An Epidemiological Approach To Traffic Safety

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ONCE THE SPECIFIC CAUSES of many of the acute infectious diseases became known, it was not difficult to develop effective programs to control them. We have been far less successful in controlling accidents and the chronic degenerative diseases. The principal reason for this failure has been a lack of knowledge concerning their causes.

Foremost among those who forged the programs that brought so many of the infectious diseases under control, and in some instances eradicated them, were epidemiologists. It is surprising that epidemiologists have not been given a more important part to play in finding out the real underlying basic reasons why traffic accidents occur, what kind of people have them, and what the precipitating factors are. It is reasonable to expect that any further significant decrease in morbidity and mortality rates from traffic accidents cannot be brought about until more is known about their causes.

The success of enforcement agencies in lowering mileage death rates is truly remarkable in the light of current ignorance concerning human factors in accident causation and accident proneness. This success alone merits the retention of traffic accident control programs in the hands of law enforcement agencies. However, it may be pertinent to note at this point that the position of epidemiologist seldom is found on a police department or motor vehicle bureau staffing chart.

If the conduct of epidemiological studies is a prerequisite for developing better methods of preventing traffic injuries and deaths, police agencies can benefit from the cooperation of other agencies. The most likely place to enlist that cooperation is among that group of agencies that normally employ epidemiologists. Foremost among these are State and local health departments, universities, and foundations.

This type of epidemiological cooperation may well be the support needed to develop traffic accident control programs based on facts instead of on only partially proved hypotheses.

The Human Factor

Fractionized public services may present a barrier before epidemiologists can be assigned to work on the accident prevention problem along with investigations carried on by police and motor vehicle bureaus. This barrier will have to be removed before new light can be thrown on this old problem. If this can be overcome, the valuable work already being performed by police and motor vehicle bureaus may develop into the broad and comprehensive investigations desired.

One important reason why an epidemiological approach to traffic safety is indicated is that most traffic authorities agree that traffic accidents, in the vast majority of cases, are caused not by automobiles but by drivers and pedestrians—in other words, by people.

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In 1952, according to data published by the National Safety Council, 94 percent of the cars involved in fatal accidents had no reported unsafe conditions at the time they were involved in a fatal traffic accident. The drivers were not so guiltless—61 percent were reported to be violating a traffic rule or regulation at the time of the accident.

Does anyone really know why drivers violate traffic laws and regulations; why drivers at certain times drive safely and at other times cast caution to the wind; or whether unsafe driving is compulsive or willful? What amount of unsafe driving is due to lack of driving skill; what amount to physical, mental, or emotional deficiencies?

Epidemiological studies are needed to answer these formidable questions. It is difficult to comprehend how a comprehensive traffic accident program can be devised until these questions are answered.

What It Would Cost

For the sake of specificity, the following estimate of the cost of an epidemiological study is presented. The data upon which the estimate is based can be found in the National Safety Council publication, Accident Facts—1953.

An average State having 3 million residents could be expected to experience about 730 traffic deaths and about 26,000 traffic injuries a year. One trained field investigator working under the supervision of an epidemiologist could reasonably be expected to conduct an adequate investigation of about 220 traffic accidents a year.

An epidemiological investigation would not necessarily have to be instigated at the scene of the accident. It probably would extend over a period of weeks, depending on the availability of those involved in the accident and those who might have played a part in developing an accident proneness on the part of the driver.

The difficulty of obtaining funds to support a new program would limit the size of the study to an investigation of all of the 730 traffic deaths, and only to a 5-percent sample (1,300) of the 26,000 traffic injuries. The minimum full-time staff for a statewide study of this size would require at least 9 field investigators, 1 biostatistician, and 1 clerk. The services of an epidemiologist would have to be obtained, at least part time, from any agency willing to cooperate in the study.

Fortunately, the cost of a small epidemiological study would not be exorbitant. One could be administered for about $60,000 a year. When this amount of money is compared with the amounts that have been spent on epidemiological studies of diseases that have taken far fewer lives than have traffic accidents, the amount seems trivial.

If a State health department undertook the survey, the salaries of some or all of the nine field investigators might be provided locally. This would greatly decrease the cost of the study to the State health department.

Only by a study of this type can we make sure that the surmises on which most of our control programs are being built are valid. Both British and American research workers indicate that about 80 percent of traffic accidents are caused by approximately 20 percent of the driving population.

A Moral Responsibility

If the real causes of traffic accidents were known, public administrators and legislators would be able to take any one of a number of remedial measures that repeatedly have been suggested from time to time. If it could be proved that physical or mental defects or emotional instability were factors which caused a significant number of traffic accidents, legislators would have a moral responsibility to correct the situation by requiring an annual physical examination of all drivers and, where indicated, a psychiatric evaluation.

In many States, cars are now inspected annually. Some States require semiannual inspections. If drivers and not cars are the cause of most traffic accidents, why do we insist on inspecting cars, but not the drivers?

If a lack of driving skill was found to be an important cause of traffic accidents, "behind-the-wheel" driver training courses could be required of all applicants for driving licenses before licenses were issued. It has been shown that high school students who have had "behind-the-wheel" driver training courses become

involved in 50 percent fewer fatal motor vehicle accidents than high school students who do not receive this type of training.

A lot of lives are lost each year, it would seem, by this failure to exploit fully a reasonably well-validated method of decreasing the number of traffic accidents. If it could be proved by adequate investigation that it is the human factor in high speeds that is an important cause of highway accidents, red light "visual" governors could be required on all cars. The blinking on and off of the governor's red light when speeds in excess of 60 miles an hour were attained might constitute prima facie evidence of reckless driving. Even the New Jersey Turnpike Authority has had to enforce a maximum speed limit of 60 miles an hour on the turnpike, largely as the result of an empirical decision.

By continued and extensive research, automobile manufacturers have built a high degree of safety, as well as speed, into their cars. Highway engineers and road builders have made highways safer to traverse at higher speeds.

Police agencies have been tireless and only somewhat successful in their efforts to curb speeding and reckless driving. They have been sorely handicapped by not having sufficient funds to employ all the enforcement officers they need. Unfortunately, the provision of enough State and local policemen to enforce existing traffic laws rigidly and consistently on every highway and byway in the United States would bankrupt the Nation. Even now, as high as 30 percent of the police force in many cities is assigned to traffic duty.

The reduction in the number of deaths per registered vehicle from 40 deaths per 10,000 registered vehicles in 1910 to 8 deaths in 1950 is a tribute to the continuous three-pronged program of education, engineering, and enforcement that has been conducted by police agencies, automobile associations, highway engineers, and the National Safety Council.

The mileage death rates have dropped in a similar manner, with a resultant saving of many lives. If the mileage death rate of 1937 had prevailed in 1950, there would have been 67,000 traffic deaths instead of 35,000 in the latter year. Unfortunately, the number of cars on the road increases each year, and the increasing number of miles being traveled cancels out the slow but steady decline in mileage death rates. That is why the annual traffic death toll has hovered for years between 30,000 and 40,000 deaths a year—an average of about 100 deaths each day.

That there are factors that can be brought into play to make driving safer and to teach drivers to drive more safely is evidenced by the spread between the high mileage death rate in South Carolina and the low mileage death rate in Rhode Island. In South Carolina, a predominantly rural State, the rate in 1952 was 12.0 deaths per million miles traveled. In Rhode Island, the comparative rate was 3.0.

In the District of Columbia, where the 1952 mileage death rate was 2.2, three beneficent influences are at work—excellent roads, a rigidly enforced speed limit of 25 miles an hour, and annual car inspections. Although speed has been indicated, more often by circumstantial implication than not, as a major factor in fatal traffic accidents, much more has to be learned about speed in its relationship to various types of drivers and to driving conditions. But no one has produced any proof that these are the exclusive causes per se of the low mileage death rates in the District of Columbia, or what are the true causes of the low rate in Rhode Island or the high death rate in South Carolina.

Until a new and more scientific light is thrown on the scene, the picture will remain about the same—or become worse—for the United States Bureau of Public Roads has estimated that by 1960 there will be nearly twice as many miles of highway travel as there were in 1940, and there is every reason to believe that this predicted increase in annual mileage will continue indefinitely.

Failure to take aggressive action along the lines suggested is not due to disinterest on the part of law enforcement agencies. When a police official or a legislator attempts to initiate a new phase of traffic accident control, the action is bound to be challenged. The administrator or legislator is asked to produce facts to back up the suggested action. In most instances the facts just aren't there. Nor will the facts ever be available until adequate epidemiological studies are conducted.