An introduction to the demography of genocide: The Timor-Leste case study

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ABSTRACT
This paper introduces the demography of genocide, an interdisciplinary branch of demographic research that examines the impact of genocides on populations. This is achieved by defining the field and discussing its limitations, such as a limited institutional and methodological framework and a lack of data sources. The analytical section presents a case study on the demographic effects of the Indonesian occupation of Timor-Leste, starting with the historical context. It then analyzes population dynamics, mortality, fertility, and population structures based on demographic indicators, primarily derived from the World Population Prospects 2024 database. The findings show that the genocide profoundly affected Timor-Leste's population development, primarily through a significant deterioration in mortality, which was highly uneven across age and gender. Excess mortality was particularly pronounced among children and men. Large-scale migration waves occurred, indirectly influencing demographic processes. The impact on fertility is complex and cannot be generalized, but the decline in female mortality likely contributed to fertility increases. The simultaneous effect of these factors significantly altered the structure of the population, leading to sharp fluctuations in the sex ratio, an acceleration of population aging, and disruptions in age distribution. Total population losses due to the occupation were estimated at 177,000 people using a counterfactual population projection.

KEYWORDS
demography; genocide; Timor-Leste; Indonesia; excess mortality

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1. Introduction

Despite its significant impact on population dynamics, genocide remains an underexplored topic in demography compared to other areas of research. Genocide, a term of relatively recent origin with deeply negative connotations, describes a phenomenon that has occurred throughout human history, from ancient to modern times. One of the most studied examples is the Holocaust, where Nazi Germany's policies resulted in approximately six million Jewish deaths, with the total death toll reaching up to 17 million when including other ethnic groups (Hillberg 2003; Niewyk and Nicosia 2000). However, many genocides, despite their significance, have received limited attention from experts, particularly in demographic research.

Genocides not only inflict immense suffering but also deeply disrupt population processes such as mortality, fertility, and migration. These events can have lasting consequences, modifying population structures and dynamics beyond the immediate crisis period. For example, migration caused by genocide can indirectly impact populations originally unexposed to such events. Thus, deeper demographic analysis of genocides is necessary to understand their effects fully.

This paper briefly introduces the demography of genocides as a branch of demographic research. The main part of this paper presents a case study on Timor-Leste during the late 20th century, one of the lesser-studied genocides, to illustrate the importance of such research.

Case studies are a fundamental tool in genocide studies, as they illustrate the diverse forms and contexts in which genocides occur. Comprehensive documentation and reliable data are crucial for demographic research on genocidal cases, enabling the analysis of mortality, fertility, migration, and changes in gender and age structures. An essential aspect of the case study is situating the studied events within their historical context, providing clarity and deeper understanding of the subject matter.

Although genocide is not a frequent topic of demographic research, the growing global security challenges highlight its importance. For example, Europe's largest conflict since WWII is ongoing, alongside other global armed conflicts prone to genocidal acts. A demographic analysis of genocides helps to understand their causes, development, and effects on population change. Such insights can be applied, for instance, to support legal processes or to forecast the recovery of affected populations following an event, including during ongoing crises. By advancing this area of research, demography can contribute to better understanding and responding to these tragic events. The UN Convention defines genocide as "any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial, or religious group" (UN 1948, p. 1). These acts include killing members of the group, causing them serious bodily or mental harm, imposing living conditions intended to destroy the group, preventing births, and forcibly transferring children out of the group. To ensure research validity, only events meeting the UN convention's definition of genocide should be analyzed.

1.1 Genocidal research in population studies

Lemkin's (1944) work defined genocide and sparked academic interest in the field (Bloxham and Moses 2010). Genocide studies, a multidisciplinary field involving history, sociology, and law, aims to prevent genocides by understanding their causes, mechanisms, and consequences (Schaller 2011; Jones 2017). Initially focused on the Holocaust, research expanded post-Cold War to colonial and gendered violence, including genocidal rape (Von Joeden-Forgey 2010). Despite its growth, the field faces challenges with definitions, methodologies, and limited use of demographic methods (Weiss-Wendt 2008; Jones 2017). Even so, Ball et al. (2000) made a significant contribution by emphasizing a data-driven approach to investigating mass atrocities through the systematic collection of primary data. For instance, the work outlined how to improve the creation of victim databases by incorporating statistical methods that reduce the margin of error in victim estimates, especially when the data are incomplete.

While early demographic research on war, exemplified by the works of Hauser (1942) and Vincent (1947) analyzed its impacts, genocide remained largely overlooked. Interest grew in the 1980s with studies on the Holocaust and the Khmer Rouge regime, including victim estimates (Yehuda and Magos 1983; Ea 1981; Heuveline 1998). Seltzer (1998) presents an uncommon perspective, showing that the role of statistics and demography goes beyond their beneficial use in legislative and evidentiary processes, as they have also been misused to facilitate the planning and execution of large-scale violence. This perspective can be extended to include another crucial view: the deliberate manipulation of data to conceal the consequences of violence. The 1937 Soviet census is a prime example. Its count of approximately 162 million people fell short of the leadership's expected 180 million (Johnson 1992). The data also revealed a population decline in specific regions since the 1926 census, which could, among other things, document the actual impact of ethnic cleansing, including the infamous famines in Ukraine and Kazakhstan (Poliakov et al. 1992). The census was subsequently invalidated, and its authors were persecuted.

In 2002, the IUSSP launched a panel on the demography of armed conflicts, an emerging field that facilitates interdisciplinary research on the impacts not only of wars but also of genocides (Brunborg and Tabeau 2005). The first comprehensive study specifically addressing the demographic effects of genocide was The Demography of Genocide by Kugler (2016),

which examined disruptions to gender-age structures, migration patterns, and recovery rates.

The demography of genocides focuses on immediate and long-term impacts on mortality, fertility, and migration for directly and indirectly affected populations. While primarily employing demographic methods, this field also integrates interdisciplinary approaches from history, sociology, and genocide studies to contribute to genocide prevention.

The accompanying violence leads to infrastructure destruction, and limited access to high-quality data remains a significant research limitation (Brunborg and Tabeau 2005; Kugler 2016). Nevertheless, demographic research aids genocide prevention and legal processes, such as victim estimation in the Bosnian genocide (Brunborg et al. 2003).

1.2 The Timor-Leste case: Historical context

The Indonesian invasion of Timor-Leste in December 1975 led to catastrophic conditions, causing tens of thousands of deaths. The crisis stems from colonial conflict between Portugal and the Netherlands, which divided Timor in 1904, leaving the eastern half under Portuguese rule (Joseph and Hamaguchi 2014). After Portugal's 1974 Carnation Revolution, decolonization efforts began. Two major factions, FRETILIN and UDT, initially formed a coalition for independence (Dunn 2012). But tensions escalated as Indonesia opposed East Timorese independence, fearing separatist movements and FRETILIN's leftist ideology (Kiernan 2008).

In August 1975, UDT, under Indonesian influence, attempted a coup, triggering civil war with FRETILIN. By December, Indonesia invaded with the tacit consent of the West (Dunn 2012). Despite armed resistance, Indonesian forces quickly occupied Timor-Leste, forcing many FRETILIN fighters and civilians into guerrilla warfare. The occupation was marked by severe repression, including massacres, torture, and sexual violence (Kiernan 2008). Forced relocations, agricultural disruption, and disease led to widespread famine. An information embargo prevented external scrutiny until 1979, when the International Red Cross exposed the crisis and prompted condemnation (Robinson 2023).

By the late 1970s, FRETILIN's resistance weakened due to starvation and military losses. Indonesian forces employed brutal tactics such as village massacres, human shields, and forced displacement to sever guerrilla support (Budiardjo and Liong 1984). A fragile ceasefire in 1983 failed, leading to renewed violence and cultural suppression, including banning the Portuguese language and promoting Indonesian migration (Kiernan 2008). By the 1990s, Indonesian settlers comprised a fifth of the population and controlled key positions (Dunn 2012).

The 1991 Santa Cruz massacre, in which 300 peaceful protesters were killed, triggered global outrage after footage surfaced, pressuring Western nations to act (Joseph and Hamaguchi 2014). The Nobel Peace Prize awarded to East Timorese leaders in 1996 and increased UN involvement further challenged Indonesia's claims (Robinson 2023). Following the May 1998 riots, Indonesia agreed to a 1999 UN-supervised referendum. Despite violent intimidation, nearly 80% voted for independence, leading to full independence on May 20, 2002 (Dunn 2012; Robinson 2023).

Post-independence, Timor-Leste faced instability, poverty, and weak accountability for wartime atrocities. Indonesia refused to extradite perpetrators, and only a quarter of the indicted individuals were prosecuted (Dunn 2012). Despite criticism, Timor-Leste has reportedly prioritized economic development over justice (Thu 2019).

2. Materials and methods

The World Population Prospects 2024 (WPP 2024) serves as the primary demographic data source for this case study. It is one of the most comprehensive sources of global population data and is particularly valuable for Timor-Leste. Due to the country's fragmented history under Portuguese, Japanese, and Indonesian rule, there is a lack of unified population data, making WPP 2024 essentially the only comprehensive source.

While Timor-Leste has its own statistical office, the data it provides are limited and difficult to access, and they only sporadically cover the period before the office's founding in 2000. The registration of vital events in the country remains significantly incomplete. For example, a 2016 Demographic and Health Surveys Program (DHS) survey found that 40% of children under five years of age were not registered (DHS 2024).

Consequently, the data in WPP 2024 are based on a combination of censuses, sample surveys, and numerical adjustments. It is important to emphasize that these figures are estimates and may be subject to errors during both initial data collection and subsequent processing. Therefore, all data presented in this study should be interpreted with appropriate caution.

To outline the historical context, literature cited in the case study itself was used including publications by historians, genocidologists, and demographers. The following subsections detail the specific procedures and indicators used to analyze demographic development within the case study.

2.1 Methods of population dynamics analysis

The population dynamics analysis utilized population growth, net migration, and vital event data, focusing on total population, births, deaths, net migration, natural increase, and growth rate. A population projection, constructed using Spectrum 6 software (Avenir Health 2024), estimated population losses due to

Timor-Leste's decolonization, civil war, and Indonesian occupation. Spectrum's DemProj tool employs the cohort-component method which conceptualizes population development as a composite process consisting of fertility, mortality, and migration (Preston et al. 2001). The projection modeled a hypothetical scenario removing excess mortality by linearly interpolating life expectancy at birth between 1973 and 2000. Survival probabilities were derived using UN model life tables. Population losses were calculated as the difference between empirical (WPP 2024) and projected population counts. While acknowledging limitations, such as ignoring interdependence of mortality, fertility and migration or relying on estimated input data, this projection offers valuable insights into estimating population losses.

2.2 Methods of mortality analysis

The study utilized WPP (2024) indicators, including infant and child mortality rates and life expectancy at various ages, to assess mortality trends. A key metric was the directly standardized mortality rate for men and women, using the WHO (2001) New Standard Population for comparison. Age- and sex-specific mortality rates ($ASMR_x$) were calculated from WPP (2024) data, allowing standardization and analysis of mortality changes.

$$ {}_tASMR_x = \frac{{}_tD_x}{{}_tP_x} $$

${}_tD_x$ = the number of deaths between ages x and x+1 for year t
${}_tP_x$ = the population between ages x and x+1 for year t

Next step leads to a directly standardized mortality rate (SDR) per 1000:

$$ SDR = \frac{\Sigma({}_tASMR_x \cdot P_x^{st})}{P^{st}} \cdot 1000 $$

P_x^{st} = the population exposed to the risk of death at age x last birthday in the standard population
P^{st} = the standard population exposed to the risk of death

The decomposition of life expectancy changes, using Shkolnikov and Andreev's (2010) Excel-based program, quantified the contributions of different age groups to the changes in life expectancy between 1973 and 1978, covering both the pre-crisis period and the peak of mortality. The method applies a stepwise replacement of mortality rates to track changes (Andreev et al. 2002).

2.3 Methods of fertility analysis

Indicators from WPP (2024) were used, including the crude birth rate to examine fertility trends and the impact of sex-age structure changes. Other indicators included the total fertility rate (TFR) and net reproduction rate, and the average age of mothers at childbirth. DHS (2003; 2024) data were used to gain a more detailed insight into fertility trends, focusing on completed fertility and the ideal number of children. The WPP contains age-specific fertility rates ($ASFR_x$), however it excludes births to mothers under 15 and over 49. Therefore, the indicator was calculated as follows:

$$ ASFR_x = \frac{B_x}{P_x^f} \cdot 1000 $$

B_x = the number of live births to females at age x,
P_x^f = the total number of females at age x.

The corresponding age limits were chosen as denominators for ages 15 and 49. However, the numerator for $ASFR_{15}$ was adjusted to include all children born to mothers aged 15 and younger. Similarly, the numerator for $ASFR_{49}$ was adjusted to include children born to mothers aged 49 and older.

2.4 Methods of the population structure analysis

The analysis of population structure utilized indicators based on WPP data, including the sex ratio, calculated for individual ages and broad age groups. Population pyramids were used to illustrate changes in the sex-age distribution between 1950 and 2023, reflecting the key changes during and after the Indonesian invasion. To assess demographic aging, we focused on the median age and dependency ratios, including young-age and old-age dependency ratios (YADR and OADR), calculated as follows:

$$ YADR = \frac{P_{0–14}}{P_{15–64}} \cdot 100 $$

$$ OADR = \frac{P_{65+}}{P_{15–64}} \cdot 100 $$

$P_{0–14}$ = the mid-year population aged 0–14,
$P_{15–64}$ = the mid-year population aged 15–64,
P_{65+} = the mid-year population aged 65 and above.

3. Results

In this chapter, we present a demographic analysis of Timor-Leste's population from 1950 to 2023, focusing on the impact of the Indonesian occupation. The historical context is provided in Chapter 1.2. The following demographic analysis examines population dynamics, mortality, fertility, and gender-age structure shifts.

3.1 Population dynamics in Timor-Leste

Timor-Leste's population experienced major fluctuations throughout the 20th century, heavily impacted

by conflicts, political instability, and external intervention. In 1920, the population was estimated at 400,000, rising to over 470,000 by 1930 (Hull 2003). However, the Japanese occupation during World War II caused significant disruption, reducing the population to 403,000 by 1946. Recovery began post-war, with the population increasing to 442,000 by 1950 (Fig. 1). However, the specific reasons behind these drastic changes remain unclear.

Population growth continued in the following decades, reaching 592,000 by 1974 (WPP 2024). However, political turmoil in 1975, including a civil war and the Indonesian invasion, marked a turning point. Deaths spiked from around 14,000 annually to over 24,000, leading to the first natural population decline, which occurred again in 1978 (Fig. 2). Despite an almost zero natural increase between 1975 and 1979, Indonesia's migration policy resulted in a

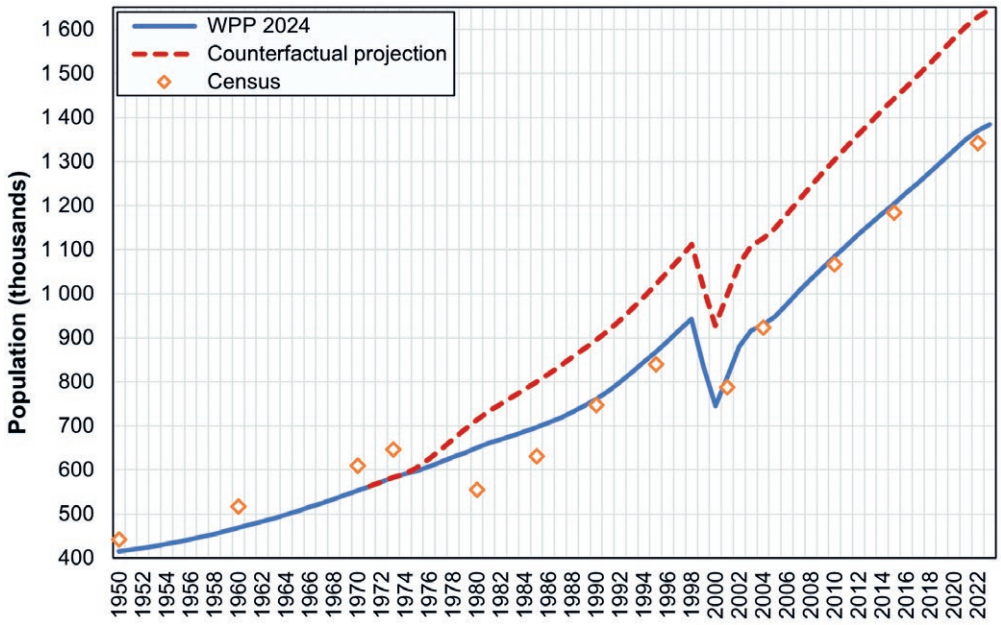

Fig. 1 Population of Timor-Leste, 1950–2023.
Note: The data correspond to July 1 of each given year, while census data refer to various dates within the respective years. The counterfactual projection, developed by the author, aimed to model a hypothetical scenario assuming the absence of excess mortality between 1974 and 1999 (see Chapter 2.1).
Source: WPP 2024, Hull 2003, BPS 1991, Dasvarma 2011, INETL 2023a, INETL 2023b and author's calculation.

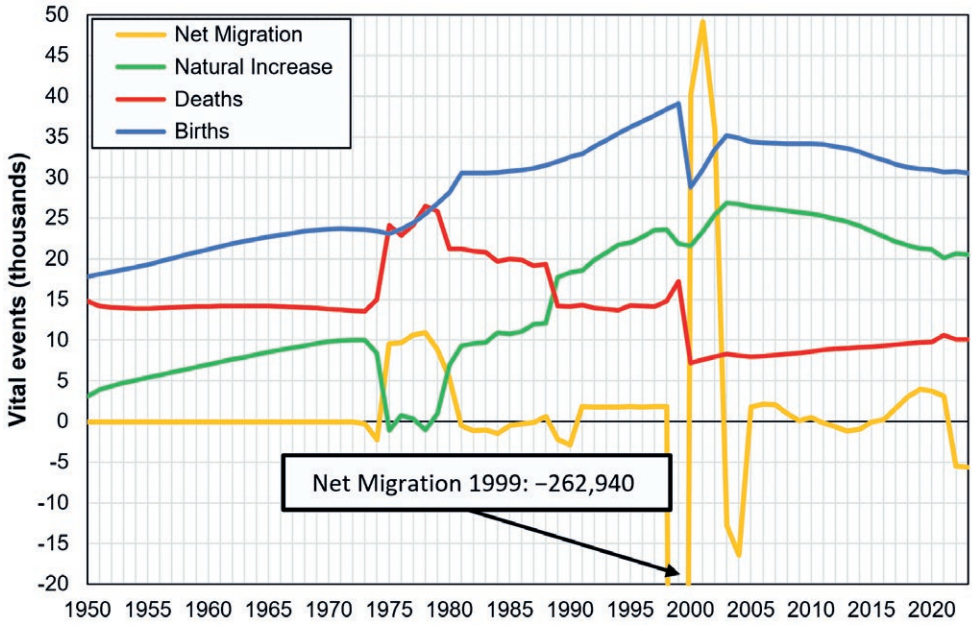

Fig. 2 Vital events in Timor-Leste, 1950–2023.
Source: WPP 2024.

population growth of 50,000 during this period (WPP 2024).

The 1980 census conducted under Indonesian rule reported 555,000 inhabitants, reflecting a loss of 91,000 compared to the 1973 census and 35,500 fewer than WPP's 1974 estimates. Cribb (2001) suggests that these figures may be inaccurate, as many East Timorese likely avoided enumeration due to the ongoing conflict, seeking refuge in remote areas.

As the conflict eased in the 1980s, natural population growth resumed, although in relative terms, it remained below pre-crisis levels. A significant growth occurred in 1989, primarily due to a decrease in mortality. This trend continued throughout the 1990s, driven by declining mortality rates and rising birth rates.

This trend fluctuated in 1999, with a significant increase in the number of deaths, likely connected to the important political changes, such as the withdrawal of Indonesian troops and the independence referendum (Kiernan 2008). However, far more significant was the effect of an unprecedented wave of emigration, which led to a negative migration balance of nearly 263,000. By the end of 1999, Timor-Leste's population had decreased by almost 90,000 people, leaving a total population of 745,000 (WPP 2024).

Following independence, the natural increase surged, driven by nearly 50% reduction in mortality. Between 2000 and 2002, there was also a very positive migration balance, totaling 125,000. Although negative migration balances were recorded again in subsequent years, the population grew rapidly. By 2023, the population of Timor-Leste exceeded 1,384,000 inhabitants.

To estimate population losses, we created a counterfactual population projection for Timor-Leste from 1971 to 2023. This projection assumes that the excess mortality observed between 1974 and 1999 – attributed to Portuguese decolonization, the civil war, and, most significantly, the Indonesian invasion and occupation – did not occur. The objective of this projection is to model a hypothetical scenario where these excess deaths were averted (Chapter 2.1).

The projection's results clearly show that these events severely disrupted Timor-Leste's population growth. Assuming the pre-crisis mortality trend had continued, the population would have exceeded actual levels from 1974 onward. By 1975, this difference would have reached nearly 7,000 individuals, exceeding 64,000 by the early 1980s. By 1999, when Indonesia withdrew, the population would have been 176,000 higher than the actual figure. This difference represents an estimate of the cumulative direct and indirect population losses resulting from the occupation (Fig. 3).

3.2 Mortality in Timor-Leste

Mortality rates in Timor-Leste had historically been high, with standardized death rates in 1950 reaching 40‰ for men and 35‰ for women (based on the WHO New Standard Population, Fig. 4). Mortality gradually declined in line with global trends, dropping by approximately one percentage point for both genders by 1973. This trend abruptly reversed in 1974 due to the collapse of Portuguese administration and violence during Timor-Leste's struggle for independence.

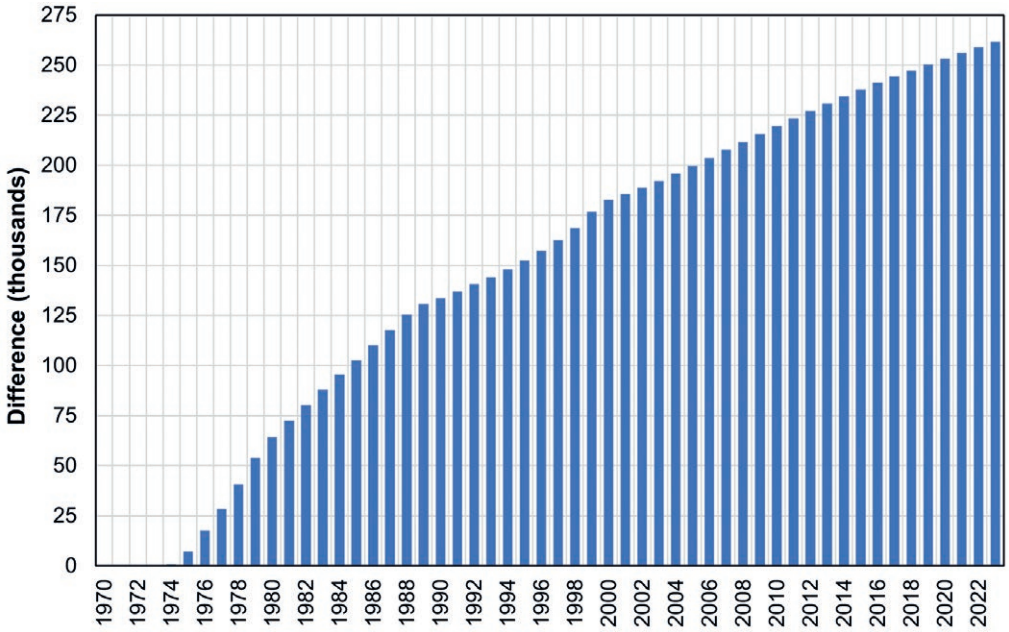

Fig. 3 Differences between projected and observed population.
Source: WPP 2024 and author's calculation.

Mortality rose dramatically in 1975 as civil war erupted and Indonesia invaded. The standardized mortality rate for males spiked to over 59‰, while for females it rose to nearly 35‰, exceeding 1951 levels. This excess male mortality caused by the conflict persisted until 1999. Gender disparities were most significant between 1980 and 1988. While female mortality returned to pre-crisis levels by 1984, male mortality remained elevated due to ongoing violence and persecution by the Indonesian army. By 1988, male mortality remained higher than pre-crisis levels by almost 42%, highlighting the conflict's selective nature of excess mortality, particularly among younger and adult men (Fig. 5).

Age-specific death rates provide further insights. From 1972 to 1978, mortality among boys aged 5–14 more than doubled, though it subsequently declined to 1972 levels by 1988. However, a similar decline occurred only in the 0–4 age group. Particularly, young and adult men aged 15–54 experienced a sustained increase in mortality. The death rate among men aged 15–39 tripled between 1972 and 1978 and remained

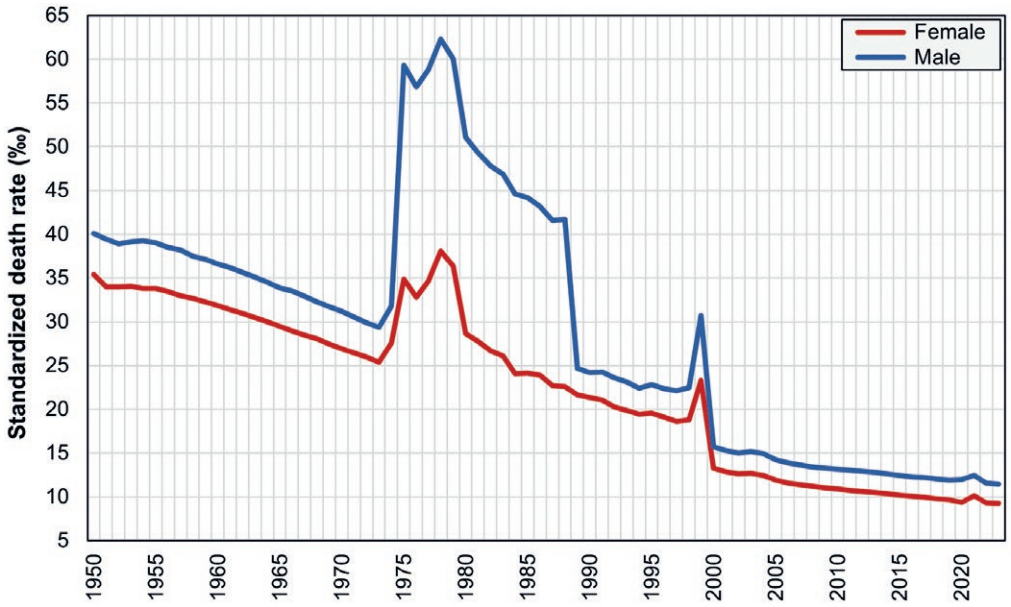

Fig. 4 Standardized death rate in Timor-Leste, 1950–2023.
Source: WPP 2024 and author's calculation.

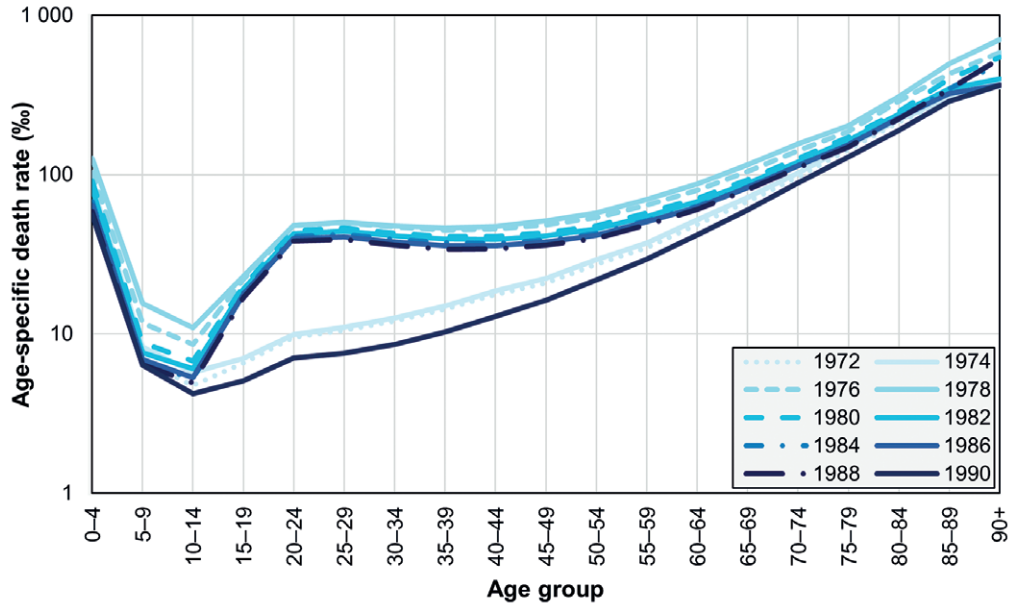

Fig. 5 Age-specific death rate in Timor-Leste, Males, 1972–1990.
Note: The Y-axis is on a logarithmic scale.
Source: WPP 2024 and author's calculation.

elevated until 1988, after which it began to decline significantly. While mortality during 1978 affected male age groups more evenly, subsequent years witnessed a concentration of excess mortality among men aged 15–39. By 1990, mortality declined across all age groups, falling below 1972 levels (Fig. 5).

There was a sharp increase of female mortality in 1976 and 1978, surpassing early 1950s levels. However, female mortality was less severe and less age-selective than male. For instance, mortality among men aged 20–24 increased fivefold between 1972 and 1978, whereas the highest rise among women occurred in the 5–9 age group, rising from 7‰ to 16‰ (Fig. 6). By 1984, the death rate among women had returned to pre-crisis levels, except for the 40–49 and 90+ age groups. Due to the mortality of very young girls, we believe women were more likely to be affected by the indirect consequences of war, such as malnutrition, rather than by direct violence.

Infant (between birth and exact age 1) and child (between birth and exact age 5) mortality rates also reflect the conflict's impact. From extraordinarily high 1950s levels – over 270‰ for infants and 400 ‰ for children – these rates declined significantly by 1973 (Fig. 7). However, the Indonesian invasion reversed this trend. By 1975, infant mortality rose to 244‰

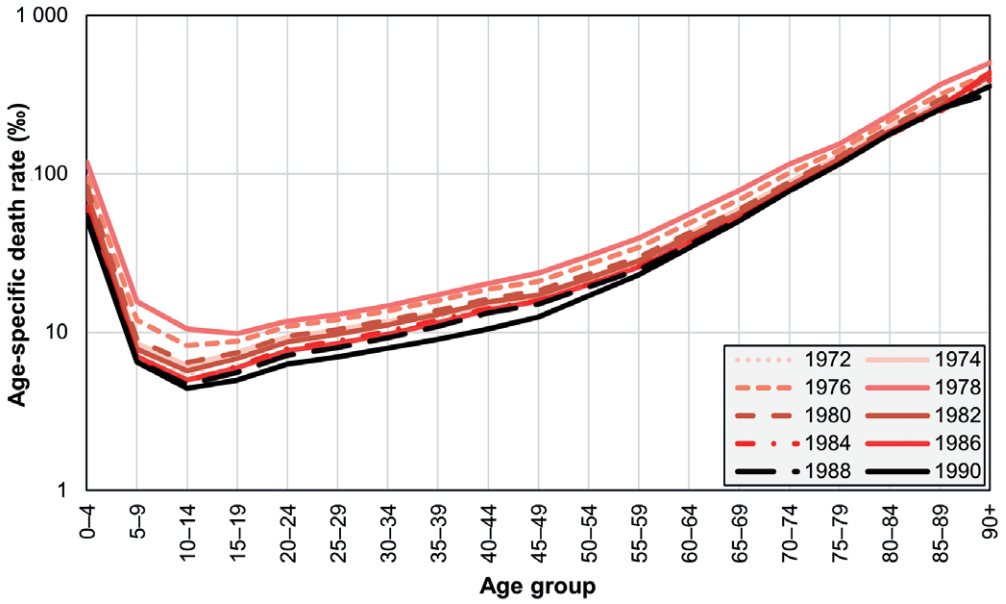

Fig. 6 Age-specific death rate in Timor-Leste, Females, 1972–1990.
Note: The Y-axis is on a logarithmic scale.
Source: WPP 2024 and author's calculation.

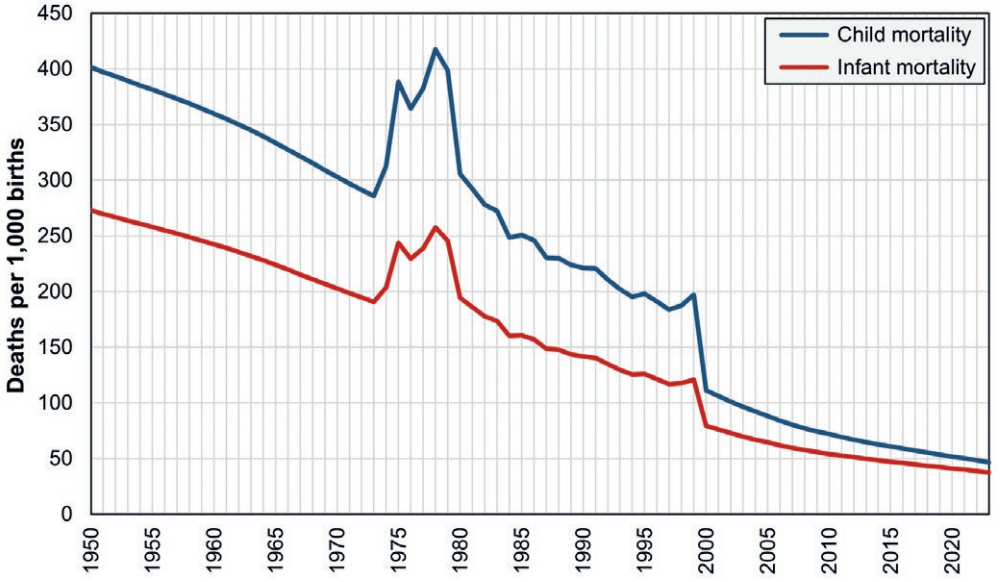

Fig. 7 Child and infant mortality in Timor-Leste, 1950–2024.
Source: WPP 2024.

and child mortality to 388‰, peaking in 1978 at 258‰ and 418‰, respectively (WPP 2024). Conditions began improving in the early 1980s, with both infant and child mortality falling below pre-crisis levels by 1982. During the conflict, the share of infant mortality within child mortality decreased to 62% (compared to a pre-crisis average of 67%), indicating a worsening situation for children aged 1–4. Mortality spiked briefly in 1999 amid the chaos of Indonesia's withdrawal but quickly declined. Since 2000, infant mortality has steadily declined, now accounting for over 80% of child mortality. However, child mortality remains high in global terms at 47‰ (WPP 2024).

Life expectancy at birth was initially low, at 27.8 years for men and 30.6 years for women in 1950, increasing to 37.6 and 40.5 years by 1973. These gains were reversed during the occupation (Fig. 8). In 1978, life expectancy plummeted to 19.4 years for men and 28.3 years for women (WPP 2024). High child mortality and excess male mortality, especially among young and adult men, contributed to this decline. Between 1980 and 1988, male life expectancy at birth exceeded that at age 15, unprecedented in Timor-Leste, driven by high mortality among young men and declining child mortality. Male life expectancy returned to pre-crisis levels by 1989, while females

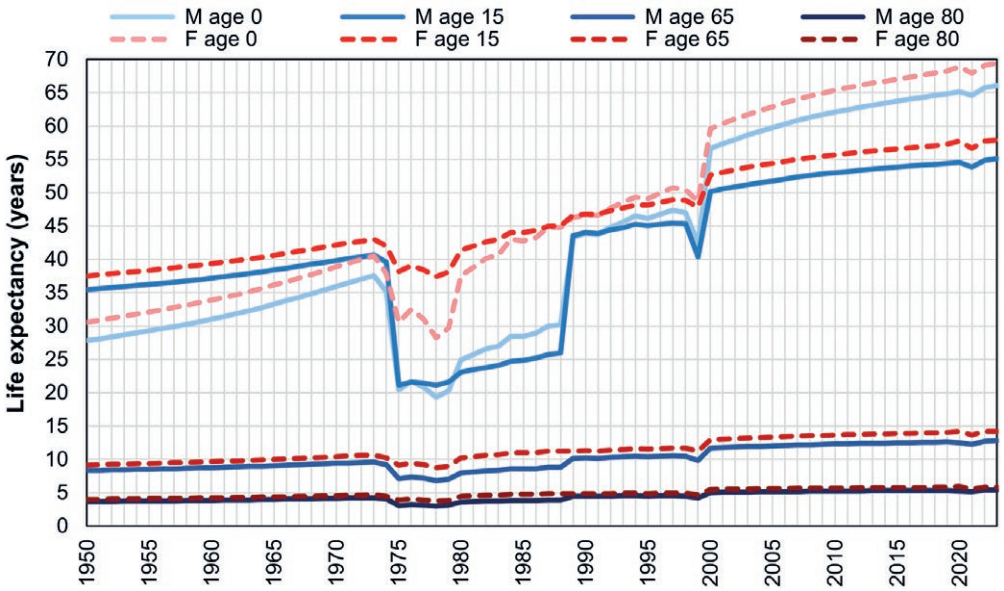

Fig. 8 Life expectancy at age 0, 15, 65 and 80 in Timor-Leste, females and males, 1950–2024.
Source: WPP 2024.

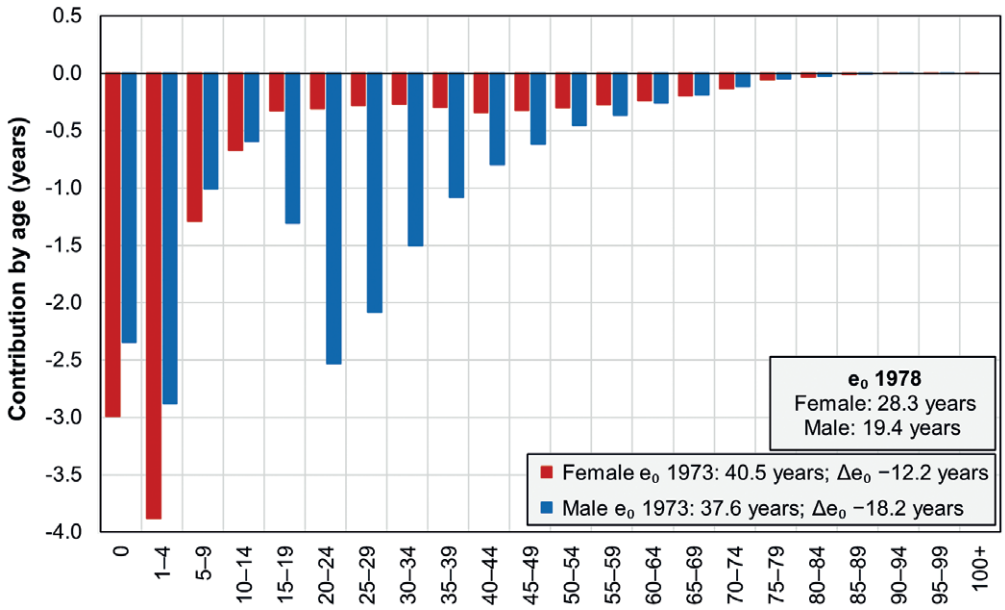

Fig. 9 Age-decomposition of life expectancy change in Timor-Leste, 1973–1978.
Source: WPP 2024 and author's calculation.

reached this level by 1984. Life expectancy generally increased thereafter, except in 1999, when mortality temporarily rose amid the chaos of Indonesia's withdrawal. Another decline occurred in 2021 due to the COVID-19 pandemic.

The age-decomposition of change in life expectancy reveals the selective impact of the conflict. Between 1973 and 1978, spanning the pre-crisis period and the peak of mortality, life expectancy at birth dropped dramatically. Decomposition analysis shows that all age groups, except men aged 100+, contributed to this decline. The most significant contributions for both sexes were observed in children, particularly those aged 1–4. Excess child mortality was more pronounced among females, with the 0–4 age group contributing −6.9 years, accounting for more than half of the total decline in life expectancy, while for males, the contribution was −5.2 years. However, a key sex difference lies in the contributions of the 15–44 age groups, which were more than five times higher for males. These groups accounted for more than half of the total decline in life expectancy at birth, which was 18.2 years. This confirms that excess mortality among young and adult men during the occupation was exceptionally high.

3.3 Fertility in Timor-Leste

Historically, the country has been characterized by high fertility. In 1950, the TFR was 6.6 children per woman, gradually declining to 5.1 by 1977 (Fig. 10). The lowest fertility level coincided with the Indonesian invasion, indicating its potential negative impact on fertility. However, the most significant interannual declines occurred earlier, between 1972 and 1974, with decreases of 0.1 children per woman.

Fertility rebounded after 1978, likely attributable to a decline in mortality in 1980 (Chapter 3.2). The most substantial increase occurred between 1980 and 1981, with the TFR rising by 0.31 children per woman (WPP 2024). This surge was likely driven by compensatory fertility, aiming to compensate for previous child losses or delayed births. Following this sharp increase, fertility continued to rise, albeit at a slower pace. Notably, the mean age of childbearing remained stable at 31 years from 1950 to 2001, suggesting consistent reproductive behaviors throughout this period (WPP 2024). Since 2002, this indicator has been gradually declining with slight fluctuations, reaching a value of 29.4 years in 2023.

Fertility rose slightly in the late 1980s, with the most significant increase between 1988 and 1990, likely linked to a decline in male mortality. The TFR grew by 0.05 children per woman annually during this period, a significantly higher rate than in previous years. However, the TFR has experienced a sharp decline since 2000, decreasing by 3.23 children per woman. By 2023, it had reached 2.71, remaining above the global average of 2.32 (WPP 2024).

Age-specific fertility rates mirrored these patterns. The fertility rebound mentioned earlier, peaking in 1999, was primarily attributable to an elevated fertility rate among women aged 30–34 (Fig. 11). It is important to emphasize that fertility data from the mentioned age-specific rates do not align with the TFR values in WPP 2024 for this period. Our estimate for 1999 based on age-specific fertility rates is 6.9 children per woman, 0.9 higher than the WPP estimate

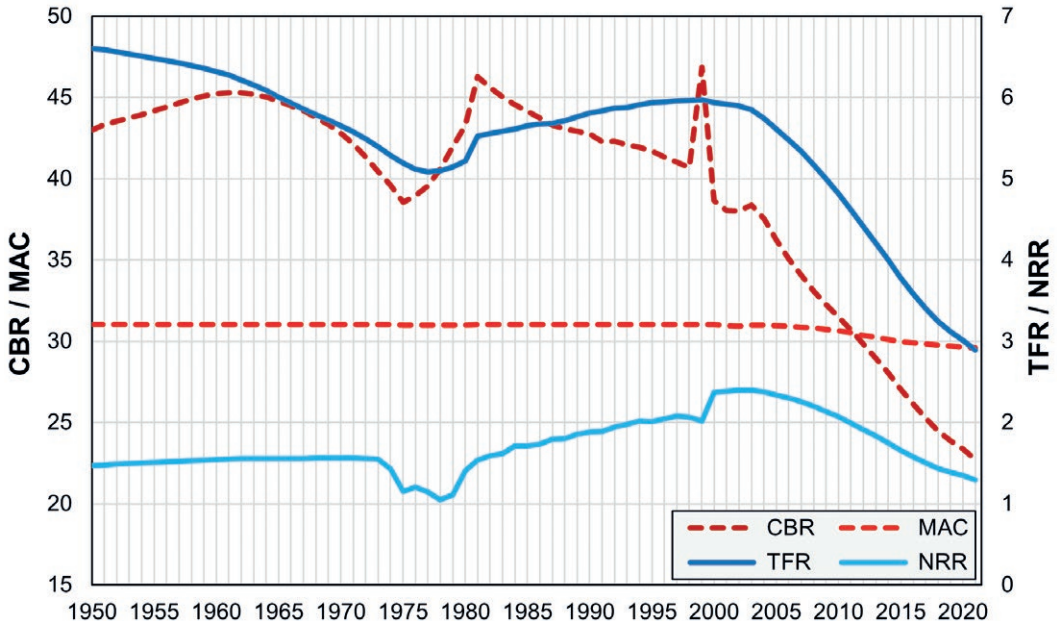

Fig. 10 Trends in fertility indicators in Timor-Leste, 1950–2023.
Note: CBR – Crude birth rate, MAC – Mean age at childbearing, TFR – Total fertility rate, NRR – Net reproduction rate.
Source: WPP 2024.

(Chapter 2.3). This discrepancy likely stems from significant population outflow that year, along with the smoothing of fertility trends in the WPP data. The differences are most pronounced between 1999 and 2002 but become negligible afterward. Subsequently, fertility has declined across all age groups. While the 25–29 age group consistently exhibited the highest fertility rate, its share has steadily increased (Fig. 11). Notably, the second-highest fertility group shifted from 30–34 to 20–24 years, reflecting a decrease in the mean age of childbearing. This leads to a shift toward a fertility regime characterized by decreasing fertility rates and a reduced role of older age groups in reproductive activity.

DHS data (2003; 2024) show a decline in completed fertility, from 5.8 to 5.0 children per woman, between 2009–2010 and 2016. However, the ideal number of children has decreased even more, from 5.7 (2003) to 3.7 (2016), suggesting an unmet need for family planning. Public distrust to such programs may stem from Indonesia's forced contraception policy during the occupation (Saikia et al. 2009).

Tab. 1 Fertility and family planning indicators, Timor-Leste, 2003–2016.

DHS survey	Completed fertility of women aged 40–49	Mean ideal number of children for all women
2003	–	5.7
2009–2010	5.8	5.0
2016	5.0	3.7

Note: Data not available for entries marked with –.
Source: DHS 2003 and DHS 2024.

3.4 Population structure of Timor-Leste

Timor-Leste's population has been historically very young. The 65+ age group remained very low, from 3.1% in 1950 to 2.2% in 1991. A significant increase only began in the early 2000s, peaking at 5.6% in 2019 (Fig. 12).

The 0–14 age group made up nearly 44% of the population in 1950 and decreased to 39% by 1965. A slight increase to a 1973 peak coincided with high, particularly adult, mortality, despite declining fertility. At the beginning of the 1970s, there was a gradual increase in the share. However, this was disrupted in 1974, after which the share began to decline, falling to 37.4% in 1980. This was likely influenced by the Indonesian occupation, as mortality in this age group increased significantly, while declining fertility rates led to fewer births.

Since the 1980s, the child population share rapidly increased due to rising fertility, reaching 43% in 1996. This trend was disrupted primarily by the increasing elderly population (Fig. 12). Since 2009, the child population share's decline has accelerated, while the working-age population increased (WPP 2024). It should be noted that the shares of the child and working-age population were essentially inversely related during the observed period, due to the very low share of the elderly.

Given the findings on the presence of excess male mortality during the occupation period, it is certainly relevant to analyze the sex ratio. It showed a unique trend during the Indonesian occupation. The sex ratio gradually declined until 1974, reaching a value of 101.3 men per 100 women. Following the onset of the occupation, a sharp decline occurred, stabilizing only in 1980 at 93.6. This phenomenon largely reflected the mortality situation, characterized by high male

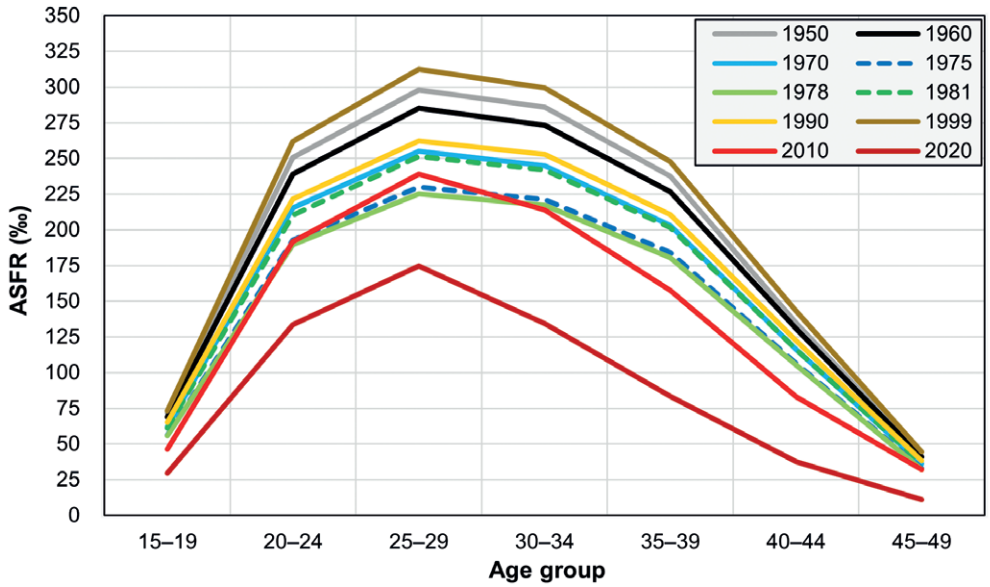

Fig. 11 Age-specific fertility rate in Timor-Leste, 1950–2020.
Source: WPP 2024 and author's calculation.

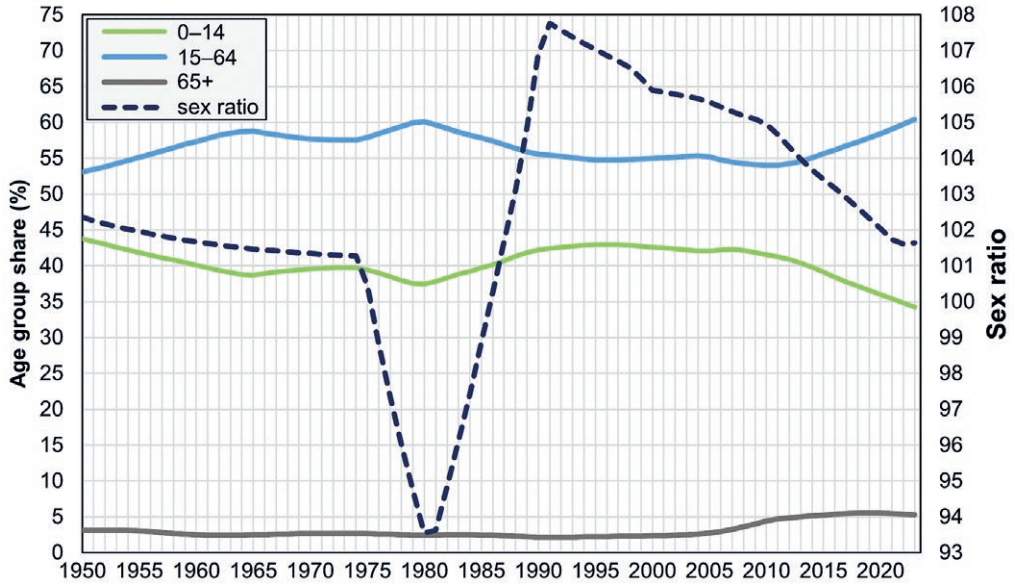

Fig. 12 Broad age groups share and sex ratio in Timor-Leste, 1950–2023.
Source: WPP 2024 and author's calculation.

excess mortality, which began to gradually decrease towards the end of the 1970s.

In the 1980s, according to WPP data (2024), the sex ratio saw a sharp increase, significantly exceeding pre-crisis levels. In 1991, at the peak, the sex ratio was 107.8 men per 100 women. However, it is highly unlikely that this increase can be solely attributed to a decline in male excess mortality. According to WPP data (2024), there was no change in the sex ratio at birth. Assuming the sex ratio estimates in the WPP database (2024) are reasonably accurate, it is likely that this phenomenon was driven by migration. Given that net migration was negative during the 1980s, the sharp increase in the sex ratio would have been primarily caused by male immigration and female emigration. However, data on the structure of migration are not available.

There was a continuous decline in the sex ratio, with the most significant drop occurring at the turn of the millennium, during the withdrawal of Indonesian troops and the gaining of independence, and again after 2010. In 2023, the sex ratio was 101.6 men per 100 women.

The median age was 17.1 years in 1950, rising to 19.4 in 1974 (WPP 2024). After the onset of the occupation, the median age increased to 20 years by 1979, likely due to significant excess mortality among children and young people (Tab. 2). This was followed by a period of gradual decline, which halted in 1999, before a renewed increase, reaching 21 years by 2023.

Tab. 2 Age structure indicators, Timor-Leste, 1950–2020.

Age group		1950	1960	1970	1980	1990	2000	2010	2020
Age group share of the total population (%)	0–14	43.8	40.1	39.6	37.4	42.2	42.6	41.6	36.0
	15–64	53.1	57.4	57.7	60.1	55.6	55.0	54.0	58.5
	65+	3.1	2.5	2.7	2.5	2.2	2.4	4.4	5.5
Age group share of the male population (%)	0–14	43.8	40.1	39.8	39.4	42.8	42.6	42.0	36.3
	15–64	53.5	57.8	58.0	58.4	55.2	55.2	53.8	58.6
	65+	2.7	2.1	2.2	2.2	2.0	2.2	4.2	5.1
Age group share of the female population (%)	0–14	43.8	40.1	39.4	35.6	41.6	42.6	41.1	35.7
	15–64	52.6	56.9	57.4	61.7	56.1	54.9	54.2	58.3
	65+	3.6	3.0	3.2	2.7	2.3	2.5	4.7	6.0
Indicators of population aging	Median age	17.1	18.2	19.5	20.0	18.0	17.5	17.8	20.1
	YADR	82.5	69.9	68.6	62.3	75.9	77.4	77.0	61.6
	OADR	5.9	4.4	4.7	4.1	3.9	4.3	8.2	9.5

Note: YADR – the number of children (aged 0–14) per 100 working-age people (15–64); OADR – the number of elderly (65+) per 100 working-age people (15–64).
Source: WPP 2024 and author's calculation.

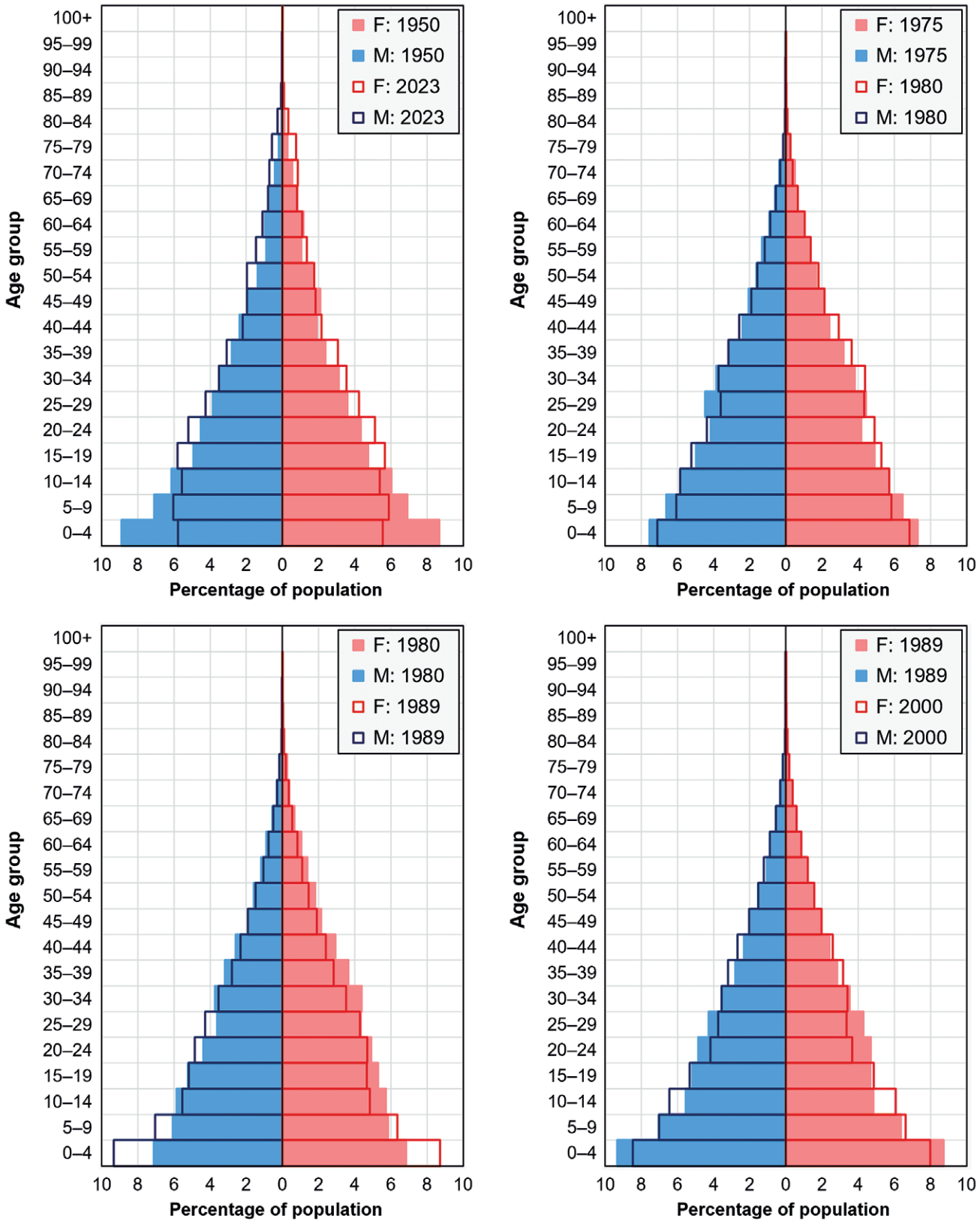

Fig. 13 Age-sex structure – Timor-Leste, 1950–2023, 1975–1980, 1980–1989 and 1989–2000.
Note: F – Females; M – Males. Source: WPP 2024.

Although demographic aging is not an immediate concern, the old-age dependency ratio is rising, while the young-age dependency ratio is declining, both driven by falling fertility and mortality rates. Since 2010, the working-age population has grown, signaling the onset of the demographic window. However, to harness such economic potential, well-designed socio-economic policies are essential (Kotschy et al. 2020).

Between 1950 and 2023, Timor-Leste's population structure became more stationary, with a declining proportion of children and a growing share of older adults, particularly men aged 70 and above (Fig. 13).

A comparison of age and gender between 1975 and 1980, the period of highest mortality, shows that declining fertility and rising mortality led to a decrease in the youngest age groups (Fig. 13). The share of the 0–9 age group declined for both sexes, while men also saw a significant drop in the proportion of those aged 25–34. Despite these trends, the population grew by 37,000 women, compared to just 14,000 men during this period (WPP 2024).

Between 1980 and 1989, the 0–9 age group grew due to higher fertility and declining mortality (Fig. 13). In contrast, the 10–14 age group saw a significant decline, likely reflecting lower fertility in the late 1970s. The male population in the 15–24 age group grew nearly four times more than the female population in the same age group (WPP 2024). At the same time, the share of those aged 30–44 declined considerably, particularly among women. The gradual reduction in male excess mortality during this period is also reflected in overall population growth, with the male population increasing by 67,200, while the female population grew by only 27,700.

Between 1989 and 2000, during the period between the significant decline in mortality and the end of the occupation, mortality rates fell, and the child population grew, particularly among women, despite a declining share of individuals in the youngest age group (Fig. 13). During this period, the male population grew by 1,900, while the female population declined by 1,600. This was likely due to a major wave of emigration in 1999, when net migration reached a negative balance of 263,000. Both men and women saw a significant decline in the 20–29 age group.

4. Discussion

The analysis of various aspects of Timor-Leste's population development has shown that the Indonesian occupation had a clear impact on both individual demographic processes and overall population trends.

The counterfactual demographic projection presented in this paper indicates that due to decolonization, civil war, and, most notably, the subsequent Indonesian occupation, Timor-Leste's population in 1989 was 130,000 lower than it would have been without disruptions to mortality trends. This finding broadly aligns with Kiernan (2008), who estimates 145,000 excess deaths. The UN estimated 103,000 deaths between 1974 and 1999, while some sources suggest the toll exceeded 200,000 (Silva and Ball 2008). By 1999, the counterfactual projection suggests the population of Timor-Leste was 176,000 lower than its estimated value, representing about 30% of the pre-crisis population. In comparison, the relative population loss during the Cambodian genocide was lower, at approximately 26% of its pre-crisis population, with an absolute death toll of around 1.9 million (Heuveline 2015). Both events occurred in a similar period and region, although it is important to note that the Cambodian genocide lasted only a few years.

Given that the highest values of net migration, whether positive or negative, were recorded at the beginning of the invasion and at its end, it is evident that the Indonesian occupation had a significant impact on migration patterns. Kugler (2016) observes similar effects of genocide on migration. However, an interesting contrast emerges: in the cases he examined, genocides typically led to large-scale emigration at the outset, followed by an immigration wave after the crisis ended. In Timor-Leste, however, the pattern was reversed. A possible explanation is that the country's geographical isolation, combined with the occupation, effectively prevented inhabitants from leaving. It is important to note that such migration also has a substantial indirect influence on other demographic processes, particularly through changes in the age and sex structure. This applies not only to the emigrant population but also to the population of the destination areas.

The events mentioned had a profound impact on the country's mortality levels due to their very nature. The mortality analysis reveals several key findings. The invasion and subsequent occupation from 1975 to 1999 significantly influenced mortality rates. Notably, excess mortality among children, as well as young and adult men (particularly those aged 15–39) was a defining characteristic of this period. The conflict's negative impact on male mortality was more intense, selective, and prolonged compared to its effect on female mortality. Similar mortality patterns were also observed during the Cambodian genocide (Heuveline 1998). However, female mortality was also severely affected, with excess deaths most concentrated among girls aged 5–14. Following the invasion, infant mortality increased by more than 30% compared to pre-crisis levels, while child mortality rose by over 40%. The scale and selectivity of the crisis can be effectively illustrated through life expectancy at birth. In 1973, female life expectancy was 40.5 years, but by 1978, it had dropped to 28.2 years. The decline was even more pronounced for men, falling from 37.5 to just 19.3 years.

The demographic analysis indicates a significant decline in fertility in Timor-Leste. Prior to this decline, the TFR was exceptionally high, exceeding 6.5 children per woman (WPP 2024). The results of the analysis reveal a gradual decline in TFR, dropping from approximately 6.6 children per woman to 5.3 before the invasion. Fertility continued to decrease until 1978, coinciding with the period of the highest mortality rates. The subsequent increase in fertility between 1979 and 1999 may have been a response to population losses caused by the occupation. However,

it is important to note that TFR estimates in WPP (2024) do not align with the figures calculated for this study based on WPP (2024) data. Furthermore, the targeted and violent Indonesianization of the country, along with the marginalization of the Timorese population, likely triggered resistance and reinforced strong pronatalist intentions among the local population (Saikia et al. 2009).

The Indonesian occupation deeply altered Timor-Leste's population structure through excess male mortality, declining fertility, and forced migration. The sex ratio dropped sharply, especially by 1980, due to high male mortality. However, compared to other cases of genocides and conflicts, its subsequent recovery was unusually rapid. For example, in the case of Germany after World War II, Urlanis (1971) suggests that the sex ratio would not return to pre-war levels until the 21st century, which, according to WPP (2024), has not yet occurred. Another example is the Cambodian genocide, which also took place in the late 1970s. Neupert and Prum (2005) state that in 1980, the sex ratio was 87 males per 100 females. However, it has only reached 96 so far (WPP 2024).

The youngest age groups saw a reduction due to both increased child mortality and declining fertility, while the working-age population, especially men aged 25–34, also declined. Migration likely further disrupted the balance, with male immigration and female emigration affecting the sex ratio. However, this remains a hypothesis, as data on the age and gender structure of migrants is unavailable. As mortality declined in the 1980s, fertility rebounded, briefly increasing the child population. By the time of independence, Timor-Leste's population had shifted toward a more stationary model, but the demographic scars of the occupation remain evident today, such as the lower numbers of persons born between 1975 and 1980.

Given that one of the greatest challenges in demographic research on genocide is the severe limitation of high-quality data sources, it is essential for future research to focus on expanding methodological approaches.

A more detailed analysis of the impact of genocide-induced migration on population dynamics would also be highly valuable. Additionally, further research should address the long-term effects of genocide on affected populations, such as changes in morbidity patterns or shifts in causes of death. Assessing the relationship between genocide and mortality in relation to socioeconomic status could also be beneficial.

5. Conclusions

This paper introduces the demography of genocide as a specialized branch of demographic research. To illustrate its importance, the main section presents a case study on the demographic impacts of the Indonesian occupation of Timor-Leste.

The demography of genocide can be described as a branch of research that focuses on the immediate and long-term impacts on mortality, fertility, and migration among both directly and indirectly affected populations. While it primarily employs demographic methods, it also incorporates interdisciplinary approaches from history, sociology, and genocide studies to aid in genocide prevention.

However, it is important to note that the demography of genocide still lacks institutional recognition: it is not formally taught at universities, nor is it the focus of dedicated research institutions. Currently, it remains largely a subfield within the demography of armed conflict and violence. An equally significant challenge is the lack of methodological frameworks, whether for assessing impacts or improving the efficiency of high-quality data collection. The scarcity of such data, due to the violent and destructive nature of genocides and related conflicts, represents a major obstacle to research in this field.

The case study clearly demonstrates the profound demographic impact of the genocide perpetrated by Indonesia against the population of Timor-Leste between 1975 and 1999.

There was a significant deterioration in mortality across the entire population. This overall rise in mortality was disproportionately severe, leading to particularly high excess mortality among children and young men.

While the effect on fertility was less significant and largely aligned with pre-existing long-term trends, the genocide nevertheless fundamentally altered the country's population dynamics. The relatively rapid rebound of fertility could indicate that a population's response to genocidal violence is not merely passive but may also be an active process of resilience. This demographic shock, combined with notable migratory shifts at the beginning and end of the occupation, significantly reshaped the age and sex structure of Timor-Leste's population. The pattern of migration, where population movement was likely constrained by the country's geographical isolation, suggests that migratory responses to mass violence may not be uniform and should be understood within their specific geopolitical and geographical contexts.

Based on the projection results presented in this paper, the total losses by the end of the Indonesian occupation in 1999 amounted to a staggering toll, representing nearly a third of the country's pre-crisis population. This methodology could be valuable for evaluating the demographic consequences in contexts where data are scarce, a situation that is common in genocide research.

Overall, the demographic scars of the Indonesian occupation remain visible today, highlighting the lasting consequences of acts of mass violence and demonstrating how such events can fundamen-

tally transform a nation's population structure for generations.

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References

Andreev, E. M., Shkolnikov, V. M., Begun, A. (2002): Algorithm for decomposition of differences between aggregate demographic measures and its application to life expectancies, healthy life expectancies, parity-progression ratios and total fertility rates. Demographic Research 4(7), 499–522, https://doi.org/10.4054/DemRes.2002.7.14.

Avenir Health (2024): Spectrum Manual, Avenir Health. Available online: https://avenirhealth.org/Download/Spectrum/Manuals/SpectrumManualE.pdf (accessed on 12 January 2025).

Ball, P., Spirer, L., Spirer, H. F. (2000): Making the Case: Investigating Large Scale Human Rights Violations Using Information Systems and Data Analysis. Washington, DC: American Association for the Advancement of Science.

Bloxham, D., Dirk Moses, A. (2010): Editor's Introduction: Changing Themes in the Study of Genocide. In Bloxham, D., Moses, A. D., The Oxford Handbook of Genocide Studies. Oxford: Oxford University Press, 1–18, https://doi.org/10.1093/oxfordhb/9780199232116.001.0001.

BPS (1991): Penduduk Indonesia Hasil Sensus Penduduk 1990 Seri L1, Badan Pusat Statistik. Available online: https://www.bps.go.id/id/publication/1991/01/28/bb2dc5b6c70e83f3a00aa495/penduduk-indonesia-hasil-sensus-penduduk-1990-seri-l1.html (accessed on 12 January 2025).

Brunborg, H., Lyngstad, T. H., Urdal, H. (2003): Accounting for Genocide: How Many Were Killed in Srebrenica? European Journal of Population 19(3), 229–248, https://doi.org/10.1023/A:1024949307841.

Brunborg, H., Tabeau, E. (2005): Demography of Conflict and Violence: An Emerging Field. European Journal of Population 21(2–3), 131–144, https://doi.org/10.1007/s10680-005-6850-7.

Budiardjo, C., Liong, L. S. (1984): The War Against East Timor. London: Zed Books.

Cribb, R. (2001): How many deaths? Problems in the statistics of massacre in Indonesia (1965–1966) and East Timor (1975–1980). In Wessel, I., Wimhöfer, G., Violence in Indonesia. Hamburg: Abera Verlag, 82–98.

Dasvarma, G. L. (2011): Demography of Timor-Leste. A Brief Overview and Some Implications for Development and Security. In Harris, V., Goldsmith, A. Security, Development and Nation-Building in Timor-Leste: A cross-sectoral assessment. London: Routledge, 195–209, https://doi.org/10.4324/9780203828199.

DHS (2003): Timor-Leste 2003 DHS. The Demographic and Health Surveys Program, Ministry of Health and National Statistics Office, The Australian National University, ACIL Australia Pty Ltd., University of Newcastle. Available online: https://www.aidsdatahub.org/sites/default/files/resource/timor-leste-dhs-2003.pdf (accessed on 16 December 2024).

DHS (2024): The DHS Program STATcompiler. Timor-Leste: 2009–10 and 2016 DHS Survey Data, The Demographic and Health Surveys Program. Available online: https://www.statcompiler.com (accessed on 17 December 2024).

Dunn, J. (2012): Genocide in East Timor. In Totten, S., Parsons, W. S., Centuries of Genocide Essays and Eyewitness Accounts. London: Routledge, 279–315, https://doi.org/10.4324/9780203867815-9.

Ea, M. T. (1981): Kampuchea: A Country Adrift. Population and Development Review 7(2), 209–228, https://doi.org/10.2307/1972621.

Hauser, P. M. (1942): Population and Vital Phenomena. American Journal of Sociology 48(3), 309–322, http://dx.doi.org/10.1086/219178.

Heuveline, P. (1998): 'Between one and three million': towards the demographic reconstruction of a decade of Cambodian history (1970–79). Population Studies 52(1), 49–65, https://doi.org/10.1080/00324720310001501 76.

Heuveline, P. (2015): The boundaries of genocide: Quantifying the uncertainty of the death toll during the Pol Pot regime in Cambodia (1975–79). Population Studies 69(2), 201–218, https://doi.org/10.1080/00324728.2015.1045546.

Hilberg, R. (2003): The Destruction of the European Jews. 3rd ed., New Haven: Yale University Press.

Hull, T. H. (2003): From province to nation: the demographic revolution of a people. In Fox, J. J., Soares, D. B., Out of the Ashes: Destruction and Reconstruction of East Timor. Canberra: ANU E Press, 28–40, http://doi.org/10.22459/OA.11.2003.02.

INETL (2023a): 2015 Census Wall Chart, Instituto Nacional De Estatística Timor-Leste. Available online: https://inetl-ip.gov.tl/2023/03/13/2015-census-wall-chart/ (accessed on 12 January 2025).

INETL (2023b): 2022 Census Wall Chart, Instituto Nacional De Estatística Timor-Leste. Available online: https://inetl-ip.gov.tl/2023/10/04/2022-census-wall-chart (accessed on 12 January 2025).

Johnson, R. E. (1992): Introduction. Russian Studies in History 31(1), 3–9, https://doi.org/10.2753/RSH1061-198331013.

Jones, A. (2017): Genocide: A Comprehensive Introduction. 3rd ed., London: Routledge.

Joseph, A., Hamaguchi, T. (2014): Timor-Leste: The History and Development of Asia's Newest Nation. Lanham: Lexington Books.

Kiernan, B. (2008): Genocide and Resistance in Southeast Asia: Documentation, Denial, and Justice in Cambodia and East Timor. London: Routledg.

Kotschy, R., Suarez Urtaza, P., Sunde, U. (2020): The demographic dividend is more than an education dividend. PNAS 117(42), 25982–25984, https://doi.org/10.1073/pnas.2012286117.

Kugler, T. (2016): The Demography of Genocide. In Anderton, C. H., Brauer, J., Economic Aspects of Genocide,

Mass Killing, and Their Prevention. Oxford: Oxford University Press, 102–124, https://doi.org/10.1093/acprof:oso/9780199378296.003.0004.
Lemkin, R. (1944): Axis Rule in Occupied Europe. Laws of Occupation. Analysis of Government. Proposals for Redress. Washington, DC: Carnegie Endowment for International Peace.
Neupert, T., Prum, V. (2005): Cambodia: Reconstructing the Demographic Stab of the Past and Forecasting the Demographic Scar of the Future. European Journal of Population 21(2–3), 217–246, https://doi.org/10.1007/s10680-005-6854-3.
Niewyk, D., Nicosia, F. (2000): The Columbia Guide to the Holocaust. New York: Columbia University Press, https://doi.org/10.7312/niew11200.
Poliakov, I. A., Zhiromskaia, V. B., Kiselev, I. N. (1992): Part I: The 1937 Census. Russian Studies in History 31(1), 10–39, https://doi.org/10.2753/RSH1061-1983310110.
Preston, S. H., Heuveline, P., Guillot, M. (2001): Demography: Measuring and Modeling Population Processes. Malden: Blackwell Publishing.
Robinson, G. (2023): Half a Century of Genocide and Extermination Indonesia, 1965–1966; East Timor, 1975–1999; and West Papua, 1963–2020. In Kiernan, B., Lower, W., Naimark, N., Straus, S., The Cambridge World History of Genocide, Volume III. Genocide in the Contemporary Era, 1914–2020. Cambridge: Cambridge University Press, 450–475, https://doi.org/10.1017/9781108767118.020.
Saikia, U. S., Dasvarma, G. L., Wells-Brown, T. (2009): The world's highest fertility in Asia's newest nation: an investigation into reproductive behaviour of women in Timor-Leste, International Union for the Scientific Study of Population. Available online: https://ipc2009.popconf.org/papers/90513 (accessed on 28 January 2025).
Schaller, D. J. (2011): From Lemkin to Clooney: The Development and State of Genocide Studies. Genocide Studies and Prevention 6(3), 245–256, https://doi.org/10.3138/gsp.6.3.245.
Seltzer, W. (1998): Population Statistics, the Holocaust, and the Nuremberg Trials. Population and Development Review 24(3), 511–552, https://doi.org/10.2307/2808153.
Shkolnikov, V. M., Andreev, E. M. (2010): Age-decomposition of a difference between two populations for any life-table quantity in Excel, Max Planck Institute for Demographic Research. Available online: https://dx.doi.org/10.4054/MPIDR-TR-2010-002 (accessed on 20 December 2024).
Silva, R., Ball, P. (2008): The Demography of Conflict-Related Mortality in Timor-Leste (1974–1999): Reflections on Empirical Quantitative Measurement of Civilian Killings, Disappearances, and Famine-Related Deaths. In Aasher, J., Banks, D., Scheuren, F. J., Statistical Methods for Human Rights. New York: Springer, 117–139, https://doi.org/10.1007/978-0-387-72837-7_6.
Thu, P. M. (2019): Internal displacement in Timor-Leste. In McWilliam, A., Leach, M., Routledge Handbook of Contemporary Timor-Leste. London: Routledge, 174–184, http://doi.org/10.4324/9781315623177-13.
UN (1948): Convention on the Prevention and Punishment of the Crime of Genocide, United Nations. Available online: https://www.un.org/en/genocideprevention/documents/atrocity-crimes/Doc.1_Convention%20on%20the%20Prevention%20and%20Punishment%20of%20the%20Crime%20of%20Genocide.pdf (accessed on 18 September 2025).
Urlanis, B. C. (1971): Wars and Population. Moscow: Progress Publishers.
Vincent, P. (1947): Guerre et population. Population (French Edition) 2(1), 9–30, http://dx.doi.org/10.2307/1523845.
Von Joeden-Forgey, E. (2010): Gender and Genocide. In Bloxham, D., Dirk Moses, A., The Oxford Handbook of Genocide Studies. Oxford: Oxford University Press, 61–80, https://doi.org/10.1093/oxfordhb/9780199232116.013.0004.
Weiss-Wendt, A. (2008): Problems in Comparative Genocide Scholarship. In Stone, D., The Historiography of Genocide. New York: Palgrave Macmillan, 42–70, http://dx.doi.org/10.1057/9780230297784_3.
WHO (2001): Age Standardization of Rates: A New WHO Standard, World Health Organization. Available online: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/gpe_discussion_paper_series_paper31_2001_age_standardization_rates.pdf (accessed on 16 December 2024).
WPP (2024): World Population Prospects 2024. United Nations, Department of Economic and Social Affairs, Population Division. Available online: https://population.un.org/wpp/ (accessed on 15 December 2024).
Yehuda, D., Magos, G. (1983): The Demographic Development of Hungarian Jewry. Jewish Social Studies 45(3–4), 189–216.