Motor Vehicle Fire Research Institute
Awarded Contracts

Title: An Analysis of Fire Occurrence and Rollover Rates in the Fatality Analysis Reporting System (FARS)

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Purpose:

The Fatality Analysis Reporting System (FARS) is one of the most important and frequently used data systems on traffic crash related deaths in the world. Initiated in 1975 by the National Highway Traffic Safety Administration (NHTSA), the FARS contains important information pertaining to fatal motor vehicle crashes that occur in the United States (US). FARS adheres to strict definitions of a fatal crash (e.g. death from the crash must occur within 30 days of the crash to be included in FARS; the crash must involve a motor vehicle in transport on a public roadway; etc.) and rules regarding coding of data. Therefore, FARS does not include information on certain fatal motor vehicle crashes that do not fit FARS definitions and rules. Based upon death certificate and other data sources, it has been estimated that motor vehicle related fatalities that occur on private property, result in a death more than 30 days after the crash, involve a death without a crash occurring (e.g. suffocation, fire) etc.(i.e. do not fit the FARS definition), may account for 1,000 to 2,000 more deaths annually than appear in FARS.

Recently, NHTSA released reports generated by Integrated Project Teams (IPTs) on high priority initiatives to address: Safety Belt Use, Impaired Driving, Rollover Mitigation and Vehicle Compatibility. An IPT report on Data Improvement (which includes FARS data) is expected soon.

Every data element in FARS is important for analysis purposes and it is imperative that data are as complete and as accurate as possible for these analyses to be useful. This is especially true for the following key data elements which are used very frequently in safety investigations and analyses: (1) fire occurrence, and (2) rollover occurrence.

For example, FARS data are used to determine the incidence of vehicle fires in fatal crashes and whether the fire caused the death of any occupant. The relative frequency of fires by year/make/model of the vehicle where the fire occurred is used to determine if there is a potential safety problem in the fuel tanks of specific vehicles. It is important for FARS Analysts to use every source of information available to assess whether a fire occurred and then to provide accurate information on the vehicle involved and the injuries sustained. For several reasons, there is good evidence that fire occurrence is underreported in FARS.

It is equally important to determine if a rollover occurred in the crash and to accurately record the vehicle identifying information and the injuries to occupants, including whether they were ejected or not from the vehicle. Vehicle rollovers cause an inordinate number of fatal injuries, so

it is important to obtain accurate information concerning their occurrence. There is also some evidence that fires occur more frequently in fatal rollover crashes.

"Unknown" and "Missing" data rates for the two key elements mentioned above (fire occurrence and rollover occurrence) are also known to be high in some States. Fire occurrence may be coded as "Unknown" or may be left blank ("Missing") frequently if a FARS Analyst has no information either way as to whether a fire occurred or not. In most States, if a fire occurred in close proximity to the crash or if it caused the death of a victim, it should appear in the police report somewhere. While quality control measures in FARS are state-of-the-art, human resources are limited and it is very difficult for Federal monitors to uncover all the reasons for incomplete or inaccurate data in these areas. There is an urgent need for a special quality control effort to improve reporting rates in these critical areas of FARS.

In order to initiate such an effort, PIRE will to perform the following tasks to provide important information on the reporting of fires and rollovers in FARS:

Task 1: Analyze Unknown Data Rates for Key FARS Elements

Examine reporting rates for the years 1975, 1980, 1985, 1990, 1995, 2000, 2001 and 2002 in the two selected data elements on a State-by-State basis compared to the rates in the Nation as a whole. While the 5-10 States with the highest number and rate of "Unknowns" in 2002 will be highlighted, it is also important to determine if any States had similarly high "Unknown" rates in the past and have corrected the problem. It is also important to determine if "Unknowns" or "Missing" data rates occur more frequently in any particular quarter of the year. So, these rates will be generated by quarter (1- Jan-Mar; 2- Apr-Jun; 3- Jul-Sep; 4- Oct-Dec). At a minimum, "Unknown" data rates will be generated from FARS for Fire Occurrence (for each vehicle, including as "Most Harmful Event") and Rollover (for each vehicle, including as "First Event" and "Subsequent Event").

Task 2: Determine Fire Occurrence and Rollover Rates

2.1 Determine fire occurrence rates from FARS in each State using FARS data for the last three available years (2000-2002). These rates will be calculated three ways: number of fire occurrences in FARS (1) per total number of vehicles in fatal crashes for that State in that year, (2) per 100,000 registered vehicles in that State for that year, and (3) per 100 million vehicle miles traveled in that State in that year.

2.2 Determine rollover occurrence rates from FARS in each State using FARS data for the last three available years (2000-2002). These rates will be calculated three ways: number of rollover occurrences in FARS (1) per total number of the same vehicle types (e.g. passenger car, van, pick-up truck, sport utility vehicle, etc.) in fatal crashes for that State in that year, (2) per 100,000 registered vehicles of that type in that State for that year, and (3) per 100 million vehicle miles traveled in that State in that year.

Task 3: Determine States with the Lowest Fire and Rollover Rates and the Reasons Why the Rates are Low

The 5-10 States with the lowest fire occurrence and rollover rates for 2000-2002 will be examined further to investigate whether underreporting of fires and rollovers in those States may be a factor in the low rate.

3.1 In consultation with NHTSA, PIRE will contact the FARS Analysts in these 5-10 low rate States to discuss high "Unknown" or "Missing" data rates (if that is the case), issues that may result in inaccurate data or underreported occurrences, and the reasons for them. PIRE will document the problems and issues brought out in the discussion sessions and classify the key data issues for each State. Classifications shall include, but are not limited to, issues such as data source problems, legal barriers in obtaining the desired data, administrative problems or policy issues, communication problems/issues, FARS definitions and data entry rules, or other.

3.2 Discuss with the FARS Analysts from the 5-10 low rate States the availability and use of such key records as death certificates, vehicle identification number (VIN), or vehicle registration files (especially for out-of-state vehicles).

3.3 Discuss the following issues with the FARS Analysts from the 5-10 low rate States:

- Definition of a motor vehicle crash death within 30 days of the crash
- Possible underreporting of vehicle fires, especially in rear-end collisions
- Crashes involving stationary vehicles off the roadway
- Various sources of information for vehicle fires or rollovers
- Use of FARS Analysts from other States to help with coding

3.4 Access newspaper records and articles that are readily available over the Internet to determine if fatal vehicle fires were reported in the news, but not in FARS, in the 5-10 States with the low rates. This information will be supplemented by newspaper searches already conducted by other sources. If any cases like this are detected, PIRE will attempt to find out why the case was not in FARS (e.g. did not fit FARS definition of fatal crash, etc.).

3.5 Contact other key officials in order to gain further insight on these problems, especially with regard to missing fire death information in FARS:

- Ken Rutland, FARS Program Manager, NHTSA
- Ken Hackman, FARS Training Contractor
- Other experts in the field with insights into reasons for underreporting FARS cases

Task 4: Reporting

Provide a brief report summarizing key findings from the analyses and make recommendations for improving fire and rollover data in FARS. The report will be submitted within one month of the completion of Tasks 1-3.