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ROAD ACCIDENTS IN MALAYSIA

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INTRODUCTION

Road accidents constitute one of the major social problem in Malaysia. In 1970, a total of 12,704 accidents (based on manual records) was recorded and this figure has been increased to a total of 3,554 cases in 1992 (Table 1). The number of fatalities (death in accidents) has also been increase from 579 victims in 1970 to 1,077 victims in 1992.

At an average growth rate, fatalities are forecasted to increase from 4,048 victims in 1990 to 5,464 in the year 2000, an increase of 35 % in a period of 10 years as shown in Figure 1. If higher growth rate is considered based on the growth in the last six years after the recession in 1985, fatalities are anticipated to increase to 6,782 victims in the year 2000, an increase of 67 % in a period of 10

years. 46,010 damage-only accidents have been recorded. Rural highway, in particular the federal routes (see Table 3), recorded the highest injury accident figures resulting a total of 11,049 injuries (38 %). Higher attention has now been given to the federal roads in the country through the blackspots and engineering countermeasure programmes.

Rear-end collisions recorded the highest number (22,936 cases-see Table 2). Skidding related accidents however, constitute the highest type of collision involving fatalities (669 fatalities in 594 fatal accidents). Other study revealed that majority of this rear-end collisions occurred on dry roads whilst most skidding accidents occurred when the surface was wet. The percentage of skidding occurred on wet surfaces is found to be five times higher than that on the dry surfaces.

CABINET COMMITTEE ON ROAD SAFETY

In 1990, a Cabinet Committee on Road Safety, chaired by the Minister was formed. The committee has agreed to set a target of reducing road accidents by 30 percent in the year 2000 and for this has allocated RM 20 million for new countermeasures and research into road safety. In 1991, a comprehensive National Road Safety Plan was formulated and special attention has been given to safety research programmes, behavioral modification of road users, road engineering and vehicles safety, medical treatments and road administration. (RM1=US\$0.37 Mar. 1994)

NATIONAL ACCIDENT DATABASE

In 1990, a research programme to improve the road accident data collection and to assist the diagnosis and treatment of accident blackspots was carried out. A pilot project on the diagnostic system was carried out and a new police accident form, POL 27 form (1/91 amendments), was redesigned. For data analysis, an analysis system based on the TRL Microcomputer Accident Analysis Package (MAAP), was used in this demonstration project.

Following the success of the pilot project in implementing a reliable diagnosis system, it was decided to extend this system at a national level. Beginning from 1992, raw accident data (NFA cases excluding minor damage-only accidents not included) from the police database data entry terminals, Bukit Aman, has been downloaded to MAAP. For a start, a total of 66,822 accident records have been transcribed using the new accident database system and these data have been used for the formulations of safety programmes in Malaysia.

ACCIDENTS AND CASUALTIES IN 1992

Out of 66,822 accidents records compiled throughout 1992 (Table 2), a total of 2,833 fatal, 6,857 serious, 11,122 slight injury and

5. INJURY INDEX OF MOTORISED VEHICLES AND TARGET GROUPS

Casualties involving motorcycles constitute about 76 percent (13,570 cases) of the total casualty injuries of motorised vehicles (Table 4). This is followed by about 16 percent (2,806 injuries) involving passenger cars and about 5 percent (828 cases) and (798 cases) involving both passenger vans and commercial lorries respectively. The index values of vehicles involved in accidents, which were calculated based on injury sustained for each type of vehicles, confirmed further the fact that the chances for injuries amongst the motorcyclists are much higher than other types of motorised vehicles with the index values of 17 and 24 times as great as for passenger cars for motorcycle fatality and serious injury respectively. This is followed by passenger vans and commercial lorries with both fatality index of about 3 compared with passenger cars. Special attentions have recently been given to the motorcycle and van accidents and safety programmes such as the construction of motorcycle lanes, ride-bright campaign and regulation and van regulation have been carried out and evaluated.

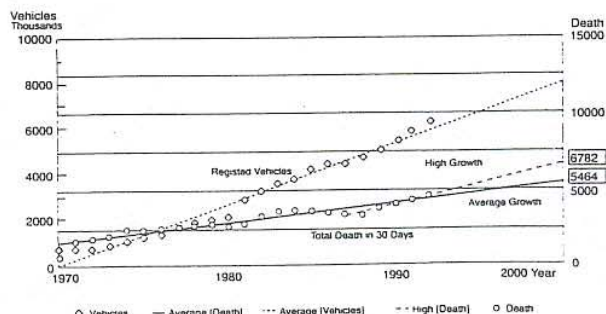


Fig. 1 Projected fatalities in Malaysia

Table 1 General road accident data (1970 - 1992)

Year	Population	Number of Registered Vehicles	Vehicles Involved In Accidents	Total Road Length Km	Total Number of Accidents	Casualties			
						Death	Serious	Slight	Total
1970	9,000,399	669,294	19,433	10,715	12,704	579	1,421	5,621	7,621
1975	10,438,137	1,267,119	75,653	12,043	48,233	2,317	2,280	14,843	19,440
1980	11,442,086	2,357,386	99,485	14,446	59,084	2,568	5,097	14,739	22,404
1985	15,866,592	4,243,142	142,653	43,944	82,059	3,603	5,652	14,669	23,924
1990	17,812,000	5,462,792	146,747	50,835	87,999	4,048	8,076	17,690	29,814
1991	18,178,100	5,877,176	161,823	55,367	96,513	4,331	8,524	17,252	30,107
1992	18,606,000	6,263,383	193,421	59,796	118,554	4,557	10,634	21,071	36,262

Table 2 Accidents and casualties by type of first collision

Type of Collision	Type of Accidents					Type of Casualties			
	Fatal	Serious	Minor	Damage only	Total	Death	Serious	Slight	Total
Head-on collision	495	988	928	2,219	4,630	659	1,593	2,044	4,332
Oblique collision	391	949	2,006	19,590	22,936	434	1,165	2,958	4,557
Right angle side collision	292	1,060	1,304	3,097	5,753	336	1,336	2,134	3,806
Frontal collision	284	1,234	2,069	6,836	10,423	307	1,476	2,938	4,721
Side swipe	182	732	1,831	6,128	8,873	200	833	2,455	3,488
Hitting animals	28	52	64	255	399	30	69	89	188
Hitting object on road	60	56	105	458	679	67	72	147	286
Hitting object off road	43	43	105	822	1,013	49	70	152	271
Hitting pedestrian	459	1,113	1,215	168	2,955	467	1,197	1,724	3,388
Reversing	594	615	1,479	6,268	8,956	669	895	2,323	3,887
Unknown	5	15	16	169	205	9	16	21	46
Total	2,833	6,857	11,122	46,010	66,822	3,227	8,722	16,985	28,970

Table 3 Accidents and casualties by road category

Category	Type of Accidents					Type of Casualties			
	Fatal	Serious	Minor	Damage only	Total	Death	Serious	Slight	Total
Expressway	91	119	195	1,104	1,509	109	176	338	623
Federal	1,225	2,552	3,647	11,954	19,378	1,450	3,481	6,118	11,049
State	784	1,972	2,921	6,722	12,399	888	2,479	4,670	8,037
Municipal	410	1,505	3,298	23,761	28,974	440	1,690	4,158	6,288
Other	322	706	1,059	2,467	4,554	375	892	1,696	2,963
Total	2,832	6,854	11,120	46,008	66,814	3,262	8,718	16,980	28,960

Unknown is not included.

Table 4 Injury index of motorised vehicles in Malaysia

Type	Injuries			Vehicles Involved	Index (per 1000 vehicles)			Index Ratio		
	Fatal	Serious	Slight		Fatal	Serious	Slight	Fatal	Serious	Slight
Motorcar	227	522	2,057	63,674	3.6	8.2	32.3	1.0	1.0	1.0
Motorcycle	100	187	541	11,324	8.8	16.5	47.8	2.5	2.0	1.5
Motorcycle	1,255	4,153	8,162	20,810	60.3	199.6	392.2	16.9	24.3	12.1
Motorcycle	109	169	520	13,119	8.3	12.9	39.6	2.3	106.0	1.2
Motorcycle	14	30	77	4,837	2.9	6.2	15.9	0.8	0.8	0.5

passive strategies (which are independent of human behaviour and make the environment safe) than by active strategies (behaviour modification e.g. drive carefully). Strategies that have been successful in developed countries need to be adapted for implementation in developing countries, taking into account the local political and sociocultural milieu.

Some Contributing Factors for Road Traffic Injuries

Motorcyclists

Motorcyclists constituted 58% of road fatalities in 1995. (3). Between 1986 and 1995, the incidence of motorcycle fatalities per 100,000 population increased from 10.2 to 16.7. About two thirds (65.5%) of victims were below the age of 30 years. In 1995, head and "multiple" injuries were observed in 36 % and 43% of victims of motorcycle fatalities respectively. Since "multiple" injuries include head injuries, the most important contributing factor in motorcycle fatalities are head injuries. Motorcycle helmets have been shown to be effective in preventing head injuries to motorcyclists in the event of a crash (6). Helmet use in motorcyclists is mandatory by law in Malaysia. Helmets that are worn should be of certified quality and should be strapped correctly. If helmets are not worn properly, they are likely to dislodge in the event of a crash and protection to the head is lost. Use of full face helmets reduces chances of facial and mandibular injuries.

Bicyclists

Bicyclists constituted 5% of road fatalities in 1995. Head and "multiple" injuries were observed in 57% and 33% of bicycle fatalities respectively. Head injuries are the single most important contributing factor for bicycle fatalities since multiple injuries included head injuries. Bicycle helmet use has been shown to be the most important strategy for the prevention of bicycle related head injuries (7).

Pedestrians

Pedestrians constituted 12 % of road fatalities in 1995 and road crossing behaviour was associated with 62% of all pedestrian fatalities. Speed of the vehicle at impact is the single most important determinant of severity of pedestrian injuries (8). The higher the speed at impact the higher the proportion of fatalities and victims with severe injuries. Measures to limit speeding ("traffic calming") and proper use of pedestrian facilities such as overhead bridges and traffic lights help prevent pedestrian fatalities and injuries. (9)

Vehicle Occupants

This group constituted 15% of road fatalities in 1995

(3). Air bags, occupant restraints such as seat belts and child restraints, and side impact protection systems have all been shown to be prevent injuries to occupants in the event of a crash (10).

Other risk factors

Alcohol use and excessive speeding are examples of other risk factors which need to be studied further in Malaysia. Speeding is particularly risky since the energy which dissipates in the event of a crash and causes harm is directly proportional to the square of the velocity of the vehicle

Future Scenario

With rapid economic growth in Malaysia, the number of new vehicles on the road (especially motorcycles and cars), new roads and highways can be expected to increase. A mathematical model has been developed to forecast the number of road traffic deaths and crashes in Malaysia. *This computer generated model is a log linear model and was developed at the Road Safety Research Centre, Universiti Pertanian Malaysia based on the trends for the last two decades. The equations for predicting the number of road crashes and deaths for a given year are as follows:*

$$\text{Number of Road deaths} = 2289(e^{0.0007 \text{ Vehicle} \times \text{Population} \times \text{Road}}) (e^{0.2073 \text{ Data system}})$$

$$\text{Number of Road crashes} = 43478 (e^{0.00011 \text{ Vehicle} \times \text{Population} \times \text{Road}}) (e^{0.2447 \text{ Data system}})$$

Data system factor is 1 for Peninsular Malaysia and 2 for East Malaysia

Vehicle means the estimated total number of vehicles in the year expressed in millions

Population means the estimated total number of people expressed in millions

Road means the estimated length total of roads expressed in thousands of kilometres

The parameters for the year 2000 when compared to the year 1994, assuming present trends and measures, are given in the Table I.

The Cabinet Committee on Road Safety with the secretariat in the Ministry of Transport has set a target of reduction in the road toll by 30% by the year 2000. The Road Safety Council is a registered society consisting of all relevant government and non governmental organisations. The Ministry of Health has set up an Injury Control Unit in the division of Non Communicable Diseases and is in the process of improving and expanding its emergency services so that injuries are minimised and prevented in the post crash

phase. The Ministry has planned Injury Prevention programs for implementation in health centres. It is also planning to carry out a media campaign on "Injury Prevention" under its Healthy Lifestyle Program. Efforts at preventing road crashes and injuries must be further enhanced to prevent unnecessary loss of lives and disability. Increased funding for education of public and target groups, research, and training of professionals needs to be allocated. The health sector needs to play a bigger role in road safety through research and education of target groups. The universities and nongovernmental organisations need to share a vision with the government to work towards a Safe and Healthy society as we march towards 2020. We need to act now before more productive members of society are killed or crippled.

Table I. Predicted Road Transportation and Safety Indicators for the year 2000. Compared to 1994 *

Parameter	Year 2000	Year 1994
Population (millions)	23	19
Vehicle number (millions)	10	6
Road length (1000 km)	72	60
Number of road crashes	352,342	148,801
Number of road deaths	9127	5159
Incidence of road deaths/ 100,000 population	39	26

* Based on current trends and measures

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