EPIDEMIOLOGY OF TRAFFIC ACCIDENTS IN TEHERAN*
I. EVENT: THE ACCIDENT

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ABSTRACT

A total of 38,300 traffic collisions have occurred in Teheran, the capital of Iran during 1973. 5,655 of these collisions resulting in 6,700 injuries and 560 deaths are selected and discussed. There has been no difference between the accident rates in working and holidays. Winter has had the lowest rate, and accidents have been in direct relationship with the crowdedness and heavy traffic periods. Ninety-eight per cent of the accidents have been caused by either the drivers or the pedestrians' negligence. These and other findings are discussed.

INTRODUCTION

Traffic accidents have become an integral part of modern living and the fatalistic attitude of the majority of people in various parts of the world have been quite instrumental in linking accidents with such factors as "fate", "chance" or "the act of God". Things are not much different in Iran, and the four million citizens of Teheran, the capital of Iran, with about one million motor vehicles of various types and shapes, have accepted the monumental traffic jams, remarkable air pollution, and traffic accidents of various forms as an integral part of living in the city.

Epidemiological approach to traffic accidents have provided a logical basis for the prevention of accidents and its outcome (1, 2). The present study, first of its kind in Iran, was planned and conducted only to show the various characteristics of the traffic accidents in Teheran, and to provide a base-line for future in-depth works.

MATERIAL AND METHOD

All the records of traffic accidents in 1973 (actually from 21 March 1973 to 21 March 1974 corresponding with the Iranian Imperial year of 2532) which were reported to the Bureau of Traffic, the Municipality of Teheran, were collected.

"Accident" is defined here as the collision of a moving motor vehicle with any object, moving or stationary, resulting in injury or death. Thus those collisions with no casualty are not included.

"Teheran" refers to the city limit under the jurisdiction of the municipality of Teheran.

RESULTS

Altogether, 38,300 collisions (104.9 per day) were reported of which 5,655 (14.76%) were included in this study. These accidents have caused 6,700 injuries and 560 deaths in a 12 months period.

Table 1 shows the monthly and seasonal distribution with a higher rate in summer and significantly low rate in winter. The daily distribution shows no significant difference between the working and the holidays (Table 2). The time distribution of the accidents by hour, using a three hours moving average method, is shown in Fig. 1. As is shown, accidents increase to a peak at about 11 a.m. and remain above the average till about 5 p.m. Such timing corresponds with the heavy traffic. However, the "deadly accidents", those resulting in death on the road, peak at 6 a.m. Other characteristics of the accidents are shown in Table 3.

DISCUSSION

This is a retrospective study of the files and like any such study

suffers from incompleteness and inaccuracies. However, since the scope of this paper is limited to the accidents with casualties the records may be more complete. The reason for such selection is their comprehensive coverage because they need judicial sanction and cannot be settled between the drivers.

The seasonal variation of the accidents shows minor fluctuations in the spring, summer, and fall. However, the winter accident rate is significantly lower (P 0.01). This might be due to the greater caution practiced during the ice months of winter in Teheran. Similar seasonal variations have been reported from Sweden too[3].

The number of accidents does not show a significant variation in different days of the week and holidays. No reason could be identified for such phenomena which is clearly in contradiction with other reports (4, 5, 6) from various parts of the world.

To show the time distribution, a 3 hours moving average method is employed. This method helps to smooth the curve, and since the average time lapse between the occurrence of the accident and arrival of the traffic police has been 70 minutes, then the curve becomes more realistic. The general consensus is that the number of accidents are in direct and positive relationship to the crowdedness. Other researchers have also shown a similar phenomena, but the peak varies during the day (4, 5, 7). The low severity of the accidents, the average of 1.3 casualties per accident (Table 3), is also another clue to their relationship with crowdedness which prevents fast movement. However, the deadly accidents peak at 6 a.m. in which time the streets are rather empty and fast movement is possible. The bimodality observed for deadly accidents may be due to the two various populations involved in these types of accidents, the drivers, and the pedestrians, but it needs verification in the future.

In more than 98% of the accidents the negligence either on the part of the drivers or the pedestrians have been mentioned as the main cause. Such statement might be open to criticism on its validity because firstly during time lapse between the occurrence of the accident and the arrival of the traffic police many things could be manipulated and secondly since a "guilty" individual must be identified in an accident for judicial purposes, then the judgment becomes more superfluous. Thirdly, accidents are usually multifactorial events and it may be improper to identify one single cause for them. However, since about 90% of the accidents reported here had occurred on "non-slippery" and properly maintained public roads under a clear and dry sky, it is very difficult to involve the environmental factors as an important element in the causation of these accidents.

Our conclusion is that although many other factors might have been important in causing these accidents, the negligence and lack of discipline in the drivers have been instrumental and clamping on them shall reduce the number of accidents drastically.

Table 1
Monthly and Seasonal Distribution of Traffic Accidents
Teheran, 1973

Month*	Number	Per cent	Season	Number	Per cent
April	438	7.75			
May	512	9.05			
June	567	10.03	Spring	1,517	26.83
July	541	9.57			
August	502	8.88			
September	549	9.71	Summer	1,592	28.50
October	556	9.83			
November	491	8.68			
December	451	7.98	Fall	1,498	26.49
January	317	5.61			
February	312	5.52			
March	367	6.49	Winter	996	17.61
Unknown	52	.92	—	—	—
Total	5,655	100.0		5,655	100.0
Average	471	8.33		1,413.8	25.00

* Iranian months which correspond to Christian months start 10 days
earlier.

Table 2
Distribution of Traffic Accidents by Weekday, Working Day
and Holidays*
Teheran, 1973

| Day	Number	Per day	Per cent
Saturday	815	15.57	14.41
Sunday	841	16.17	14.87
Monday	788	15.15	13.93
Tuesday	754	14.50	13.33
Wednesday	807	15.52	14.27
Thursday	810	15.58	14.32
Friday	800	15.38	14.15
Unknown	40	—	.71
Total	5,655	15.49	100.0
Working days	4,648	15.55	82.19
Holidays	967	14.65	17.10

* Thursdays and Fridays are weekends; total number of official
holidays and weekends, 66 days.

Table 3
Some Important Characteristics of Traffic Accidents
Teheran, 1973

Total Accidents	5,655
Severity	
Accidents with one person injured	84.1%
Average casualty	1.3 person
Type of collision	
With another car	59.5%
With pedestrian	31.9%
Cause of collision	
Driver's negligence *	87.3%
Pedestrian's negligence *	11.1%
Locality of collision	
Crossroads	41.7%
Road condition	
Dry and non-slippery	89.7%
Type of Road	
Black top	97.4%

* As determined by traffic police.

FIG.1
THE TIME DISTRIBUTION OF ACCIDENTS BY 3 HOURS
MOVING AVERAGE – TEHERAN 1973

----- DEADLY ACCIDENTS (73)
——— TOTAL ACCIDENTS (5655)
——— AVERAGE
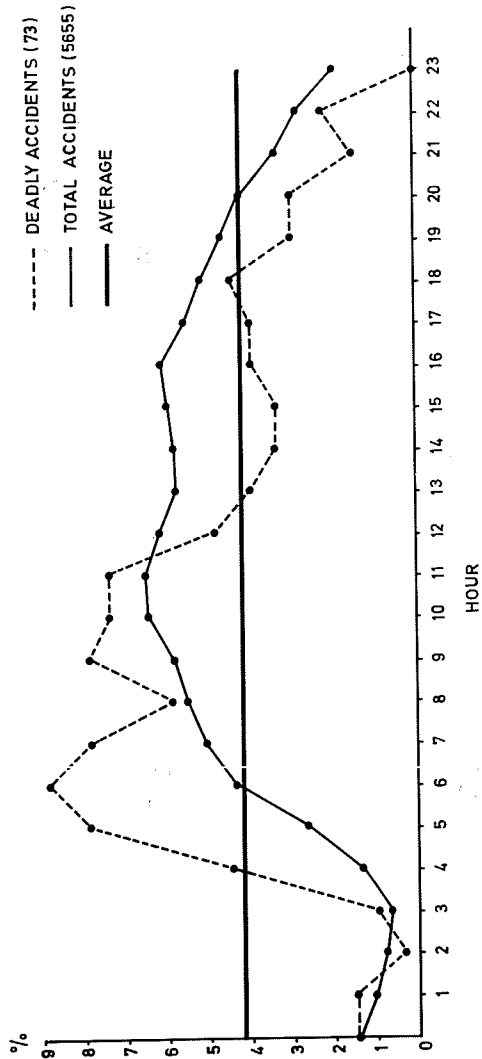
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