Motor Vehicle Deaths: Failed Policy Analysis and Neglected Policy

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ABSTRACT

The author of a recent book inferred that the slowed decline in US vehicle fatality rates in the 1990s relative to other industrialized countries resulted from too much emphasis on vehicle factors. He claimed that Canada had the same vehicle mix but a lower fatality rate. Actually, US death rates by make and model applied to Canadian vehicle sales indicates that Canada’s death rate would be the same as the US if Canada had the same vehicle mix and annual miles driven. The US had much greater growth in sales of large SUVs and pickup trucks that are heavier and stiffer than passenger cars, contributing to excess deaths of other road users in collisions. They are also more unstable, contributing to excess deaths of their occupants in rollovers. Lack of policy regarding these vehicle characteristics is the primary reason for the attenuated decline in vehicular fatality rates.

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INTRODUCTION

In a recent book by a retired General Motors employee, Leonard Evans, trends in motor vehicle death rates in the US compared to other countries were used to infer a “Dramatic Failure of US Safety Policy” (1). The decline in US rates slowed in the 1990s compared to those of several other industrialized countries. As a result, the US no longer holds its historically leading position – the lowest rate. Evans’ assessment was confined to eyeballing the trends and assertion regarding the cause. He attributed the changed slope in US rates to personal injury lawyers who, he said, have an interest in focusing on vehicles to the neglect of programs to change driver behavior. He said that the emphasis on vehicle factors that resulted in the Motor Vehicle Safety Act of 1966 was the beginning of the problem and singled out the airbag controversy of the 1970s and 1980s as the
recent major culprit. The purpose of this paper is to correct his misstatements regarding the history of vehicle regulation in the US and to examine data that he ignored regarding vehicle mix that contributes to different vehicle death rates among countries.

Personal injury lawyers were not involved in the events that resulted in vehicle safety regulation in the US. A book co-edited by a physician and two social scientists (2), who had no interest in injury lawsuits, inspired the Motor Vehicle Act of 1966. The book emphasized that the energy in car crashes (and other injurious events) could be managed by product and environmental modifications to reduce injury severity. Based on that analysis, Senator Abraham Ribicoff began hearings on vehicle manufacturer responsibility to improve vehicle safety. When private detectives hired by General Motors were caught trying to entrap Ralph Nader in a scandal, and GM’s Chairman apologized in a Senate hearing, the issue gained wider public attention (3). Whether the Motor Vehicle Safety Act would have been enacted without that incident is problematic but it was a positive step to reduce vehicle fatalities.

The 1966 Act and subsequent amendments authorize the government to adopt “performance standards” rather than specific rules regarding how the vehicles are to be designed. For example, the steering mechanism must absorb a specific amount of energy in a crash test but the design to accomplish that goal is left to the manufacturer. The initial regulations substantially improved the crashworthiness of passenger cars and included crash avoidance standards such as reduced glare in driver’s eyes and standards for brakes. Trucks were exempted. The manufacturers subsequently improved crashworthiness of cars, possibly in response to publicized crash tests (4).

Evans says an “air bag mandate” in the US was imposed by Joan Claybrook (lawyer) in the Carter Administration, egged on by Ralph Nader (lawyer). In fact, the only air bag mandate was introduced by non lawyers Douglas Toms, head of the National Highway Traffic Safety Administration (NHTSA) and a former state motor vehicle administrator, and John Volpe, Secretary of Transportation and a former owner of a construction company, in the Nixon administration. Because their proposed airbag rule was not a performance standard as required by US law, the standard was later revised to require minimum forces on crash dummies in frontal impacts at
30 miles per hour, which is not an “air bag mandate”. Automakers chose to use air bags to meet the standard but were not compelled to do so if they had chosen to design the vehicles differently. The Reagan administration tried to overturn the standard but was overruled by the courts as a result of a lawsuit by insurance companies and others, not personal injury lawyers.

Evan’s assertions would ordinarily be dismissed as an uninformed, unscientific polemic but, in this case, the book has received widespread attention and was favorably reviewed in leading medical and other journals. The reviewer in the Journal of the American Medical Association called the chapter on US policy failure a “showstopper” and devoted most of the review to an uncritical repetition of Evans’ allegations regarding the history of vehicle regulation (5).

Evans failed to analyze available data on vehicle differences among countries. One prominent trend in US vehicle sales in the 1990s was the increase in heavy “sport utility vehicles” (SUVs) built on pickup truck frames. Most of the new SUVs built in the 1980s and 1990s are essentially trucks with the cargo area covered, the larger ones equipped with a second row of seats for passengers. Readers unfamiliar with these vehicles may access pictures by typing “SUV” in any internet search engine.

The governmental standards for crashworthiness and fuel economy of SUVs are the same as those of trucks. Evans mentioned a possible effect of SUVs but said they could not make a difference of more than “a few thousand” deaths per year, “up or down”. He did not mention the fact that pickup trucks also increased in sales. It has long been known that higher-weight vehicles contribute disproportionately to the deaths of occupants of other vehicles, as well as pedestrians and bicyclists (6). Most SUVs and pickup trucks have center of gravity too high relative to their width, which produces excessive vehicle rollover death rates (7). Stiff frames in certain SUVs, pickup trucks and vans are also a factor in increased risk to occupants of other vehicles (8).

**METHOD**

Using data from the countries that Evan’s claims superior in safety policy to the US, trends in the sales of trucks were examined to see if
those countries had a similar increase in truck use compared to the US (9). Evans gives special emphasis to the decline in Canadian vehicle death rates because, he claims, Canada has the same mix of vehicles and drivers as the US. The Canadian motor vehicle death rate per vehicles in use declined 63 percent from 1979 to 2002, similar to other industrialized countries, compared to a reduction of 46 percent in the US. The major separation in the vehicle fatality rates of the US and other countries occurred in the 1990s.

Canada does not keep records of the makes and models of vehicles in fatal crashes but the data from vehicle death rates for each make and model in the US can be applied to the same make-models in use in Canada to calculate an expected death rate, adjusted for average miles traveled per vehicle. The fatalities in the US by make and model of vehicle in the years 2001–2002 were obtained from the National Highway Traffic Safety Administration’s Fatal Analysis Reporting System. To obtain an estimate of the effect of given vehicles on all road users, the rate of all deaths in a fatal crash in which a given vehicle was involved were counted. Only 1991 and later models were included. In collisions of two or more vehicles, only the occupants who died in each vehicle were counted for that vehicle to avoid double counting. Vehicles in use in the US and Canada were estimated by tabulating the annual sales by make and model in each country during 1991–2002 and subtracting the number scrapped before 2002, using published data on vehicles remaining after a given number of years of use for cars and trucks separately in each country (10).

The following steps were undertaken to obtain an expected vehicle death rate for Canada:

1. Count the number of deaths of each make and model in use in the US and divide by the number in use during 2001–2002.
2. Multiply the death rate for each make and model in the US times the number of each make and model in use in Canada during the same period to obtain expected deaths for each make and model in Canada.
3. Sum the number of expected deaths across makes and models and divide the total by the total number of vehicles in use in Canada. Multiply the expected rate per 100,000 vehicles by the ratio of annual miles in Canada to annual miles in the US.
Although documentation of all the behavioral programs in both countries would be an impossible task, the extent of government funding was examined to give some clue to the issue of the extent to which US policy has neglected behavioral factors.

**RESULTS**

The trends in truck sales in eight industrialized countries are shown in Figure 1. In the US, trucks and SUVs were 25 percent of sales in 1991 and steadily increased to more than 40 percent of sales in 2002. None of the other countries experienced a parallel increase. In Japan, the percent of trucks sales declined substantially but the trend was relatively flat in most countries. Trends among other European countries mentioned by Evans (Denmark, Finland, Luxembourg and the Netherlands) were similar to those of their nearby neighbors shown here. The Canadian percentage started lower but rose similar to that of the US until 1998 and then declined. These trends led to substantial differences in vehicle mix among the countries.

Differences in types of vehicles in use in 2001–2002 between the US and Canada are shown in Table 1, based on examination of specific make-model sales from 1991 to 2002, discounted for scrapped vehicles. US drivers used proportionately larger cars that

![Figure 1](image-url)  
Percent truck sales.
have somewhat lower death rates than smaller cars while Canadian drivers disproportionately used vans – the vehicles with the lowest aggregate death rates. US drivers used proportionately more SUVs and pickup trucks. The higher total death rates of these vehicles are mainly the result of their higher involvement in deaths to road users other than their occupants. Motorcycles are also used more in the US. Even with deaths to motorcycle riders counted in the total rate of other vehicles that collided with motorcycles, the single-vehicle death rate of motorcycles is higher than the total death rate of the other classes of vehicles.

US drivers drove an average 12,655 miles in 2002 compared to 10,733 miles driven by Canadian drivers. Applying the US rates for each make-model to the numbers of vehicles of the same make-model in use in Canada and correcting for mileage differences results in an expected death rate in Canada of 15.9 per 100,000 vehicles compared to 18.9 per 100,000 in the US. That difference is exactly the difference in the total vehicle death rates between the countries in 2002.

**CONCLUSION**

Contrary to Evan’s assertion, the US and Canada did not have the same mix of vehicles. The difference in death rates between Canada and the US is predicted by the difference in vehicle mix and miles
driven between the two countries. The results suggest that if Canadian drivers had driven the same mix of vehicles the same miles per vehicle as US drivers, they would have the same total death involvement rate as US drivers. Also, trends in sales of more dangerous SUVs and pickup trucks in the US relative to other countries suggest that vehicle mix would account for much of the differences in death rates among those countries relative to the US as well.

There is no evidence for the claim that the differences between the US and Canada resulted from too little emphasis on behavioral factors in the US. Indeed, the US federal government spends large amounts on such programs. According to officials at Transport Canada, there is no Canadian federal government expenditure on behavior programs. In addition to the Motor Vehicle Safety Act in 1966, the US Congress enacted the Highway Safety Act that provides grants to the states for safety programs. Study of the early effects of such grants found that high school driver education expenditures had an adverse effect on state motor vehicle fatality rates but other programs had a favorable effect (11). Driver education is no longer federally funded. The grants more than doubled in the 1990s. From 1998 to 2002, the grants were incremented from $236.1 million to $556.8 million – targeted substantially toward alcohol abuse, seat-belt use and child restraint use. Of course, states in the US and Canadian provinces may fund programs as well but there certainly is not a paucity of funding for behavioral programs in the US, as Evans alleged.

Evan’s attack on vehicle regulation is odd given that little such regulation has occurred in almost a quarter century. The effect of vehicle stability on death rates has been known for more than 20 years but the federal government has issued no stability regulation. The government sponsored the noted study of aggressive designs of SUVs and pickup trucks but has issued no standards to reduce the death toll. Analysis of vehicle characteristics in relation to vehicle fatality rates of 1999–2002 models in use through 2004 indicates that those fatality rates would have been reduced by more than half if the manufacturers had adopted the crashworthiness, stability, and weight distribution per size of the vehicles that excelled on these characteristics (12). Thousands of people are dying on US roads because of neglect of policy on vehicle factors, not because of vehicle regulation.
REFERENCES