

Research Article

Motor Vehicle Accidents: Analysis of Casualty Department Data, St. Luke's Hospital, Malta.

Maurice N. Cauchi

Department of Pathology, University of Malta Medical School, Guardamangia.

Summary: Motor vehicle accidents (MVAs) referred to St. Luke's Hospital Casualty Department were analysed. There were 616 MVAs referred to hospital during the year, an incidence of 170 per 100,000 of the population. There were 3 accident peaks. The majority (55%) involved young persons under the age of 30 years. The risk of hospitalisation was highest for males in the 20-29 age group (480/100,000). Early one third required hospitalisation for more serious injuries. This analysis emphasises the need for urgent measures to be taken to reduce the rate of MVAs and associated morbidity.

Keywords: motor vehicle accidents, St. Luke's Hospital, Emergency admissions

The number of motor vehicle accidents is increasing at an alarming rate. This has resulted from a number of factors. In Malta there is currently one car for every two residents (see Brockdorff 1995). Moreover, Maltese drivers have become more mobile, using their cars more frequently and younger in age as a result of the increasing purchasing power of the individual.

Studies relating to the incidence and pattern of car accidents in Malta are not readily available (see Canilloni 1969). In this study, a detailed analysis of MVA casualties admitted to the Casualty Department of St. Luke's Hospital over a period of one year (1994) was carried out with a view to determine patterns which were significantly related to increased traffic accidents.

Materials and Methods

The registers of the Casualty Department, St. Luke's Hospital, were examined for the year 1994. The following information was obtained.

Age, sex, place of residence, date and time of accident, and outcome (whether discharged or transferred to a hospital ward). Data was stored on a data-base and analysed using a statistical analysis package (Microsoft's Statgraphics Plus). Risk of admission to SLH for injury from MVAs was defined as:

$$\frac{\text{Number of persons admitted during a defined time}}{\text{Number of persons in that age, sex bracket in the Maltese population}}$$

Results

The number of injuries resulting from motor vehicle accidents admitted to St. Luke's Hospital (MVAs) per month varied from a low of 21 in May to a high of 97 in July (Table 1, Figure 1). As expected, there is a considerable male preponderance, with male:female ratios ranging from 1.4 to 3.2. There does not seem to be a seasonal distribution in this ratio.

	Total	Male	Female	Ratio M/F
Jan	37	26	11	2.36
Feb	45	29	16	1.81
Mar	38	22	16	1.37
Apr	34	24	10	2.40
May	21	16	5	3.20
Jun	70	48	21	2.28
Jul	97	62	32	1.94
Aug	43	26	15	1.65
Sep	44	26	16	1.69
Oct	34	20	13	1.70
Nov	42	28	14	2.00
Dec	61	41	19	2.16

Table 1: Motor vehicle injury admission to SLH by month and sex 1994.

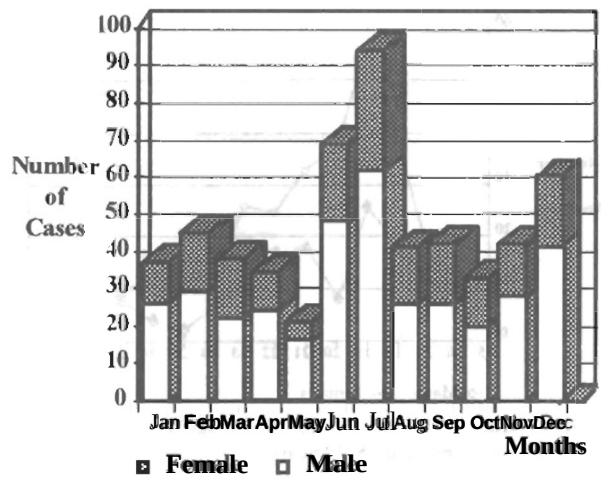


Figure 1: Monthly variation in the number of admissions to SLH casualty department.

There was a preponderance of accidents in the early hours of the morning. In males, the period from midnight till 4.00 am accounted for 28.5% of all accidents. There was a second peak during late

morning and another around 6 pm. In females, the periods between 4 and 6 pm accounted for the highest relative proportion of accidents (Figure 2, Table 2).

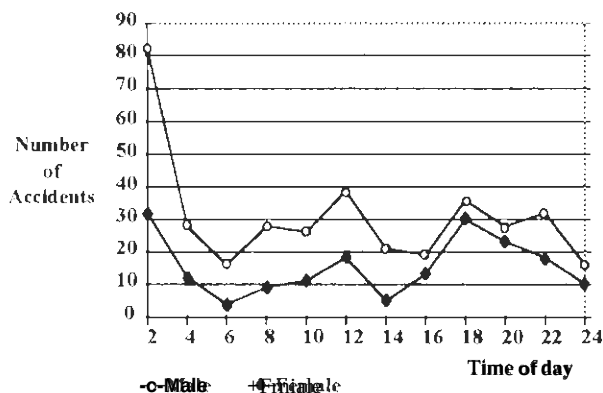


Figure 2. Variation in the number of admissions to SLH by time of day. Note the prominent early morning peak affecting mainly male individuals. Other peaks occur at around mid-day and around 6 p.m.

Time	Males		Females		Total		M/F
	No.	%	No.	%	No.	%	
<4.00hrs	113	28.5	54	25.3	167	27.6	2.09
4.00 -< 8.00hrs	46	11.6	14	6.6	63	9.8	3.29
8.00 -<12.00hrs	68	17.2	38	17.8	106	17.4	1.79
12.00 -<16.00hrs	45	11.4	21	9.8	66	10.8	2.14
16.00 -<20.00hrs	73	18.4	56	26.4	129	21.2	1.30
20.00 -<24.00hrs	51	12.9	30	14.1	81	13.3	1.7

Table 2: Number of persons hospitalised following MVAs, by time of occurrence.

The majority of accidents involved young persons under the age of 30 - in fact, 64% of injuries involved persons in this age group, with a sharp drop after the age of 30 years (Figure 3, Table 3).

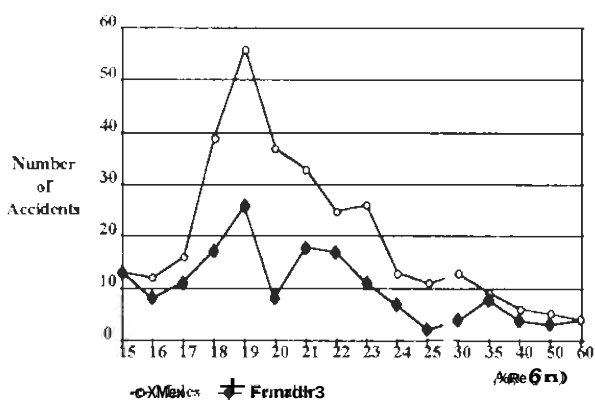


Figure 3: variation in admission to SLH by age and sex. Note the sharp peak for males aged 18-20 years.

There were 185 MVAs involving persons under the age of 20 years (33%), and 171 between the age of 20 and 30 years (23.4%). For the 20-29 age group, the risk of hospitalisation was 480/100,000 in males and 199/100,000 in females and was only slightly less for the 10-19 age group (373 and 181 respectively).

There were significant variations in the incidence of hospitalisation rates between the days of the week, with Sundays showing the highest incidence (21%) (Table 4)

Age (Yrs)	MVA's		Maltese Population		Risk per 100,000	
	M	F	M	F	M	F
0-9	13	16	27817	26502	47	60
10-19	107	49	28708	27086	373	181
20-29	123	48	25601	24112	480	199
30-39	59	32	28981	28102	203	114
40-49	37	23	27471	27736	134	83
50-59	17	11	16477	18669	103	59
>60	27	17	23507	30502	115	56
TOTAL	383	175	178560	182709	2.314	9%

Table 3: MVAs: risk of Hospitalisation, by age and sex.

	Injuries	
	Number	Per cent
Monday	62	11.3
Tuesday	55	10.1
Wednesday	64	11.7
Thursday	90	16.5
Friday	80	14.2
Saturday	81	14.1
Sunday	113	20.9

Table 4: Variation in number of injuries, by day of week.

A measure of the degree of severity of the MVA may be obtained from an analysis of the discharge rates after attending the Casualty Department: obviously, those transferred to one of the hospital wards would account for the more severe cases. Table 5 shows that nearly 29% of all MVAs were referred. The proportion of males was slightly higher than that for females, but this was not statistically significant.

	Males	Females	Total
Discharged	251	147	404
Referred	104	49	153
Total	355	196	551
% Referral	29.3	25.0	27.8

Table 5: Proportion of MVA patients referred for further investigations and/or treatment (Note: Relative risk = 1.24, SE(RR) = 1.22, 95% confidence interval for corrected RR = 0.38 - 1.84, CI for equal risk = 0.96, N.S.).

Table 6 gives an analysis by area of residence, for localities where the total number of MVAs was 10 or more. When expressed as a proportion of the total

TOWN	MALES	FEMALES	TOTAL	% EXPECTED	POPULATION
FLORIANA	10	4	14	4.86	5 2883
MASCALA	10	5	10	3.95	7 3799
ST. JULIANS	16	8	24	3.42	12 7012
SANTA LUCIA	8	4	12	3.34	6 3594
MSIDA	12	10	22	3.21	12 6854
ST. PAULS BAY	11	5	18	3.00	10 6001
ZEBBUG	21	3	24	2.34	18 10248
B'KARA	31	18	50	2.33	37 21456
GZIRA	12	6	18	2.24	14 8032
SLIEMA	12	11	25	1.84	23 13567
ATTARD	11	3	14	1.79	13 7799
TARXEN	8	5	13	1.75	13 7417
ZABBAR	16	7	23	1.69	23 13622
SAN GWANN	12	6	18	1.66	14 8032
HAMRUN	5	12	17	1.46	20 11653
ZURRIEQ	9	3	12	1.41	15 8518
MOSTA	11	9	21	1.36	26 15401
QORMI	17	7	24	1.34	31 17958
RABAT	9	7	16	1.27	22 12613
ZEJTUN	8	6	14	1.23	10 11411
PAOLA	9	2	11	1.15	16 9522

Table 6: Hospitalisation following MVAs: by place of residence

population residing in the particular locality, it is seen that certain areas of residence are associated with a greater than expected incidence of MVAs. For instance, Floriana, Marsascala, St. Julians, Santa Lucia, Msida and St. Pauls Bay (Bugibba) were associated with a MVA rate of more than 3 per 1000 population, whereas at the other end of the scale, Paola, Rabat, Qormi, Mosta, Zejtun and Hamrun had less than 1.5 per 1000 ($X^2 = 64.5$; $P < .001$).

Discussion

This study represents an analysis of motor vehicle accidents presented at SIH during a period of one year. There were 616 MVAs treated during this year, representing 170 per 100,000 population. It is important to bear in mind that this represents only a proportion of MVAs and does not include the considerable number of minor accidents that do not require hospitalisation.

It is of interest to note that while in June and July, a saw peak MVA rates, August was a relatively quiet month (with 45 MVA incidents, less than the number in February). Thus the distinction between the "busy" summer months and the rest of the year is not so clear-cut. The reasons for this low incidence in this relatively busy month are not clear, and could be due to random variation from year to year. Analysis over a number of years would be required before an analysable pattern can emerge.

The time distribution of MVAs calls for comment. There were three distinct peaks seen in the rate of accidents, namely (a) early hours of the morning, (b) around mid-day, and (c) from 4-7 pm. While the daytime accidents might be correlated with the increase in motor traffic on the roads, the early morning peak is more likely to be associated with a young age group.

Possible factors accounting for this unnecessary loss of life include the following:

- the marked tendency for Maltese youths to indulge in late night entertainment, particularly on a weekend, and, in the summer months, throughout the week.
- the increased tendency to drink, which is now being offered in bulk (Discos clients are being offered the option of paying a once only fee of £10.00 and drink all they can).
- increased availability of motor cars for younger age group drivers. Increased affluence has been a major factor in this phenomenon.

In fact, one of the most obvious findings in this study in comparison with the study carried out by Camilleri relating to traffic accidents in 1967 is the presence of the early morning peak of accidents which was non-existent at that time.

The day-to-day variation was significant, with lowest incidence during Monday-Wednesday and increasing for the rest of the week with a peak on Sunday (which includes the Saturday night / Sunday morning MVAs).

Whether there exists an accident-prone personality is difficult to prove. A recent study from Finland (Fintuivi et al, 1989) has shown that young male persons involved in traffic accidents are more likely to show impassivity, adventurism, naïveté, excessive trustfulness, and depression - factors relating to the control of emotions.

It is to be noted that wherever statistics over a long period of time have been analysed, the conclusion is confirmed that there is a tendency for accident death rates to increase over all ages, but the most striking increase is likely to affect youths aged 15-24 years of age (Millar & Last, 1988). These findings have been confirmed in Malta in a recent study (Gala, 1992). Any preventative aspects must take this into consideration, and special effort should be made to investigate the factors that could possibly be responsible for the escalation of this specific type of MVA.

The value of wearing seat belts in preventing serious injury has been emphasised again in a number of studies. For instance, Orsay et al (1988) conclude that "safety belt wearers had a 60.1% reduction in severity of injury, a 64.6% decrease in hospital admissions, and a 66.3% decline in hospital charges", emphasising the increased cost of medical care required for non seat-belt wearers.

The higher than expected incidence of MVAs associated with certain localities is of interest. Residents at Floriana, Msida, St. Julians, Santa Lucia, Msida and St. Pauls Bay (Bugibba) are 2-3 times more likely to be involved in MVAs than residents of Paola, Zejtun, Rabat, Qormi, Zurrieq or Hamrun (Table 6). It is to be emphasised that these are residential addresses and not accident localities, and therefore do not

necessarily relate to local road or traffic conditions. although it is reasonable to argue that residents of high density traffic areas are more likely to be involved in car accidents than those residing in more rural areas. More study would be required to confirm these findings and to ferret out those factors associated with this increased accident rate.

While this study is restricted to only one year's W.A.S. the pattern of accidents found is likely to be repeated. Efforts to reduce the number of W.A.S. must start with an analysis of the factors that lead to these accidents. While it was not the aim of this study to tease out these factors, serious efforts must be made by the relevant authorities to ensure that the multiple factors involved in car accidents as highlighted in the daily press (see eg Cauchi M, N 1995) are analysed and dealt with.

References

Brockdorff PV (1995) Facts, Figures, and Myths on

Malta. *The Sunday Times*, February 12, 6.
 Cauchi MN (1995) Road Carriage Need for Action. *The Sunday Times*, March 5, 39.
 Camilleri W (1969) Traffic Injuries in Malta - some considerations and suggestions. *The St Luke's Hospital Gazette*, iv, 19-27.
 Galea G (1992) A Young man's Death: An Analysis of Premature Mortality in Malta. University of Malta.
 Hilakivi J, Veilanti J, Asplund P, Siniwo J, Laitinen L, Koskenvuo K (1989) A sixteen factor model for predicting automobile driving accidents of young drivers. *Accid Anal Prev* 21, 4, 13-18.
 Millar WJ and Last JAD (1988) Motor vehicle accident mortality in Canada 1971-1984. *J. Prev. Med.* 4(4) 220-230.
 Orsay EM, Turnbull FL, Dunne M, Barrett JA, Langenberg P and Orsay GP (1988) Prospective study of the effect of safety belts on morbidity and health care costs in motor vehicle accidents. *J.A.M.A.* 260, 3598-3603.



LÖWENBRÄU

Your favourite Lager... The better Lager

