

# Part **A**

## **Cause of Death Statistics in ASEAN+3 Countries**

September 2022

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## Part A

### Cause of Death Statistics in ASEAN+3 Countries

#### 1. Regional Overview

Tracking cause of death statistics is crucial to monitoring the health of the people. It is also important for the calculation of Sustainable Development Goal (SDG) indicators such as 3.4.1 (Mortality rates attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease), 3.4.2 (Suicide mortality rate), 3.6.1 (Death rate due to road traffic injuries), 3.9.1 (Mortality rate attributed to household and ambient air pollution), 3.9.2 (Mortality rate attributed to unsafe water, unsafe sanitation, and lack of hygiene) and 3.9.3 (Mortality rate attributed to unintentional poisoning). However, the quality of cause of death statistics in Asia is often insufficient.

In 2014, member countries of the United Nations in Asia and the Pacific adopted the 'Ministerial Declaration to "Get Every One in the Picture" in Asia and the Pacific', for universal and responsive civil registration and vital statistics systems (CRVS), setting 2015 to 2024 as the CRVS Decade for Asia and the Pacific (UNESCAP 2021). The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) is facilitating the progress, and resources are available online. The United Nations (UN) defines the CRVS as the 'continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events of the population in accordance with the law.' Births, deaths, marriages and divorce, and causes of death are amongst the vital events to be recorded and disseminated.

Since the 19<sup>th</sup> century, the international community has gathered to create a standardised cause of death classification. The World Health Organization (WHO) inherited the efforts since its creation in 1948. In 2019, the World Health Assembly adopted the 11th Revision of the International Classification of Diseases (ICD). Each member country is expected to use this classification once it takes effect on 1 January 2022.

However, in most middle- and low-income countries, death registration is not complete. Even amongst registered deaths, causes of death are not properly stated and compiled. Based on the country report on cause of death statistics, WHO examines the usability of vital statistics and assigns the data quality into one of four categories (WHO, 2020):

- i. Category 1. Multiple years of data with high completeness and quality
- ii. Category 2. Moderate quality issues
- iii. Category 3. Severe quality issues
- iv. Category 4. Death registration data are unavailable or unusable due to quality issues

As of 2019, amongst 183 countries<sup>1</sup> included in the data, only 61 are in category 1, including four ASEAN+3 countries: Japan, Republic of Korea, the Philippines, and Singapore. Brunei and Malaysia are in category 2, Mongolia and Thailand in category 3, and the remaining countries in category 4 (Table A-1, Figure A-1). The category assigned to a country can change over time. For example, the Philippines entered category 1 for the first time in 2019.

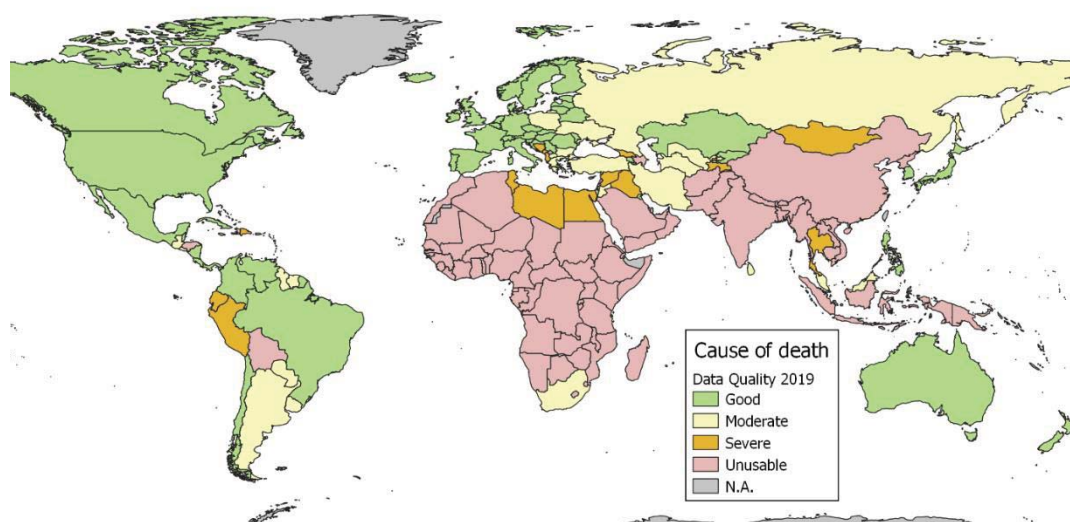
**Table A-1. Cause of Death Statistics Quality Category, ASEAN+3 countries**

Category	Description		Countries
1	Multiple years of data with high completeness and quality		Philippines, Singapore, Japan, Republic of Korea
2	– Multiple years of death registration data available.	Moderate quality issues	Brunei, Malaysia
3	– Data has low completeness and/or issues with cause-of-death assignment	Severe quality issues	Thailand
4	Death registration data is unavailable or unusable due to quality issues		Cambodia, China, Indonesia, Lao PDR, Myanmar, Viet Nam

Lao PDR = Lao People's Democratic Republic

Source: WHO (2020).

**Figure A-1. Data Quality of Causes of Death Statistic**



Note: Map created by Shapefile of Natural Earth (<https://www.naturalearthdata.com/>) using QGIS Geographic Information System.

Sources: WHO (2020).

<sup>1</sup> Out of 194 member states of WHO, eleven (Andorra, Cook Islands, Dominica, Marshall Islands, Monaco, Nauru, Niue, Palau, Saint Kitts and Nevis, San Marino, Tuvalu) with a population of less than 90,000 in 2019 were not included.

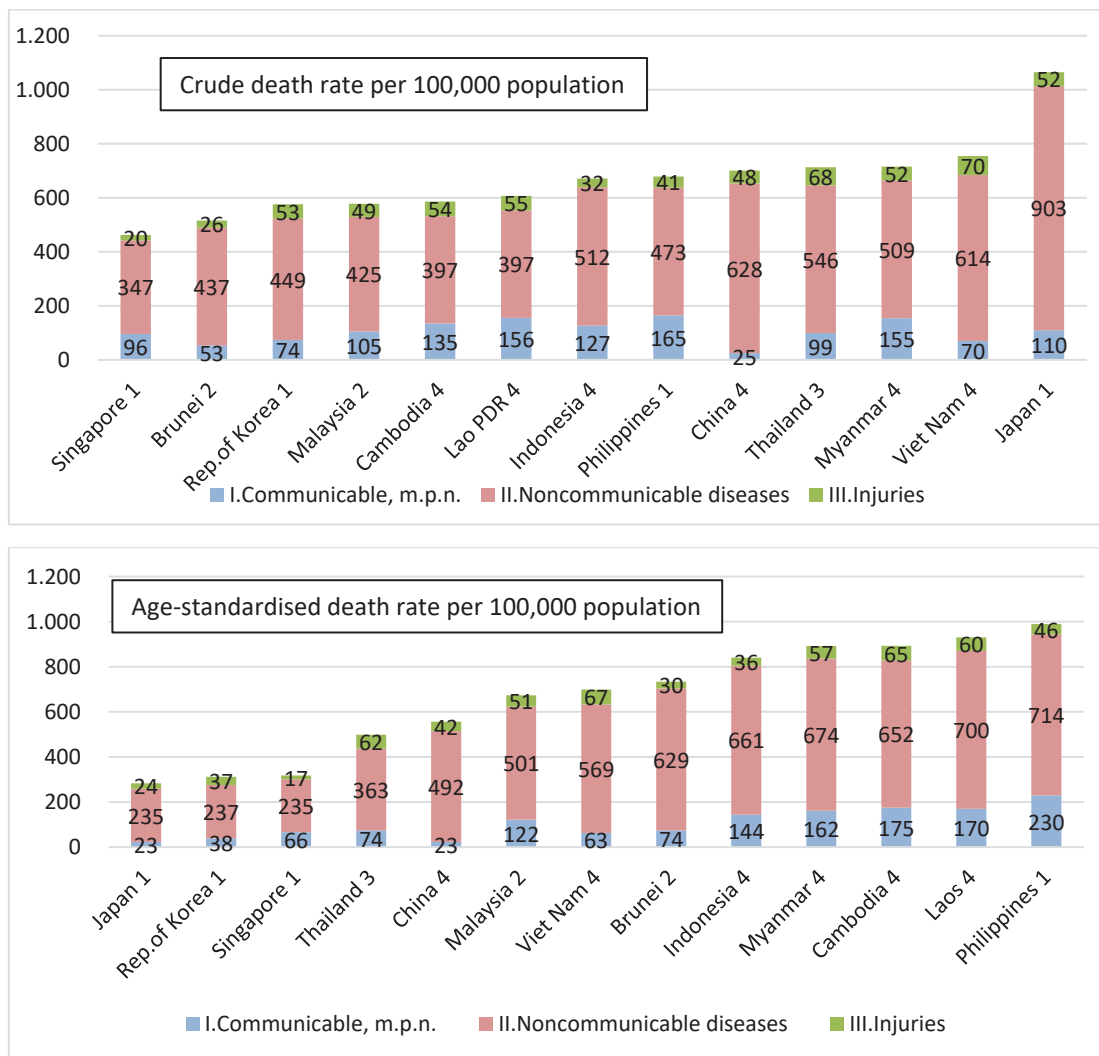
The Global Health Estimates (GHE) 2019 is compiled and adjusted by WHO using the registration based vital statistics produced by each country government if it is available and usable. In the absence of usable data, WHO uses other data from WHO and UN interagency programs on child mortality, maternal mortality, HIV/AIDs, tuberculosis, malaria, and also the Global Burden of Disease (GBD 2019) study estimates.

Figure A-2 shows mortality by broad categories of causes in ASEAN+3 countries. Japan has the highest crude death rate (number of death per 100,000 population) with 1,066, and Singapore has the lowest with 462 persons. Crude death rate is affected by the population age structure. Inevitably, a population with a high number of older persons has a higher crude death rate. Hence, when we see the age-standardised death rate,<sup>2</sup> Japan has the lowest and the Philippines has the highest. As Japan is a super-aged country, where 29% of the population are aged 65 years and over (as of July 2021, Statistics Bureau of Japan, 2021), the increasing number of very old persons increases the number of deaths. However, if the effect of ageing is removed, the level of mortality is the lowest in Japan. For all ASEAN+3 countries, the prevailing cause of deaths in both crude and age-standardised death rates is non-communicable diseases.

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<sup>2</sup> Age-standardised death rate is calculated using age-specific death rate applied to the standard population by age-group. Here, the standard population is set by WHO as the 'world standard population' (Omar et al., 2001).

**Figure A-2. Crude and Age-standardised Death Rate by Cause, ASEAN+3 countries**

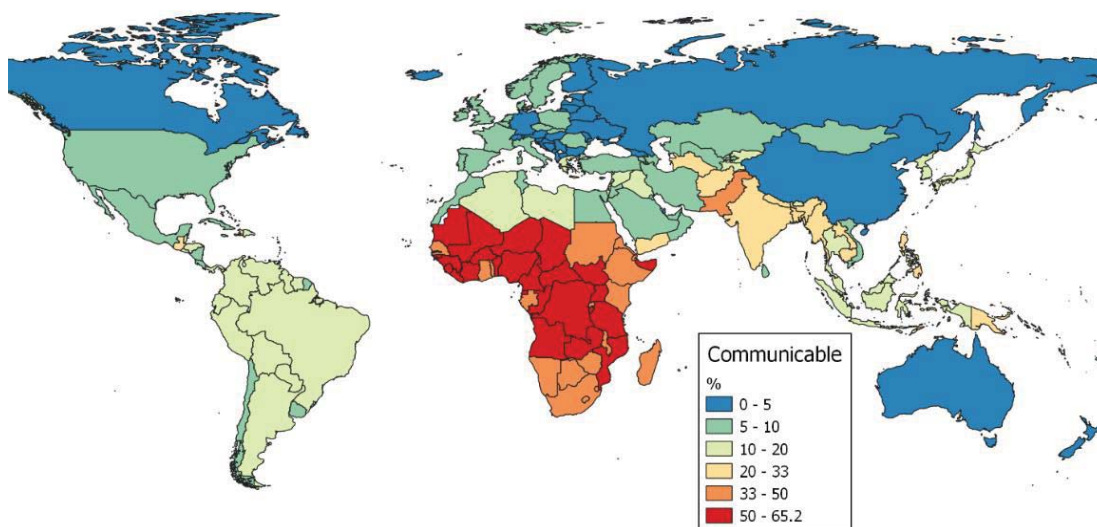


Notes:

1. Number after the country name is the data quality category shown in Table A-1.
  2. Communicable, m.p.n. means communicable, maternal, perinatal, and nutritional conditions.
- Source: WHO (2020).

According to the widely accepted epidemiological transition theory, causes of death should shift from communicable to non-communicable diseases along with the development of society. In 2019, data shows that ASEAN+3 are already post-transition countries in contrast with many low-income countries in other regions, especially Africa, where the majority of deaths are caused by communicable, maternal, perinatal, and nutritional conditions (Figure A-3).

**Figure A-3. Proportion of cause of death category of ‘Communicable, Maternal, Perinatal and Nutritional Conditions’ by Country, 2019**



Note: Map created by Shapefile of Natural Earth (<https://www.naturalearthdata.com/>) using QGIS Geographic Information System.  
Source: WHO (2020).

However, communicable diseases are not eradicated even in high-income countries. In 2019, a large portion was attributed to respiratory infections, which includes pneumonia – one of the significant causes of death of older persons. In addition, the coronavirus disease 2019 (COVID-19) pandemic started in 2020, raising the number of deaths caused by communicable diseases.

Globally, the top cause of death is ischaemic heart disease (16% of total deaths), followed by stroke (11% of total deaths; WHO, 2021a). On the contrary, in many ASEAN+3 countries, more deaths are caused by stroke than ischaemic heart disease, such as in Cambodia, China, Indonesia, Lao People’s Democratic Republic (Lao PDR), Myanmar, and Viet Nam. In 1951, Japan’s top cause of death became stroke, replacing tuberculosis. It was later surpassed by cancer in 1981. Stroke, a common risk in the region, is preventable by hypertension control and proper medical treatment. This means that countries with high numbers of deaths caused by stroke have the potential to lower the mortality rate in the coming years.

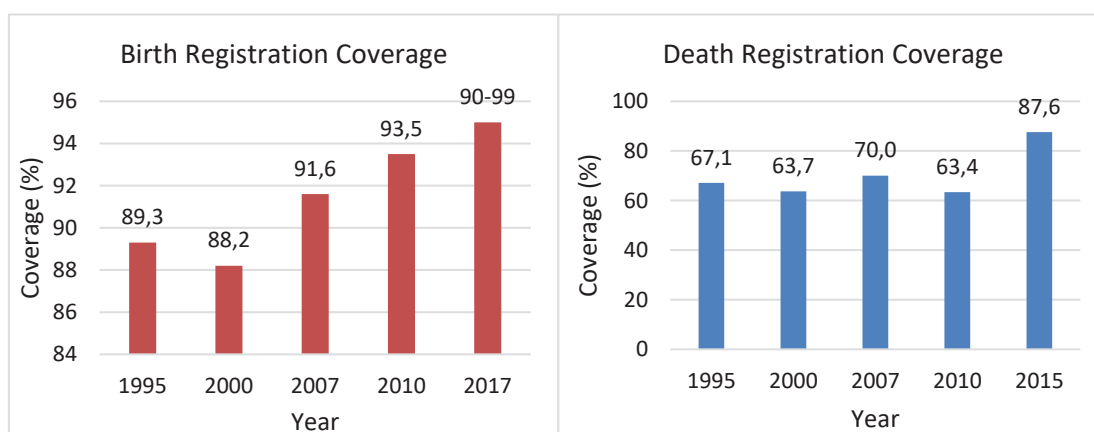
In the following chapter, the cause of death statistics system in each ASEAN+3 country is described in the order shown in Table A-1. Though WHO compiles the cause of death statistics in a comparable format, the source of data varies by country. Death registration and statistical procedures are inherent to each country and it is essential to know the original data made by the country authority. Also, the country statistics are released sooner than international compilations. A comparison of 2020 causes of death is conducted with countries with available data.

## 2. Country Situation

### 2.1. Philippines

The vital statistics system of the Philippines is rapidly progressing. Historically, births and deaths have been registered and compiled in reports since 1903, and the Civil Registry Law (Act No.3753) was implemented in 1930 (PSA, 2019a). In August 2015, the President declared the Civil Registration and Vital Statistics (CRVS) Decade. The Philippine Statistics Authority (PSA), which is in charge of vital statistics, made extensive efforts. For example, national workshops were organised bi-annually so that all the civil registrars in the country can update their activities, get the latest regulations, and discuss various issues to improve civil registration. Also, the PSA reaches out to overseas Filipinos through the Philippine Foreign Service Post so they can properly register their vital events. Through these practices, the coverage of births and deaths improved: from 89.3% in 1995 to 90%–99% in 2010 for births and from 67.1% in 1995 to 87.6% in 2015 for deaths (Figure A-4).

**Figure A-4. Birth and Death Registration Coverage, Philippines, 1995–2015**



Sources: Data for 1995 to 2010 from Orcilla (2016). Data for 2017 births and 2015 deaths from UN (2021).

The quality of cause of death statistics is also improving. WHO raised the quality level from category 2 in 2016 (WHO, 2018) to category 1 in 2019 (WHO, 2020). As shown in Figure A-4, the coverage of death registration increased but also there is certain progress of procedures. Since 2017, the automated coding system, IRIS<sup>3</sup>, was introduced to determine the underlying cause of death (Mikkelsen, 2019). It reduced the length of time required to produce each year's cause of death statistics from 3 years to 1 year. The data is available on the PSA website in the form of reports or for download through OpenSTAT (PSA, 2021a). As of August 2021, the preliminary results for the the 50 leading causes of death in 2020 and detailed data for

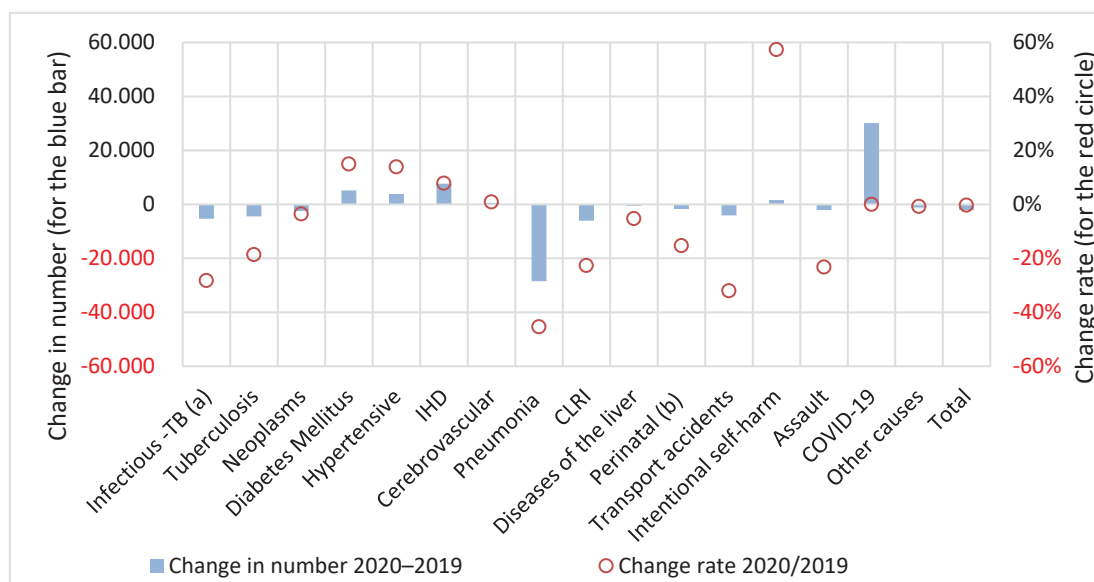
<sup>3</sup> IRIS is created by DIMDI Iris Institute and widely used in many countries to determine the underlying cause of death (WHO, 2021c).

2016 is downloadable through OpenSTAT.

According to the preliminary report for 2020, the total number of deaths in the Philippines decreased by 7,379 (1.2%) compared to 2019, despite an increase in the number of older persons with higher mortality (PSA 2019b). Pneumonia, which decreased the most by 28,468 deaths, was offset by 30,140 COVID-19 deaths (Figure A-5). The number of deaths by infectious diseases including tuberculosis and chronic lower respiratory infections also decreased. It can be assumed that the behaviour change to avoid COVID-19, such as wearing masks, washing hands, or refraining from meeting people, could have contributed to reducing these deaths. In addition, transport accidents and assault deaths decreased. The major causes of death in the Philippines, such as diabetes mellitus, hypertensive diseases, ischaemic heart diseases, increased substantially. The rising trend in ischaemic heart disease deaths from 2015 to 2019 continued in 2020. However, diabetes mellitus and hypertensive diseases were not on the rise in the past, and certain COVID-19 effects, such as not receiving necessary antihypertensive drugs or dialysis, might be suspected. Intentional self-harm (suicide) is not a significant cause of death in the Philippines, but it increased in 2020. Lack of socialisation, unemployment, and economic downturn might have caused this increase.

The decrease in the total number of registered deaths in 2020 could be due to the difficulties of registration, as people refrain from going to the municipal office to register the death. However, as the cause-specific number of deaths is not uniformly affected, it is highly plausible that the decline is not due to the registration problem but the actual decline of mortality.

**Figure A-5. Change of Death by Cause, Philippines, 2019–2020**



Note: IHD is ischaemic heart diseases. CLRI is chronic lower respiratory infections. Infectious -TB means infectious and parasitic diseases minus tuberculosis. Perinatal means conditions originating in the perinatal period.

Source: PSA (2021b).

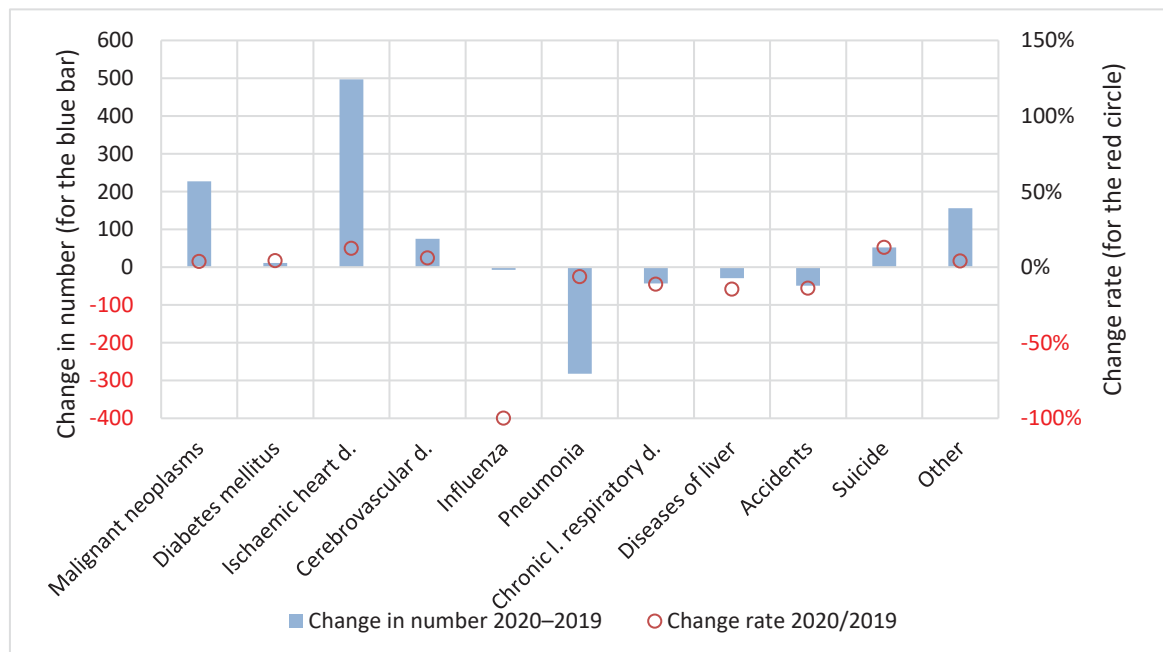
## 2.2. Singapore

The Immigration & Checkpoints Authority (ICA) of Singapore compiles and publishes vital statistics (ICA 2021). Cause of death statistics are published in the annual and quarterly reports online, and causes are classified by the WHO ICD-10 condensed list (103 causes)(WHO 2016). Data for the second quarter of 2021 was published online in August 2021, so the monthly data for cause of death is available after four months, at the latest. The number of deaths is disaggregated by ethnic group – Chinese, Malays, Indians, and Others – but not by citizenship. The annual data is for statistics on Singapore citizens and permanent residents, quarterly data is for statistics on Singapore citizens, permanent residents, and foreigners.

In 2020, there were 22,054 deaths in Singapore: 21,175 certified by doctors and 879 by coroners. Coroners certified all external causes of death. Amongst 73 ill-defined deaths – symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified – 12 are certified by doctors and 61 are certified by coroners. The number of ill-defined deaths is small and also well verified by doctors or coroners. Hence, the unknown causes are well suppressed amongst the Singaporean deaths.

In 2020, the number of deaths increased by 608, or 2.8%, from 2019. The ICA report did not disaggregate the number of COVID-19 deaths. However, based on the WHO COVID-19 dashboard data (WHO, 2021b), there were only 29 COVID-19 deaths in Singapore in 2020, and the increase of total number of death could not be due to COVID-19. Deaths caused by pneumonia also decreased substantially. There were seven influenza deaths in 2019 but none in 2020. The highest increases were deaths caused by heart & hypertensive diseases, malignant neoplasm, and cerebrovascular diseases, which are typical degenerative diseases. Age-standardised death rate in 2020 is lower than in 2019, so the increase of deaths in 2020 is due to the increasing number of older people. Compared to 2019, deaths by accidents decreased, but deaths by suicide increased in 2020. These trends are parallel to other Asian countries with available data sets such as Japan and the Philippines.

**Figure A-6: Change of Death by Cause, Singapore, 2019–2020**



Source: ICA (2021).

### 2.3. Japan

The Ministry of Health, Labour, and Welfare (MHLW) in Japan compiles and publishes cause of death statistics (MHLW, 2021). The ministry releases three sets of data: rapid, which is released 2 months later from month of occurrence; approximate, five months later; and final data, September the following year. The three sets differ and earlier data contains less tabulation. All three data sets are on the ministry's website (MHLW, 2021) and *e-stat*, a portal site of official statistics of Japan in Japanese (Government of Japan, 2021). Final data is on the *e-stat* website in English.

The cause of death statistics started a few years after the family registry system began in 1872. The first Medical Act, or *Isei*, stipulated on 18 August 1874 ordered doctors in the country to report the cause of death within three days from when the death occurred. The first statistics covered only metropolitan areas of Tokyo, Kyoto, and Osaka with 8,594 deaths in the latter half of 1875, followed by an rapid increase in coverage. By 1882, almost all registered deaths in the country had a medical cause of death. In that year, there were 39,768 doctors in the country (Sanitary Bureau, 1883), or 1.1 doctors per 1,000 population, slightly above the criteria that WHO recommends at present.

The classification of cause of death used in Japan during the late 19<sup>th</sup> century is similar to that developed by Dr. William Farr (Farr, 1885). At the International Statistical Congress held in 1853 at Brussels, Belgium, Dr. William Farr and Dr. Marc d'Espine were appointed to propose a classification for causes of death (WHO, 2016). From 1871 to 1873, Dr. Sensai Nagayo joined the Iwakura Mission and visited the United States, United Kingdom, France, Germany, and the Netherlands (Nagayo 1902), where he might have learned the international trend on the cause of death classification. Upon returning to Japan, he drafted the Medical Act and

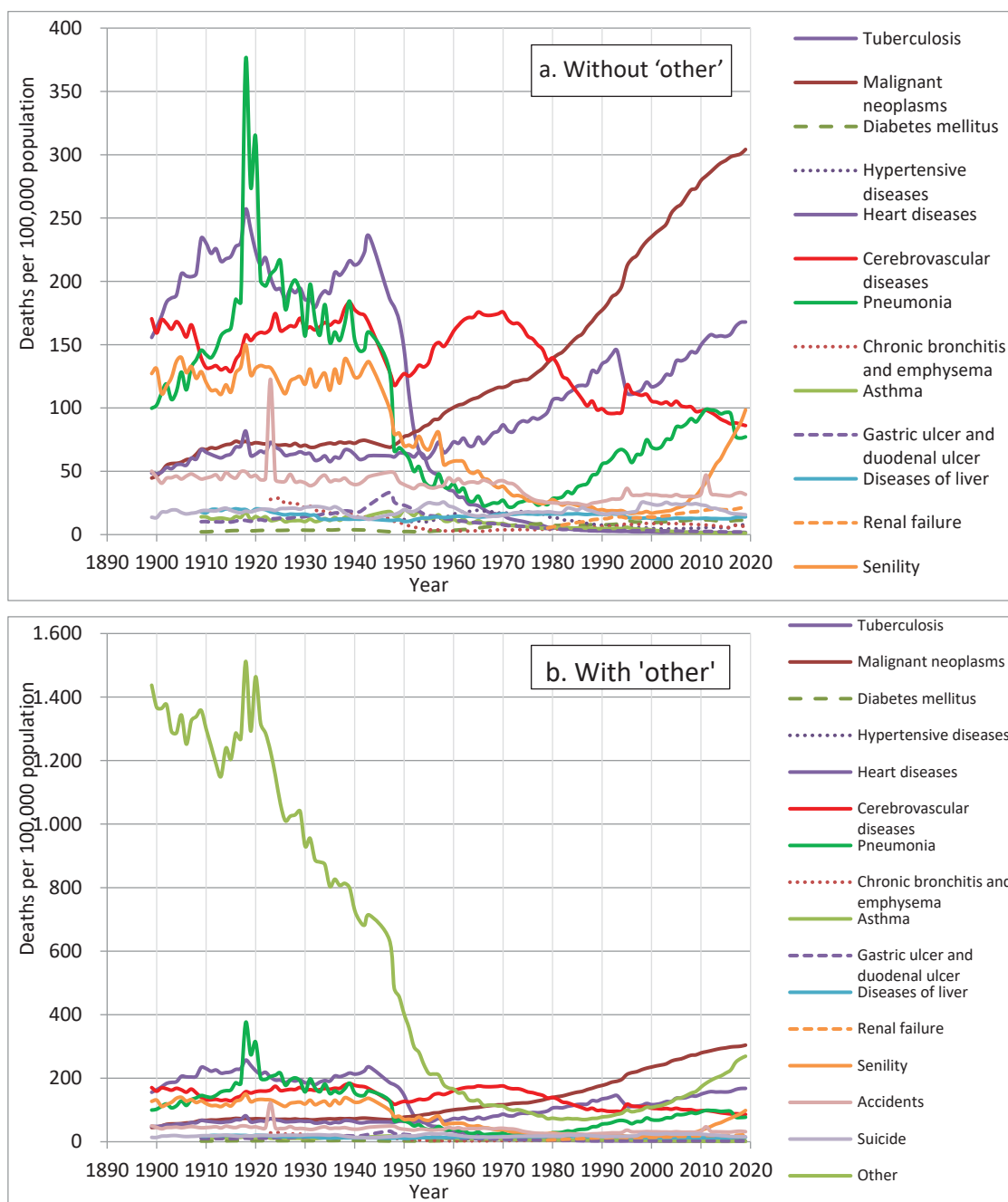
became the first Director of the Sanitary Bureau of the Home Department (Ministry of Health and Welfare 1988), which was in charge of the cause of death statistics.

The vital statistics started in 1899, and the Statistics Bureau became in charge until the Ministry of Health and Welfare succeeded it in 1946 (Statistics and Information Department, 2000). The transition was supported by the recommendation of the General Headquarters of the Supreme Commander for the Allied Powers (GHQ), which advocated vital statistics as an effective tool for public health (Phelps 1974).

The causes of death shifted from communicable diseases to non-communicable diseases, from pneumonia and tuberculosis to cerebrovascular diseases, malignant neoplasms, and heart diseases (Figure A-7a). At present, malignant neoplasm is the top cause of death. The second cause is heart disease, which surpassed cerebrovascular disease in 1985. This shift is attributed to the change in eating habits from salty Japanese food to fatty western food, as well as the expansion of Universal Health Coverage which promoted the spread of antihypertensive drugs (Ikeda 2008). Also, national stroke control programs implemented during the 1960s to 1970s contributed to the shift (Health and Welfare Statistics Association 1969–1990, Iso 1998).

Figure A-7a shows the trend of main causes of death chosen in the 1990s. However, in earlier times, there were many deaths which were not included in those main causes of 1990s. These deaths are grouped as ‘other’ and shown in Figure A-7b. The ‘other’ diseases include diarrhea and enteritis, meningitis, dysentery, and there were many ‘unknown diseases.’ The causes of death evolved with time, and it is not an easy task to trace the change for more than hundred years.

Figure A-7. Cause of Death Trend, Japan, 1899–2019



Source: MHLW (2021).

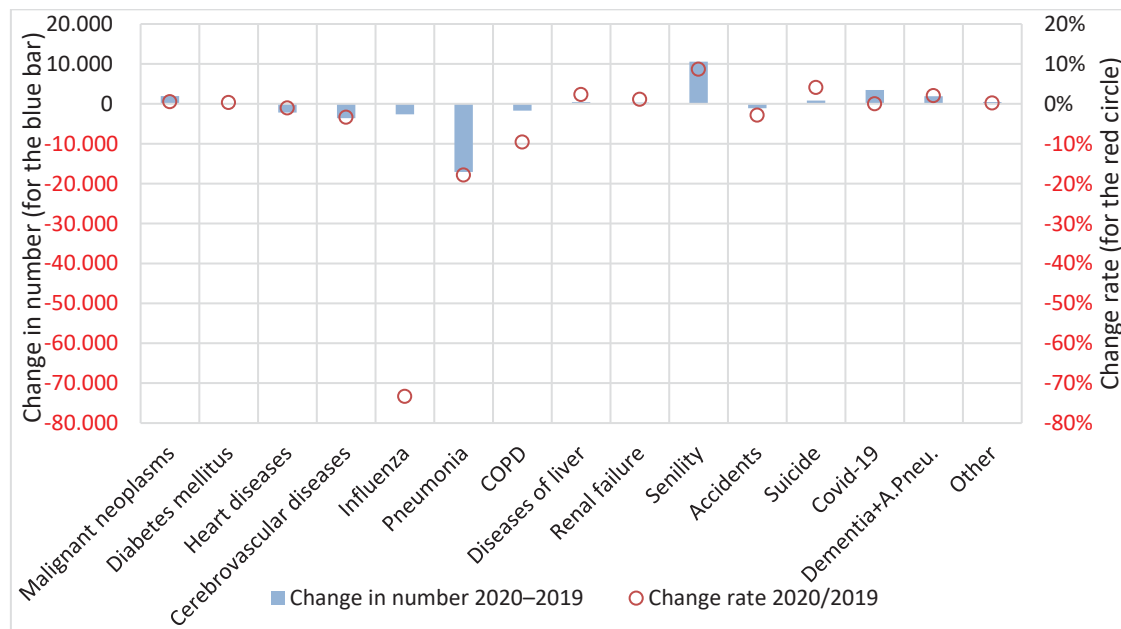
As the population ages in Japan, the higher number of very old persons increases the number of deaths caused by senility, which, in 2020, comprised 9.6% of total deaths. Senility is the most accepted cause of death for families of the deceased as it implies the fulfilment of a long life. However, senility, or R54 in ICD-10, is considered ill-defined and not a reasonable cause of death by WHO. Senility is an easy cause for doctors to write in death certificates, but it could hide the diseases or symptoms that caused the deaths. The abundance of senility deaths could deteriorate the quality of statistics. However, as humans are mortal, there could

be a 'natural' death', without any particular diseases but described only as senility. At the beginning of the discourse of cause of death classification, it was proposed that there were morbid and non-morbid deaths. Senility was included in the latter (d'Espine, 1858). While it is important to disclose the hidden medical conditions that lead to the deaths of old persons, it is equally important to reconsider the existing classification system.

In 2020, during the COVID-19 pandemic, the total number of deaths in Japan decreased by 8,445 (0.6%). COVID-19 deaths remained small, with 3,466, 0.3% of total deaths, while pneumonia deaths decreased from 95,518 in 2019 to 78,445 in 2020 (

Figure A-8). The most significant decrease was by 73.3% for influenza. Cerebrovascular diseases and heart diseases also decreased. Malignant neoplasms increased slightly, but this is due to the population ageing (age-standardised death rate decreased). Senility deaths increased in 2020. The increasing trend of senility death was not affected by COVID-19. Deaths by accident decreased, but suicide increased. The suicide increase is found amongst the youth, especially for women. Suicide increased for the first time since the national strategy on suicide prevention reduced the number of suicide in 2010. Unfortunately, the COVID-19 pandemic had a stronger influence on suicide rates than national preventive strategy.

**Figure A-8. Change of Death by Cause, Japan, 2019–2020**



Source: MHLW (2021).

## 2.4. Republic of Korea

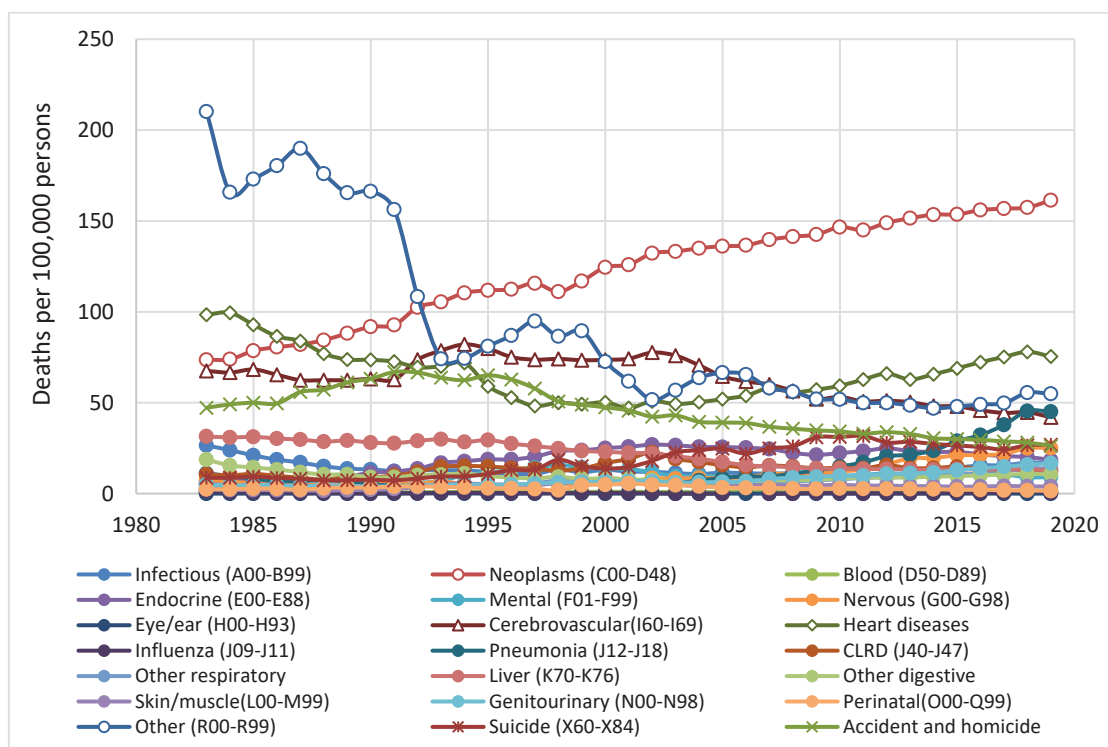
The cause of death statistics of the Republic of Korea is compiled and published by Statistics Korea, and results are on the website as reports or data (Statistics Korea, 2021). Death registration is complete for ages 15 and over (WHO, 2020), but some registration are missing for infant deaths (Statistics Korea, 2016). To determine the underlying cause of death, the death certificate information is supplemented with 22 administrative data such as national health insurance, cancer registration, and criminal investigation.

Statistics Korea has published cause of death statistics starting from 1983. However, much older statistics exist. The modern population registration system started following the renovation of the Family Register in 1894 (Choe, 1996). In 1937, the vital statistics regulation was promulgated. Until 1942, the vital statistics, including the cause of death statistics, was of good quality (Ishi, 1972). Then, after the Korean war, the population registration and vital statistics system collapsed. The registration coverage was estimated to be 30%–70% from 1958 to 1967, and the registered data was not usable for vital statistics. To improve the registration, the vital events declaration form stipulated by the Economic Planning Board was integrated into the Family Register Declaration Form in 1970, in collaboration with the Ministry of Justice. Quarterly sample surveys were also conducted from 1963, which became monthly from 1978 (Statistics Korea, 1992). Publication of the annual report on the causes of death for 1980 began in 1982 (Statistics Korea, 2017).

In 2019, the top cause of death was neoplasms, followed by heart disease (Statistics Korea 2021). The third cause is ‘other’, which pertains to symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified (R00–R99). The fourth cause is pneumonia, which was increasing rapidly but decreased slightly in 2019. This peculiar movement is also found in Japan from 2016 to 2017 due to the change of coding rules of the underlying cause of death. The same statistical procedure might be involved in this stagnation of pneumonia deaths in the Republic of Korea. The fifth cause is cerebrovascular diseases, which has continued to decline since 2002.

From 1983 to 2019, the cause of death structure changed (Figure A-9). The neoplasms almost constantly increased whereas heart diseases decreased from 1983 to 1997, then increased after that. The opposite trend is found in cerebrovascular diseases, which increased during the 1990s and declined since 2002.

**Figure A-9. Causes of Death Trend, The Republic of Korea, 1983–2019**

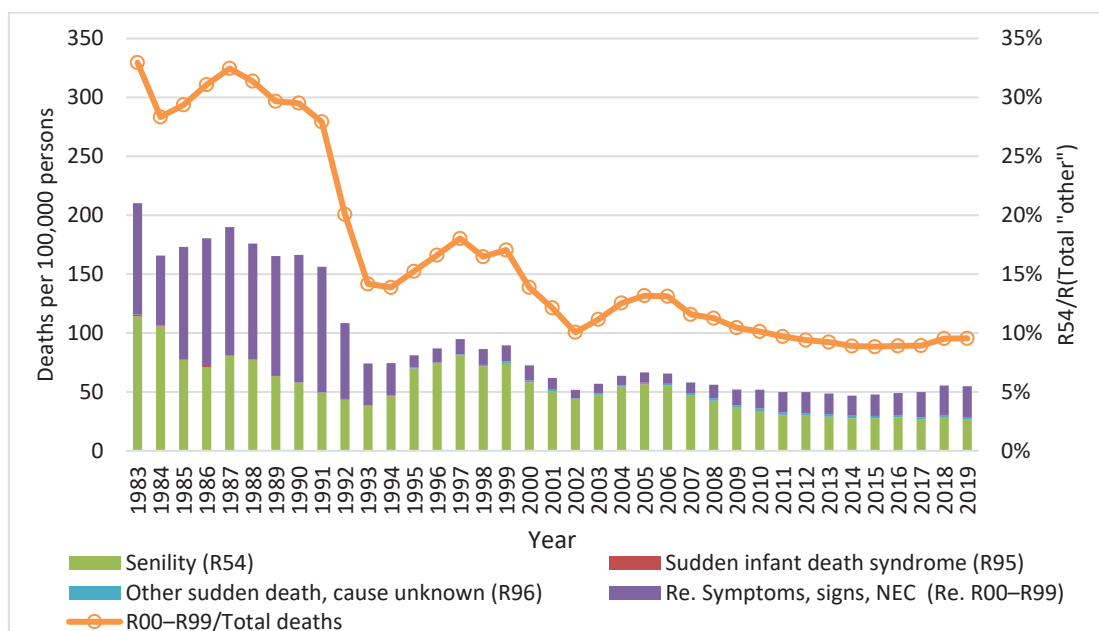


Note: ICD-10 code is in (). ‘Heart diseases’ is diseases of the circulatory system (I00–I99) minus cerebrovascular diseases (I60–I69). ‘Other respiratory’ is diseases of the respiratory system (J00–J98, U04) minus Influenza (J09–J11), Pneumonia (J12–J18) and Chronic lower respiratory diseases (here, labelled as ‘CLRD’, J40–J47). ‘Other digestive’ is diseases of the digestive system (K00–K92) minus diseases of the liver (K70–K76). ‘Accident and homicide’ are external causes of morbidity and mortality (V01–Y89) minus Intentional self-harm (here, labelled as ‘suicide’, X60–X84). The cause of death by 103 items.

Source: Statistics Korea (2021).

Causes of death classified as ‘other’ was the top cause of death, comprising 30% of total death in the 1980s but drastically decreased in 1990s. In 2019 ‘other’ cause of death is the third largest cause of death comprising close to 10% of total death (Figure A-10). Senility death was half of the total ‘other’ deaths in the 1980s, increased around 1997 and 2005, then have been decreasing since then. The rising number of deaths of very old persons pushed up the unclassifiable deaths slightly, but not senility deaths, unlike Japan.

**Figure A-10. 'Other' Cause of Death, Republic of Korea, 1983–2019**



Note: The cause of death by 236 items.

Source: Statistics Korea (2021).

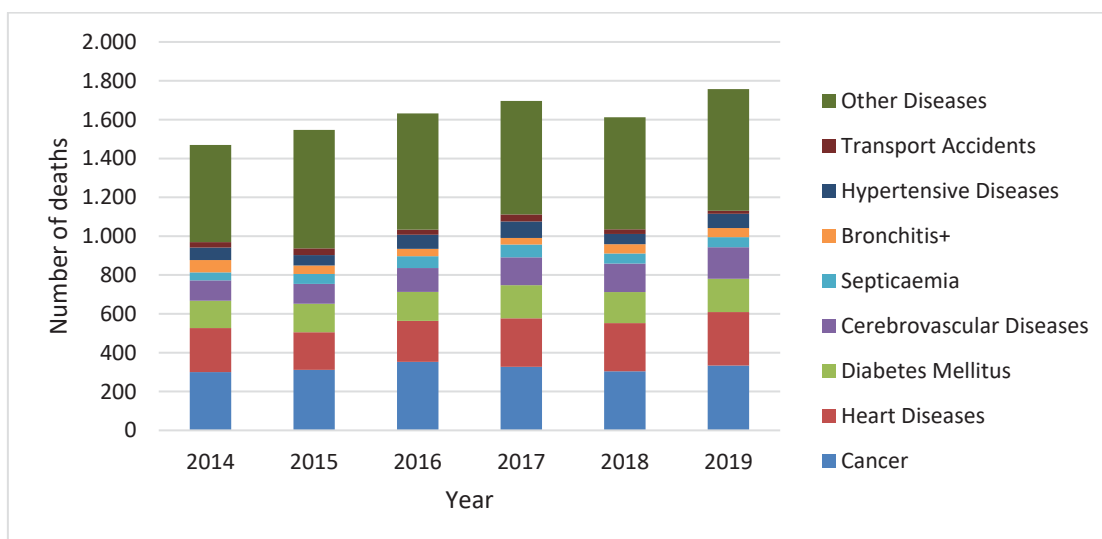
In response to the COVID-19 pandemic, the number of deaths were released weekly to compare excess mortalities with other countries (Jdanov et al., 2021). As of August 2021, cause of death statistics for 2020 have not been published.

## 2.5. Brunei

Death registration coverage is complete in Brunei (UN, 2021), and vital statistics are with medically certified causes (UNESCAP, 2021). The Laws of Brunei, Births, and Deaths Registration, Chapter 79 is the legal framework, and local area registration offices are in charge of registration. The Department of Economic Planning and Statistics (DEPS) under the Ministry of Finance and Economy publishes cause of death statistics regularly. As of August 2021, the latest statistics available are for 2019, which had 1,757 deaths (DEPS, 2020). In 2019, the largest cause of death was cancer, followed by heart diseases, diabetes mellitus, and cerebrovascular diseases (Figure A-11). There are many deaths with 'other diseases', but their details are not published online.

Verbal autopsies, the method to ascertain the cause of death based on an interview with family member or other caregivers, are adopted and conducted for unexpected maternal and child death (UNESCAP, 2019).

**Figure A-11. Top Causes of Death, Brunei**



Note: Bronchitis+ is Bronchitis, Chronic & unspecified Emphysema & Asthma. Cancer is malignant neoplasms. Heart diseases includes acute rheumatic fever.

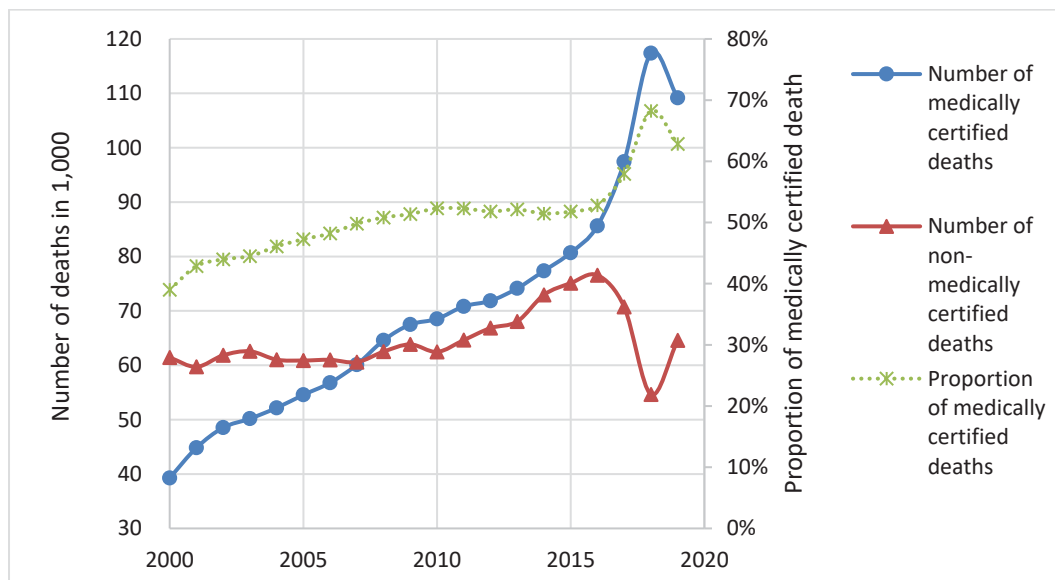
Source: DEPS (2020).

## 2.6. Malaysia

The death registration coverage of Malaysia is 90% – 99% complete (UN, 2021). The Department of Statistics Malaysia, in collaboration with the National Registration Department and the Ministry of Health, publishes the annual report regularly online (Department of Statistics Malaysia, 2020). WHO raised the quality category of cause of death statistics for Malaysia from 4 in 2016 to 2 in 2019 (WHO, 2020).

In Malaysia, not all deaths are medically certified, i.e. the causes of death are not verified by a medical officer or a coroner. Informants, such as police or laypersons, verify cause of death. Due to efforts by the Ministry of Health to increase medical verification, the proportion of medically certified death increased from 39.0% in 2000 to 68.2% in 2018 (Figure A-12). There was a sudden increase in 2017 and 2018, which might be due to the series of research on cause of death conducted during the period (Omar, 2019). However in 2019, the proportion and number of medically certified deaths declined with no explanation in the official report.

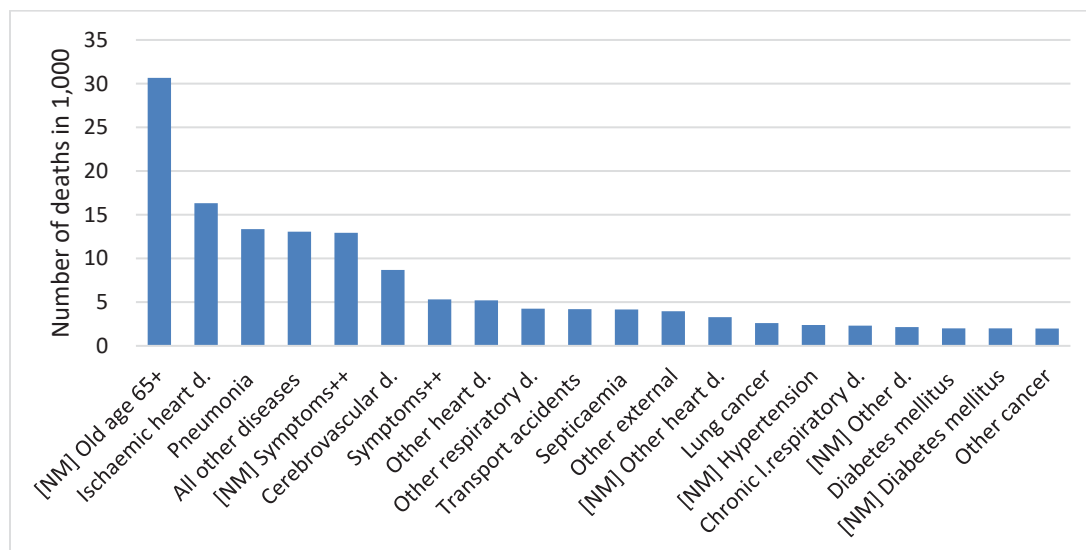
**Figure A-12. Trend of medically and non-medically certified deaths, Malaysia, 2000–2020**



Source: Department of Statistics Malaysia (2020).

The causes of death significantly differ between medically certified and non-medically certified deaths. Still, when combined, the largest cause of deaths in Malaysia is the non-medically certified 'old age 65 years and over' in 2019 (Figure A-13), comprising 17.7% of total deaths. The second cause is ischaemic heart disease and third is pneumonia.

**Figure A-13. Top 20 Causes of Death, Malaysia, 2019**



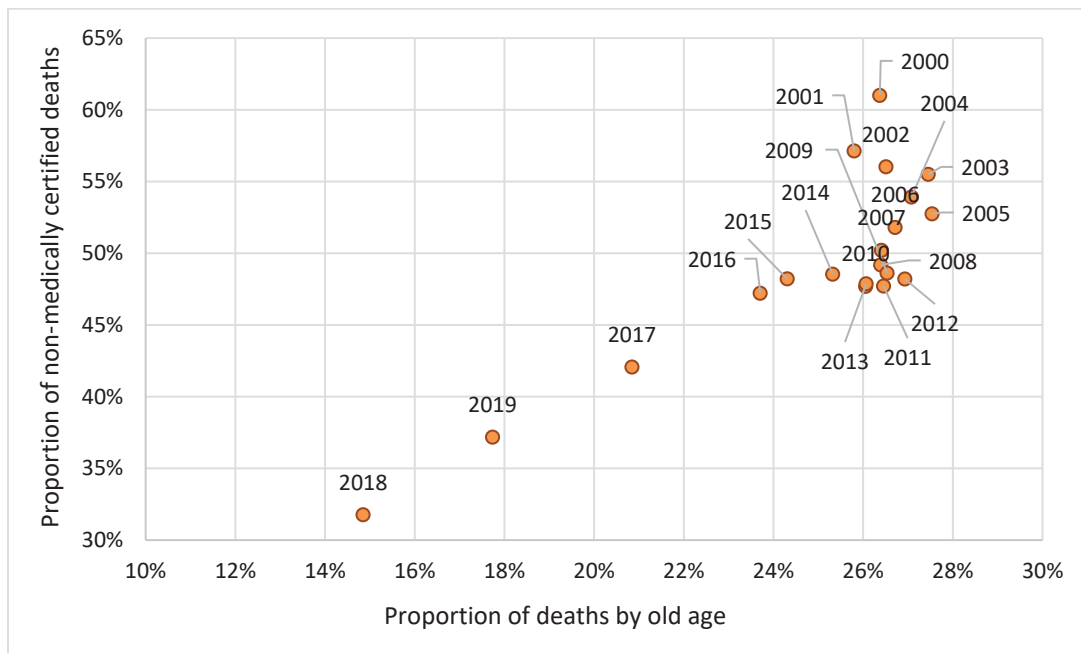
Notes:

- [NM] is not medically certified cause.
- Symptoms++ means 'symptoms, signs and abnormal findings' for not medically certified cause, 'symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified' for medically certified cause.
- 'd.' stands for 'diseases.'

Source: Department of Statistics Malaysia (2020).

With population ageing, deaths caused by ‘old age’ are increasing in many countries. Even in countries where all deaths are medically certified, these deaths are often coded as ‘senility’, ‘dementia’, ‘heart failure’, or ‘pneumonia.’ However in Malaysia, the proportion of deaths due to ‘old age’ is directly linked with the proportion of non-medically certified deaths (Figure A-14). ‘Old age’ is an ambiguous cause, and there should be proper medical causes behind it. Clarifying these causes would further reduce preventable deaths.

**Figure A-14. Proportion of Deaths by Old Age and Non-Medically Certified Causes**



Source: Department of Statistics Malaysia (2020).

According to WHO, data from Malaysia is 50%–51% complete and only 32%–40% usable, and it is not integrated into WHO’s Global Health Estimates (WHO, 2020). Up to present, one-third of deaths are not medically certified. Verbal autopsy was implemented since 2017 for deaths occurring outside the health facility, without the attention of a medical practitioner (UNESCAP, 2019). The Malaysian death certificate form does not conform with the WHO format. It only provides one line for the cause of death.<sup>4</sup> As deaths in Malaysia are registered almost completely, the remaining challenge is how to increase the medical death certification in compliance with ICD-10.

## 2.7. Thailand

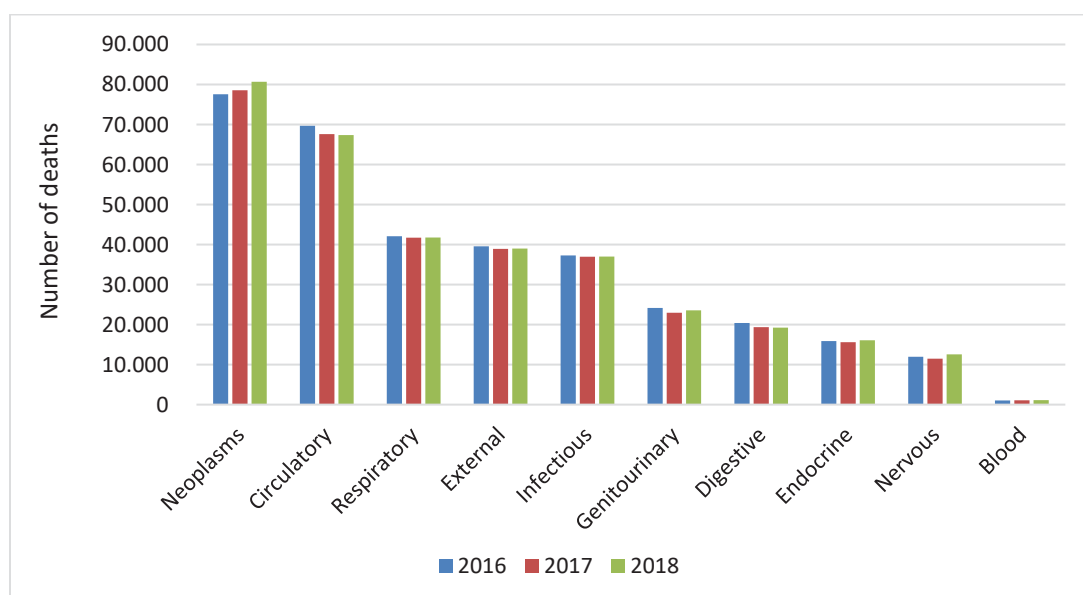
In Thailand, the Bureau of Registration Administration has been in charge of population registration since 1988. Statistics captured through registration such as population by age,

<sup>4</sup> WHO recommends 4 parts to provide the chain of events which led to death in addition to another line for other significant conditions contributing to death.

birth, marriage, or divorce are published online, except for death statistics (DOPA 2021). The Office of the Permanent Secretary, Ministry of Public Health is in charge of death statistics with agreement from the Provincial Administration Department, Ministry of Interior to use the civil registration database. So far, the summary of vital statistics is published online in the Statistical Yearbook (NSO, 2020).

As of August 2021, the number of births and deaths from 2014 to 2018 is published, and cause of death statistics from 2016 to 2018 is available for the ten leading causes (NSO, 2020). These causes are 72.4% of total deaths in 2016, 73.0% in 2017, and 73.3% in 2018. They are increasing slightly but are almost the same level each year. Amongst the ten causes classified by the ICD-10 chapter-level, the most important cause is neoplasms, followed by the diseases of the circulatory system. From 2016 to 2018, the number of deaths by neoplasms increased, and circulatory system diseases decreased (Figure A-15). So far the published data is not disaggregated by more detailed causes, sex, and age.

**Figure A-15. Ten Leading Causes of Death, Thailand, 2016–2018**



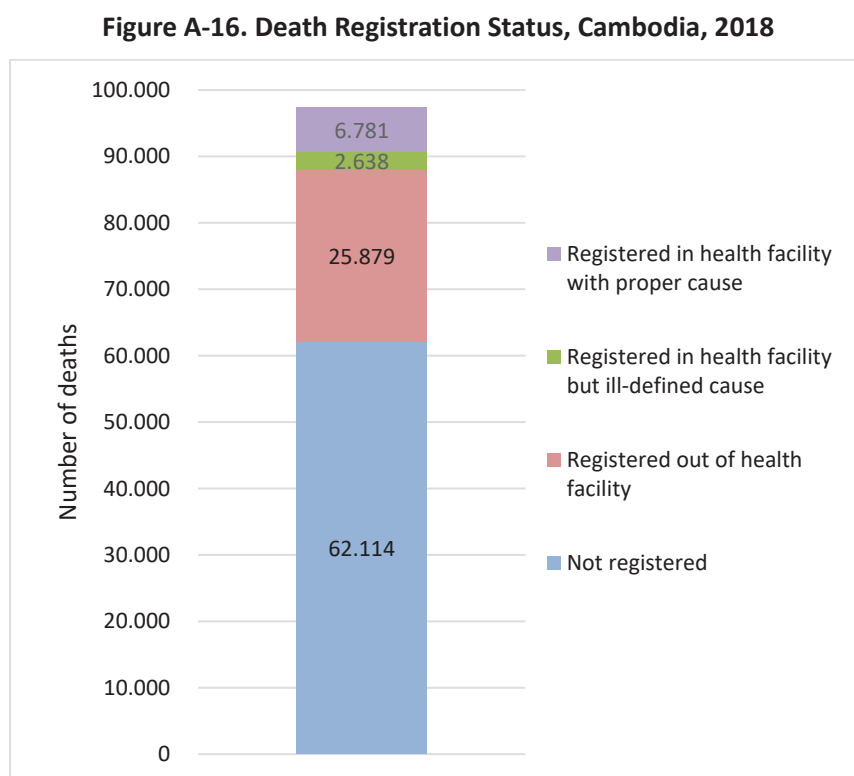
Source: NSO (2020).

According to the UN Statistical Division, birth registration coverage is at 100% and 85% for death in 2012 (UN, 2021). According to WHO, data from Thailand is in quality category 3; while the completeness of death data for ages 15 and over is 91%–100%, only 34%–65% is usable. The registered data is not used for WHO compilation (WHO, 2020). In 2018, amongst the 461,818 deaths registered by civil registration system, 97% were recorded by the health sector. Verbal autopsy is performed for some of the deaths occurred outside hospital but not integrated in the civil registration data (UNESCAP, 2019).

## 2.8. Cambodia

The register-based cause of deaths statistics is yet to be published by the General Department of Identification, Ministry of Interior, or Ministry of Health, which are in charge of the Civil Registration and Vital Statistics (CRVS).

In 2018, amongst an estimated 97,412 deaths, 35,298 (36.2%) deaths were registered (UNESCAP, 2019). The health sector registered 9,419 deaths, but 2,638 of them are ill-defined (Figure A-16).



Source: UNESCAP (2019).

While the country needs more effort to achieve full coverage, Cambodia already achieved their target of registering at least 30% of all deaths by 2024. Further progress in death registration coverage and the implementation of the certification system to medically certify causes of death, in accordance with ICD, would enrich vital statistics from Cambodia. The cloud-based CRVS database was introduced (UNESCAP, 2017) but the statistics out of this database is not yet published.

## 2.9. China

In China, the National Health and Family Planning Commission, Ministry of Public Security, and Ministry of Civil Affairs jointly issued the 'Notice Regarding the Medical Death Certificate' in 2013 (National Health Regulation [2013] No. 57), which requires all death registrations to

be submitted with a medical death certification. However, cause of death statistics is compiled only using sample surveys with 605 monitoring points, composed of county-level municipalities which are chosen to be nationally representative. According to the Chinese Center for Disease Control and Prevention (CCDC) and National Health Commission of the People's Republic of China (NHC), the population at these 605 sites is 24% of the total population of China (CCDC & NHC, 2020). The population and number of deaths registered in these monitoring points are published and available online for the years 2017 and later (CCDC & NHC, 2021). The abridged results of death rates by cause are also published on the Health Statistical Yearbook from 2011 (NHC 2021) and Statistical Yearbook of China from 2010 (NBS 2021).

Historically, the oldest cause of death statistics in China seems to be the result of a nation-wide survey conducted from 1973 to 1975, led by the National Cancer Control Office, published in 1976 (Zhou, 1985). From 1973 to 1975, the number of deaths rose to 18.4 million, which was divided into 20 major and 56 minor causes of death classifications. However, the summary table was published not as the number of deaths but as the rate. Looking at the mortality rates for the major causes of death (Table A-2), heart disease was the highest in both men and women, followed by respiratory diseases and cancer.

**Table A-2. Top Ten Causes of Death, China, 1973–1975**

Cause of Death	Male			Female			Total		
	Crude <sup>a</sup>	Adjusted <sup>b</sup>	Comp. <sup>c</sup> (%)	Crude	Adjusted	Comp. (%)	Crude	Adjusted	Comp. (%)
Heart Disease	117.72	105.94	15.35	141.09	108.75	19.23	129.11	106.98	17.20
Respiratory Disease	117.52	132.14	15.33	118.20	119.27	16.11	117.85	125.44	15.70
Cancer (Malignant Neoplasm)	87.77	81.90	11.45	65.96	55.99	8.99	77.14	68.73	10.28
Accident (Unintended Death)	82.01	89.90	10.69	58.61	65.93	7.99	70.60	78.12	9.40
Digestive Disease	72.60	73.65	9.47	60.62	55.86	8.26	66.76	64.73	8.89
Infectious Disease	64.08	81.90	8.36	63.40	55.99	8.64	63.75	68.73	8.49
Cerebrovascular Disease	59.73	51.52	7.79	65.55	45.37	8.93	62.57	48.23	8.34
Neonatal Disease	50.98	107.50	6.65	41.51	88.58	5.66	46.36	98.33	6.18
Tuberculosis	46.01	43.72	6.00	40.44	36.36	5.51	43.29	39.89	5.77
Urinary Disease	15.11	13.83	1.97	12.92	10.85	1.76	14.04	12.22	1.87

<sup>a</sup> Crude = Crude death rate per 100,000 population.

<sup>b</sup> Adjusted = Standardised mortality rate by 1964 population structure of China

<sup>c</sup> Comp = composition rate

Source: Zhou (1985).

The current cause-of-death monitoring system started in 1978 as an experiment in Dongcheng District and Tong County (now Tongzhou District) in Beijing. In 1989, the number of monitoring points expanded to 71 in 29 provinces, autonomous regions, and directly controlled cities. In 1990, with the support of the World Bank, 145 monitoring points were chosen to represent all provincial, autonomous regions, and directly-controlled cities, covering 1% of China's total population at that time. In 2003, there were 161 monitoring points covering 6% of the total population. By 2013, it became the current 605 monitoring points (CCDC & NHC, 2020).

The latest available cause of death statistics is for 2019. Although the number of monitoring points is stable at 605, population covered and registered deaths are increasing (Table A-3).

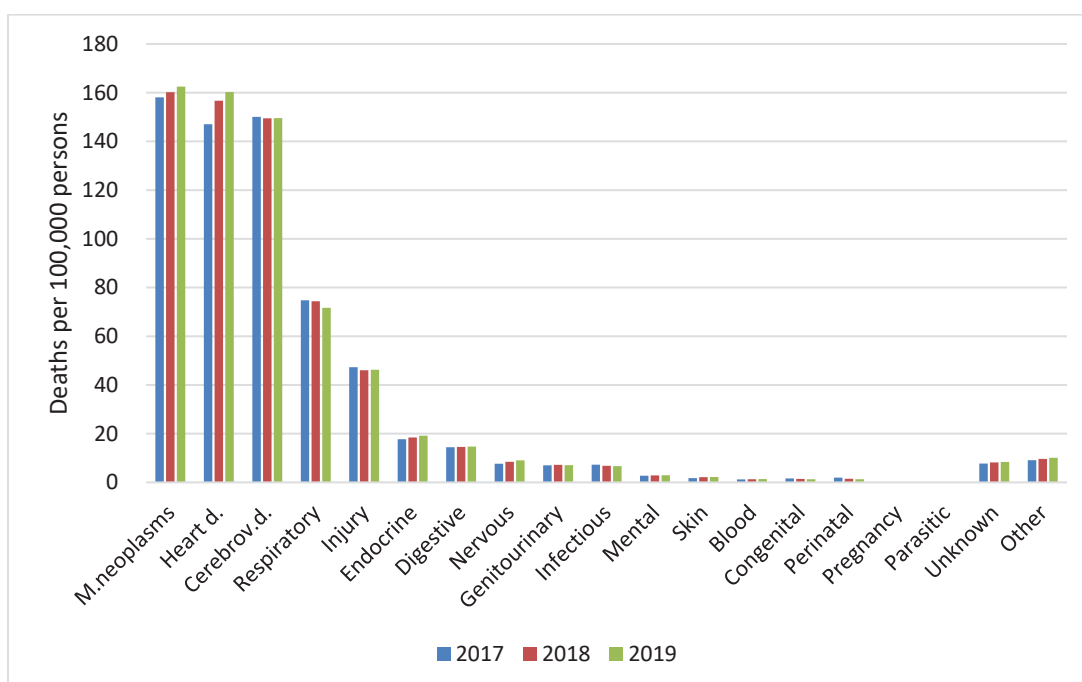
**Table A-3. Population Covered and Number of Registered Deaths in Monitoring Points, China**

	<b>2014</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Population covered (a)</b>	253,610,895	271,135,671	272,254,849	276,873,145
<b>Registered deaths (b)</b>	1,643,377	1,783,455	1,822,530	1,867,524
<b>Crude death rate (b/a) per 1,000</b>	6.48	6.58	6.69	6.75

Source: CCDC & NHC (2020).

In 2019, the top cause of death was malignant neoplasm, followed by heart diseases and cerebrovascular diseases. In 2017, the second cause was cerebrovascular diseases, which was replaced by heart disease in 2018 due to the rapid increase of heart disease, not by the extensive reduction of cerebrovascular diseases (Figure A-17). Infectious diseases, congenital malformation, perinatal conditions, and pregnancy-related causes declined significantly for a short period from 2017 to 2019. The unknown cause is only 1.2% of total deaths.

**Figure A-17. Death Rate by Cause, China, 2017–2019**



Note: M(alignant) neoplasms C00–C97; Heart diseases I05–I09, I11, I20–I27, I30–I52; Cerebrovascular diseases I60–I69; Respiratory diseases J00–J99; Injury V01–Y89; Endocrine (nutritional and metabolic diseases) E00–E90; Digestive K00–K93; Nervous (system disorders) G00–G99; Genitourinary N00–N99; Infectious A00–A99, B00–B49, B90–B94, B99; Mental (disorders) F00–F99; Skin (and subcutaneous tissue, musculoskeletal system and connective tissue) M00–M99; Blood (and immune disorders) D50–D89; Congenital (malformations) Q00–Q99; Perinatal P00–P96; Pregnancy (childbirth and the puerperium) O00–O99; Parasitic B50–B89; Unknown R00–R99.

Source: CCDC & NHC (2020).

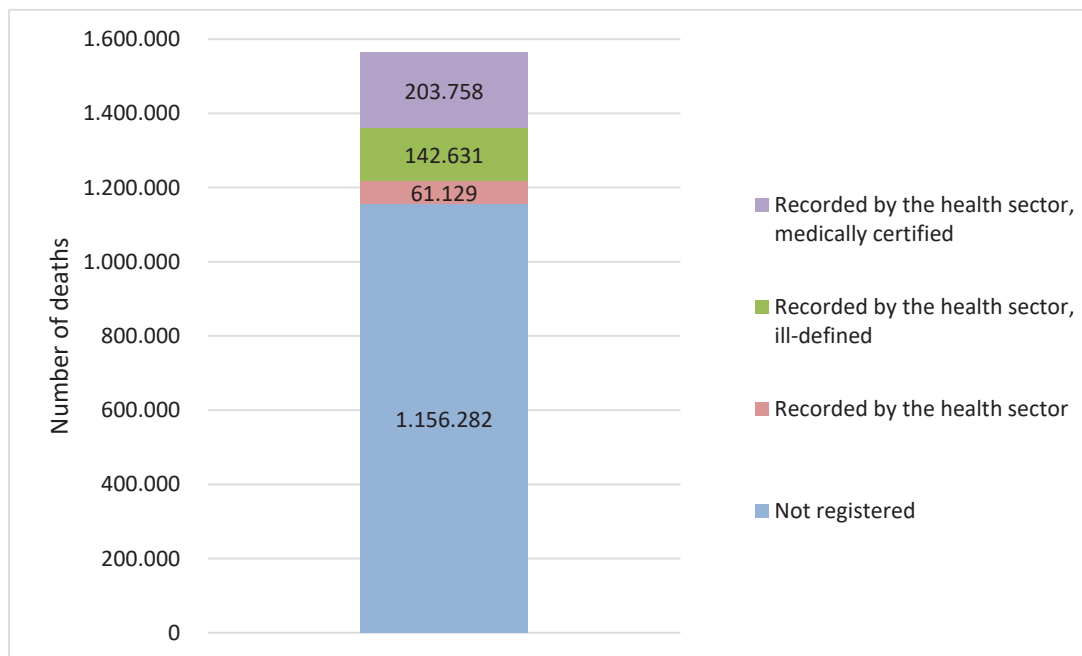
## 2.10. Indonesia

As a middle-income country that is very aware and responsive to the global development agenda, Indonesia has prioritised death registration for infant and maternal mortality. Each infant or maternal death must be reported by community health centres (Puskesmas) guided by a medical doctor within 24 hours. Apart from those deaths, the registration practice was not prevalent. Since the Sample Registration System (SRS) was implemented in 2014, births and deaths occurring in the nationally representative 128 subdistricts, which covers 8 million people, were registered. The cause of death information was collected by verbal autopsy conducted at the village level. This system was managed by the National Institute of Health Research and Development, based on the joint decree between the Ministry of Health and the Ministry of Home Affairs in 2010 (Usman, 2019). It was estimated that 51%–55% of deaths occurred in the sample areas were registered. However, the data was not published after 2018 (Sorchik, 2019). In the Statistics Yearbook of Indonesia, compiled by the *Badan Pusat Statistik* (Central Bureau of Statistics) with the collaboration of all ministries, there is no section concerning vital statistics, except for marriage and divorce statistics (BPS 2021).

In 2018, amongst the estimated total number of deaths of 1,563,800, a quarter (407,518)

were registered. Amongst the registered deaths, half were medically certified (UNESCAP, 2019, Figure A-18).

**Figure A-18. Death Registration Status, Indonesia, 2018**



Source: UNESCAP (2019).

In 2019, the national strategy to strengthen the CRVS system was launched by Presidential Regulation No. 62/2019. The national coordination mechanism was formed with the Ministry of Planning (BAPPENAS), the Directorate General of Population and Civil Registration (DUKCAPIL), and the Ministry of Home Affairs as focal points. DUKCAPIL is in charge of issuing KTP-el, the national electronic identity card and promoting civil registration using KTP-el. As of December 2020, the 98.0% of Indonesian population, 192,468,599 persons, were registered (DUKCAPIL 2021).

## 2.11. Lao People's Democratic Republic

The Ministry of Home Affairs and Lao Statistics Bureau are in charge of the national CRVS coordination mechanism for Lao People's Democratic Republic (Lao PDR). The mechanism was established in 2015 with the participation of seven ministries. In 2018, amongst an estimated 51,599 total deaths, 37.3% were registered. Amongst the registered deaths, 64.0% were recorded in health facilities (UNESCAP, 2019, Figure A-19). However, it is not sure how many of them include cause of death information. Following the CRVS ministerial declaration in Asia and Pacific adopted in 2014, Lao PDR set its 2025 target for 60% death registration coverage, 85% of them recorded with the medically certified cause of death. In March 2020, the World Bank launched a project on civil registration and vital statistics with a \$25 million

budget to upgrade the national civil registration system (World Bank 2021). This project is aimed to improve the civil registration coverage with the establishment of an electronic civil management information system. It is hoped that a functional CRVS system will be constructed by the end of the project in March 2025.

**Figure A-19. Death Registration Status, Lao People’s Democratic Republic, 2018**



Source: UNESCAP (2019).

**2.12. Myanmar**

Statistics from Myanmar are published regularly online. So far, only registered deaths for urban areas include cause of death statistics (CSO, 2021). The coverage is estimated at 12%–14% of total deaths. The top causes of these registered deaths were cerebrovascular diseases, followed by other cardiovascular diseases and hypertensive diseases in 2018 (Table A-4).

**Table A-4. Major Causes of Death and Data Coverage, Urban Myanmar, 2014–2018**

Cause Group	Number of Deaths, Urban				
	2014	2015	2016	2017	2018
Cerebrovascular disease	10,776	11,398	10,528	10,136	10,714
Other cardiovascular diseases	9,291	8,339	6,783	6,885	7,683
Hypertensive disease	8,508	7,170	5,879	5,879	6,476
Cirrhosis of the liver	4,846	5,162	4,474	4,597	4,625
Ischaemic heart disease	3,718	3,728	3,562	3,730	4,008
Other digestive diseases	2,895	3,716	3,580	3,697	4,286
Diabetes mellitus	3,702	3,508	2,916	3,612	3,677
Road traffic accidents	2,668	3,097	-	2,754	2,803
Tuberculosis	3,486	3,038	2,963	2,582	2,584
Alcohol use disorders	3,010	2,611	2,134	2,183	2,525
Other infectious diseases	14,691	16,231	2,927	-	-
Ill-defined diseases (ICD10 R00–R99)	-	-	13,980	13,620	15,117
<b>Total (a)</b>	<b>67,591</b>	<b>67,998</b>	<b>59,726</b>	<b>59,675</b>	<b>64,498</b>
Registered Deaths in urban (b)	96,697	102,923	88,606	89,779	96,832
Registered Deaths (c)	213,085	225,526	213,187	231,210	264,620
Estimated Deaths (d)	477,993	490,493	488,268	485,288	478,706
Coverage a/b	69.9%	66.1%	67.4%	66.5%	66.6%
Coverage a/c	31.7%	30.2%	28.0%	25.8%	24.4%
Coverage a/d	14.1%	13.9%	12.2%	12.3%	13.5%
Coverage c/d	44.6%	46.0%	43.7%	47.6%	55.3%

Notes:

1. The 2014 Census single age population is used for the age distribution of 0–4 and 65+ to calculate estimated deaths.
  2. Deaths by cause and registered deaths are by Central Statistical Organization.
  3. Estimated deaths are calculated using age-specific mortality rate by Central Statistical Organization multiplied population estimate by Population Department.
  4. ‘-’ stands for nil or negligible.
- Source: CSO (2021).

So far, the coverage of death registration with cause is low and not increasing from 2014 to 2018. However, the coverage of registered deaths, with or without cause, is increasing. At present, the number of registered deaths are published annually, and further development of mortality statistics, disaggregated by state and region, or by sex and age, which include causes of death, would be beneficial for implementing health policies.

### 2.13. Viet Nam

In Viet Nam, 14.4% of deaths occurred in health facilities, and 77.6% of deaths occurred at home (Hoang, 2017). According to the Health Statistics Yearbook of 2017, the most frequent deaths in hospitals are intracranial injury, followed by pneumonia, and 'conduction disorders and cardiac arrhythmias' (Ministry of Health 2017). From these descriptions, it is apparent that Viet Nam hospitals do not use the cause of death classification of ICD-10. As for the deaths at home, they are registered by village health workers with the routine report of form A6/YTCS and 10/BCX, which are sent to district, provincial, then to the central level (Hoang, 2017). So far, these home death registrations are not published as statistics.

Verbal autopsies are being tried to obtain the causes of deaths occurred in the community (Hong, 2018) and interventions were made to improve the hospital deaths statistics quality (Walton, 2016). In 2018, the General Statistics Office (GSO) began to publish the registered number of deaths by province in the Statistical Yearbook (GSO, 2018). Using the population and crude death rate in the 2020 Statistical Yearbook, registered deaths are now 98.1% of calculated deaths, up from 88.4% in 2018 (Table A-5). Although the source of the crude death rate is not mentioned in the Statistical Yearbook, the coverage of death registration is becoming almost complete.

**Table A-5. Registered and calculated number of deaths, Viet Nam, 2018–2020**

	2018	2019	2020
<b>Registered deaths (person, a)</b>	569,338	556,015	583,751
<b>Crude death rate ‰</b>	6.8	6.3	6.1
<b>Population (person)</b>	94,666,000	96,484,000	97,582,700
<b>Calculated deaths(b)</b>	643,729	607,849	595,254
<b>Calculated coverage a/b (%)</b>	88.4%	91.5%	98.1%

Source: GSO (2018).

## 3. Conclusion

Although every country is at a different stage, substantial progress has been made for civil registration and vital statistics during the CRVS Decade, 2015–2024, for Asia and the Pacific. For countries with low civil registration coverage, ICT based national ID system is now being developed such as in Cambodia, Indonesia or Lao PDR, and it could be the driving force to improve the system. Online publication of vital statistics is becoming a standard, facilitating quick and affordable dissemination. Also, it lowers the language barrier as the texts and documents online usually are machine-readable, enabling online translation.

Within the civil registration system, there is a global tendency that the birth registration develops first, then the death registration. Cause of death registrations are more challenging because they require medical certificates, delivered by doctors. In circumstances where those

medical death certificates could not be delivered, the verbal autopsy has been experimented in some countries. While countries such as Brunei and Malaysia, with full death registration coverage, use verbal autopsy for deaths occurring in remote areas, countries such as Indonesia and Viet Nam, which use verbal autopsy to improve the death registration, are facing challenges of sustainability.

Sample registration is another strategy. China has set up its system, and the data are well produced and published regularly. Indonesia conducted a sample registration system, but the publication ceased. It needs national government dedication to continuing the practice. The sample registration clarifies the structure of causes of death, but it does not cover every death. In the long run, the sample should be expanded to cover all deaths.

Malaysia's approach is unique. All deaths are registered but with medically certified causes and non-medically certified causes separately. The death registration form used by Malaysia contains only one part for cause, instead of four parts recommended by WHO, and one-third of deaths are not medically certified. However, the simpler form might have facilitated a higher number of registrations. Other countries could consider this example of using a simpler form first to increase the registrations. Countries can later improve the quality of cause of death information once the registrations have increased.

Amongst countries WHO placed in category 1, i.e. countries with multiple years of data with high completeness and quality, the Philippines, Japan, and the Republic of Korea have an increasing number of deaths in the categories 'unknown' or 'other.' The quality of cause description as well as a rising number of very old people are the cause of this increase. However, the proportion of these 'unknown' or 'other' causes in Singapore and China remains low. In light of population ageing in the region, a comparative approach would improve the quality of cause of death.

As of August 2021, cause of death statistics from Japan, the Philippines, and Singapore are available for 2020. The number of deaths decreased in the Philippines and Japan but increased in Singapore. However, when the population age structure is adjusted, Singapore's death rate also declined in 2020. Deaths due to pneumonia declined in all three countries. Another common feature is the decline of accidents and increase in suicide. In 2020, the COVID-19 death toll was not catastrophic in the ASEAN+3 countries compared to Europe and American countries. While preventing COVID-19 is the current major challenge of health systems, the common feature of death patterns in ASEAN+3 countries is worth investigating further.

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