

RESEARCH ARTICLE

Changes in demographic components during the COVID-19 pandemic and economic recession in Sri Lanka

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Abstract: The objective of this paper is to investigate the impact of the COVID-19 pandemic and subsequent economic recession on the three demographic components, namely mortality, fertility and migration in Sri Lanka and possible implications. A secondary data analysis of mortality, fertility, migration, and marriage data from the Registrar General's Department of Sri Lanka and the Ministry of Health was conducted. Although excess mortality (COVID-19 deaths) in 2022 was substantially lower, it was elevated in 2021. In comparison to non-COVID-19 years, the number of deaths has increased substantially during the post-COVID-19 era – 146 thousand deaths in 2019 increased to 194 thousand in 2023 (30.1%). This marked increase could be attributed to the economic recession and related serious constraints faced by the health system in Sri Lanka. Further, a marked decrease in marriages (14.2%) was observed in 2020 due to COVID-19 which recovered to pre-COVID-19 level in 2021. However, instead of experiencing the “baby-boom” phenomenon (as observed in some previous pandemics) in the aftermath of the COVID-19 pandemic, the observed data for Sri Lanka indicates a significant downward trend in fertility. Unexpectedly, 319 thousand births were reported in 2019 in Sri Lanka dropping to 257 thousand by 2023, which is a decline of over 62 thousand births (19%). This situation is further complicated by the highest reported outbound migration ever reported in Sri Lanka in 2022, displaying a 250% year-to-year increase. The changes in these demographic components would impact the macroeconomics and the future size of the Sri Lankan population.

Keywords: The COVID-19 pandemic, mortality, fertility, marriage, economic recession.

INTRODUCTION

Fertility and mortality are the key demographic components which determine the natural growth of a population in a country. Apart from changes in these two demographic components, international migration also influences the overall growth of the population of a country. In many countries of the world, fertility level is strongly related to marriage practices, particularly the average age of marriage of females (Abeykoon, 1998). The COVID-19 pandemic that emerged in the latter part of 2019 has significant implications on the above-stated demographic components and thereby the growth of the population of most countries and finally the world population itself (Ghaznavi *et al.*, 2022).

Despite being an Island, Sri Lanka was unable to escape from this deadly virus – the first case of COVID-19 was detected from a Chinese tourist in February 2020 and subsequently, a large number of COVID – 19 infections were detected in Sri Lanka. Although Sri Lanka had a small number of COVID-19 deaths in 2020, a considerable rise in COVID – 19 mortality was observed in 2021. This pandemic has both direct and indirect implications on the demographic Patterns in many

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countries including Sri Lanka (Sri Lanka Epidemiology Unit, 2023). For instance, many COVID-19 deaths have implications on mortality directly, while the COVID-19-related economic recession observed in present Sri Lanka is expected to enlarge non-communicable diseases and deaths (NCDs) indirectly (Sri Lanka Epidemiology Unit, 2023; Matthias & Jayasinghe, 2022). At the same time, long-term lockdown experienced in the country and the death of a loved one in a family would have postponed the planned marriages considerably. Thus, a drop in marriages and fear of conceiving during this pandemic period, particularly in the year 2021 would have implications on the fertility level of the country (Family Health Bureau, 2024).

The global financial crisis a decade ago resulted in a recession and left long-lasting scars on future growth through its impact on fertility rates. Economic recessions are associated with increased maternal and infant mortality rates, particularly in the earlier stages of a country's development (Ensor *et al.*, 2010; Doerr & Hofmann, 2020a).

Apart from the deadly virus, the economic performance of the country has suffered due to the lockdown and travel restrictions (Central Bank of Sri Lanka, 2022). Today, Sri Lanka is facing a challenging situation with the current economic crisis and high inflation which critically affected the country before the recovery from the ill effects of the COVID-19 pandemic (Matthias & Jayasinghe, 2022). Political uncertainty developed from the early part of 2022, which continues even today, and various socio-economic problems, the public faces become worse (Matthias & Jayasinghe, 2022). Against this backdrop, the main objective of this paper is to investigate the impact of the COVID-19 pandemic and subsequent economic recession on the four demographic components, namely mortality, fertility, migration and marriage in Sri Lanka and possible implications.

Sources of data

The main data source for the paper was obtained from the Registrar General's Department of Sri Lanka. The vital events, particularly births, deaths and marriages are compiled by the Registrar General's Department and the resulting statistics are known as vital statistics. Several national surveys were conducted in Sri Lanka to estimate the completeness of the registration of births and deaths. Of many such surveys, the latest one was conducted in 1980. Results of this survey reveal that the completeness of births and death registration in 1980 was 99% and 94% respectively (Department of Census and Statistics, 1984). Although after 1980 no such surveys were carried out,

the improvement in reporting and the necessity of birth and death certificates for routine daily activities, both birth and death registration completeness would have reached almost 100% in the recent past (Economynext, 2021). Reported deaths due to the COVID-19 pandemic in Sri Lanka by age and sex were obtained from the Epidemiology Unit of the Ministry of Health. Data on hospitalized deaths were taken from the Annual Health Bulletin of the Ministry of Health, Sri Lanka.

PAST PANDEMICS AND EPIDEMICS IN SRI LANKA

In the early part of the 19th Century, people in Colonial Sri Lanka (then Ceylon) faced new diseases, epidemics and food shortages - various epidemics including cholera and smallpox resulted in a steep rise in mortality. The great cholera pandemic in India during the second decade of the nineteenth century was felt in Sri Lanka. Although cholera was never endemic in Ceylon, it became a serious health issue after the 1830s with the arrival of Indian immigrants as labourers on the coffee estates in increasing numbers. Henceforth, cholera epidemics became a regular occurrence. Epidemiological reports reveal a total of 16,869 cholera cases during 1841-1850, with 10,296 reported deaths (Meegama, 1979; 2012). From the last decades of the 19th Century and 20th Century following major causes of mortality were identified – Dysentery, Diarrhoea, Enteritis, Malaria, Pneumonia, Bronchitis, Typhoid, Tuberculosis etc. The history indicates that quarantine was a major instrument of pandemic/epidemic control in Sri Lanka (Jones, 2001). Along with the COVID-19 pandemic, the same situation reappeared in Sri Lanka.

Since the 1920s mortality rates started to decline gradually irrespective of the occasional outlier such as 1935, when heavy tolls on deaths occurred. A clear downward trend in the death rate in Sri Lanka has been noticeable since 1921. The decline continued at a uniform rate until the malaria epidemic broke out in 1935. The year 1935 was the worst malarial year when the highest number of deaths (204,823) in the country was recorded (Government Press, 1935). There were over 47,000 malarial deaths reported in 1935. The infant death rate also recorded a sharp rise from 173 per 1,000 live births in 1934 to 262 in 1935. As the reports indicate the malaria epidemic caused not only increased fatality but also severe economic depression (Government Press, 1935). The same scenario reappeared in Sri Lanka during the current era.

COVID-19 PANDEMIC: GLOBAL IMPACT

In the first two decades of the 21st Century Severe Acute Respiratory Syndrome (SARS), Middle East respiratory syndrome (MERS), and Ebola existed in parts of the world, without any occurrence of an epidemic in Sri Lanka. Although the number of infected persons and deaths was not comparatively high due to these epidemics when compared to pandemics in the 19th to early 20th centuries, it was a different scenario with COVID-19 (Piret & Boivin, 2021). With the spread of COVID-19, the WHO declared the outbreak of a Public Health Emergency of International Concern on 30 January 2020, and a pandemic on 11 March 2020. Since then, cases of COVID-19 have risen exponentially throughout the world partly due to globalization with increased international travel and trade. Globally, as of, 21 September 2023, there have been 770,778,396 confirmed cases of COVID-19, including 6,958,499 deaths, reported to WHO. By 16 September 2023, a total of 13,504,973,753 vaccine doses had been administered (WHO Health Emergency Dashboard, 2023). The

severity of COVID-19 cases is changing considerably resulting in 40% mild, 40% moderate (with Pneumonia), 15% severe and only 5% becoming critically ill cases and following the commencement of vaccination against COVID-19, the disease-related mortality and morbidity has decreased significantly (WHO Health Emergency Dashboard, 2023).

COVID-19 PANDEMIC: IMPACT IN SRI LANKA

Sri Lanka reported its first COVID-19 case on 27 January 2020a tourist from Hubei Province, China. The first local case emerged almost after 1½ months on 11 March 2020a tour guide with contact history of an Italian tourist group. Although the number of confirmed COVID-19 deaths was less in 2020, in 2021, it was more than 15,000. In both 2021 and 2022, various mutations of the virus were identified and even by mid-2022, a sizable number of COVID-infected persons and deaths were reported by the authorities in Sri Lanka. As of 22.09.2023, there were 672,587 confirmed cases with 16,882 deaths (Epidemiology Unit, 2023).

Table 1: COVID-19 situational update

Wave	Duration	No. of cases	No. of deaths	Case Fatality Rate*
1 st	27.01.2020-03.10.2020	3,396	13	0.38
2 nd	04.10.2020-14.04.2021	92,341	591	0.64
3 rd	15.04.2021-30.04.2023	576,434	16,238	2.81

*Case is defined as a -laboratory-confirmed patient

Source: Epidemiology Unit - Ministry of Health (www.epid.lk)

Table 2: Number of deaths by sex and number of births 2007-23

Year/Period	No. of deaths			No. of births
	Total	Male	Female	
2007-11 (Average)	124,820	73,622 (58.9%)	51,198 (41.1%)	370,875
2012-16 (Average)	128,206	72,271 (56.4%)	55,935 (43.6%)	348,238
2017	139,822	77,206 (55.2%)	62,616 (44.8%)	326,052
2018	139,498	77,311 (55.4%)	62,187 (44.6%)	328,112
2019 ^a	146,053	79,725 (54.6%)	66,328 (45.4%)	319,010
2020 ^a	132,431	72,874 (55.0%)	59,557 (45.0%)	301,706
2021 ^a	163,936	90,836 (55.4%)	73,100 (44.6%)	284,848
2022 ^a	179,792	98,706 (54.9%)	81,086 (45.1%)	275,321
2023 ^{ab}	194,190	105,748 (54.5%)	88,442 (45.5%)	257,656

^a Provisional

^b Estimated figures based on provisional data of the first six months of 2023

Source: Registrar General's Department of Sri Lanka.

Sri Lanka, until an effective immunization coverage against COVID-19 was achieved, implemented a ‘whole-of-government, whole-of-society approach’ centered around science-based and law-based strategies for controlling the COVID-19 pandemic in compliance with WHO recommendations. It purely focused on slowing the epidemic spread (flattening the curve) by keeping the patient load at any given time at a level manageable by the health services. This has extensively slowed down the transmission of the disease where the health services were not saturated beyond their capacity. These multifaceted, multi-stakeholder and society-oriented strategies were the best approaches to counteract the expected damage (Erandi *et al.*, 2020).

Impact of COVID-19 and economic recession towards mortality upturn

Mortality data is regularly used in the analysis of demographic trends, dynamics and growth perspectives of the past, present and future. The mortality pattern in Sri Lanka is at a transitional stage; it is changing from a pattern seen in a developing country to a developed country (World Health Organization - SEARO, 2018). The mortality transition indicates a decrease in deaths due to infectious and parasitic diseases to deaths due to non-communicable diseases (Sanderatne, 1998; Meegama, 2012; De Silva 2015).

Although in Sri Lanka there was a gradual increase in the number of deaths over the past 10-15 years, interestingly in 2021, 2022 and 2023 due to COVID-19 and economic recession, the number of deaths increased in an unexpected manner (Figure 1). Along with the increase in the total population and ageing process –age structure transition - it is generally expected to have an increase in the number of deaths. The average number of deaths was only 124,820 during 2007-2011, however, the number has increased steadily and by 2019 it has reached over 146,000 – an increase of 10 per cent (Table 2). The number of deaths increased to 194 thousand in 2023 from 180 thousand in 2022. Throughout 2022 and 2023, the number of deaths demonstrated a significant increase of 33 per cent, which could not be attributed entirely to the population ageing issue. A significant increase of deaths was observed during 2022-23 which could be attributed to implications arising from COVID-19 and economic recession. It should be noted that there were hardly any COVID-19 deaths reported in 2023.

Although with the spread of COVID-19 pandemic, the number of deaths increased significantly in many parts of the world, interestingly during the first year of the COVID-19 pandemic (2020), the number of deaths in Sri Lanka dropped by 10% compared to the figures for 2019 (Table 2 & Figure 1).

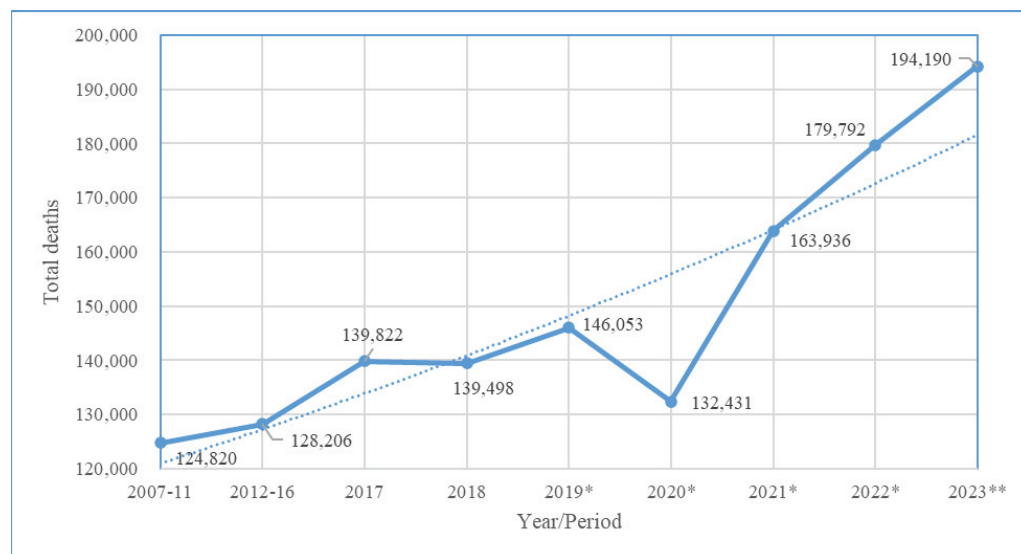


Figure 1: Number of deaths 2007-23

* Provisional, ** Estimated

Note: Trend line

Source: Registrar General's Department of Sri Lanka

A significant drop in deaths in 2020 could be attributed to several reasons - a significant drop in road accidents, homicides and suicides, and also a drop in respiratory viral infections due to the use of masks, hand washing and social distancing (Seelarathna, et al. 2021). Looking at the number of hospitalized deaths due to selected diseases indicates a sharp drop in the number of deaths in 2020 compared to 2019. It was also noticed that case fatality rates (CFR) per each disease have not changed from 2019 to 2020, and on the contrary, CFR for pneumonia has increased from 15.8% to 19.6%. (Figure 2). Also, it was found that significant reduction in the incidence of dengue during the period Mar-20 to Apr-21 (Surendran *et al.*, 2022).

Excess mortality due to COVID-19 and economic recession

The estimation of excess mortality provides a more comprehensive understanding of the impact of the COVID-19 pandemic on global mortality as well as any individual country where reliable data is available. The WHO defines excess mortality as “the mortality above what would be expected based on the non-crisis mortality rate in the population of interest”. The global excess mortality associated with COVID-19 was 14.91 million in the 24 months between 1 January 2020 and 31

December 2021, representing 9.49 million more deaths than those globally reported as directly attributable to COVID-19. Out of which, 5.99 million was predicted by WHO to have occurred in South-East Asia which is close to two-thirds (63%) of total excess mortality due to COVID-19 (World Health Organisation, 2023).

As highlighted in Figure 3, the total number of deaths in Sri Lanka during 2020 & 2021 has increased by over 31,000 (163,936 – 132,431). Over the same period, deaths which are not directly attributable to COVID-19 are estimated to be about 17,000 (149,156 – 132,232). However, from 2021 to 2022 non-COVID-19 deaths have increased by over 28,000. Over the same period, the total number of deaths increased by about 15,000 (179,792– 163,936). Excess mortality over 2021 and 2022 was significantly lower compared to earlier periods. The increment of non-COVID-19 deaths (estimated) from 2022 to 2023 is about 16,000, while there are (estimated) less than 100 incidents of COVID-19-related mortality.

Although excess mortality is significantly lower in the year 2022, when compared to 2021, in the years 2021, 2022 and 2023 non-COVID-19 deaths have increased significantly. In this background, an important question emerged – why during the years 2021, 2022 and 2023 non-COVID-19 deaths increased significantly?

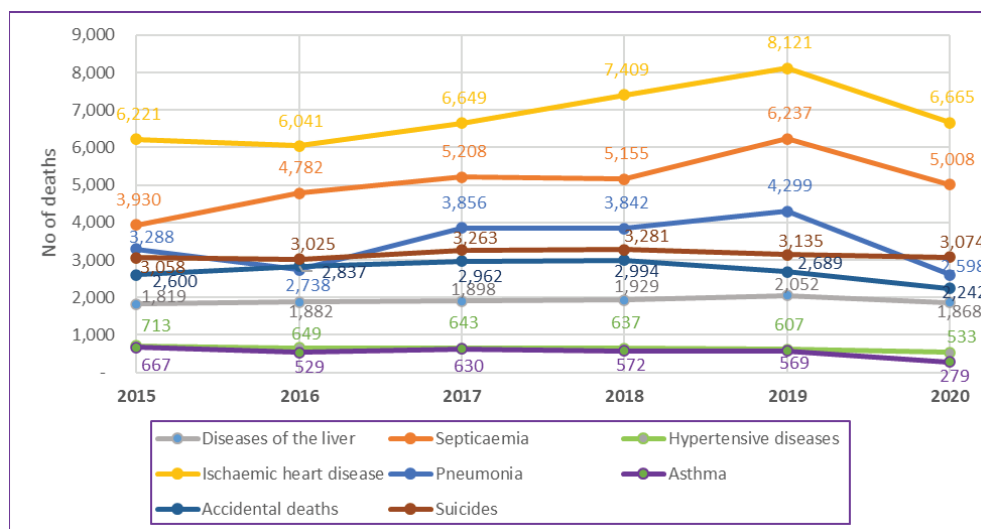


Figure 2: Common causes of death 2015-20

Note: Data includes only for the hospital deaths

Source: Annual Health Bulletin 2020, Ministry of Health

COVID-19 deaths by age and sex

Once the COVID-19 deaths in Sri Lanka are analysed by age and sex, it demonstrates an interesting pattern. Not only the least number of COVID-19 deaths were reported among children and adolescents, there was no sex difference in deaths (Figure 4). Beyond age 20 COVID-19 deaths have risen significantly and the gender difference in deaths demonstrates a clear pattern – more male deaths than the female. The highest number of COVID-19 deaths in Sri Lanka was observed in the age group of 70-79 years, where the total accumulated to 5,103, of which 56% is male. However, the highest

number of male deaths (63%) is observable from the 40-49 age group. In the above-stated two age groups male population is lower than their female counterparts – as of projected figures of 2022 male proportion is 48% and 47% for the 40-49 and 70-79 age groups respectively (De Silva and de Silva, 2015). Along with the ageing population and higher level of survival of females than males of Sri Lanka, on an average, male life expectancy at birth is about 6 years lower than that of females.

Over the last decades in Sri Lanka, the crude death rate has gradually increased due to the rapid ageing process (De Silva and de Silva, 2015). During the

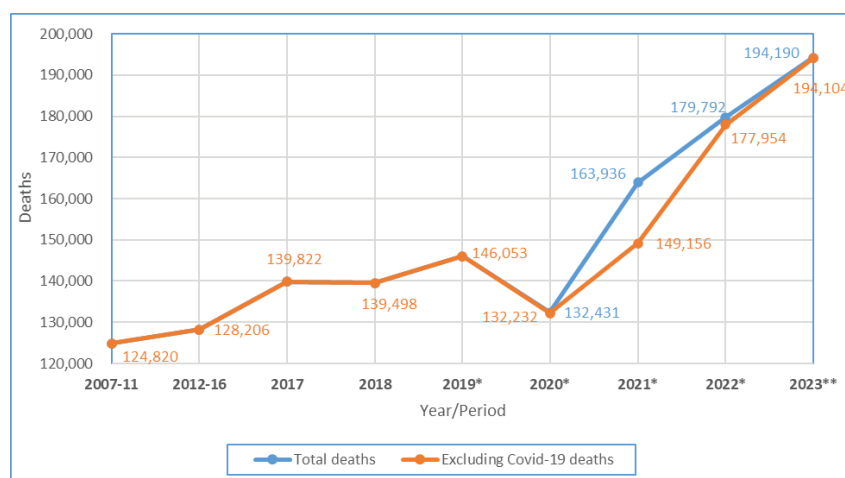


Figure 3: Total deaths vs COVID-19 deaths 2007-23

* Provisional, ** Estimated

Note: 65 COVID-19 deaths were reported till 22/9/2023 and it was estimated 86 deaths for the year 2023

Source: Registrar General's Department of Sri Lanka, Epidemiology Unit - Ministry of Health (www.epid.lk)

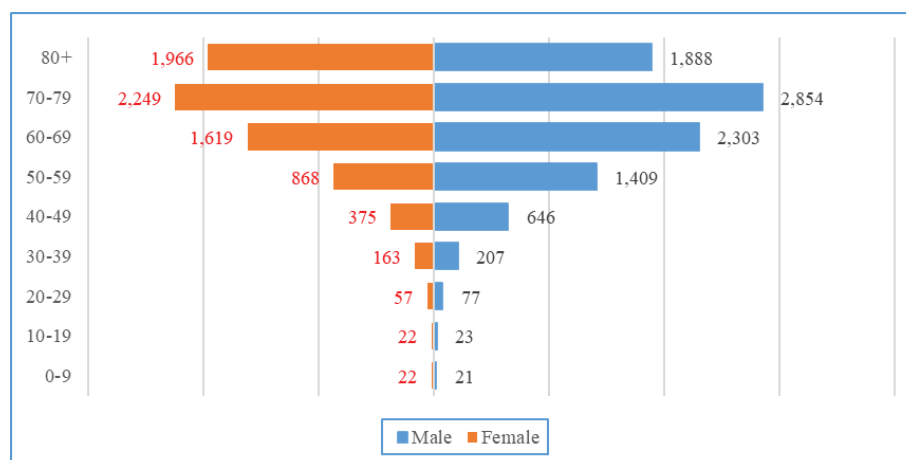


Figure 4: Gender breakdown of COVID-19 deaths up to 30th September 2022

Source: Epidemiology Unit - Ministry of Health (www.epid.lk)

previous epidemic periods, although the ageing trend was not a key determinant, the crude death rate has increased substantially in Sri Lanka. Interestingly compared to the previous epidemics in Sri Lanka, crude death rate (CDR) has declined during the initial period of the COVID-19 pandemic. Particularly the reduction in the CDR in 2020 related to various restrictions imposed by the government and the strong cooperation of the general public.

Although the proportion of COVID-19 deaths in 2022 was small at 0.5%, the total deaths reached almost 180 thousand, and CDR jumped to as high as 8.1 per 1,000 population (Figure 3). Without COVID-19 deaths in 2023, the number of total deaths increased to over 194 thousand and CDR rose to 8.7 per 1,000 population.

For a longer period, Sri Lanka has been identified as a selective developing country, which achieved low mortality levels despite having low per capita income.

The question may be raised 'Why there is a sudden increase in the number of deaths and the CDR in this particular era'. The economic recession could have a significant impact on the rise in the number of deaths and CDR in Sri Lanka (Matthias & Jayasinghe, 2022).

Impact of NCDs on mortality upturn

In Sri Lanka past reductions in mortality were achieved from a decline in deaths due to infectious diseases and maternal and child complications. However, at present,

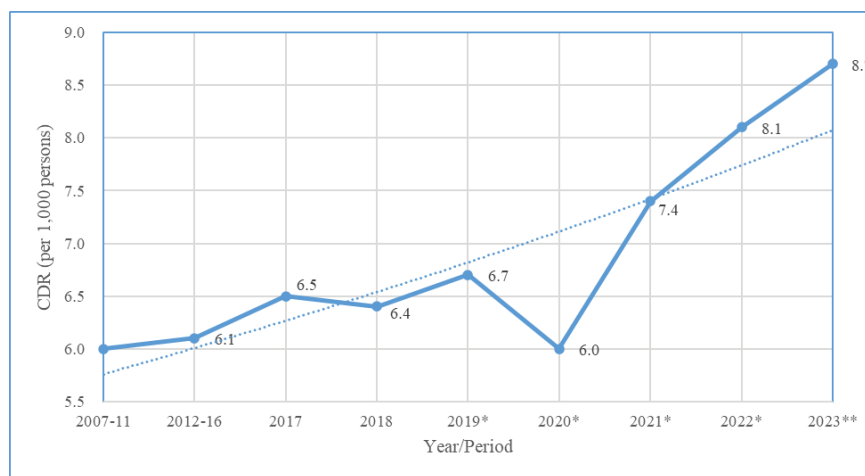


Figure 5: Crude Death Rate 2007-23

* Provisional, ** Estimated

Note: Trend line

Source: Registrar General's Department of Sri Lanka

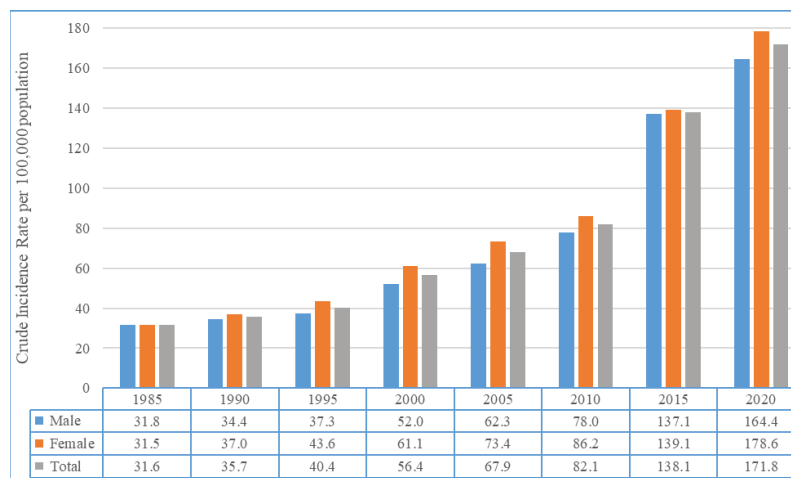


Figure 6: Cancer Incidence in Sri Lanka, 1985-2020

Source: Cancer registry, Sri Lanka

globally, and in Sri Lanka, non-communicable diseases (NCDs) have replaced infectious diseases as the leading cause of mortality (WHO, 2011; 2022). The World Health Organisation identifies NCDs as an umbrella term that includes chronic diseases, principally cardiovascular disease, diabetes, cancer and asthma/chronic obstructive pulmonary disease, in addition to injuries and mental illness.

Ageing is a significant issue in Sri Lanka where the proportion of elderly (age 60+) has increased from 8% in 1981 to over 12 per cent in 2012. By 2025 the figure will rise to 20% and by 2030 close to one-quarter of the population will be elderly (De Silva and de Silva, 2015). NCD burden is significantly higher among the elderly, thus rapid ageing will naturally function as a contributory factor accounting for more deaths in Sri Lanka (De Silva, 2015). However, the observed significant increase in mortality during the past few years in Sri Lanka could not be attributed only to the ageing issue. Along with the economic recession, the Sri Lankan health sector encountered serious challenges such as a shortage of medicine and equipment in state hospitals, high price of pharmaceuticals in the open market, more and more patients (sick/ill persons) demanding service from state sector hospitals, migration of a sizable number of medical and technical experts to other countries, etc (Jayawardena, Kodithuwakku, & Sooriyaarachchi, 2023; Matthias & Jayasinghe, 2022). In this environment, specifically, adults are experiencing a higher incidence of deaths due to various reasons - "premature mortality" is on the rise in Sri Lanka. Further elaborating on the effects of the pandemic on health care that could have resulted in the above-mentioned "premature mortality", two major factors could have played an important role, namely indirect effects of the pandemic and deviation of health system attention from NCDs to communicable diseases. Widespread transmission during 2021–2022 disrupted health services due to the pressure on health facilities from patients with COVID-19 and infection of healthcare workers (Rannan-Eliya, *et al.*, 2024). This, along with COVID-19 anxiety, discouraged patients from seeking healthcare (Rannan-Eliya, *et al.*, 2024). Additionally, the rapid increase in cases and the emergence of new variants led to shortages of medical resources, including hospital beds and medical equipment (Jayawardena, Kodithuwakku, & Sooriyaarachchi, 2023; Matthias & Jayasinghe, 2022). Mental health issues also increased, with healthcare professionals experiencing elevated depressive symptoms and anxiety (Perera, *et al.*, 2021). The economic crisis in Sri Lanka, worsened by the pandemic, has had impacts on health, with rising costs of amenities and weakening of preventive

and control measures (Matthias & Jayasinghe, 2022). The co-occurrence of infectious diseases and non-communicable diseases (NCD) presents health service delivery challenges, especially in low- and middle-income countries (Jakson-Morris, *et al.*, 2024). The attention of the health system deviated from NCDs to communicable diseases due to the COVID-19 pandemic (Murthy, *et al.*, 2023). This could have led to an increase in premature mortality due to NCDs (Ediriweera, *et al.*, 2018). For instance, from 2001 to 2010, premature NCD mortality in Sri Lanka increased from 15.8% to 19.1%, with males showing higher mortality compared to females throughout the period (Ediriweera, *et al.*, 2018). The highest mortality was due to cardiovascular diseases followed by cancer and diabetes, and all three showed an increasing trend (Ediriweera, *et al.*, 2018). Among the four NCDs, diabetes revealed the most marked increasing trend in premature mortality during this period (Ediriweera, *et al.*, 2018). Therefore, it is critical to analyse the NCD prevalence trends after COVID-19 that could further aggravate premature mortality in Sri Lanka. Non-Communicable Diseases Risk Factor Survey (STEPS survey) is the only national NCD-related survey conducted post-COVID-19 (Ministry of Health and Department of Census and Statistics, 2021).

The selected key findings of two STEPS national surveys conducted in 2015 and 2021, were summarised in the proceeding paragraphs to highlight the current trends in NCDs in recent Sri Lanka (Ministry of Health, Nutrition and Indigenous Medicine, 2015; Ministry of Health and Department of Census and Statistics, 2021). Both surveys covered adults aged 18–69 years, with a sample size of 5,188 and 6,267 in 2015 and 2021 respectively.

As of the 2021 STEPS survey, the mean systolic blood pressure of the respondents was 128.5 mmHg. It is important to note that this value is significantly greater than the value recorded in the STEPS survey in 2015, which was 125.1 mmHg. Clearly among the adult population (age 18–69 years) in Sri Lanka blood pressure levels have increased and both men and women also display the same trend.

In the latest survey of 2021, 9.3% of men and 8.5% of females had a heart attack or chest pain from heart disease (angina), while the corresponding figures of 2015 (4.5% of males and 4.2% of females) were notably lower than that of 2021. Among the respondents, 6.5% of males and 8.3% of females were taking Statins regularly to prevent or treat heart disease and this is higher than in 2015, where 4.6% of males and 5.7% of females were taking Statins regularly to prevent or treat heart disease.

Self-reported high blood sugar levels in the 2015 STEPS Survey are considered (among the 18-69 age group) 6.7% of males and 7.8% of females respectively indicated their high blood sugar levels raised within the last 12 months. The corresponding self-reported figures of high blood sugar levels of the 2021 survey indicated a clear increase of male figure to 13.4% and female figure to 14.3 level.

Over 11% of respondents were observed to be obese in 2021 STEPS Survey data, compared to 5.9% obesity found in the 2015 survey. Importantly, the percentage of all respondents with normal Body Mass Index (BMI) has declined from 55.4% in 2015 to 48.6% in 2021, which indicates an increase in the percentage of adult persons in the overweight and obese categories in Sri Lankan society.

As observed in Sri Lanka cancer incidence is increasing significantly over the past several years. The number of cancer patients reported in the year 2000 was 10,925. However, the figure rose to 37,648 by 2020. In the same period, a higher proportion of females suffered from cancer compared to males (Figure 6).

As the NCDs were on the rise among the Sri Lankan population, the burden appeared in the entire health system. The overall admissions to leading government hospitals have gone up by 25% during the last nine months of the year 2023, said the Health Minister (Fernandopulle, 2023). In addition, "The number of patients seeking treatment at Outpatient Departments (OPD) in state hospitals has also increased by 42% during the last nine months," she said. The rise in outpatient visits and hospital admissions in state-sector hospitals can be attributed to the fact that many people can no longer afford private hospital care. However, The state sector suffers from drugs, equipment and health care persons (Jayawardena, Kodithuwakku, & Sooriyaarachchi, 2023). In this environment, it can be hypothesized that a sizable number of sick persons may stay at home without taking appropriate medical treatment. This vulnerable situation, combined with higher levels of stress and a poor economy, is linked to a higher incidence of premature deaths to be observed in the coming years in Sri Lanka.

Impact of COVID-19 and economic recession towards a drop in fertility

Sri Lanka has been grappling with a severe economic crisis, which is considered the worst in its history as an independent nation (Perera, 2023). The crisis was characterized by soaring prices, shortages of essential goods, and crippling international debts. This led to nationwide protests, causing the president to resign

(Perera, 2023). In early 2022, Sri Lankans started experiencing power cuts and shortages of basic consumer items such as fuel (Perera, 2023). The rate of inflation rose to 50% a year (Perera, 2023). The country ran short of fuel for essential services such as buses, trains, and medical vehicles because it did not have enough reserves of foreign currency to import any more (Perera, 2023). This fuel shortage caused petrol and diesel prices to rise dramatically (Perera, 2023). In May 2022, Sri Lanka failed to make interest payment on its foreign debt for the first time in its history (Perera, 2023). This damaged its reputation with lenders, making it even harder to borrow money on the international markets (Perera, 2023). Private debt also played a significant role, diverting earnings towards debt servicing and limiting room for consumption or investment, exacerbating Sri Lanka's economic challenges (Dehiwatte, 2024). Despite these challenges, Sri Lanka's economy showed signs of stabilization in 2024, with a projected moderate growth of 2.2% (World Bank, 2024). However, the country still faces elevated poverty levels, income inequality, and labour market disruptions (World Bank, 2024).

There was a debate about the extent to which a pandemic would affect human fertility. Historical data indicated that in some pandemics there was an increase in fertility, particularly when infant and child mortality increased significantly during the pandemic (Meegama, 2012). However, during the COVID-19 pandemic mortality at young ages was negligible – in almost all the countries COVID-19 deaths were very much concentrated in the 50+ age group. The claim that the COVID-19 pandemic will result in a 'baby boom' and thereby a rise in the fertility rate globally in the short term has not been realized (Aassve, et al. 2020). Thus, examining the occurrence of deaths by age during the COVID-19 period to the present, many researchers have noted as the opposite trend – the present pandemic will bring about a drop in fertility, even in the long run (United Nations Population Fund, 2021; Aassve *et al.*, 2021).

The impact of COVID-19 or any other natural or manmade disaster on the fertility of developing countries, including Sri Lanka is influenced by its demographic transition, particularly the current stage of transition and socio-economic conditions. Although Sri Lanka experienced an unexpected fertility upturn during the first decade of the present century, since the second decade the trend demonstrated an opposite inclination (De Silva *et al.*, 2010; De Silva and Goonatilaka, 2021). In Sri Lanka, the key factors that contributed to the fertility decline to below replacement include a delay in age at marriage that curtails the reproductive age span, particularly among females, and a high reliance on contraception

and induced abortion (Kumarasinghe, *et al.*, 2022). Even when fertility increased well above the replacement level and the same key factors had been at play, the trend was ultimately reversed (De Silva, 2016; Perera, 2017).

What was the fertility behaviour during the COVID-19 and economic recession periods in terms of the number of births reported in Sri Lanka? The trend highlights the drop in births from 371,000 in the 2007-2011 period to 319,000 by 2019 (Table 2). During 2019 and 2022, the number of births has declined significantly – no ‘baby boom’ noticeable from Sri Lanka and the decline of births was over 44,000 (319,010 – 275,138) or the births declined by 16% over the period (Figure 7). Throughout 2019 and 2023, the decline in births was noted to be over 19 per cent. Research highlights that births during the earlier pandemics in less developed countries have shown low birth rates during the pandemic, however the sudden rise in the birth rates in the post-pandemic period, termed the ‘baby boom’ is not evident up to now (Aassve *et al.*, 2020).

Fertility decline in Sri Lanka during the past many years was also noted with the crude birth rate (CBR). From 2016 to 2018, the crude birth rate gradually declined (Figure 7). However, since 2018 the CBR demonstrates a significant decline – the rate has declined from 15.1 to 11.5 per thousand population throughout 2018 and 2023.

Marriage incidence and its impact on fertility

Unlike in the West where marriage is not necessarily the precursor of childbearing any upward or downward trend in marriage trends in Asian countries influences

the fertility of women, as reproduction is almost entirely within the marriage (Caldwell, *et al.*, 1989; Fernando, 1985). Undoubtedly, postponement of marriage contributes significantly towards a reduction in the level of fertility by shortening the total reproductive span of the female, which in turn, owing to a cumulative effect influences the size of individual families as well as the population growth rate of the country (Jones, 2007). Therefore, it is important to investigate whether the age at marriage of Sri Lankan women during the COVID-19 and economic recession periods demonstrated an increase or has stabilized or demonstrated a decline, which will have a clear impact on fertility behaviour.

Historical information indicates that marriages were delayed because of economic hardship or increased mortality (Meegama, 1979; Langford, 1982). Either economic hardship, directly linked with finding money for a dowry, housing or wedding functions, or an increase in mortality, in the mid-1970s, caused women to postpone marriage probably for 1-2 years. Economic hardship was further aggravated by the poor harvest in 1973 and 1974. However, once the overall economy improved after 1977, more marriages took place (De Silva, 1990).

When there is a death among close relatives in Sri Lanka, marriage is delayed for over a year due to cultural considerations of death as an inauspicious event in life. Around 1974, mortality rose considerably compared to earlier levels (Langford, 1982; Meegama, 1986; Gajanayake, 1988). However, when the overall economy improved, as a result of changes in government economic policy from 1977, most of the women who had delayed their marriage then quickly married.

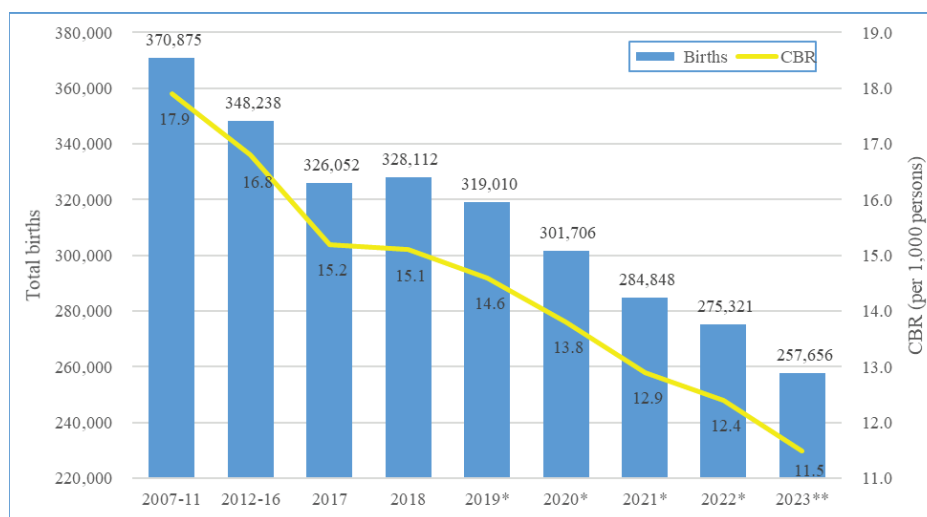


Figure 7: Number of births and Crude Birth Rates 2007-23

* Provisional, ** Estimated

Source: Registrar General's Department of Sri Lanka

As of 2016 Demographic and Health Survey (DHS), the mean age of marriage of females was noted to be 23.7 years, which is slightly higher compared to 23.4 years observed from the 2012 population census (De Silva, 2016; Department of Census and Statistics, 2017). Although detailed data is not available to compute of mean age of marriage after the year 2016, marriage data reported in Figure 8 indicate an increase in the mean age of marriage.

Although the total number of marriages was 174,000 in 2016 the subsequent periods in general demonstrated a gradual decline until 2019. During the period 2019 to 2020 total number of marriages dropped by 20,000 (Figure 8). This drop could be primarily due to COVID-19-related restrictions and fears about the disease. However, of those who were unable to get married in 2020 due to COVID-19, Most of them were able to enter marriage in 2021 and 2022. After the year 2016, the highest number of marriages was reported in 2022, which is over 171 thousand. The predicted number of marriages in 2023 is lower than the corresponding figure for 2022. Since the economic recession will continue for many more years, annual marriages are expected to range from 160-170 thousand. However, even among those who got married, the possibility exists that the majority plan for one or two children primarily due to the economic recession.

Even before the economic crisis, one or two children's norm existed. However, the production of

live births reported per woman (Total Fertility Rate) in DHS 2016 was 2.3 live births – the practice was more than the norm. TFR of 2.3 is above the replacement level of 2.1 live births. A significant declining trend of live births reported in Sri Lanka from 2020 demonstrates that women are reproducing well below the replacement level. Along with the economic recession, the rearing and careering of children are much more expensive than in previous cohorts. So, during the past couple of years (2020+), avoidance of conceptions and terminations would be significantly high.

Investigation of the decline in marriage incidences is captured in crude marriage rates of Sri Lanka. Although the rate was 8.2 marriages per 1000 persons in the population of 2016 by the year 2020 it has dropped to 6.5 (Figure 8). The rate has increased to 7.3 and 7.7 per 1000 population by 2021 and 2022 respectively. It is important to note that even though the total number of marriages has increased to over 171 thousand in 2022, the crude marriage rate is significantly lower than the figure reported in 2016. The number of marriages dropped in 2023 and this could be due to economic problems, the migration of a sizable number of youths to foreign countries and increasing unemployment (Matthais & Jayasinghe 2022; Sooriyaarachchi & Jayawardena, 2023). The crude marriage rate dropped to 7.4 in 2023, which is only lower than the figures reported in Figure 8, except for the figures for 2020 and 2021.

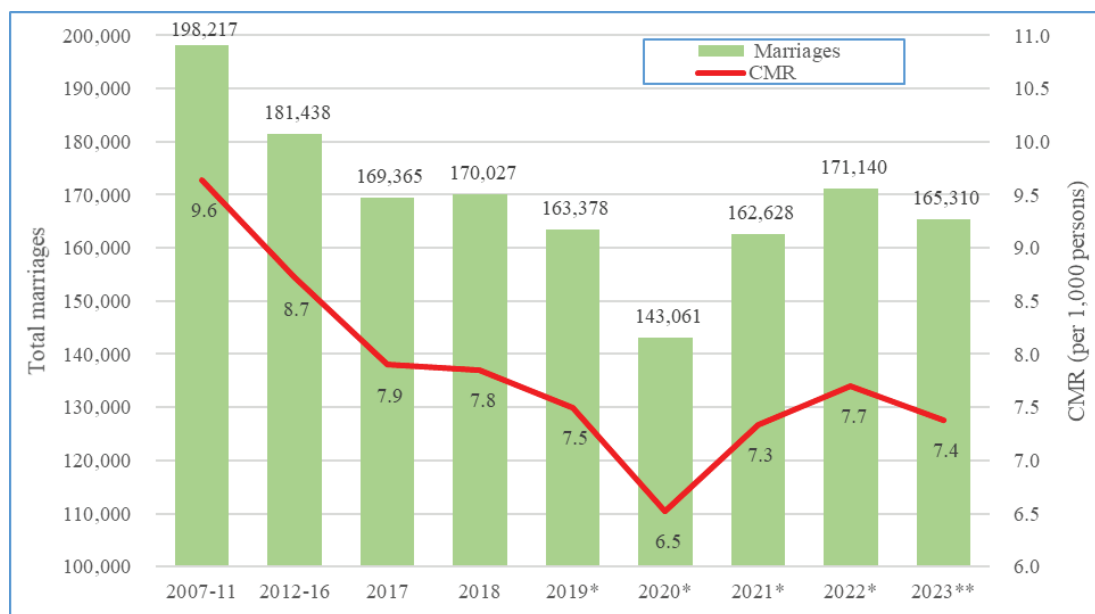


Figure 8: Number of Marriages and Crude Marriage Rates 2007-23

* Provisional, ** Estimated

Source: Registrar General's Department of Sri Lanka

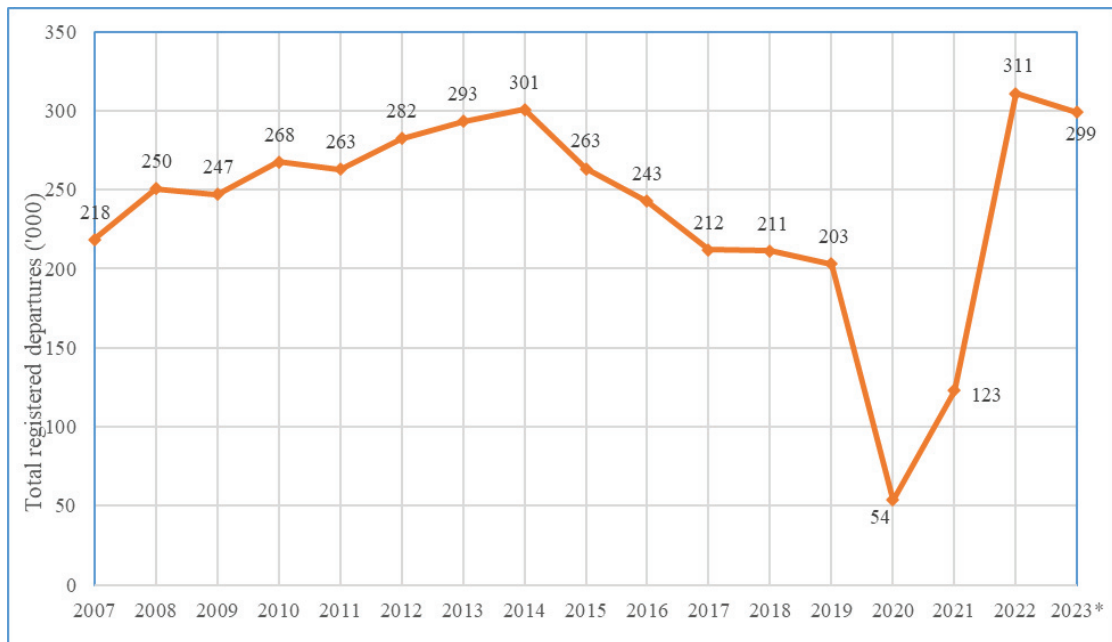


Figure 9: Departures for foreign employment from Sri Lanka, 2007-2023

* Estimated Note: 149,541 departures were reported for the first 6 months of the year 2023

Source: Data for 2023 from Central Bank of Sri Lanka (2023a; 2023b), Rest of the data from Sri Lanka Foreign Employment Bureau

Impact of COVID-19 and economic recession on outbound migration boom

The outflow of migrants has increased steadily and reported first time over 300,000 total registered departures in the year 2014. Since 2015 the trend has reversed dropping a considerable number of departures (from 301,703 in 2014 to 203,087 in 2019, a decrease of 32 per cent). International Labour Organization (ILO) explains this decline due to economic downturn and labour market reforms in Gulf Cooperation Council (GCC) countries which are the key destination countries and the Government regulatory measures for movement of female migrant workers (ILO, 2019). Border restriction implemented due to COVID-19 severely restricted international movement in 2020 and 2021. Thereby severely limiting the outbound migration from Sri Lanka in 2020 and partially limiting it in 2021. However, in the year 2022, the highest reported outbound migration was observed in Sri Lanka crossing 311,056 for the first time and displaying a 250% year-to-year increase (Sri Lanka Foreign Employment Bureau, 2023). There could be two explanations for the rise. First, the excess number could be the backlog of people who could not migrate in 2020 and 2021 due to border restrictions and lockdowns. This

argument is supported by the total reduction of emigration in 2020 and 2021 compared to 2019 is higher than the total excess emigration in 2022 compared to 2019. The second explanation is related to the economic recession where a large number of workers lost their employment and started outmigration for various employment categories available in various countries in the world.

However, the figures reported by the Sri Lanka Foreign Employment Bureau (SLBFE) have several limitations and therefore should be interpreted with caution. First, many professionals including doctors and engineers who migrate for employment in developed countries do not register with the Foreign Employment Bureau and therefore not included in the data. For example, Shaw (2008) reported that 30% of the study sample that returned from foreign employment in the Kuliyaipitiya area were employed outside the Middle East whereas SLBFE confirmed that 89% were employed in the Middle East in the exact period. Therefore, the author argues the percentage difference was due to unregistered outbound migration to Europe and Asia. As they are less likely to register with the SLBFE than workers emigrating to Middle East (Shaw, 2008). A similar sentiment was echoed by the British Council in Sri Lanka this year

(2023), stating that “the true number of people leaving the country is likely much higher, as only unskilled and semi-skilled workers are required to register with the bureau” (British Council, 2023; Samath, 2023).

Secondly, there is a substantial number of people who seek employment in foreign countries using illegal methods including the use of visitor visas (Samath, 2023). Thirdly, though many Sri Lankan students pursue both undergraduate and postgraduate qualifications through foreign universities, minimum data is available in Sri Lanka on student migration (Weeraratne, Weerasekera & Bandara, 2022).

Further, the economic crisis in Sri Lanka with severe limitations in foreign reserves prompted the Sri Lankan government to promote foreign employment among Sri Lankans including public health workers to boost foreign currency coffers. For example, the Sri Lankan government introduced a special non-pay leave of 5 years for government executive officers to work abroad to earn remittance with the condition of a monthly deposit of a fixed amount of earned foreign currency. Many doctors used this system to embark on finding employment. However, the system was withdrawn at present due to an increased number of emigrations leading to a shortage of critical staff in the public sector including specialist doctors in public hospitals (British Council, 2023; Mushtaq, 2023).

DISCUSSION

The COVID-19 pandemic has caused the greatest post-World War II global economic contraction. Surprisingly, after accounting for official COVID-19-related fatalities, countries with a higher predicted GDP decline in 2020 have also so far experienced a higher number of excess deaths. This is especially true for emerging markets and developing economies. Researchers have highlighted the negative relationship between excess deaths and recession intensity, though regional variations were owing to the pandemic’s severity. Higher infection rates might have resulted in deeper recessions via lockdowns and voluntary movement restrictions, as well as higher excess deaths due to undercounting of COVID-19 fatalities or overburdening of healthcare systems. But some argue that even after accounting for the number of infections and hospitalisation capacity, there is still a negative correlation between the depth of the recession and mortality which couldn’t be fully explained by variations in the pandemic’s severity and the capabilities of the healthcare system.

Doerr & Hofmann (2020b) argue that recession increases mortality rates primarily in emerging market

economies like Sri Lanka compared to advanced economies. This interpretation seems to be validated in the Sri Lankan current Sri Lankan context. Although excess mortality (COVID-19 deaths) in 2022 was significantly lower, it was significantly higher in 2021. When considering non-COVID-19 years, the number of annual deaths has increased significantly during the post-COVID-19 era – 146 thousand deaths in 2019 increased to 194 thousand in 2023, which is over a 33 per cent increase. This significant increase could be attributed to economic recession and problems faced by the health system in Sri Lanka. The mortality situation would be more vulnerable to males than females in Sri Lankan society. Over the past couple of years, 55 per cent of the total deaths in Sri Lanka are noted to be males, therefore the expected increase in life expectancy of males may stall significantly unless the overall socio-economic status of the country improved – throughout 2001 and 2012 male life expectancy in Sri Lanka at birth has increased by over four years particularly due to the cessation of civil strife in 2009 (De Silva and de Silva, 2015).

Further, the COVID-19 pandemic has affected the global economy in contrast to many previous public health crises, as it disrupts supply chains, reduces confidence in financial markets, forces scale-back or closure of businesses, and increases job loss. In Sri Lanka, economic recession and uncertainty are some of the main dimensions of the COVID-19 pandemic that have significant potential to impact fertility trends, patterns, and choices. Other mechanisms by which recessions might negatively impact fertility include declines in real wages, which reduces the affordability of children, and increased difficulty acquiring adequate housing. The migration of youth to other countries has been increasing significantly during the recent past, primarily due to the increase in youth unemployment in the country, which is expected to impact marriage and fertility. Further, fertility could be further declined due to the outbound migration of younger adults in addition to youth in Sri Lanka (Sri Lanka Foreign Employment Bureau, 2023; Weeraratne, Weerasekera & Bandara, 2022).

Examining past pandemics, researchers have predicted that COVID-19 will bring about fertility decline. According to research conducted in high-income countries, the pandemic has been accompanied by a significant drop in crude birth rates. (Aassve *et al.*, 2021). Similarly, the COVID-19 pandemic impact extends beyond the increased morbidity and mortality and economic recession in Sri Lanka. The country’s lockdown situation and restrictions on public gatherings had a major effect on delaying marriages until the crisis settled. The reported rising trend of proportional maternal

deaths due to COVID-19 infection in 2020 and 2021, and a high proportion of mothers detected positive for COVID-19 infection in the same period led the health authorities to request the public to delay pregnancies until vaccination is completed. As a result, some reproductive women might have decided to delay their pregnancy. This purposeful delay in conceiving could have led to a reduced number of live births in the past few years (Mughal and Javed, 2022). The vaccination program against COVID-19 was affected to some extent by the infodemics and misconceptions associated with it, especially driven by social media. For example, there was a misconception regarding the COVID-19 vaccine that it could negatively impact early pregnancy and could have negative fetal effects. These factors could have led to reduced marriages and fertility during the COVID-19 pandemic.

There are frequent claims that the ongoing pandemic will result in a “baby boom” and result in a high fertility rate globally in the short term. These claims were based on a reduction in work-life balance due to COVID-19 pandemic restrictions which resulted in increasing family union time due to lockdown situations and the work-from-home concept. Even people who worked abroad returned to their families after years. This increases the family reunion would have a marginal positive impact on fertility. Meantime, the health care system had a crisis where the accessibility to reproductive health services declined. Further, during the COVID-19 pandemic, child mortality has been negligible, removing one of the main drivers of the fertility rebounds observed in the combined mortality-fertility crises. However, this school of thought of increased fertility due to the above factors did not materialize as we observe a significant downward trend in fertility in Sri Lanka and many other countries (Wang *et al.*, 2022).

Whether the COVID-19 pandemic causes a temporary depression in the total fertility rate, or a longer-term downward impact on cohort fertility is likely to depend on the severity and duration of the crisis. Although the COVID-19 issue has been managed satisfactorily in Sri Lanka, the resultant economic depression is more serious. During the post-COVID-19 era, many people lost their employment, some engaged in part-time employment and, particularly youth, encountered serious unemployment problems in the labour markets. As noted by Currie *et al.* (2014) higher levels of unemployment in developing countries demonstrate a significant impact on marriage and thereby fertility levels. In this environment, many Sri Lankan youth are migrating to various countries for higher education, employment etc.

Unexpectedly 319 thousand births reported in 2019 in Sri Lanka dropped to 257 thousand by 2023, which is

a decline of over 62 thousand or 19 per cent. Since the number of marriages has increased to 171 thousand in 2022, which is well above the figures reported in 2020 and 2021, there would be a possibility of an increase in the number of live births in the year 2024. However, that would not be translated to an upturn in fertility rate. Presumably, the fertility rate of Sri Lanka would reach the replacement or even below the replacement level soon. The resulting decline in population could be further complicated by the rise in infant mortality rate (8.4 per 1000 live births in 2020 to 10.4 per 1000 live births in 2023) and under-5 mortality rates (9.8 per 1000 live births in 2020 to 12.5 per 1000 live births in 2023) observed post-COVID-19 (Family Health Bureau, 2024).

Limitations

The use of secondary data does not fully elaborate on the social transitions, fertility behaviours, marriage patterns and perceptions, cause of morbidity and migration intentions in the current context. However, we have used data from credible sources and our study could act as the precursor for further studies exploring the dynamics of demographic changes and factors influencing the change originating from COVID-19 and ensuing economic impact.

CONCLUSION

This article highlights the impact of the pandemic and post-pandemic recession on demographic behaviours and outcomes, such as mortality, fertility and marriage in Sri Lanka. Although only about 15,000 COVID-19 deaths were reported in 2020-21, beyond that a significantly large number of deaths is observable due to the post-COVID-19 recession - during 2019 and 2023 the number of deaths increased as high as 33 per cent. A significantly large increase in the number of deaths in the latest period should be mainly related to the massive increase in the prevalence of non-communicable diseases and problems uncounted by the health system. Sri Lanka's economic growth rate was -7.8 per cent in 2022, and the predicted growth rate for 2023 is also in negative figures. Along with the continuation of the recession, presumably, the number of deaths tends to rise in coming years and that could harm the life expectancy of the Sri Lankan population unless the overall economic situation of the country improves. Over the period of 2019 and 2023, births have declined by 19 per cent. Although the number of marriages has increased in 2022 compared to 2021, primarily due to inflation, youth unemployment and the migration of large numbers of youth to other countries would suppress the marriage rates in Sri Lanka in coming years. In 2022, the highest reported outbound

migration was observed in Sri Lanka displaying a 250% year-to-year increase. More likely that the fertility rate of Sri Lanka will soon reach the replacement or even below the replacement level shortly. The changes in the key demographic components, namely fertility, mortality and migration, would impact the growth rate of the population and the future size of the Sri Lankan population. Thus, forecasted figures for the Sri Lankan population may be an overestimate compared to the population enumerated in the near future.

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