

ARTICLE ON ROAD SAFETY: A SAD TALE OF ROAD TRAFFIC INJURIES IN MALAYSIA

Road traffic injuries are preventable

Road safety advocates, who are among the people affected by the COVID-19 pandemic, should take the global crisis as a blessing in disguise. Why? It allows comparison to be made between how much effort and resources have been committed to address road traffic injuries (RTIs) and the pandemic. Such comparison would allow benchmarking to be made of the number of resources spent for road safety against that for the pandemic and to review if it is sufficient enough all this while.

RTIs and the COVID-19 pandemic are public health issues that have resulted in premature deaths among the people, but the latter received tremendous attention and action because no one would have thought it could take away so many lives over a short period. It is also because the number of deaths will keep increasing unless interventions are put in place to stop the virus from spreading, mutating, and infecting more. RTIs on the other hand receive relatively little media attention despite almost all transportation-related fatalities occur on the roads. The reason? First, it is because the number of fatalities and injuries in each road crash is usually low and second, they occur so frequently that they are not newsworthy. A comparison of the impact brought upon by these two issues should be able to help transport policy-makers gauge if existing measures for road safety are up to par or way below expectation.

Extremely many resources have been pooled and invested by public sectors, corporates, non-governmental organisations as well as individuals to reduce deaths due to the pandemic, to mitigate the risk of death due to the pandemic, to prevent more deaths due to the pandemic, and to revive businesses to slow down the progression of economic downturn. In contrast, a similar degree of attention is seldom seen to prevent more deaths and serious injuries on the road. However, one thing is for sure. While the effectiveness of new vaccines distributed worldwide to create the so-called herd immunity against the COVID-19 virus is still hotly debated, 'vaccines'

for roads have existed and have proven to save lives¹. There are hundreds to choose from a wide range of treatments and costs².

What is happening now?

On average, 19 lives are lost each day due to RTIs in Malaysia since the last decade³. Many more suffered from injuries that caused permanent disabilities and life-long health-related predicament. According to statistics released by the Department of Statistics Malaysia (DOSM), RTIs ranked within the top five principal causes of death since 2013 (Figure 1). Do policy-makers aware that the estimated costs of road crashes in Malaysia make up more than 5% as a share of the Gross Domestic Product (GDP)⁴? Interestingly, a study revealed that the percentage for low-and-middle-income countries averages only less than 3%⁵. These information strongly support a contention that measures taken by the government to curb RTIs is far from adequate. Going by the existing trend in the allocation of resources for road safety, we would never be able to achieve the targeted scale of reduction in road deaths and serious injuries of at least 50% as proclaimed by the United Nations General Assembly Decade of Action for Road Safety 2021-2030⁶. A worldwide road assessment programme estimated that Malaysia should be looking at investing 0.1% of GDP annually over the next 10 years on road infrastructure improvement to allow more than 75% of travel to occur on 3-star or better roads⁷, hence meeting the global reduction target in RTIs.

¹ Elvik, R., Høy, A., Vaa, T., Sørensen, M., 2009. The Handbook of Road Safety Measures, Second Edition. Emerald Group Publishing Ltd, Bingley, UK.

² <http://toolkit.irap.org/>

³ Statistical Report Road Accident 2009-2018, Royal Malaysian Police

⁴ <https://www.vaccinesforroads.org/irap-big-data-tool-map/>

⁵ Wijnen W., and Stipdonk, H. (2016). Social costs of road crashes: An international analysis. *Accident Analysis and Prevention*, 94, 97-106.

⁶ [Decade of Action for Road Safety 2021-2030 \(who.int\)](https://www.who.int/news-room/fact-sheets/detail/road-safety)

⁷ <https://www.vaccinesforroads.org/irap-big-data-tool-map/>

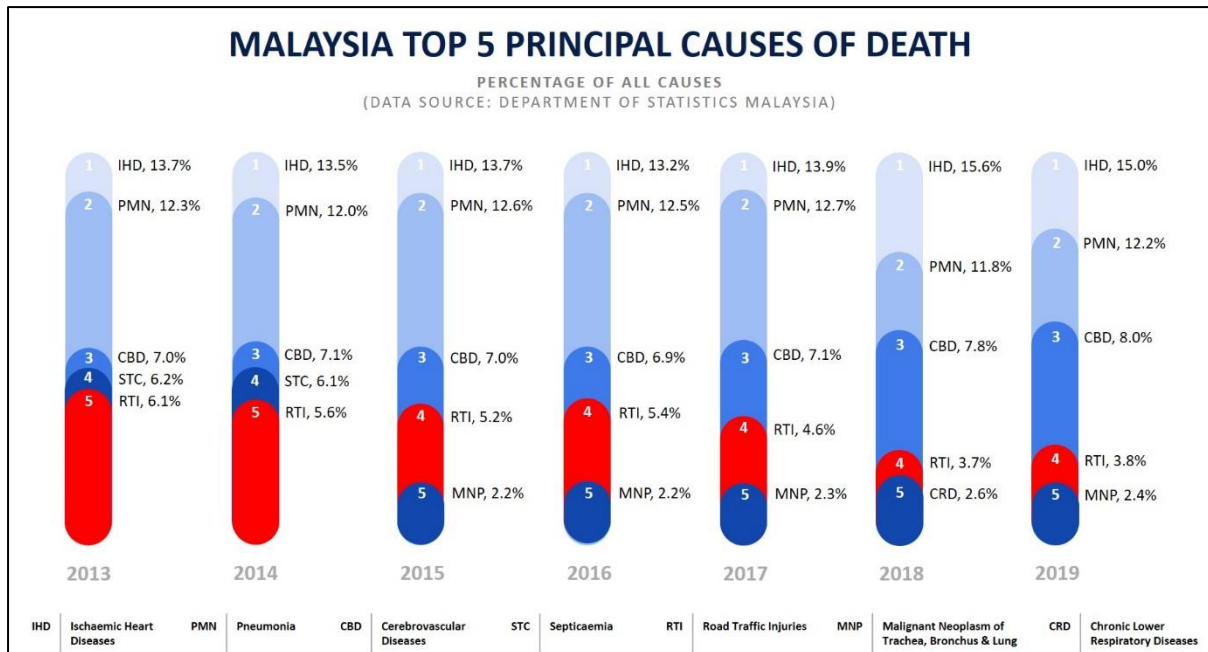


Figure 1. Principal causes of death in Malaysia 2013-2017

How to ensure allocation for road safety can be optimized?

It is long overdue for the government to adopt a new way to set priority and decide on fiscal allocation for road infrastructure and road safety projects. Specifically, the government should consider the social return on investments for road development and maintenance projects to ensure they do not increase the economic burden of road crashes. Particularly, one recommendation to the government is to incorporate the value of a statistical life (VSL) as well as the value of a statistical injury (VSI) to quantify the consequences of road crashes to the nation from an economic point of view. These values, or project appraisal mechanisms that make use of these values, have long been used in developed countries to indicate the level of investment justified for the saving of lives and prevent serious injuries.

The advantage of using VSL and VSI is that they are primarily derived and therefore change according to gross domestic product (GDP), a measure heavily used by legislators to make fiscal policy decisions. As far as international studies are concerned, the relationships $VSL = 70 \times (\text{GDP per capita})$ and $VSI = 17 \times (\text{GDP per capita})$ are adopted by the International Road Assessment Programme (iRAP) as a rule-of-thumb to ensure consistency in applying their road assessment models across

participating countries⁸. Another study found that VSL for low-and-middle-income countries with GDP per capita between \$1,268 and \$20,000 can be estimated as $1.3732E-4 \times (\text{GDP per capita})^{2.4789}$. These findings allow many banking institutions and funding agencies around the world to identify high impact road safety project investments based on an objective and scientifically proven method. Unfortunately, such practice is yet to be adopted in Malaysia despite facing a limited budget for road improvements. A simple example is shown in Table 1 on the application of VSL and VSI in determining the better option between two types of dedicated motorcycle facility to reduce motorcycle deaths on Malaysian high-risk sections. The VSL and VSI are used to calculate the present value of safety benefits for the total number of deaths and serious injuries that can be prevented over the entire service life of the intervention. In this example, providing the non-exclusive motorcycle lane would be the better option from an economic point of view as the BCR is higher. The exclusive lane however would be the better investment from an ethical point of view because it yields a higher number of lives saved.

Table 1. Application of VSL and VSI in benefit-to-cost analyses

| BENEFIT-TO-COST ANALYSES FOR MOTORCYCLE INTERVENTION | | |
|---|--|--------------------------------------|
| | Non-exclusive motorcycle lane | Exclusive motorcycle lane |
| Effectiveness in death reduction | 60% | 80% |
| Baseline deaths/year | 61 | 61 |
| Baseline serious injuries/year | 610 | 610 |
| Post-intervention deaths/year | 24 | 12 |
| Post-intervention serious injuries/year | 240 | 120 |
| Deaths prevented/year | 37 | 49 |
| Serious injuries prevented/year | 370 | 490 |
| Total present value of safety benefits | RM3.1 bil. | RM4.0 bil. |
| Total cost of construction & maintenance | RM1.0 bil. | RM2.0 bil. |
| Benefit-to-cost ratio (BCR) | 3.1 | 2.0 |

Information used in the analyses:
i. GDP/capita (2019): RM46,366 (source: www.imf.org)
ii. VSL (2019) : RM3.25mil
iii. VSI (2019) : RM0.81mil
iv. Death to Serious Injury Ratio : 1 to 10
v. Intervention service life : 20 years
vi. Analyses period : 20 years
vii. Discount rate : 12%

⁸ Dahdah, S, and McMahon, K. The true cost of road crashes. Hampshire, UK: International Road Assessment Program, 2008.

⁹ Milligan, C., Kopp, A., Dahdah, S., Montufar, J. (2014). Value of a statistical life in road safety: A benefit-transfer function with risk-analysis guidance based on developing country data. Accident Analysis and Prevention, 71, 236-247

A happy ending tale of road traffic injuries

Every country needs to make smart decisions on ways to save people from becoming victims of road traffic injuries, especially when the resources to do so are limited. The decisions rely heavily on the impacts an investment could have so that they bring high social and economic returns. Decision-makers, especially engineers, should not be having difficulties in making life and death decisions because of subjective or incomplete information. Optimizing resources in life-saving investment especially for the benefit of road users should and can be done innovatively. The use of VSL and VSI shall be considered. MIROS is currently in the progress of developing both these metrics to better reflect the costs of road crashes in the local context. In Malaysia, motorcyclists comprise more than half the vehicle's population and when the environment does not permit safe riding, the death rates will not reduce significantly. If alternatives of road safety investment are objectively and scientifically assessed, the chances are the country will be free of high-risk roads. Any Malaysian can then happily say "I love to travel on Malaysian roads".

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