);* ${}_nL_x$ Number of years of life lived by the cohort within the indicated age interval *(x, x+ n)* (or person-years of life in the age interval); T_x Total person-years of life contributed by the cohort after attaining age x; e_x^0 Average number of years of life remaining for a person alive at the beginning of age interval x.

Table 4.2: Life table, females, 2022 census

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)	a(x,n)
0	0.0392	0.0380	100000	3800	96823	0.9491	6927489	69.3	0.16
1	0.0074	0.0289	96200	2780	377744	0.9751	6830666	71.0	1.46
5	0.0038	0.0187	93420	1743	462742	0.9862	6452922	69.1	2.50
10	0.0018	0.0088	91677	810	456360	0.9900	5990180	65.3	2.50
15	0.0024	0.0117	90867	1066	451776	0.9868	5533820	60.9	2.60
20	0.0029	0.0144	89801	1297	445830	0.9850	5082045	56.6	2.55
25	0.0031	0.0153	88505	1357	439162	0.9841	4636214	52.4	2.52
30	0.0034	0.0166	87148	1449	432165	0.9825	4197052	48.2	2.53
35	0.0038	0.0186	85699	1592	424581	0.9803	3764887	43.9	2.54
40	0.0043	0.0210	84107	1770	416214	0.9768	3340307	39.7	2.56
45	0.0052	0.0258	82336	2123	406573	0.9702	2924093	35.5	2.59
50	0.0070	0.0346	80213	2776	394461	0.9586	2517520	31.4	2.62
55	0.0100	0.0487	77438	3773	378128	0.9451	2123059	27.4	2.60
60	0.0125	0.0607	73664	4469	357376	0.9349	1744930	23.7	2.55
65	0.0144	0.0697	69195	4822	334102	0.9243	1387555	20.1	2.54
70	0.0173	0.0829	64373	5338	308819	0.9084	1053453	16.4	2.56
75	0.0224	0.1065	59035	6286	280537	0.8468	744634.4	12.6	2.67
80	0.0492	0.2214	52749	11681	237559	0.4881	464097.1	8.8	2.76
85	0.1813	...	41069	41069	226538	...	226538.3	5.5	5.52

4.3 Lifetable survivors by sex

Adult mortality, however, compared to fertility and infant and child mortality is much less understood in the large majority of developing countries (Timeaus, 1996). Nevertheless, it is important and relevant to study and understand levels and patterns of adult mortality in a scenario of population aging and major changes in the socioeconomic scenario.

The number of male and female survivors are illustrated in Figure 4.1. The age patterns of mortality confirm the general expected shape of more survivors at younger ages, and the number declines with age. Males have slightly elevated mortality than females.

Figure 4.1: Number of male and female lifetable survivors (lx), 2022 census

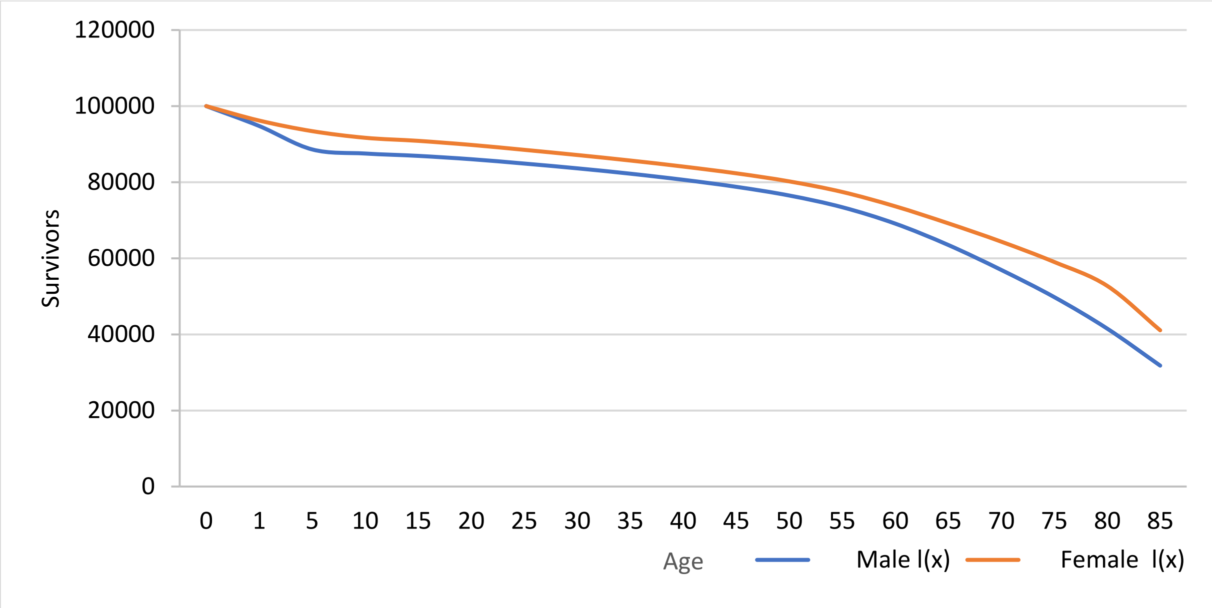
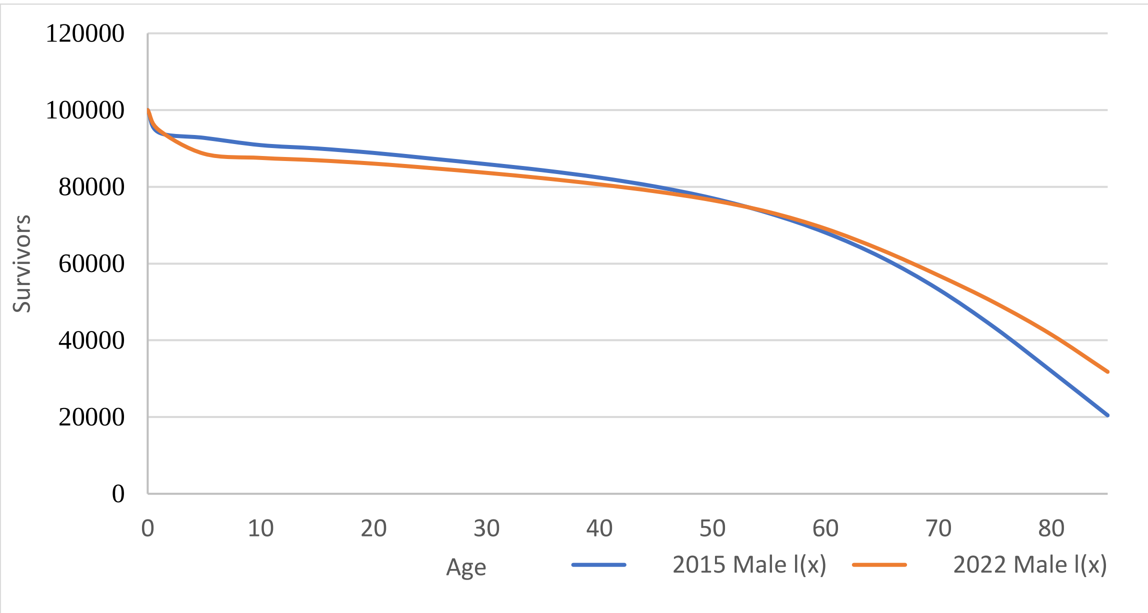


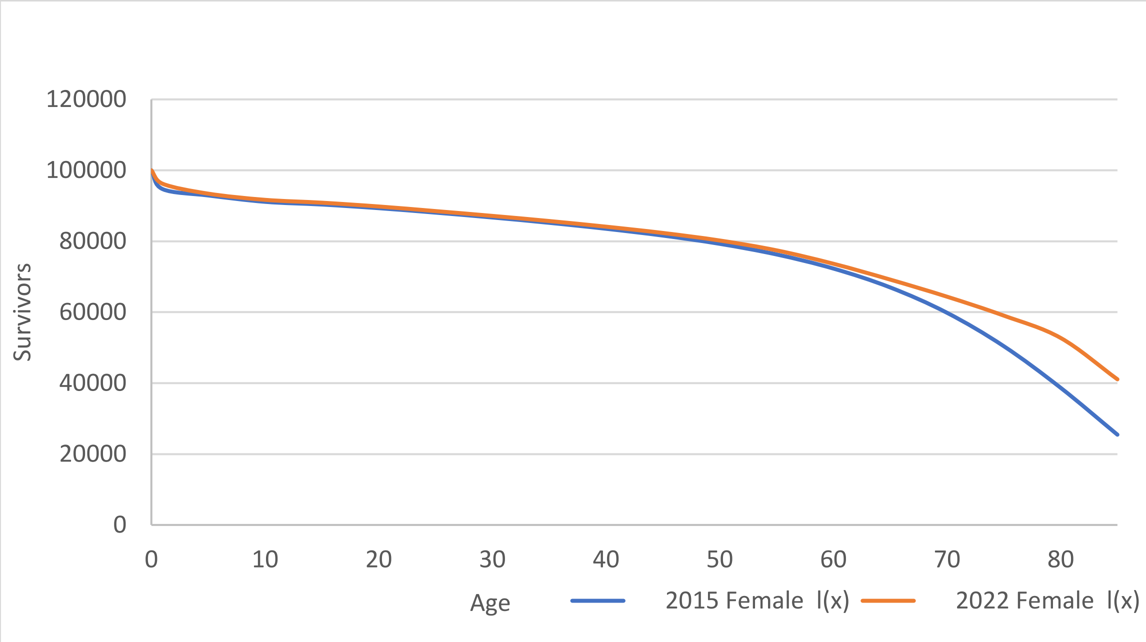
Figure 4.2 compares the number of male survivors between 2015 and 2022 census. The figure reveals that the mortality pattern has not changed over the past decade. However, it shows a dramatic decline of infant and child mortality during the intercensal period. It also reveals that the mortality level has not changed much between age 45 and 55 and increased only slightly for ages 55 and above.

Figure 4.2: Number of male survivors (lx),2015 and 2022



Similarly, Figure 4.3 compares the number of female survivors in 2015 and 2022 census. The figure depicts improvement in adult mortality; the curve for the 2022 is above one for the 2015, which indicates that there are more adult survivors in the latter census than the in the former census.

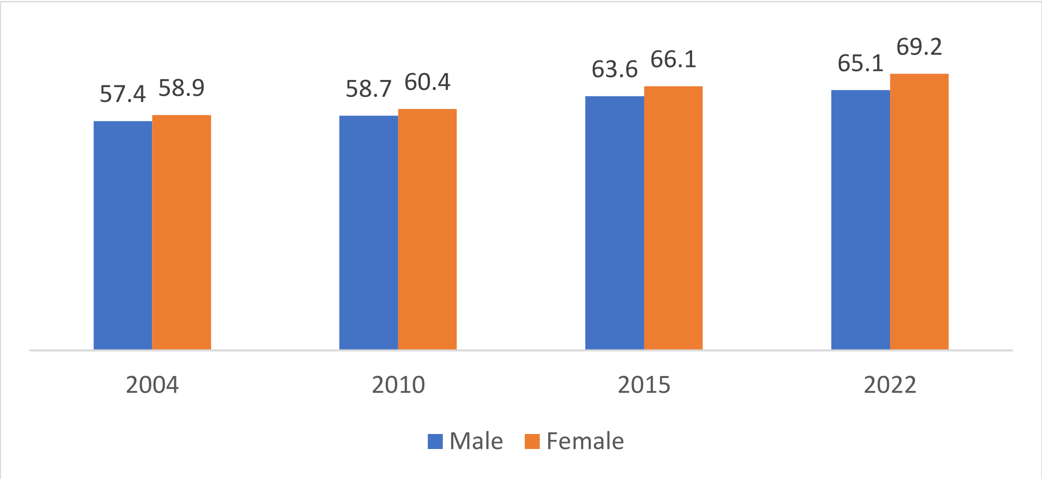
Figure 4.3: Number of female survivors (lx), 2015 and 2022



4.4 Trends in life expectancy

Life expectancy in Timor-Leste has improved since early 2000 as shown in Figure 4.4; male life expectancy at birth increased from 57.4 years in 2004 to 65.3 years in 2022 - an increase of 7.9 years. During the same period, female life expectancy at birth increased from 58.9 in 2004 to 69.2 in 2022, an increase by 10.3 years.

Figure 4.4: Trends in life expectancy by sex, 2004-2022

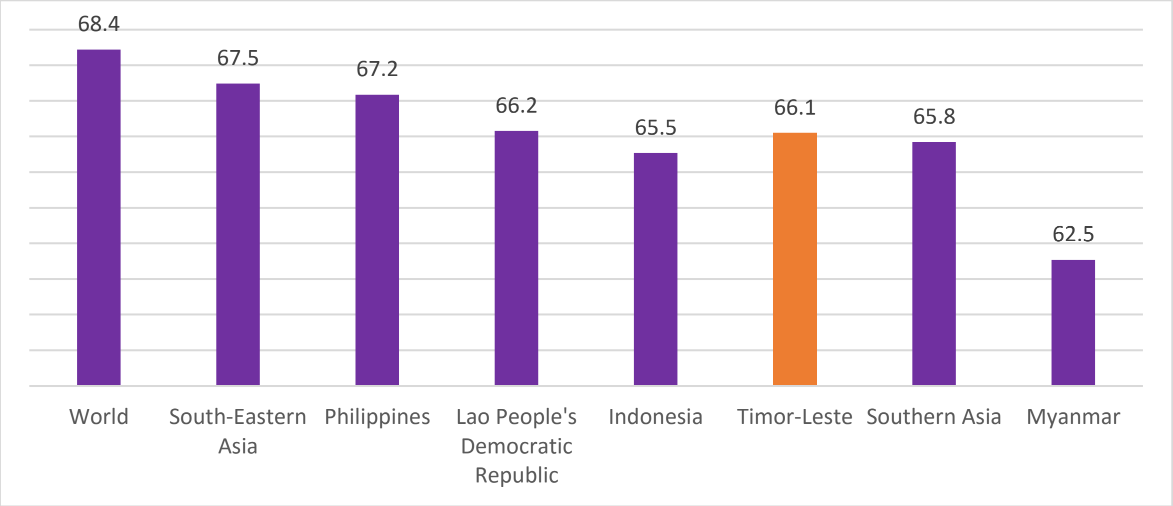


Sources: 2004 (2002 Timor-Leste Mortality monograph); 2010 (2008-9) Census; 2015 (2015 census), and 2022 (2022 census)

4.5 International comparison of life expectancy

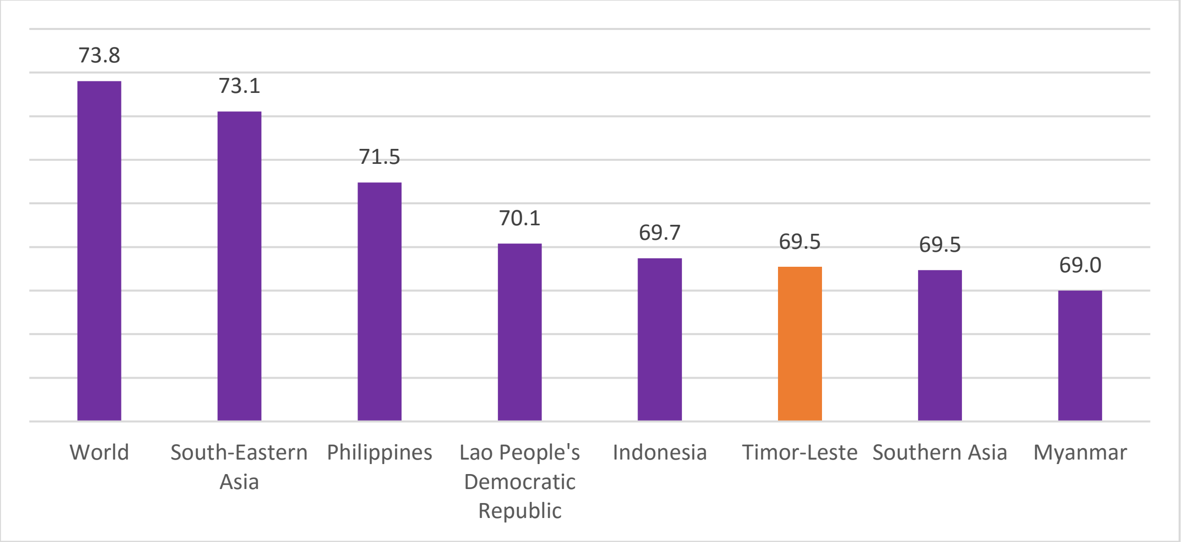
According to the 2022 WPP, the life expectancy at birth of males in Timor-Leste is slightly higher than some countries in Southern East Asian region, as illustrated in Figure 4.5. The estimated life expectancy at birth of males in Timor-Leste of 66.1 years sits above Myanmar (62.5 years), Indonesia (65.5) and Southern Asia average of 65.8 years; it is just 2.3 years below the global average life expectancy (68.4 years). Similar pattern is observed for life expectancy among females in Timor-Leste as shown in Figure4.6.

Figure 4.5: The male life expectancy in Southern East Asian region, World Population Prospects, 2022



Source: UNDESA, World Population Prospects, 2022

Figure 4.6: The female life expectancy in Southern East Asian region, World Population Prospects, 2022



Source: UNDESA, World Population Prospects, 2022

4.6 Life expectancy differentials

4.6.1 Place of residence

Generally, urban areas display a relatively lower level of mortality than rural areas, as shown in Table 4.3. People living in urban areas tend to have access to better socio-economic services than their rural counterparts and this phenomenon is obvious from the results. Overall, life expectancy increased more among males in the urban areas than in the rural.

Table 4.3: Life expectancy by place of residence, 2022 census

	2015		2022	
	Male	**Females**	**Male**	**Females**
Timor-Leste	63.6	66.2	65.1	69.3
Urban	67.3	69.8	68.7	71.1
Rural	62.3	64.8	63.2	65.7

An increase was observed in male life expectancy between in the urban at two points; from 67.3 to 68.7 years representing 2.1percent increment while for life expectancy for females increased 69.8 to 71.1 years representing 1.9percent increase. Within the rural areas, the differences between the census were 1.4percent for males (increasing from 62.4 to 63.2 years). Similarly, female life expectancy in the rural areas increased 62.3 to 63.2 years among males.

4.6.2 Municipality level

Among municipalities, life expectancy is highest for males living in Dili with 69.1 years, and lowest in Covalima (61.2 years) as illustrated in Figure 4.7. Life expectancy by municipalities reveals a wider variation with majority of them characterised as having male life expectancy of above the national average of 64.3 years. The municipalities in this domain are Oe-Cusse, Bobonaro, Lautem, Baucau, Liquicia, Viqueuque had the above national average life expectancy. However, the male life expectancy for Alieu and Covalima, are at 62.8 and 61.2 years respectively, which is below the national average male life expectancy of 64.3 years.

Figure 4.7: Life expectancy at birth, males, by municipality, 2022 census

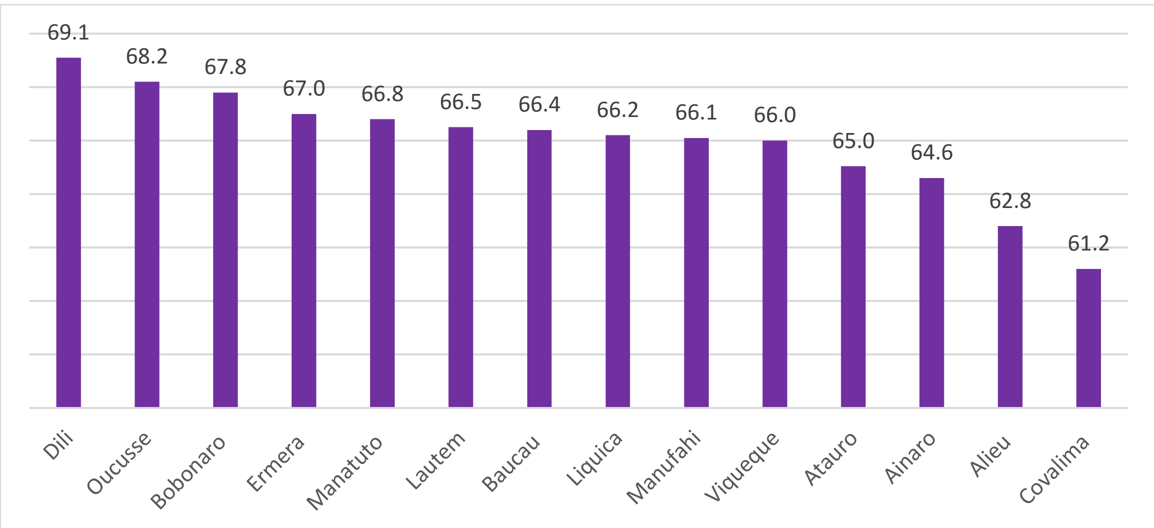


Figure 4.8 shows how life expectancy at birth varies by municipality. The shade of the municipality corresponds to the magnitude of the indicator. The estimates of life expectancy are calculated using period (current) life tables at municipality.

Figure 4.8: Life expectancy at birth, males, by municipality, 2022 census

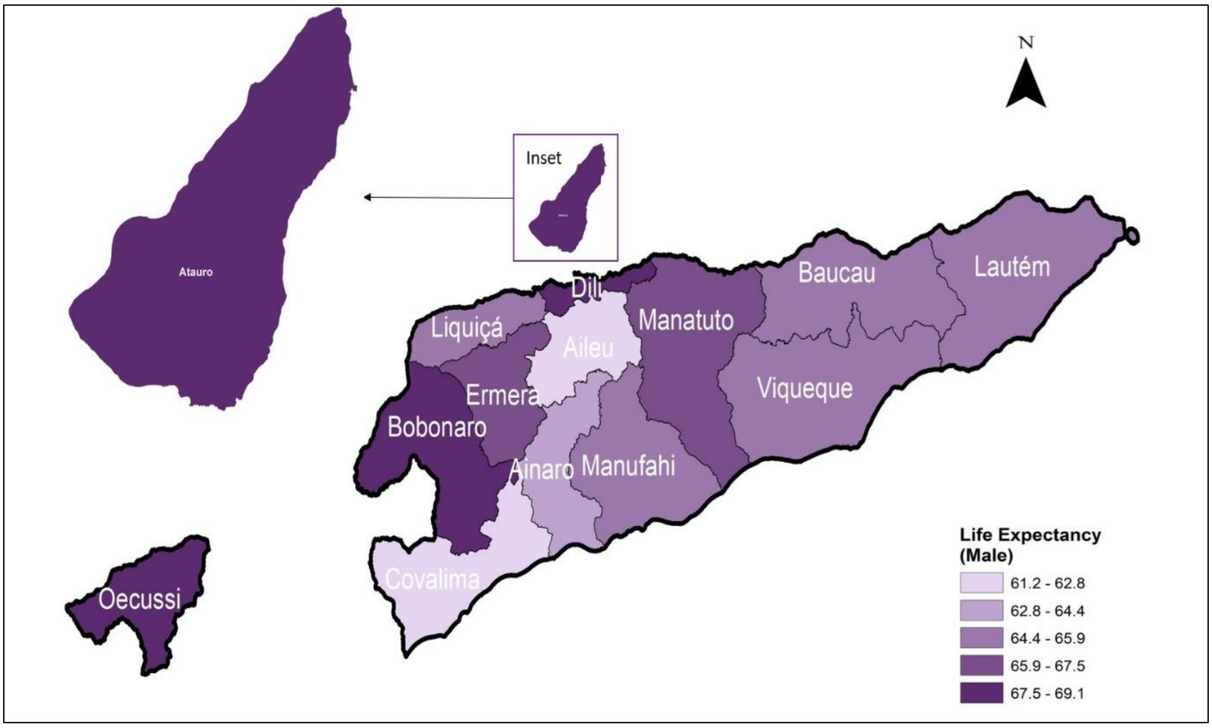


Figure 4.9 shows the estimates for the female life expectancy at birth for municipalities in Timor-Leste, revealing considerable variations. The results show that the female life expectancy is lowest in the Manufahi (64.2 years) – five years below the female life expectancy (69.3 years). Dili and Oe-Cusse have the highest life expectancies at 72.3 year and 70.9 years respectively.

Figure 4.9: Life expectancy at birth, females, by municipality, 2022 census

4.7 Probability of dying between 15 and 60 years

The probability of dying in adulthood also known as adult mortality rate is typically calculated from age 15 up to 60. Figure 4.10 presents the probabilities that a 15-year-old male will die before attaining exact age 60 at national and municipality level. The mortality risk between ages 15 and 60 at national level is 0.20. At municipality level, there is significant variation as also shown in Figure 4.11. A 15-year-old male residing in Baucau has the lowest (0.13) risk of dying before reaching age 60 while his counterpart residing in Cavalima has the highest (0.24) risk of dying.

Figure 4.10: Probability of dying between ages 15 and 60, males, by municipality, 2022 census

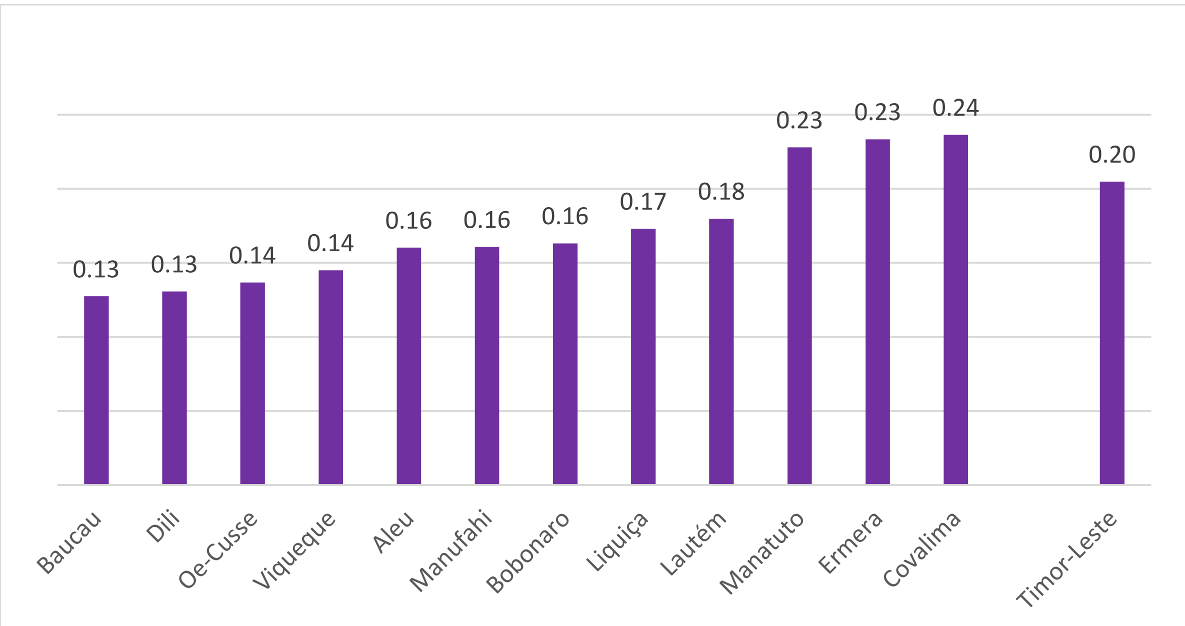
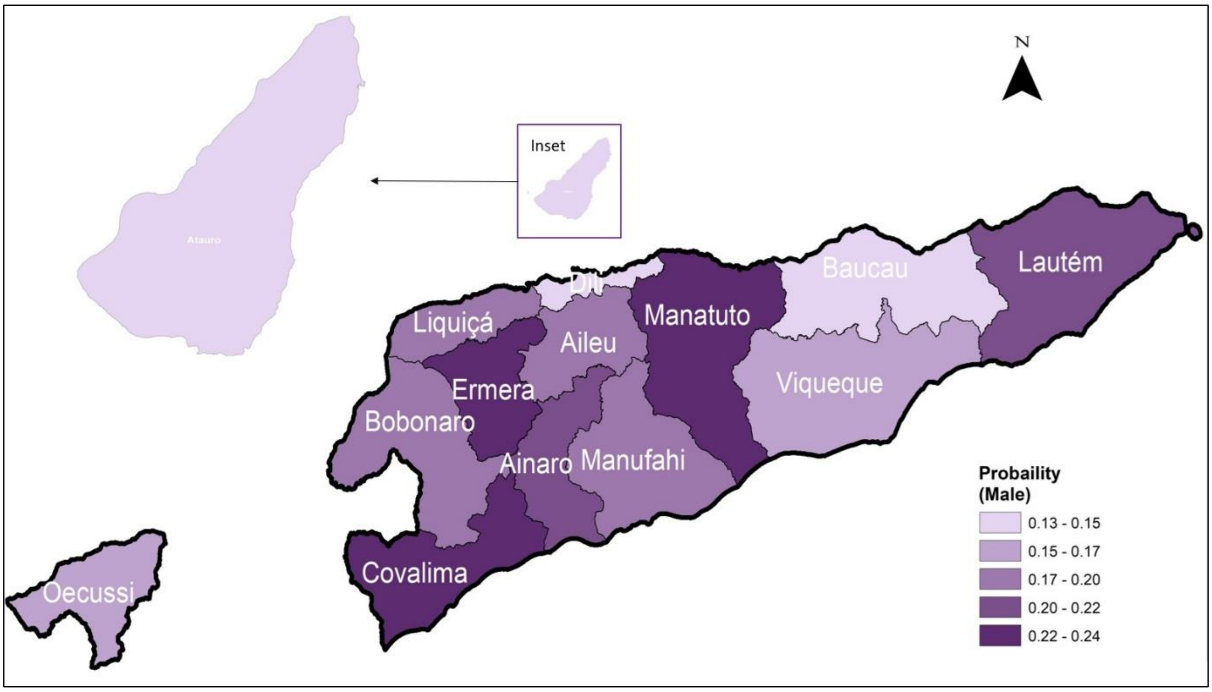


Figure 4.11: Probability of dying between ages 15 and 60, males by Municipality, 2022 Census



Figures 4.12 and 4.13 provide information on the risks of females dying between 15 and 60 at national and municipality level. The chance of a 15-year-old female dying within ages15 and60 ranges from 0.13 in Dili to 0.21 in Aileu while overall at national level, it stands at 0.19. This information on female adult mortality is also presented in form of a map in Figure 32.

Figure 4.12: Probability of dying between ages 15 and 60, females, by municipality, 2022 census

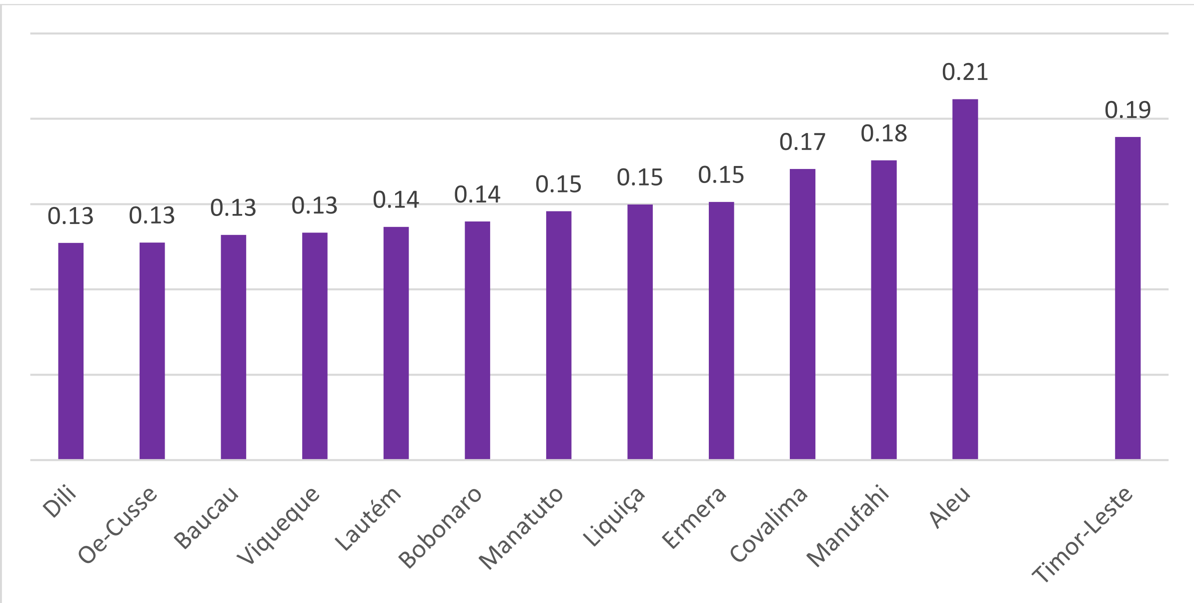
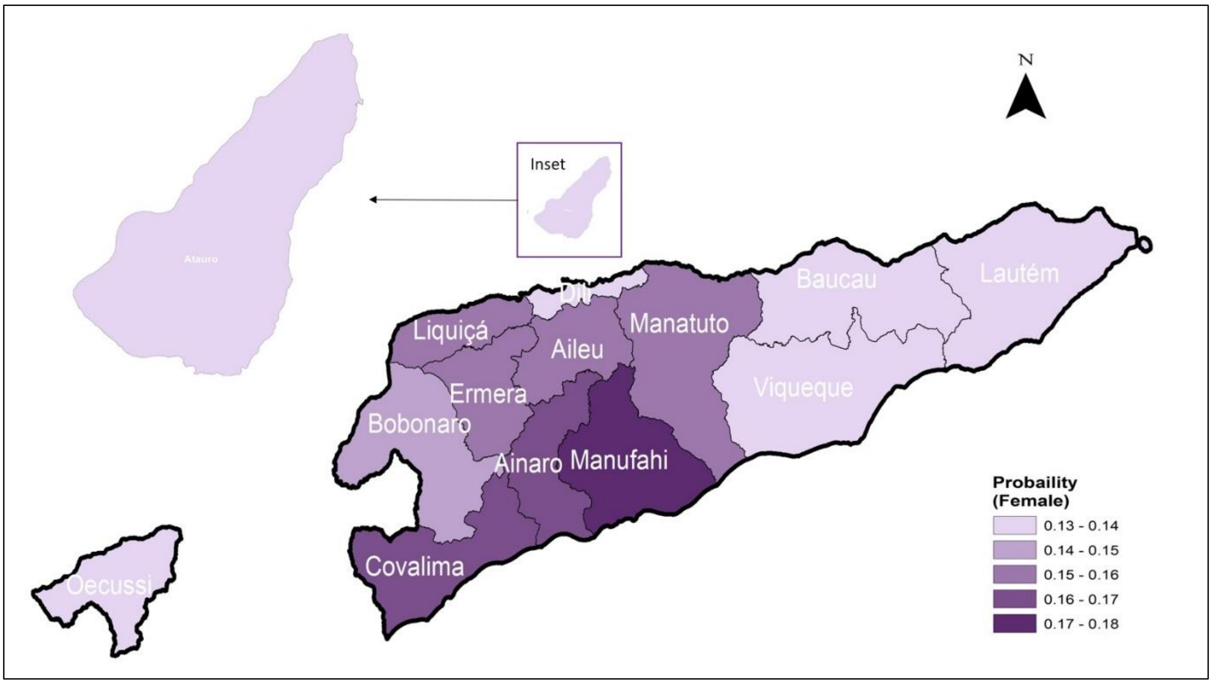


Figure 4.13: Probability of dying between ages 15 and 60, females, by municipality, 2022 census



4.8 Trends in probabilities of dying between 15 and 60 years

Information on adult mortality presented in Table 4.4 shows that there were gains in male adult mortality in all the municipalities. The results show a change in the female probabilities of dying between the ages of 15 and 60 (25.1 and 22.0 percent each). Ainaro had the highest improvement in adult mortality, seconded by Alieu. The least gain is observed in Manufahi (4.0percent), followed by Dili and Covalima with 6.8percent and 6.9percent, respectively.

Table 4.4 Adult mortality and percentage change by municipality, 2010 and 2022

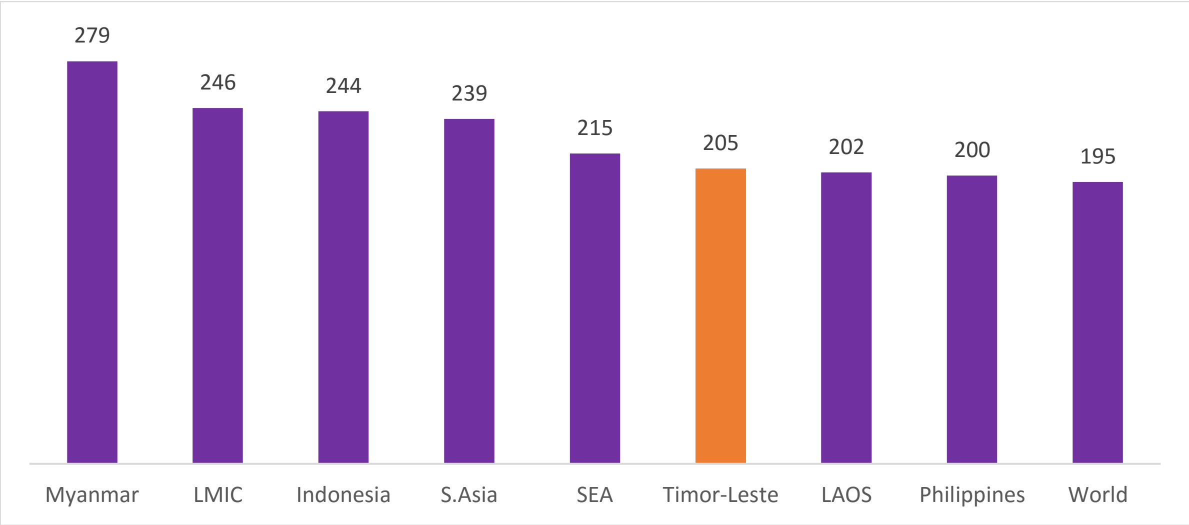
	2010		2022		Percentage change	
Municipality	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Alieu	0.266	0.22	0.16	0.16	10.6	22.0
Ainaro	0.305	0.251	0.19	0.17	30.5	25.1
Atauro	-	-	0.15	0.14	-	-
Baucau	0.301	0.281	0.13	0.13	17.1	15.1
Bobonaro	0.331	0.317	0.16	0.14	17.1	17.7
Covalima	0.286	0.238	0.24	0.17	4.6	6.8
Dili	0.24	0.199	0.13	0.13	11.0	6.9
Ermera	0.359	0.324	0.23	0.15	12.9	17.4
Lautem	0.266	0.211	0.18	0.13	8.6	8.1
Liquica	0.295	0.226	0.17	0.15	12.5	7.6
Manatuto	0.277	0.268	0.23	0.15	4.7	11.8
Manufahi	0.266	0.22	0.16	0.18	10.6	4.0
Ou-Cusse	0.292	0.259	0.14	0.13	15.2	12.9
Viqueque	0.283	0.304	0.14	0.13	14.3	17.4

4.9 International comparison of probabilities of dying between 15 and 60 years

The 2022 World Population Prospects edition shows that the probability of an adult male aged 15 dying before reaching his 60th birthday (15q45) in Timor Leste is 0.205, which is slightly above the global probability of 0.195, as shown in Figure 4.14. When compared with other countries in the region, the WPP estimate for Timor-Leste is below the countries in the region but is nearly at par with the Lao People's Democratic Republic (0.202). The probability of dying in adulthood for Timor-Leste is also lower than in Lower-middle-income countries. There is a marginal difference between the WPP estimate and that from the 2022 Timor-Leste census. Furthermore, the results from the 2010 and 2015 Timor-Leste census demonstrate a declining trend in the probability of a male surviving age 15 years but dying before reaching 60th birthday. For example, the 2010 census show that male probability (15q45) was 0.290, which declined to 0.240 in 2015, and in 2022 census it was 0.200, which represents an improvement of 30percent in adult mortality risk.

The WPP estimates for adult mortality for males and females presented in Figures 4.14 are expressed per 1,000 population unlike the previous sections presented in this chapter.

Figure 4.14: Adult male mortality between age 15 and 60, World Population Prospects, 2022

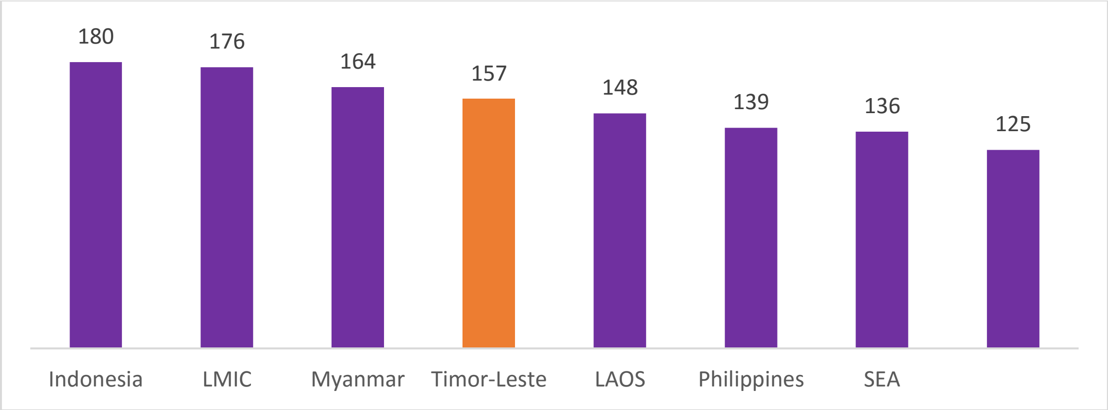


Source: UNDESA, World Population Prospects, 2022

With respect to female probability of dying between ages 15 and 60, there are similar patterns observed at regional level, but showing a slightly higher level (see Figure 28); the UN estimate for the world is 0.125, that is there are 125 female deaths for every 1000 female population who die before reaching their 60th birthday. The UN estimate for Timor-Leste in 2021, female adult mortality rate for Timor-Leste was 157 deaths per 1,000 female adults.

Though female adult mortality rate in Timor-Leste is above the world average (125 deaths per 1000 female adults) and that of South East Asia (136 deaths per 1000). The evidence suggest Timor-Leste is performing as well for adult mortality as compared to other countries in the region.

Figure 4.15: Adult female mortality between age 15 and 60, World Population Prospects, 2022



Source: UNDESA, World Population Prospects, 2022

5 Maternal Mortality

5.1 Sources and quality of maternal data

The World Health Organization (WHO) defines maternal deaths as all deaths that occurred during pregnancy or childbirth or within 42 days of termination of pregnancy. The death of women during pregnancy, childbirth, or six weeks following the termination of the pregnancy is a manifestation of challenges they face in accessing quality reproductive health services. In developing countries majority of women die from maternal causes due to low including poor ante-natal care and Women in Women in developed countries have a reduced risk of dying from pregnancy related causes than their counterparts in developing countries due to improved standards of ante-natal care and obstetrical skill and other advances in medical science.

Maternal mortality data are collected through different sources including civil registration and vital statistics (CRVS) systems, household surveys and population censuses. In the 2022 Timor-Leste population and housing census, maternal mortality data were collected by asking heads of households if female members of the household aged 15 years and over who died in the last 12 months preceding the census were pregnant, delivering or they died six weeks after termination of pregnancy. Respondents were asked to ascertain whether or not the deaths resulted from accidents or violence. Based on the questions, maternal deaths were deaths of women that occurred while giving birth, during pregnant or occurred within 6 weeks after end of pregnancy or childbirth.

Mortality data are often subjected to data quality issues related to underreporting and misclassification. A woman who dies while pregnant, during birth or six weeks after termination of pregnancy can be missed when the respondent perceives that the death occurred outside the 12 months period preceding a census date. Further, a maternal death may be missed when the respondent is ignorant that the woman died from pregnancy related causes. This might particularly be true for unmarried girls who hide their pregnancies.

Not all deaths of women who died while pregnant or six weeks after termination of pregnancy qualify as maternal deaths. Some of the women might have died as a result of accidents or violence. Such deaths should be excluded from maternal deaths. Some deaths maybe misclassified as maternal or nonmaternal death considering the people who respond to questionnaires are nonmedical people. It is important to address such data quality problems related to the underreporting and misclassification of maternal deaths before estimation of maternal mortality is undertaken. Adjustments for underreporting and misclassification of deaths is necessary to obtain reliable estimates of maternal mortality.

The total number of births that occurred during the 12 months period prior to the 2022 Timor Leste census is an important input data for estimation of the maternal mortality ratio. To collect data on births, women were asked about the date (year and month) of birth of their lastborn children. Such data are prone to under or over reporting. Underreporting or overreporting of births often result from incorrect recall of children dates of births. Children whose dates of birth were located outside the 12 months period preceding the census date were excluded from the estimation of maternal mortality and vice versa. There is need to adjust the reported births to correct for possible underreporting or overreporting.

5.2 Estimation methods of maternal mortality

Maternal mortality is commonly measured by an index called maternal mortality ratio (MMR), defined as the number of maternal deaths per 100,000 live births. It measures the degree of risk women face that is associated with childbearing. Estimates of maternal mortality ratio are useful globally, regionally or at country level to track progress made to achieve Sustainable Development Goal (SDG) target 3.1: to reduce maternal mortality to less than 70 maternal deaths per 100,000 live births by 2030.

The 2022 Timor-Leste maternal mortality ratio was calculated by dividing maternal deaths by total live births that occurred in the 12 months period before the census multiplied by 100,000. The census recorded a total of 709 deaths of women aged 15-49. Among these births, 160 deaths were pregnancy related. The analysis showed that 25 deaths out of the 160 deaths resulted from accidents or violence. Such deaths were excluded from the analysis of maternal mortality, leaving a total of 135 maternal deaths.

A total of 28,316 live births were reported in the 2022 census. Using the Generalized Growth Balance Method (GGB), the number of reported births were adjusted upwards by a scaling factor of 1.156 based on the results of the Brass P/F Ratio method, giving a total of 32,722 live births.

Dividing 135 maternal deaths by 32,722 live births and multiplying the result by 100,000 gives an estimate of 413 maternal deaths per 100,000 live births for Timor Leste in 2022. This indicates that in Timor Leste the MMR has declined from 426 maternal deaths per 100,000 live births in 2015 to 413 maternal deaths per 100,000 live births in 2022.

5.3 Comparison with other national estimates of maternal mortality

Table 5.1 presents national estimates of MMR and their reference dates for Timor-Leste for the period 2010-2022. The MMR estimates were derived based on different data sources and estimation methods.

The census-based estimates indicate MMR has declined from 570 maternal deaths per 1000 live in 2010 to 413 maternal deaths per 1000 live births in 2022. Results from the demographic and health surveys show MMR declined from 557 maternal deaths per 1000 live births in 2009-10 to 195 maternal deaths per 1000 live births in 2016. The Maternal Mortality Estimation Inter-Agency Group (MMEIG) estimated that the MMR was 215 maternal deaths per 1000 live births in 2014. The estimated levels of maternal mortality differ according to data sources and estimation methods. Although the MMR estimates vary by data sources and estimation methods, the estimates from both the censuses and demographic health surveys indicate the level of maternal mortality in the country is declining.

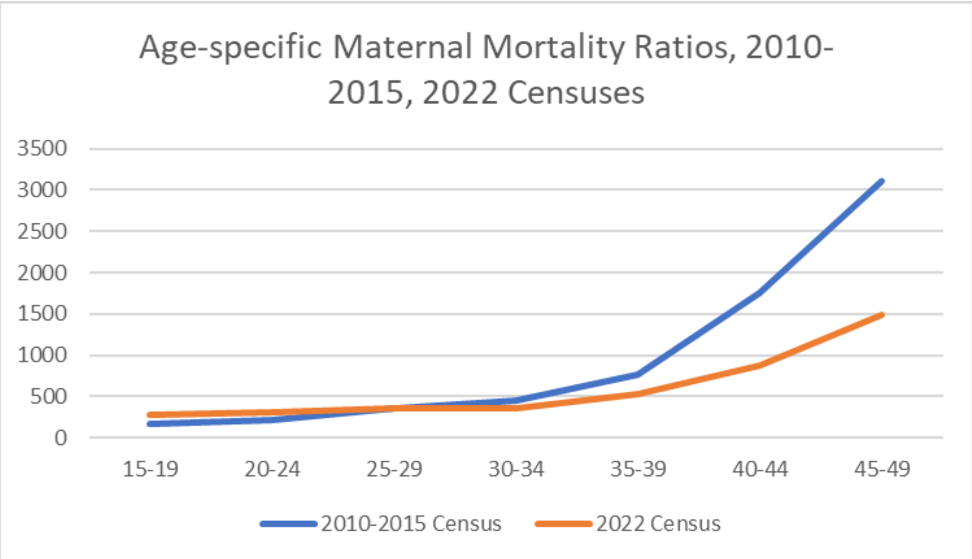
Table 5.1: Trends in Maternal Mortality Ratio estimates, 2010-2022

Data source	Maternal Mortality Ratio estimate
2010 census	570
2015 census	426
2022 census	413
2009-10 DHS	557
2016 DHS	195
2014 MMEIAG	215

5.4 Other measures of maternal mortality

In addition to maternal mortality ratio, maternal mortality is measured by the age specific death ratios and maternal mortality rate. Age specific maternal mortality ratio (ASMMR) is defined as the number of women who died from maternal causes in an age group per 1000 live births in the same age group. The ASMMRs indicate the levels and pattern in the risk of dying from pregnancy related causes by age. Figure 5.1 shows the 2022 ASMMRs together with corresponding values from the 2015 censuses.

Figure 5.1: Trends in Age specific maternal mortality ratio (ASMMR), 2010-2022



In most countries throughout the world childbearing in young age (15-19) and old age (45-49) is associated with high mortality compared to the risk of childbearing in the intermediate ages. The results in Figure 34 shows a departure from this general relationship between maternal mortality in ages 15-19 and 20-24. In South East Asian countries, maternal mortality in age group 15-19 is lower than in the 20-24 age group. Maternal mortality has nearly declined in all age groups between 2015 and 2022.

Maternal mortality is also measured by maternal mortality rate. Maternal mortality rate is defined as the number of women who died from maternal related causes per 1,000 women aged 15-49. Given that the total number of childbearing women in 2022 was 336 882 and 135 women died from pregnancy related causes, the estimated maternal mortality rate is 0.4 maternal deaths per 1,000 women aged 15-49. The corresponding mortality rates in 2010 and 2015 were 1 and 0.5 deaths per 1,000 women respectively.

Another measure of maternal mortality is the lifetime risk of dying due to maternal causes (LTRDMC). The LTRDMC is defined as the probability that a 15-year-old woman will eventually die from a maternal cause. The indicator is calculated as follows:

$$LTRDMC= 100x(1-(1-MMR)^{TFR})$$

Given an estimated MMR of 413 maternal deaths per 100,000 live births and an estimated TFR estimate of 3.7 children per woman, the estimated LTRDMC in 2022 is 1.52 percent, a decline from 2.0 percent in 2015.

Table 5.2 presents estimates of maternal mortality ratio, maternal mortality rate and life time risk due to maternal causes from the 2010, 2015 and 2022 censuses. All the indicators in Table 20 show that the risk of women of dying from maternal causes in Timor-Leste is progressively declining.

Table 5.2: Trends in maternal mortality ratio, maternal mortality rate and lifetime risk due to maternal causes, 2010-2022

Maternal mortality indicator	**Women 15-49**		
	2010	**2015**	**2022**
Maternal mortality ratio (maternal deaths/100000 live births)	570	426	413
Maternal mortality rate (maternal deaths per 1000 women 15-49)	1.0	0.5	0.4
Lifetime risk due to maternal causes (%)	2.9	2.0	1.5

6 Recommendations and Policy Implications

6.1 Recommendations

The mortality data provided by a census are, in general, not as complete and reliable as data obtained through specialized demographic household surveys. Despite this limitation, the analyses have shown that there have been improvements in adult mortality; life expectancy has improved as well as the probabilities of surviving from age 15 to 60.

SDG 3.1 sets out that by 2030, the global maternal mortality ratio (MMR) should be reduced to less than 70 per 100,000 live births, and no country should have an MMR more than 140 per 100,000 live births. The results show that using census data, MMR remains high. Further reduction in MMR should focus on increasing access to quality healthcare including addressing human resource shortages.

- High mortality among male children highlights the urgent need to further accelerate progress in preventing child deaths
- Strengthen coverage of quality antenatal care, skilled care at birth, post-natal care for mothers and baby
- Access to life saving interventions is critical to ensuring steady mortality declines in municipalities experiencing high under-five mortality
- Delivery care, postnatal care, vaccinations, and early childhood preventative and curative services to address these causes is critical
- Strengthen the strategies will be implemented that enhance access to diagnostic and treatment services.
- Attention should be given to the municipalities where mortality rates are highest across all ages and where population increase continues
- Government should strengthen improved access to water, sanitation, and hygiene and immunizations programmes.
- Undertaking research to collect relevant baseline data and monitoring the efficacy of interventions in local contexts.

6.2 Policy implications

While there have been significant improvements in under five mortality rate (which refers to the number of children per 1,000 who died before their fifth birthday) and infant mortality rate (which refers to the number of children per 1,000 who died before their first birthday), we still need to do more to minimise the number of children who die in Timor-Leste. Findings of the Timor-Leste Demographic and Health Survey and other recent surveys highlight the enormity of the problem of malnutrition in young children and women in particular. For children: almost 45percent are underweight-for-age; 15percent are severely underweight-for-age; Almost 58percent of children under five years are stunted, and 33percent are severely stunted. This requires implementing. Adequate nutrition in the first years of life is essential for children’s physical and mental growth. It is important to expand and maintain the quality and coverage of preventive and curative services to newborns, infants and children in order to reduce infant and child mortality.

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