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Death in Malaysia –

What are the statistics telling us?

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Death in Malaysia – What are the statistics telling us?

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Views

Of all the statistics in health, death is the easiest, because you can go out and ask people, "Hey, have you had any children who died, did your siblings have any children who died?" People don't forget that.

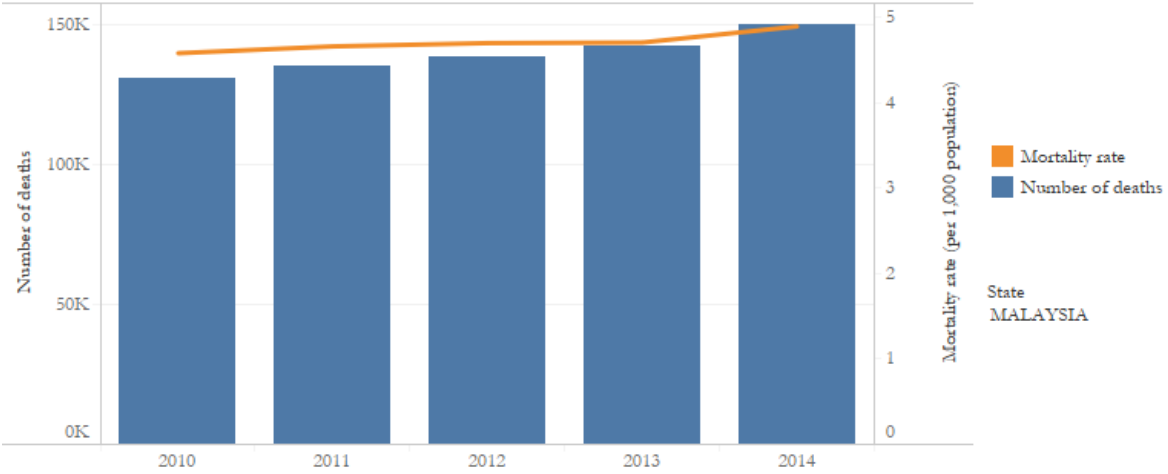
\- Bill Gates[1]

150,300 people died in Malaysia in 2014. This is equivalent to 4.9 out of 1,000 people living in Malaysia. This number, 4.9—also known as the crude death rate or mortality rate—is one of the many statistics that was published by the Department of Statistics Malaysia (DOS) in December 2016 in its "Statistics on the Causes of Death, 2014" report.

The collection of vital statistics on death for the nation began more than a century ago, with the earliest record for the year 1911. The crude death rate then, in 1911 was 39.1. In 1957, the rate stood at 12.4. Since then, the collection of these statistics has continuously been enhanced and expanded upon, and it now provides a wealth of information on not just the crude death rate, but also the myriad causes of death in the country. The latest report for 2014 contains a very rich set of information, with details on a vast permutation of dimensions such as age, gender, state, and ethnicity.

In this issue brief, we provide a summary of some of the insights that can be gleaned from this latest report. We have also built six different interactive charts based on these statistics and we encourage readers to explore and hopefully get a deeper appreciation of the richness of the information.

Chart 1: Number of deaths and mortality rate in Malaysia, 2010-2014



Source: DOS (2015) and (2016)

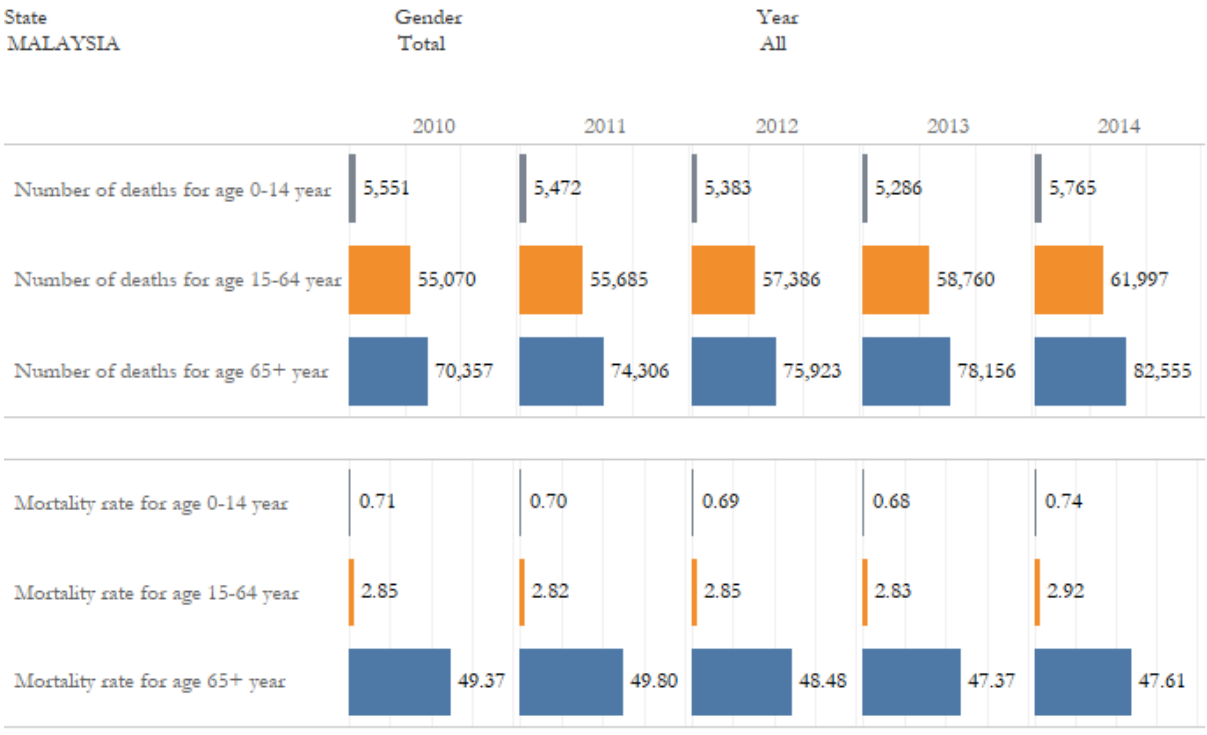
Note:
i. This is an interactive chart. Readers can compare the number of deaths and mortality rate across Malaysian states by clicking on the respective dropdown menu.
ii. The statistics on deaths for Sabah for period 2010-2013 are not published as it is still being studied. However, data for Sabah are included at Malaysia level.
iii. Mortality rate or also known as crude death rate refers to the number of deaths per 1,000 population.

So, what are the statistics telling us?

Comparing the number of deaths across three major age groups (see Chart 2), the oldest generation, that is, those above the age of 64 years, unsurprisingly recorded the highest number of deaths, representing 55% of total deaths in 2014. Their mortality rate indicates that for every 1,000 persons who are above 64-year-old, approximately 48 of them died. In comparison, the mortality rates for adults and children show that only three adults and one child died amongst every 1,000 people in their respective age groups.

Although children represent a smaller proportion of total deaths, it is important to note that the group recorded an increase in the number of deaths in 2014 after experiencing a declining trend over the past four years. This unanticipated rise is mainly due to an 11% increase in the number of infant (aged less than 1 year old) deaths from 3,199 to 3,543 deaths, as illustrated in Chart 3. Unfortunately, the precise reason on why this is so cannot be ascertained from the existing statistics.

Chart 2: Number of deaths and mortality rate across age group in Malaysia, 2010-2014



Source: DOS (2015) and (2016)

Note:
i. This is an interactive chart. Readers can compare the number of deaths and mortality rate across states, gender and years by clicking the respective dropdown menu.
ii. The statistics on deaths for Sabah for period 2010-2013 are not published as it is still being studied. However, data for Sabah are included at Malaysia level.

Dying later

Nonetheless, our life expectancy[2] has improved (see Chart 3). In 2010, the highest number of deaths was recorded amongst those aged 70 to 74 years. In 2013, the highest number of deaths was recorded amongst those aged 75 to 79 years.

This pattern of death differs by gender. The median age of death for women was between 70 and 74 years, compared to 60 and 64 years for men. This is consistent with our understanding that men die younger than women. As discussed in our "The State of Households II" report, life expectancy for women is higher compared to men—a new born baby girl in 2015 is expected to live to the age of 77.4 years compared to a new born baby boy who is expected to live to the age of 72.5 years.

Chart 3: Number of deaths by various age group and gender, 2010-2014

Gender
All

Age group	2010	2011	2012	2013	2014
Under 1 year	3,295	3,330	3,277	3,199	3,543
Under 1 day	598	644	638	609	685
1 day to < 1 week	971	947	935	887	972
1 week to < 4 weeks	537	542	515	529	545
4 weeks to < 3 months	506	523	487	473	515
3 months to < 6 months	314	332	337	334	384
6 months to < 9 months	229	205	216	227	263
9 months to < 12 months	140	137	149	140	179
1 year	173	163	179	191	181
2 years	288	259	249	285	318
3 years	214	185	169	171	194
4 years	138	155	135	136	148
Age 0-4	4,108	4,092	4,009	3,982	4,384
Age 5-9	599	616	590	554	594
Age 10-14	844	764	784	750	787
Age 15-19	2,014	1,942	2,043	1,958	1,953
Age 20-24	2,346	2,243	2,235	2,313	2,294
Age 25-29	2,418	2,367	2,283	2,377	2,390
Age 30-34	2,847	2,711	2,769	2,816	3,009
Age 35-39	3,418	3,371	3,451	3,495	3,693
Age 40-44	4,478	4,411	4,545	4,726	4,909
Age 45-49	6,441	6,255	6,452	6,563	6,995
Age 50-54	8,670	8,728	9,282	9,323	9,837
Age 55-59	10,285	10,890	11,178	11,711	12,572
Age 60-64	12,153	12,767	13,148	13,478	14,345
Age 65-69	12,803	13,429	14,218	14,416	16,002
Age 70-74	16,174	16,373	16,365	16,277	16,755
Age 75-79	14,812	15,938	16,695	17,991	19,096
Age 80-84	12,752	13,934	13,979	14,127	14,401
Age 85 and over	13,816	14,632	14,666	15,345	16,302

Source: DOS (2015) and (2016)

Identifying the cause of death

Medical practitioners usually declare patient's cause of death by referring to the patient's disease and medical history. However, complications occur if the patient is diagnosed with more than one disease. For example, a patient may have lung cancer and is admitted to the hospital for treatment. However, during the stay in the hospital, the patient developed severe pneumonia (i.e., lung

infection) which give rise to death. Hence, the cause of death is identified as "hospital acquired pneumonia with underlying lung cancer". Another example is when a patient is diagnosed with breast cancer and is undergoing chemotherapy. Chemotherapy can lead to low immunity, which exposes the patient to septicaemia[3], and eventually causes the patient to go into shock. Hence, the cause of death is recognised as "septic shock secondary to neutropenic sepsis[4] with underlying breast cancer"[5].

Therefore, the most probable cause of death is determined by looking at what occurs at the time of death and not merely at the type of diseases the patient has developed. In some cases, a patient's cause of death may not be at all connected to their comorbidities[6] . The official cause of death would normally be declared by medical practitioners after examining the patient's medical history, physical examination and investigation i.e. blood test, chest X-ray, changes in electrocardiogram (ECG) reading before the death and during the resuscitation etc. Nevertheless, the actual cause of death is identified accurately only through a post mortem report, which details all the diseases and complications incurred by the patient.

Box 1: Classification of the causes of death by DOS

The National Registration Department (NRD) is the authorised body to produce death certificates based on the death information attained from the Ministry of Health (MOH). The death certificate records the details of the deceased and the informant, date, time and place of death, cause of death and details of the death certifier. These death records are collated by DOS to derive the mortality tabulation, published in the "Statistics on Causes of Death" report.

The causes of death documented in the death certificate can either be certified by a medical officer or a non-medical officer e.g. police officer. DOS classifies numerous causes of death into two categories: medically certified and not medically certified, generally by looking at the certifier details on the death certificate. As per the definition by DOS (2016), "medically certified" causes of death refer to those verified by the Medical Officer and Coroner only. The Coroner is a public officer who investigate cases of sudden death, of which the causes are suspected to be related to a criminal case. Whereas, verification made by informants without medical qualification such as the police or individuals is categorized as "not medically certified" deaths.

Additionally, DOS refers to the guidelines set by the World Health Organisation (WHO) in the report entitled "International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) to derive the mortality tabulation. This report details the procedures for selecting the underlying cause of death for mortality tabulation.

When there is more than one cause of death, DOS recognises the underlying cause as the cause of death and groups them according to the mortality coding specified in the ICD-10 report. For example, for cause of death records such as "pneumonia with underlying lung cancer", DOS treats lung cancer as the cause of death and categorise it in their respective codes. Similarly, DOS categorises "septic shock secondary to neutropenic sepsis with underlying breast cancer" as breast cancer. The general principle for mortality tabulation is to treat the underlying cause as the cause of death. Nonetheless, in occurrence of special cases, additional rules may be applied in selecting the cause of death.

It is important to note that the underlying causes are not captured most of the times, particularly for deaths certified by non-medical officers. It is observed that the causes for nearly 50% of the death registered in 2014 are classified as not medically certified. This raises concern on the accuracy of the statistics on the causes of death as the certification is performed by non-medical officers based on information received from the deceased's family members or relatives. Inaccurate statistics creates a misleading analysis for policy interventions. Therefore, relevant authorities should strive to increase the percentage of medically certified deaths to generate a conclusive analysis and provide useful insights for effective policy interventions.

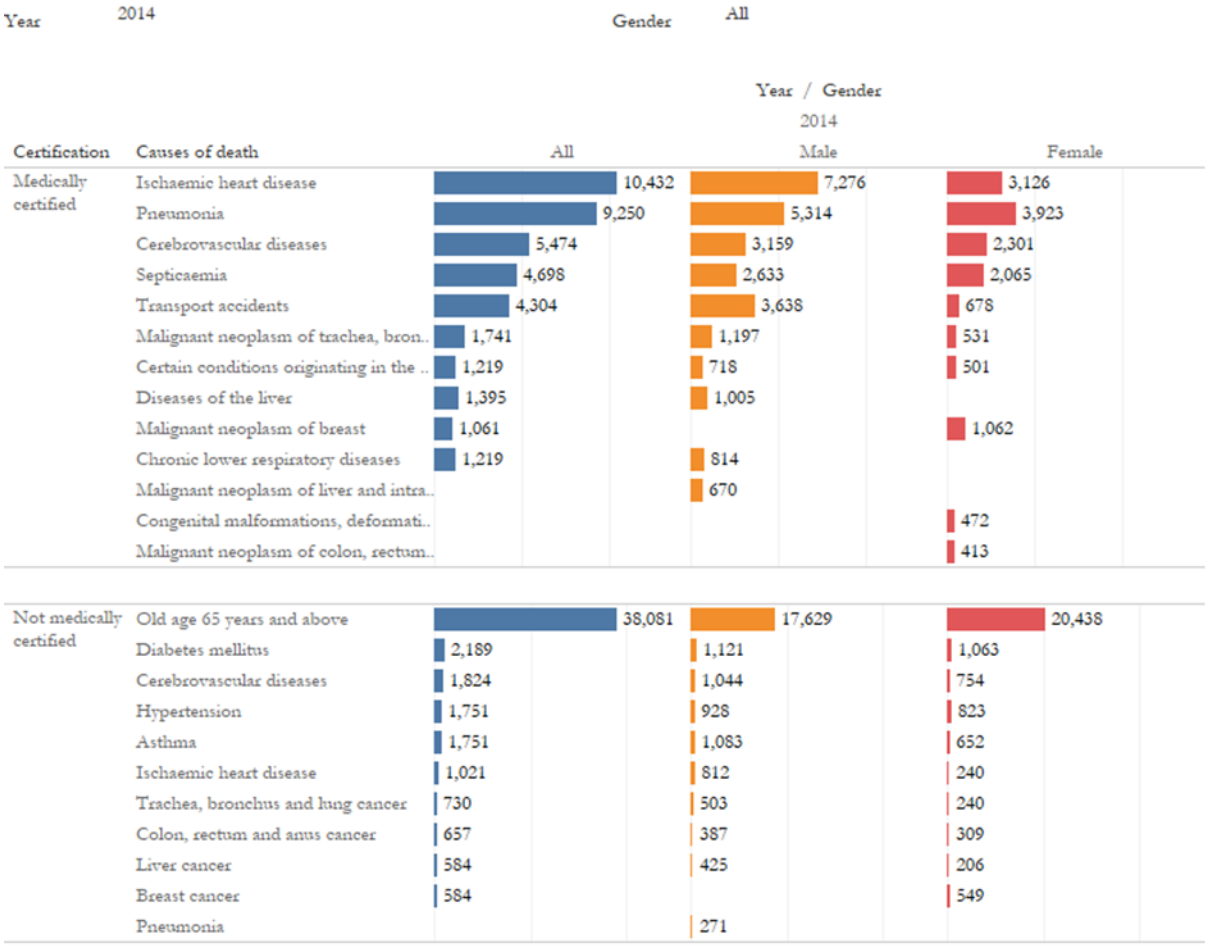
Heart disease: The principal cause of death in Malaysia

Chart 4 allows for the exploration of the principal causes of death by gender and age group for both medically and non-medically certified.

Overall, more than a quarter of all deaths in Malaysia for 2014 were due to old age, which is categorised as not medically certified cause of death. However, it could be misleading to state old age as the major cause of death. Most of the time, it is challenging for non-medical officers to identify the exact reason causing the death of aged people and they tend to certify the cause of death as old age. Hence, in this brief, we will focus on medically certified cause of death.

Looking at the medically certified cause of death, coronary (ischaemic) heart disease emerged as the principal cause of death—approximately one in fourteen deaths in Malaysia was due to it. The other major causes of death include, pneumonia, cerebrovascular diseases (i.e., stroke) and septicaemia (i.e., blood poisoning). Transport accidents come next—it caused 4.3 thousand deaths in 2014. It is noticeable that the aforementioned causes of death remained their positions for the last five years. Chart 4 provides further details into this.

Chart 4: Ten principal causes of death by gender, Malaysia, 2010-2014



Source: DOS (2015) and (2016)

Note:
i. This is an interactive chart. Readers can explore the causes of death by year and gender by clicking the respective dropdown menu displayed on the chart.

Additionally, the most common cancer among men is different from the one among women (see Chart 4). It is observed that malignant neoplasm of trachea, bronchus and lung (i.e., lung cancer) is more prevalent for men whereas malignant neoplasm of breast (i.e., breast cancer) is more prevalent for women.

108.7 thousand of dengue cases were recorded in 2014—increased by 151% from 2013. Despite its high incidence, dengue is still not the major causes of death in the country as death resulting from dengue is less compared to other major causes of death listed in DOS's report. In 2014, 215

casualties' due to dengue was reported which is five times less compared to breast cancer—the tenth top cause of medically certified death[7] .

Chart 5: Ten principal causes of death by age group and gender, Malaysia, 2010-2014

Year: 2014 | Gender: All | Certification: Medically certified

Age group	Causes of death	Year / Gender: 2014 All	2014 Male	2014 Female
Age 0-14 years	Certain conditions originating in the perinatal period	1,217	713	506
	Congenital malformations, deformations and chromosomal a..	1,008	554	454
	Transport accidents	201	142	60
	Pneumonia	192	105	88
	Septicaemia	169	96	75
Age 15-64 years	Ischaemic heart diseases	5,503	4,355	1,152
	Transport accidents	3,629	3,122	510
	Pneumonia	3,310	2,143	1,184
	Cerebrovascular diseases	2,472	1,610	867
	Septicaemia	2,233	1,346	892
Age 65 years and above	Pneumonia	5,714	3,085	2,645
	Ischaemic heart diseases	4,921	2,937	1,983
	Cerebrovascular diseases	2,939	1,539	1,415
	Septicaemia	2,279	1,185	1,104
	Malignant neoplasm of trachea, bronchus and lung	892	621	273

Source: DOS (2015) and (2016)

Note:
i. This is an interactive chart. Readers can compare the causes of death across gender, certification and years by clicking on the respective dropdown menu.

Chart 5 summarises the causes of death across three age groups[8]. For Malaysian adults between the age of 15 and 64, the differences in the causes of death (medically certified) for men and women are striking. For coronary heart disease, 79% of the recorded deaths were men. Approximately one in ten adult men died due to heart disease. Compared to women, the same statistic is much lower with only one in eighteen deaths were due to it. More interestingly, transport accident is the second major cause of death for adult men – the number of deaths amongst men due to transport accidents is six times to that of women.

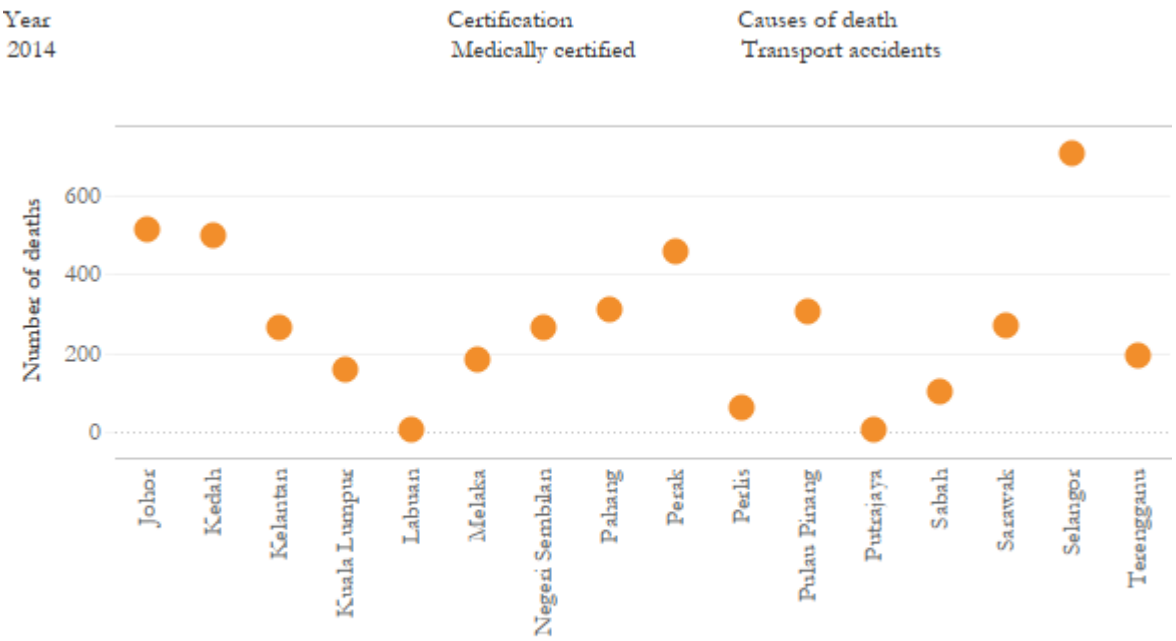
On the other hand, pneumonia is identified as the leading cause of death for women in this age group—nearly one in eighteen death amongst women were due to it. This is followed by heart disease, septicaemia and cerebrovascular disease. Breast cancer is the fifth top cause of death for adult women, with one in twenty-five death amongst women were due to it.

For children below the age of 15 who died in 2014, 61% died before they turned 1-year-old and 76% before 2-years-old. The main cause of death is categorised as "certain conditions originating in the perinatal period", amounting to 1,217 deaths (see Chart 5). Maternal factors, complications during pregnancy and delivery, and disorders related to gestational length are a few examples of conditions originating in the perinatal period that leads to death. About 7%, or 400 children died from non-disease factors such as transport accidents and drowning.

Similar to adult women, pneumonia emerged as the top cause of death (medically certified) for those aged 65 years and above, recording 5.7 thousand of deaths. This is followed by heart disease, cerebrovascular disease and septicaemia. Looking at both medically and not medically certified causes, it can be concluded that almost half of all deaths were due to old age. As discussed earlier, the higher number of older female deaths indicates the survival of more woman at an older age compared to men.

Looking at the statistics, there are several trends that are evident. Firstly, the mortality rate for children, although low, has increased, reversing a trend that we have seen prior to 2013. Secondly, the large proportion of death for adults attributable to non-communicable diseases, such as heart diseases, strongly informs the need for both policy makers and the public at large to focus on this issue. Thirdly, although the number of accident deaths has been on a declining trend, it has stubbornly remained as one of the top causes of death in Malaysia over the past five years. The next section, this brief explores this issue in greater depth.

Chart 6: Number of deaths by causes and state, 2010-2014



Source: DOS (2015) and (2016)

Note:
Readers can compare the number of deaths for various causes of death by clicking the respective dropdown menu.

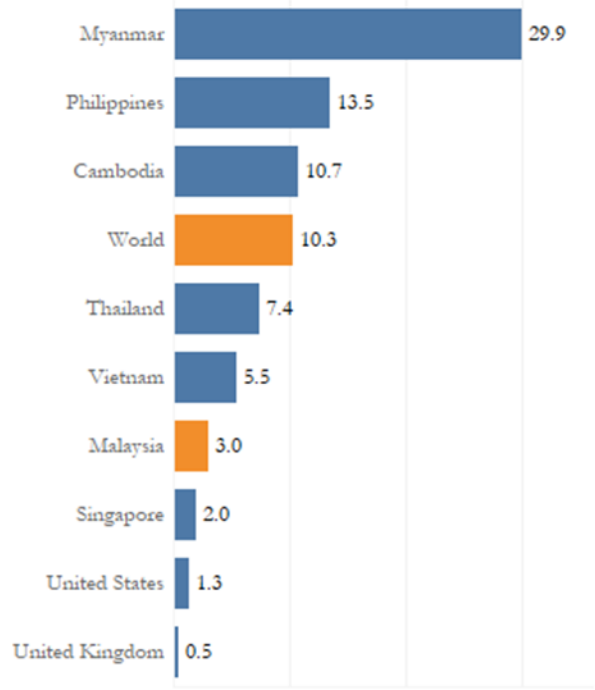
Roads kill

As the figures (see chart 5) show, death on the roads is alarming. As discussed, transport accident is one of the major causes of death among children and adults. Selangor is the state with the highest record for transport accidents death after Johor, Kedah, and Perak, as illustrated in Chart 6.
According to the statistics released by Malaysian Institute Road Safety Research (MIROS), 477.2 thousand road crashes was reported in 2013, more than double the amount recorded in 1997. However, the death index per 10,000 vehicles and the death toll per 100,000 population has reduced from 7.37 and 29.1 in 1997 to 2.9 and 23.1 in 2013, respectively[9] .

Death index per 10,000 vehicles and death index per 100,000 population are two indicators used to measure the level of road safety in a country. With the aim to improve the road safety in Malaysia, the Ministry of Transport (MOT) targeted to reduce the death index per 10,000 vehicles to 2.88 by 2014—one of their Key Performance Indicator (KPI). By employing several initiatives, MOT has effectively reduced the death index to 2.66 in 2014[10].

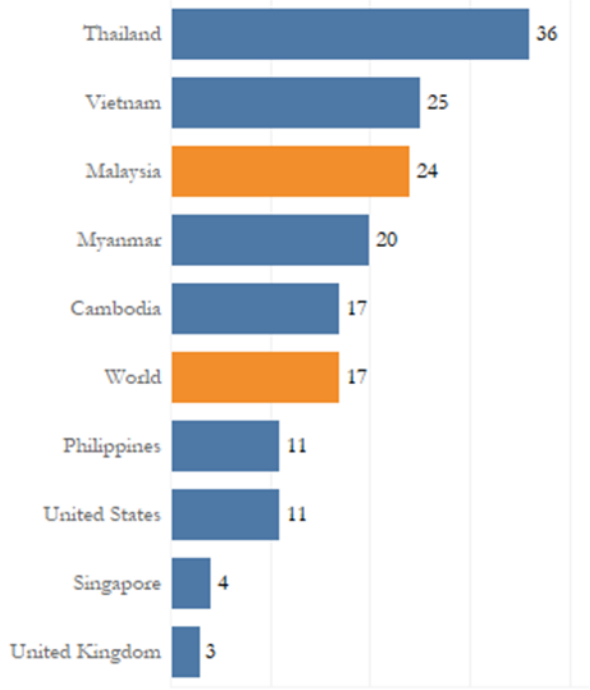
Despite the positive progress shown, Malaysia is above the world in terms of road traffic fatality rate[11] , as estimated by the World Health Organisation (WHO). In fact, Malaysia registered a higher fatality rate compared to its regional peers such as Singapore, Philippines, Cambodia and Myanmar (see Chart 8).

Chart 7: Death index per 10,000 vehicles in 2013



Source: World Health Organisation (WHO), Deparment of Land Transport, Thailand, Myanmar Road Transport Administration Department. United States Department of Transportation, Department for Infrastructure, Department for Transport, United Kingdom and The Statistics Portal

Chart 8: Road traffic fatality rate in 2013



Source: World Health Organisation (WHO)

Conclusion – from death statistics to better lives

Death statistics is a critical input for policy-making. Insights from these statistics are essential for the formulation and monitoring of evidence-based health, social and economic policies. For example, deaths from road accidents in Malaysia continues to be alarming, particularly for adult men. This insight can inform new and adjustments to existing policy interventions. This is true for other related policies, such as those pertaining the high incidence of non-communicable diseases related deaths.

As alluded to from the quote by Bill Gates at the beginning – good policies to save live begin with statistics, including death statistics.

ENDNOTES

1. From Washington Post's interview with Bill Gates on global health and how his foundation's work to save lives begin with statistics, especially statistics on death (Klein, E. (2013, May 17). Bill Gates: 'Death is something we really understand extremely well'. Retrieved from https://www.washingtonpost.com).
2. For more information on life expectancy, readers may wish to read "Population ageing: Can we "Live Long and Prosper"?" here: http://www.krinstitute.org/Discussion_Papers-@_Population_Ageing_Can_We_Live_Long_and_Prosper.aspx
3. The example given is applicable only to vulnerable patients as not all of them undergoing chemotherapy will eventually exposed to septicaemia.
4. Neutropenic sepsis occurs due to decreased neutrophils caused by chemotherapy.
5. The examples provided in this paragraph are gathered from discussions with several medical practitioners.
6. Comorbidity is the presence of multiple underlying chronic diseases such as diabetes mellitus, and hypertension.
7. The statistic on the number of dengue cases and casualties is sourced from 'iDengue untuk komuniti' website. Retrieved from: http://idengue.remotesensing.gov.my/idengue/page2.php?kandungan=content/statistik.pdf
8. Readers can also view the overall cause of death included in Chart 5. Overall causes of death were calculated by adding both the medically and not medically certified death. The figures might not add up due to rounding up error and the limitation of "not medically certified" causes of death, which were identified based on information received from the deceased's family members or relatives.
9. For more information, refer to General Road Accident Data in Malaysia published in MIROS website.
10. For more information, refer to the official portal of Ministry of Transport Malaysia.
11. Fatality rate refers to the number of road traffic deaths per 100,000 population.

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