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An Assessment of the Reliability and Validity of the
Information on Vehicle Fires Contained in the
Fatal Accident Reporting System (FARS)

by

Lindsay I. Griffin, III

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Safety Division
Texas Transportation Institute
The Texas A&M University System
College Station, Texas 77843

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INTRODUCTION

Since 1975 the National Highway Traffic Safety Administration has, on an annual basis, managed the collection, processing, and storage of all fatal traffic crashes recorded in the United States. This annual census of fatal crashes is referred to as the Fatal Accident Reporting System (FARS).

The raw data for FARS are provided by the states and the District of Columbia and drawn (primarily) from information contained in individual police accident reports (PARs). Accordingly, the quality of the information in FARS is very much dependent upon the quality of the information contained in the original PARs.

Over the years, the FARS data base has been used to study the safety effects of many different vehicle characteristics and devices. A brief list of these characteristics and devices includes: air bags (Evans, 1990; Kahane, 1996), antilock brakes (Kahane, 1994), motorcycle helmets (Evans and Frick, 1987) safety belts (Evans and Frick, 1986; Evans, 1987; Evans, 1988), vehicle size (Kahane, 1997), and vehicle fires (Tessmer, 1994).

The objective of this report is to assess the reliability and validity of the FARS data base for purposes of studying fires in passenger cars and light trucks and suggest how the reliability and validity of the system might be improved.

In this report the reliability of the fire-related data in FARS is first assessed by examining the consistency with which the states and the District of Columbia report vehicle fires for passenger cars and light trucks. Then, for those vehicles that are reported to have experienced a fire, the consistency with which the states code fire (or explosion) as the "most harmful event" (MHE) for a crash-involved vehicle is examined. Finally, the reporting of fire-related data in FARS is assessed by comparing the FARS data to the injury information (i.e., N-codes) contained in Multiple Cause of Death (MCO) files, i.e., injury information obtained from death certificates.

All of the analyses in this report were carried out on data from calendar years 1987 through 1989. Although more recent FARS data were available for analysis, the most recently available MCO data available were from 1987-1989.

PROCEDURE

INPUT DATA

The input data for the analyses contained in this report consisted of 12 files: nine (9) Fatal Accident Reporting System (FARS) files produced by the National Highway Traffic Safety Administration (NHTSA) and supplied by the Bureau of Transportation Statistics (BTS) and three (3) Multiple Cause of Death (MCOD) files supplied by NHTSA. The MCOD data (i.e., death certificate data) provided by NHTSA were obtained from the National Center for Health Statistics for calendar years 1987 through 1989. NHTSA matched the death certificate information in the MCOD tile to specific FARS cases and added FARS case number (ST-CASE), vehicle number (VEH_NO), and person number (PER-NO) to the MCOD file.

The FARS files consisted of an accident file, a vehicle file, and a person file for each of three years (1987-1989). The three MCOD files were for the same three years (1987-1989).

The 12 input files used in the analyses contained herein are summarized in Table 1.

| Table 1: Summary of the 12 Input Files Used in the Current Study | | | |
|--|--------------------|------|---------|
| | File | Year | Cases |
| 1 | FARS Accident File | 1987 | 41,438 |
| 2 | Vehicle File | 1987 | 61,836 |
| 3 | Person File | 1987 | 111,457 |
| 4 | MCOD | 1987 | 43,501 |
| 5 | FARS Accident File | 1988 | 42,130 |
| 6 | Vehicle File | 1988 | 62,703 |
| 7 | Person File | 1988 | 112,958 |
| 8 | MCOD | 1988 | 44,791 |
| 9 | FARS Accident File | 1989 | 40,741 |
| 10 | Vehicle File | 1989 | 60,870 |
| 11 | Person File | 1989 | 109,866 |
| 1 2 | MCOD | 1989 | 43,291 |

FATAL ACCIDENT REPORTING SYSTEM (FARS) DATA

This report pertains only to passenger cars and light trucks that were involved in fatal crashes. Passenger cars and light trucks were defined by body type (BODY-TYP = 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 50, 51, 53, 54, 55, 56, 58, 59, 67, 68, 69, or 79). There were 147,253 vehicles meeting this definition, as shown in Table 2. Some 96,301 driver or passenger fatalities in known seat positions (SEAT-POS > 10 and SEAT_POS < 54) were recorded in these 147,253 vehicles.

| Body Type (BODY-TYP) | Frequency | Percent |
|---------------------------|-----------|---------|
| Convertible | 729 | 0.5 |
| 2dr Sedan/HT/Coupe | 54,153 | 36.8 |
| 3dr/2dr Hatchback | 3,896 | 2.6 |
| 4dr Sedan/HT | 37,124 | 25.2 |
| 5dr/4dr Hatchback | 1,000 | 0.7 |
| Station Wagon | 6,750 | 4.6 |
| Hatchback/# doors unk | 214 | 0.1 |
| Other auto | 11 | 0.0 |
| Unk auto type | 4,495 | 3.1 |
| Auto Pickup | 568 | 0.4 |
| Auto Pane! | 22 | 0.0 |
| Short Util/not Trk Based | 1,399 | 1.0 |
| Pickup | 29,831 | 20.3 |
| Pickup w/Slide-in Camper | 92 | 0.1 |
| Cab chassis Based | 305 | 0.2 |
| Truck Based Pane! | 13 | 0.0 |
| Truck Based SW | 647 | 0.4 |
| Truck Based Utility | 3,677 | 2.5 |
| Other Lt Conventional Trk | 46 | 0.0 |
| Unknown Lt Convent Trk | 1,130 | 0.8 |
| SW, Base Body Unknown | 5 | 0.0 |
| Utility, Base Body Unk | 47 | 0.0 |
| Unknown Light Truck | 195 | 0.1 |
| Unknown Trk Type | 904 | 0.6 |
| Total | 147,253 | 100.0 |

3,963 (2.69 percent) of the 147,253 vehicles in the data set were coded as having experienced a fire (FIRE_EXP) (“fire occurred in vehicle during accident”). The remaining 143,290 (97.31 percent) were coded as having not experienced a fire (“no fire”).

For 1,207 (30.46 percent) of the 3,963 vehicles that experienced a fire, “fire or explosion” was the most harmful event (M-HARM) for the occupants of that vehicle.’ For the remaining 2,756 vehicles that experienced fire (69.54 percent), “fire or explosion” was not the most harmful event.

MULTIPLE CAUSE OF DEATH (MCOB) DATA

The FARS data and MCOB data were merged by calendar year, accident case number (ST-CASE), vehicle number (VEH_NO), and person number (PER-NO). The primary purpose in merging the FARS and MCOB data was to determine the nature of the injuries sustained by the deceased in this study. For the 96,301 drivers and passengers who were fatally injured in passenger cars and light trucks, one or more “nature of injury codes” (N-codes) were available for 90,598 individuals (94.08 percent of the deceased). For the remaining 5,703 fatalities (5.92 percent), no nature of injury codes were available.²

-For each MCOB case (i.e., for each deceased individual in the MCOB data base) up to 14 injury codes (record axis codes) were recorded (REC_CD1 through REC_CD14). Most cases had only two, three, or four record axis codes, however, six of the 90,598 cases had entries for all 14 codes.

Record axis codes can represent nature of injury codes (N-codes) or some other code, typically “external cause of injury codes” (E-codes), depending upon the status of a flag or indicator variable. Thus for example, when R_FLAG1 equals 1, the code entered for REC_CD1 refers to an N-code; when R_FLAG1 equals 0, the code entered for REC_CD1 refers to some other code, most likely an E-code.

For purposes of this study, the full set of N-codes was further subset to define those injury codes that gave some indication that the deceased suffered fire-related or burn-related injuries. These N-codes are shown in Table 3. Included in this subset are all “burn codes” (940-949) as well as four codes indicative of the toxic effects of carbon monoxide (986) or some other gas, fume, or vapor (987, 987.8, and 987.9).

‘From the FARS 1988 Coding and Validation Manual:

Most harmful event is “the major event for this vehicle, even if different from the first harmful event (in the crash).”

“If this vehicle is involved in more than one event which causes fatality to its own occupants or to non-motorists, choose the event which causes the greatest number of fatalities to occupants of this vehicle or to non-motorists (not occupants of other vehicles).”

‘Nature of injury codes (N-codes) are defined in the ICD-9-CM, i.e., the “International Classification of Diseases, 9th Edition, Clinical Modification, Volume 1.”

Table 3: N-Codes that were Selected as Potential Indicators of Fire-Related Injuries and the Frequencies with which these N-Codes were Actually Used (ICD-9-CM)

| Freq | Code | Summary |
|-------------|--------------|---|
| | 940 | Burn confined to eye & adnexa |
| | 940.0 | Chemical burn of eyelids & periocular area |
| | 940.1 | Other burns of eyelids & periocular area |
| | 940.2 | Alkaline chemical burn of cornea & conjunctival sac |
| | 940.3 | Acid chemical burn of cornea & conjunctival sac |
| | 940.4 | Other burn of cornea & conjunctival sac |
| | 940.5 | Burn with resulting rupture & destruction of eyeball |
| | 940.9 | Unspecified burn of eye & adnexa |
| | 941 | Burn of face, head, & neck |
| 9 | 941.0 | Burn of face, head, & neck, unspecified degree |
| | 941.1 | Erythema due to burn [first degree] of face, head, & neck |
| | 941.2 | Blisters with epidermal loss due to burn [second degree] of face, head, & neck |
| 3 | 941.3 | Full-thickness skin loss due to burn [third degree NOS] of face, head, & neck |
| 2 | 941.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of face, head, & neck without mention of loss of a body part |
| | 941.5 | Deep necrosis of Underlying tissues due to burn [deep third degree] of face, head, & neck with loss of a body part |
| | 942 | Burn of trunk |
| 130 | 942.0 | Burn of trunk, unspecified degree |
| 1 | 942.1 | Erythema due to burn [first degree] of trunk |
| 4 | 942.2 | Blisters with epidermal loss due to burn [second degree] of trunk |
| 22 | 942.3 | Full-thickness skin loss due to burn [third degree NOS] of trunk |
| 15 | 942.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of trunk without mention of loss of body part |
| | 942.5 | Deep necrosis of Underlying tissues due to burn [deep third degree] of trunk with loss of a body part |
| | 943 | Burn of upper limb, except wrist & hand |
| 5 | 943.0 | Burn of upper limb, except wrist & hand, unspecified degree |
| | 943.1 | Erythema due to burn [first degree] of upper limb, except wrist & hand |
| 1 | 943.2 | Blisters with epidermal loss due to burn [second-degree] of upper limb, except wrist & hand |
| 2 | 943.3 | Full-thickness skin loss due to burn [third degree NOS] of upper limb, except wrist & hand |
| 3 | 943.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of upper limb, except wrist & hand, without mention of loss of a body part |
| | 943.5 | Deep necrosis of underlying tissues due to burn (deep third degree) of upper limb, except wrist & hand, with loss of a body part |
| | 944 | Burn of wrist(s) & hand(s) |
| 2 | 944.0 | Burn of wrist(s) & hand(s), unspecified degree |
| 1 | 944.1 | Erythema due to burn [first degree] of wrist(s) & hand(s) |
| | 944.2 | Blisters with epidermal loss due to burn [second degree] of wrist(s) & hand(s) |
| 1 | 944.3 | Full-thickness skin loss due to burn [third degree NOS] of wrist(s) & hand(s) |
| | 944.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of wrist(s) & hand(s), without mention of loss of a body part |
| | 944.5 | Deep necrosis of underlying tissues due to burn [deep third degree] of wrist(s) & hand(s), with loss of a body part |
| | 945 | Burn of lower limb(s) |
| 14 | 945.0 | Burn of lower limb(s), unspecified degree |
| | 945.1 | Erythema due to burn [first degree] of lower limb(s) |
| 4 | 945.2 | Blisters with epidermal loss due to burn [second degree] of lower limb(s) |
| 7 | 945.3 | Full-thickness skin loss due to burn [third degree NOS] of lower limb(s) |

Table 3 (continued): N-Codes that were Selected as Potential Indicators of Fire-Related Injuries and the Frequencies with which these N-Codes were Actually Used (ICD-9-CM)

| <u>Freq</u> | <u>Code</u> | <u>Summary</u> |
|-------------|--------------|--|
| 4 | 945.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of lower limb(s) without mention of loss of a body part |
| | 945.5 | Deep necrosis of underlying tissues due to burn [deep third degree] of lower limb(s) with loss of a body part |
| | 946 | Burns of multiple specified sites |
| | 946.0 | Burns of multiple specified sites, unspecified degree |
| | 946.1 | Erythema due to burn [first degree] of multiple specified sites |
| | 946.2 | Blisters with epidermal loss due to burn [second degree] of multiple specified sites |
| | 946.3 | Full-thickness skin loss due to burn [third degree NOS] of multiple specified sites |
| | 946.4 | Deep necrosis of underlying tissues due to burn [deep third degree] of multiple specified sites, without mention of loss of a body part |
| | 946.5 | Deep necrosis of underlying tissues due to burn [deep third degree] of multiple specified sites, with loss of a body part |
| | 947 | Burn of internal organs |
| 1 | 947.0 | Burn of mouth & pharynx |
| 14 | 947.1 | Burn of larynx, trachea, & lung |
| | 947.2 | Burn of esophagus |
| | 947.3 | Burn of gastrointestinal tract |
| | 947.4 | Burn of vagina & uterus |
| 3 | 947.8 | Burn of other specified sites of internal organs |
| 2 | 947.9 | Burn of internal organs, unspecified site |
| | 948 | Burns classified according to extent of body surface involved |
| 4 | 948.0 | Burn [any degree] involving less than 10 percent of body surface |
| 3 | 948.1 | Burn [any degree] involving 10-19 percent of body surface |
| 1 | 948.2 | Burn [any degree] involving 20-29 percent of body surface |
| 9 | 948.3 | Burn [any degree] involving 30-39 percent of body surface |
| 12 | 948.4 | Burn [any degree] involving 40-49 percent of body surface |
| 5 | 948.5 | Burn [any degree] involving 50-59 percent of body surface |
| 8 | 948.6 | Burn [any degree] involving 60-69 percent of body surface |
| 12 | 948.7 | Burn [any degree] involving 70-79 percent of body surface |
| 12 | 948.8 | Burn [any degree] involving 80-89 percent of body surface |
| 458 | 948.9 | Burn [any degree] involving 90 percent or more of body surface |
| | 949 | Burn, unspecified site |
| 899 | 949.0 | Burn of unspecified site, unspecified degree |
| 1 | 949.1 | Erythema due to burn [first degree], unspecified site |
| 1 | 949.2 | Blisters with epidermal loss due to burn [second degree], unspecified site |
| 69 | 949.3 | Full-thickness skin loss due to burn [third degree NOS], unspecified site |
| 25 | 949.4 | Deep necrosis of underlying tissues due to burn [deep third degree], unspecified site without mention of loss of a body part |
| | 949.5 | Deep necrosis of underlying tissues due to burn [deep third degree], unspecified site with loss of a body part |
| | | |
| 154 | 986 | Toxic effect of carbon monoxide |
| | 987 | Toxic effect of other gases, fumes, or vapors |
| 317 | 987.8 | Toxic effect of other specified gases, fumes, or vapors |
| 95 | 987.9 | Toxic effect of unspecified gas, fume, or vapor |

Note in Table 3 that many of the N-codes that might have been used to give indication of a fire-related or burn-related injury were, in fact, not used. The three codes that were used most often were:

- 949.0 Burn of unspecified site, unspecified degree (N=899)
- 948.9 Burn [any degree] involving 90 percent or more of body surface (N=458)
- 987.8 Toxic effect of other specified gases, fumes, or vapors (N=3 17)

ANALYSES

Two analyses are described in this report. In the first analysis FARS data are accessed to determine how consistently (i.e., how reliably) the individual states are reporting vehicle fires and “most harmful event” (MHE). Does each state report about the same percentage of passenger cars and light trucks experiencing fires? Or, do the states differ in their reporting of vehicle fires? Given that a vehicle has experienced a fire, is “fire or explosion” equally likely to be cited as the MHE in all states? Or, are some states more apt than others to report “fire or explosion” as the “most harmful event”?

In the second analysis—the injury information in the MCOB files is compared to the crash circumstances in FARS. If, for example, the driver of a passenger car sustains “deep necrosis of underlying tissues due to burn [deep third degree] of face, head, & neck without mention of loss of a body part” (ICD9 941.4), does FARS indicate that the vehicle in which the deceased was riding “experienced fire”? Does FARS indicate that “fire or explosion” was the MHE for this vehicle? Conversely, if there is no indication in the MCOB files that a decedent sustained any fire-related or burn-related injuries, does FARS indicate that the vehicle in which the deceased was riding “experienced fire” or that “fire or explosion” was the MHE?

RESULTS

FIRE EXPERIENCE BY STATE

Although the average number of passenger cars and light trucks that experienced fire in the United States was 2.69 percent, for the 50 states and the District of Columbia “percent of vehicles experiencing fire” ranged from a low in Utah of 0.11 percent (one vehicle experienced fire; 887 did not) to a high in Hawaii of 5.30 percent (23 vehicles experienced fire; 411 did not).

Figure 1 shows the rank ordering of states by “percent of vehicles experiencing fire.” The vertical line in this figure represents the 2.69 percent of all passenger cars and light trucks that experienced fire nationwide. The horizontal lines around the data points represent the 95 percent confidence intervals about the individual state estimates.³

The “fire estimates” from 16 states (HI, MN, IA, AR, OK, OR, CT, KY, MA, WI, MO, LA, CA, IN, IL, and GA) are significantly above the national average. For 12 states (AZ, MD, NY, NC, NJ, NM, VA, SC, FL, ID, MS, and UT), the “fire estimates” are significantly below the national average.

Visual inspection of the data in Figure 1 suggests that there is great variability among the individual state (and District of Columbia) estimates of the percents of passenger cars and light trucks that experience fire. This suggestion can be confirmed statistically through a chi-square (χ^2) analysis. The calculated χ^2 (referred to as χ^2 homogeneity) for these data (with 50 df) is 484.6 (pr < 0.000), indicating that the 51 estimates depicted in Figure 1 are so variable that it is extremely unlikely that all states (and the District of Columbia) are estimating the same phenomenon.*

MOST HARMFUL EVENT BY STATE

The analysis presented in this section is based on data from 45 states.⁷ For these 45 states,

³The procedure for defining the 95 percent confidence intervals about the data points in Figure 1 is provided in Appendix A.

*This chi-square (χ^2) analysis is described in Appendix B

⁷Collectively, four states [AK (4), RI (4), VT (9), and WY (5)] and the District of Columbia (8) indicated that 30 passenger cars or light trucks in their jurisdictions experienced fires. For none of these 30 vehicles was “fire or explosion” cited as the MHE. Utah (UT) recorded one vehicle fire. “Fire or explosion” was cited as the MHE for this vehicle. Data from these five states and the District of Columbia were not included in this analysis in order to avoid dividing by zero or taking the natural logarithm of zero. Data from the remaining 45 states (which recorded 99.22 percent of all passenger car and light truck fires in the United States) form the basis of the analysis described in this section.

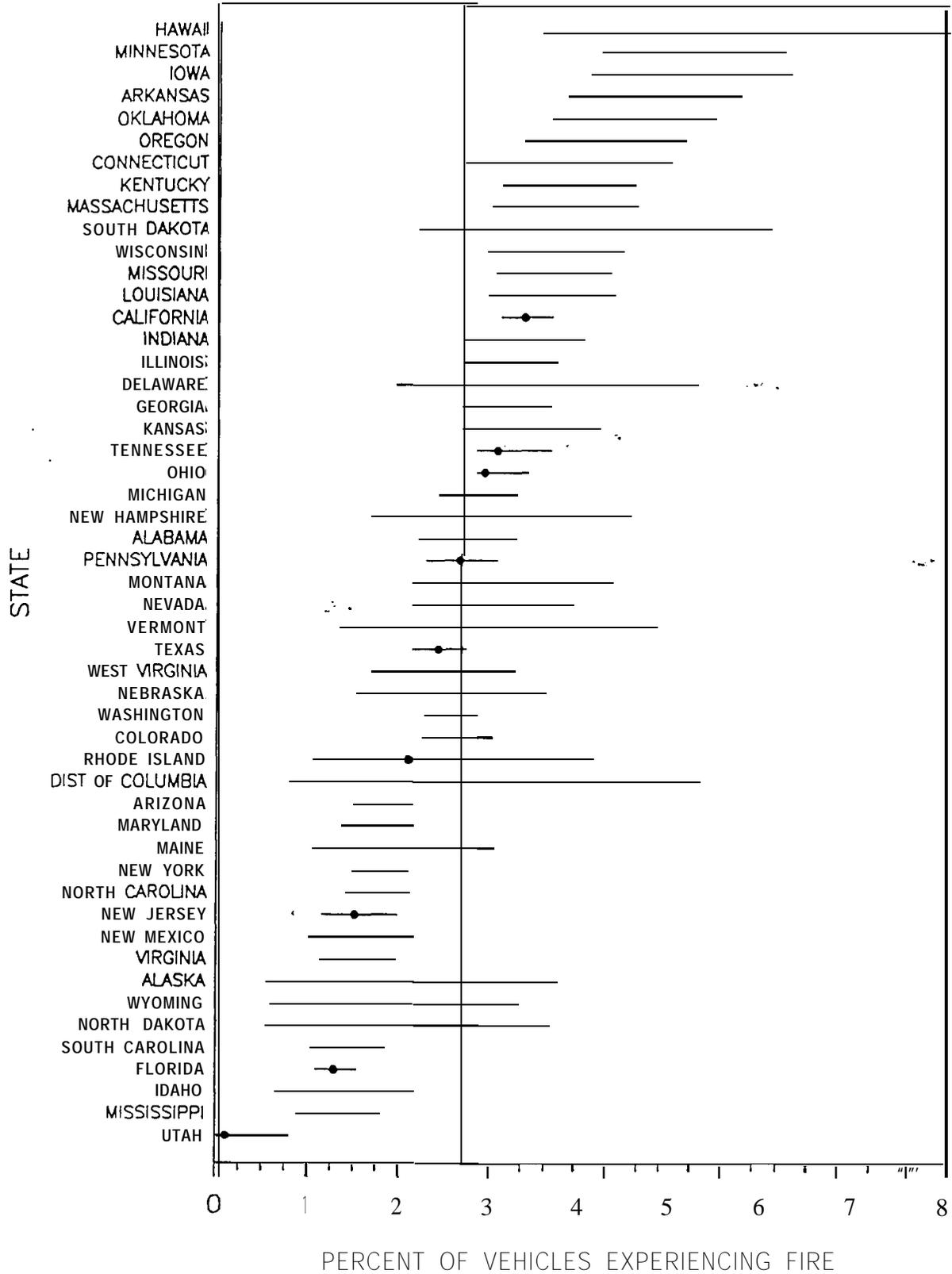


Figure 1: Percent of Vehicles Experiencing Fire by State

1,206 (30.67 percent) of 3,932 passenger cars and light trucks that experienced fire had “fire or explosion” coded as the **MHE**. Of the 180 vehicles that experienced fire in Illinois, only one (0.56 percent) had fire or explosion listed as the **MHE**. At the other extreme, in Virginia, 47 (95.92 percent) of 49 vehicles that experienced fire had fire or explosion listed as the **MHE**.

In Figure 2 the rank ordering of the 45 states by “percent fire/explosion as the most harmful event” is depicted. The 45 data points in this figure are scattered around the national average of 30.67 percent—the percent of vehicles for which “fire or explosion” was cited as the **MHE**. The 95 percent confidence intervals about the individual state estimates were derived as before. See Appendix A.

For ten states (VA SC, MO, MT, TX, TN, MD, AR, AZ, and CA), the estimates of “fire or explosion” as the **MHE** are significantly above the national average. For fifteen states (OR, FL, IA, MA, GA, CT, MN, KY, MI, MS, NJ, KS, OK, OH, and IL), the estimates are significantly below the national average.

These data suggest that it is extremely unlikely that the 45 states included in this analysis are estimating (i.e., measuring) the same phenomenon: χ^2 (with 44 df) equals 498.6 (pr < 0.000). This χ^2 was calculated as before. See Appendix B.

MCOD INJURIES AND FARS CRASH CIRCUMSTANCES

Of the 147,253 passenger cars and light trucks involved in fatal crashes, 143,290 (97.31 percent) did not experience fire. 2,756 vehicles (1.87 percent) experienced fire, but for these vehicles, fire or explosion was not the **MHE**. Another 1,207 vehicles (0.82 percent) also experienced fire, and for these vehicles, fire or explosion was the **MHE**. See Figure 3.

Some 96,301 drivers and passengers (SEAT-POS > 10 and SEAT-POS < 54) riding in passenger cars or light trucks were fatally injured. Of this number, 92,116 (95.65 percent) were riding in vehicles that did not experience fire, 2,718 (2.82 percent) were riding in vehicles that did experience fire, but fire or explosion was not the **MHE**, and 1,467 (1.52 percent) were riding in vehicles that did experience fire, and fire or explosion was the **MHE**. See Figure 4.

For 90,598 (94.08 percent) of the 96,301 fatally-injured vehicle occupants shown in Figure 4, one or more injury codes (N-codes) were available from the MCODE files. 86,662 of the individuals for whom N-codes were available (95.65 percent) were riding in vehicles that did not experience fire. 2,566 individuals with N-codes (2.83 percent) were riding in vehicles that did experience fire, but fire or explosion was not the **MHE**. 1,370 other individuals with N-codes (1.51 percent) were riding in vehicles that did experience fire, and fire or explosion was the **MHE**. See Figure 5.

Of the 1,785 fatally-injured vehicle occupants who sustained “fire-related” injuries (as defined in Table 3), 201 (11.26 percent) were in vehicles that did not experience fire; 659 (36.92 percent) were in vehicles that experienced fire, but fire or explosion was not the **MHE**; and 925 (51.82 percent) were in vehicles that experienced fire, and fire or explosion was the **MHE**. See Figure 6.

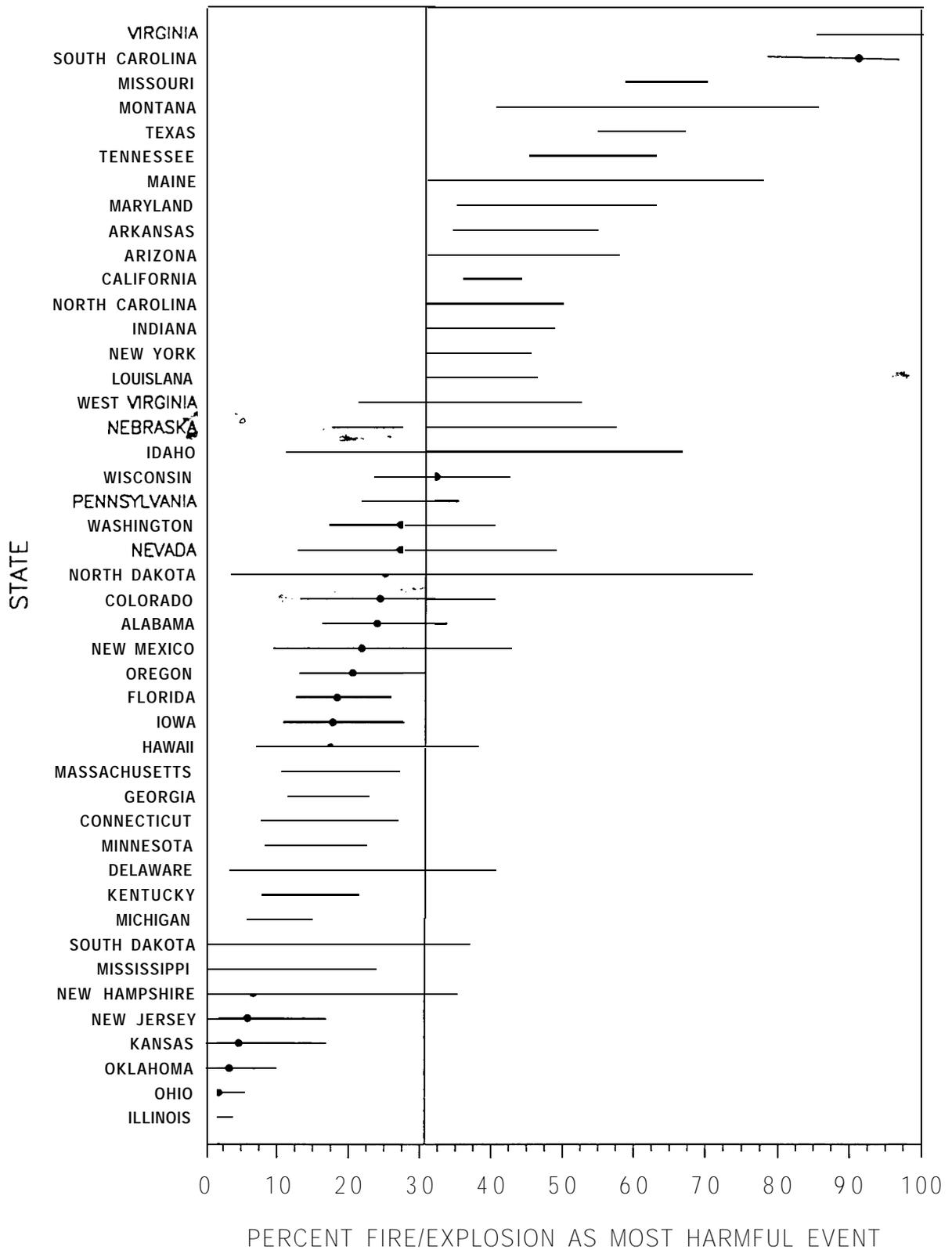


Figure 2: Percent Fire or Explosion Coded as the Most Harmful Event by State

**PASSENGER CARS AND LIGHT TRUCKS
INVOLVED IN FATAL CRASHES (N=147,253)**

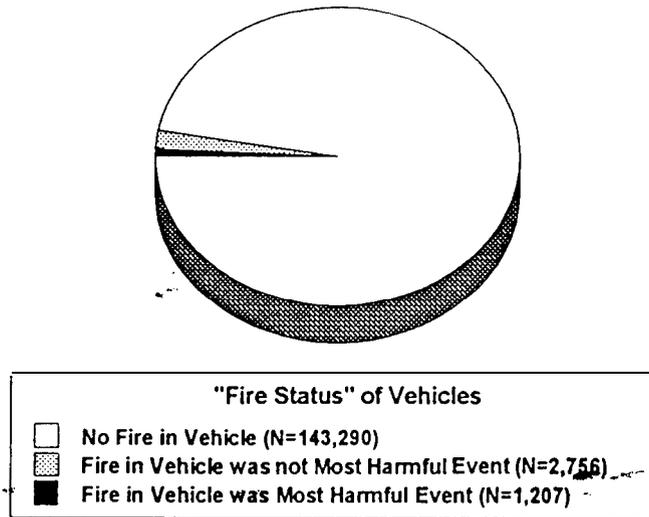


Figure 3: Passenger Cars and Light Trucks Involved in Fatal Crashes by "Fire Status"

**FATALLY - INJURED OCCUPANTS OF PASSENGER
CARS AND LIGHT TRUCKS (N=96,301)**

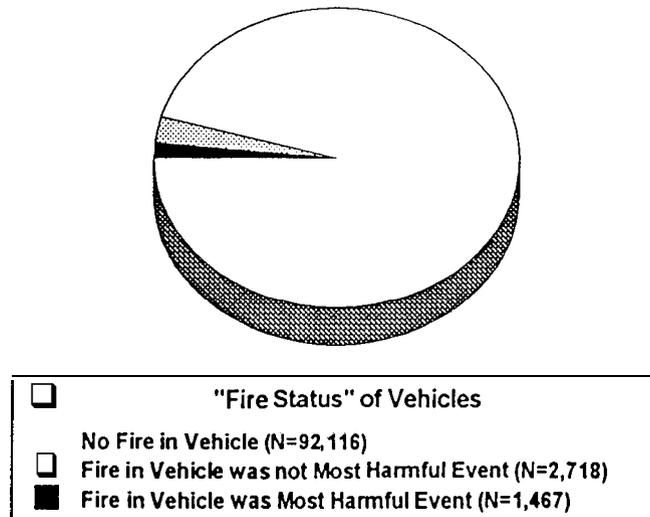


Figure 4: Fatally-Injured Occupants of Passenger Cars and Light Trucks by "Fire Status"

**FATALLY - INJURED VEHICLE OCCUPANTS
FOR WHOM N - CODES ARE AVAILABLE (N=90,598)**

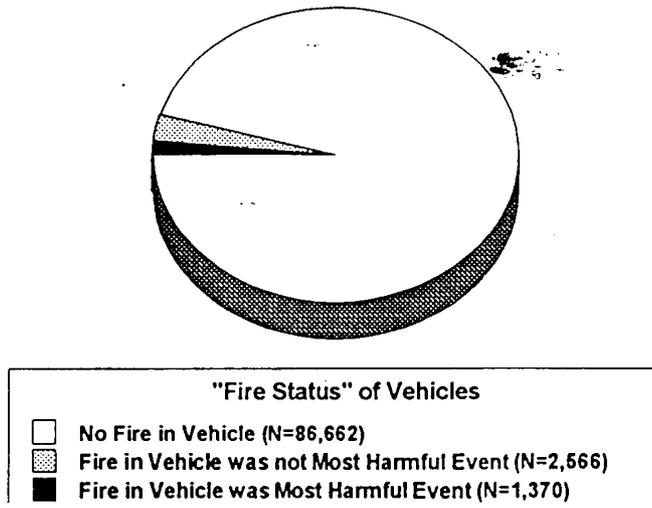


Figure 5: Fatally-Injured Vehicle Occupants for Whom Injury Codes (N-Codes) are Available by "Fire Status"

**FATALLY - INJURED VEHICLE OCCUPANTS WHO
SUSTAINED FIRE - RELATED INJURIES (N=1,785)**

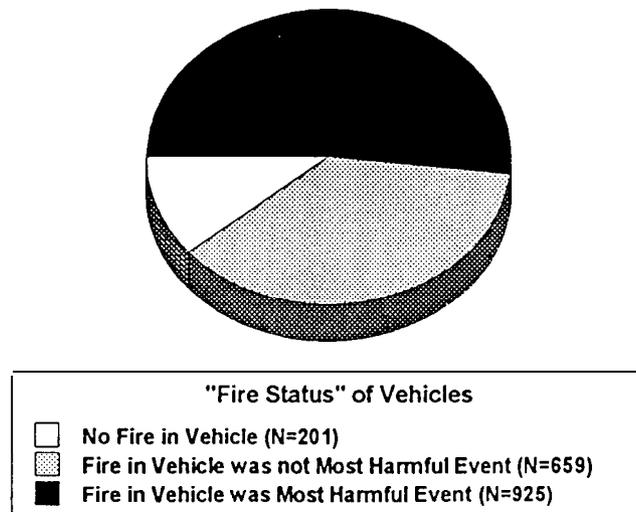


Figure 6: Fatally-Injured Vehicle Occupants Who Sustained Burn-Related Injuries by "Fire Status"

The data from Figures 3 through 6 are summarized in Table 4.

| Table 4: The Numbers of Vehicles, Fatalities, Fatalities with N-Codes, and Fatalities with Fire-Related N-Codes Recorded between 1987 and 1989 for Passenger Cars and Light Trucks, by Fire Experience and Most Harmful Event (FARS/MCOD) | | | | | |
|---|--------------------|---------|--------------------|-------|--|
| Most Harmful Event | Fire Experience | | | | |
| | No Fire | | Fire in Vehicle | | |
| No Fire or Explosion | Vehicles | 143,290 | Vehicles | 2,756 | |
| | Fatalities | 92,116 | Fatalities | 2,718 | |
| | N-Codes | 86,662 | N-Codes | 2,566 | |
| | Fire-Related Codes | 201 | Fire-Related Codes | 659 | |
| Fire or Explosion | | | Vehicles | 1,207 | |
| | | | Fatalities | 1,467 | |
| | | | N-Codes | 1,370 | |
| | | | Fire-Related Codes | 925 | |

FATALLY-INJURED OCCUPANTS WITH FIRE-RELATED INJURIES WHO WERE RIDING IN VEHICLES THAT DID NOT EXPERIENCE FIRE

A state-by-state breakdown of the 201 fatally-injured vehicle occupants with fire-related injuries (for whom seating position was known) who were riding in 178 vehicles that did not experience fire is provided in Table 5. Thirty-one states had one or more occupants with fire-related injuries riding in vehicles that did not experience fire. Texas had six of these cases. More detail on the six Texas cases is provided in Appendix C

| Table 5: Fatally-Injured Occupants with Fire-Related Injuries who were Riding in Vehicles that did not Experience Fire, by State | | | | | |
|--|-----------|-------------|-----------|----------------|-----------|
| STATE | Frequency | STATE | Frequency | STATE | Frequency |
| Alabama | 2 | Indiana | 2 | North Carolina | 13 |
| Arizona | 2 | Kansas | 9 | Ohio | 17 |
| Arkansas | 2 | Louisiana | 10 | Oklahoma | 2 |
| California | 1 | Maine | 3 | Pennsylvania | 6 |
| Colorado | 2 | Maryland | 7 | South Carolina | 21 |
| Connecticut | 1 | Michigan | 8 | Tennessee | 1 |
| Florida | 15 | Mississippi | 13 | Texas | 6 |
| Georgia | 5 | Missouri | 2 | Utah | 6 |
| Idaho | 2 | New Jersey | 11 | Virginia | 13 |
| Illinois | 3 | New York | 9 | Washington | 4 |
| | | | | Wisconsin | 3 |
| | | | | | 201 |

For each of the six Texas fatalities shown in Appendix C, photocopies of the original police accident reports (PARs) were obtained and compared to the FARS/MCOD data cited. In Table 6 the observations and conclusions drawn from comparing the original PARs to the FARS/MCOD information are shown.

| Table 6: Review of the Police Accident Reports (PARs) for the Six Texas Vehicle Occupant Fatalities that Sustained Fire or Bum Related Injuries While Riding in Vehicles that did not Experience Fire | | | |
|---|---------|---------|--|
| FARS Case No. | Veh No. | Per No. | Comments and Conclusions |
| 480062 | 1 | 1 | <p>According to the PAR two vehicles were involved in this collision. The driver of the first vehicle sustained “head and internal” injuries. He was not ejected There were no other fatalities in this crash.</p> <p>There is no reference in the PAR to vehicle fire or occupant bums. On the basis of the information contained in the PAR, fire experience for vehicle 1 was “correctly” coded as “no tire occurrence.”</p> <p>The N-code for this driver (from the MCOD file) is: Deep necrosis of underlying tissues due to bum [deep third degree] of trunk without mention of loss of body part. If this information from the MCOD file is correct, then, in a!! likelihood, this vehicle did experience a fire.</p> |
| 480226 | 2 | 1 | <p>For the deceased in this crash, the P-AR indicates that the “body (was) severely burned,” but not ejected from the vehicle. Furthermore, in a second collision following immediately upon the first, a driver stated (concerning the first collision), “saw heavy smoke and began to slow down.” It is reasonable to infer that vehicle 2 in the first collision did experience fire.</p> |
| 480426 | 1 | 1 | <p>The PAR indicates that the decedent suffered “massive head injuries, body burned in vehicle.” The parts of the vehicle causing injury were “roof, and fire.” The decedent was not ejected from the vehicle. This vehicle should have been coded as having experienced a fire.</p> |
| 480502 | 1 | 1 | <p>According to the PAR in this single-vehicle crash the “vehicle burned after impact with culvert.” The driver, who was not ejected, was “burned.” Clearly, this vehicle experienced a fire.</p> |

Table 6 (continued): Review of the Police Accident Reports (PARs) for the Six Texas Vehicle Occupant Fatalities that Sustained Fire or Burn Related Injuries While Riding in Vehicles that did not Experience Fire

| | | | |
|--------|---|---|--|
| 482297 | 1 | 1 | <p>In this two-vehicle crash, the driver of the first vehicle was ejected from his vehicle. Furthermore, the vehicle in which he was riding came “to rest on top of the driver.” The PAR indicates that the deceased suffered “massive chest and internal injuries” from the “undercarriage of the vehicle.”</p> <p>The N-codes for this individual (from the MCODE file) were: injury to heart & lung; Full-thickness skin loss due to bum [third degree NOS], unspecified site; Other & unspecified injury to trunk.</p> <p>From the information in the PAR it is quite possible that the bums noted in the MCODE came from contact with the engine or the exhaust system. Vehicle one may, in fact, not have experienced a fire, even though its driver sustained bum-related injuries.</p> |
| 480302 | 1 | 2 | <p>Three vehicle occupants were killed in this single-vehicle crash. For two of the decedents, the MCODE file lists no burn-related or fire-related injuries. For the third decedent (the center front passenger who was ejected from the vehicle), the MCODE file lists two N-codes: Burn of face, head, & neck, unspecified degree; Burn of upper limb, except wrist & hand, unspecified degree.</p> <p>The PAR describes the deceased in this crash as having sustained “head & internal” injuries from the “roof of cab and post.” There is nothing in this PAR indicating a vehicle fire.</p> <p>On the basis of the information contained in the PAR, fire occurrence for vehicle one was “correctly” coded as “no fire occurrence.”</p> |

Three of the six vehicles shown in Table 6 should have been coded as having experienced a fire. For one of the six vehicles, it appears that “no fire” was the correct code, even though the driver of that vehicle was burned. And, for two of the six vehicles, it is still not clear whether or not the vehicle experienced a fire.

FATALLY-INJURED OCCUPANTS RIDING IN VEHICLES THAT EXPERIENCED FIRE AND FOR WHICH FIRE OR EXPLOSION WAS THE MOST HARMFUL EVENT

1,467 individuals (for whom seating position was known) were fatally-injured in vehicles that experienced fire and for which fire or explosion was the MHE. For 1,370 (93.39 percent) of these individuals, one or more N-codes were available. For 925 (67.52 percent) of these 1,370 individuals, there is indication of fire-related injury (see Table 3). However, for 445 (32.48 percent) of the fatally-injured occupants who were riding in vehicles for which fire or explosion was the MHE in the crash and for whom one or more N-codes were available, no fire-related injuries are evident.

It is quite possible that some individuals who did not sustain fire- or burn-related injuries could very well have been riding in vehicles that experienced fire, and “fire or explosion” may indeed have been the MHE for those vehicles. Imagine, for example, that three individuals were riding in a vehicle that left the road, rolled over, and caught fire. One individual is ejected from the vehicle prior to the vehicle catching fire, but dies of mechanical trauma. The other two occupants die of fire-related injuries. The MHE for this vehicle is correctly coded as “fire or explosion” even though one of the three vehicle occupants did not sustain fire-related injuries.⁶

To determine the reliability with which “fire or explosion” was cited as the MHE for the passenger cars and light trucks in Table 4, each of the 1,467 occupant fatalities in these vehicles was reviewed to determine the nature of the injuries (i.e., the N-codes) he or she sustained. The 1,467 fatally-injured occupants in this analysis were found to be riding in 1,141 vehicles, i.e., passenger cars or light trucks.

The N-codes for each of the 1,467 fatally-injured occupants riding in these 1,141 vehicles were examined and divided into three groups:

- Fire-Related: The deceased had one or more N-codes indicating a fire-related injury (see Table 3). 925 individuals were contained in this group.
- Not Fire-Related: The deceased did not have any N-codes indicating a fire-related injury (see Table 3). 445 individuals were contained in this group.
- Unknown: No N-codes were available for the deceased. 97 individuals were contained in this group.

⁶To repeat the operative part of the FARS definition of most harmful event contained in the 1988 Coding and Validation Manual:

“ . . . choose the event which causes the greatest number of fatalities to occupants of this vehicle . . . ”

For each of the 1,141 vehicles of interest, the numbers of occupant fatalities and the types of injury sustained (i.e., fire-related, not fire-related, unknown) were tallied. On the basis of the number of fatally-injured occupants in a given vehicle, and the types of injuries those occupants sustained, the determination was made that the coding of the MHE for the vehicle as “fire or explosion” was:

- . OK A majority of fatalities in the vehicle had N-codes indicating fire-related injuries
- Questionable A majority of fatalities in the vehicle had N-codes that did not indicate fire-related injuries
- Maybe An equal number of fatalities did and did not have fire-related N-codes, or

Because some of the deceased did not have N-codes, it was not clear whether there were more, fewer, or an equal number of fatalities with and without fire-related N-codes

Examples

- . OK In 1987 the first vehicle in state case 10503 contained only one fatally-injured occupant, but that occupant sustained fire-related injuries. This case was labeled OK.

In 1989 the first vehicle in state case 190275 contained three fatally-injured occupants, two of whom had fire-related injuries. This case was labeled OK.
- Questionable In 1987 the second vehicle in state case 50194 contained two fatally-injured occupants, neither of whom had fire-related injuries. This case was labeled questionable.

In 1989 the fourth vehicle in state case 481638 contained three fatalities, none of whom sustained fire-related injuries. This case was labeled questionable.
- Maybe In 1988 the first vehicle in state case 290810 contained three fatalities, for whom no N-codes were available. This case was labeled maybe.

In 1989 the first vehicle in state case 480145 contained two fatalities, one of whom sustained fire-related injuries. This case was labeled maybe.

For 707 (61.96 percent) of the 1,141 vehicles that experienced fire, the coding of “fire or explosion” as the MHE was reasonable, i.e., “OK.” For 326 (28.57 percent) vehicles, the coding

seemed inconsistent, i.e., “Questionable.” For 108 (9.47 percent) vehicles, the coding was unclear, i.e., “Maybe.” See Figure 7.

VEHICLES WITH ONE OR MORE OCCUPANT FATALITIES AND FOR WHICH "FIRE/EXPLOSION" WAS MOST HARMFUL EVENT (N=1,141)

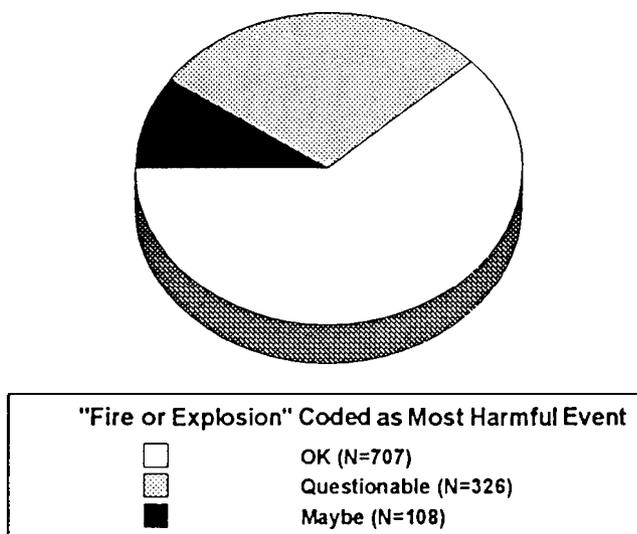


Figure 7: Assessment of the Coding of “Fire or Explosion” as “Most Harmful Event”

Subsetting the 1,141 vehicles in Figure 7 by state, it is apparent that some states have a much higher percentage of “questionable” fire or explosion codings than others (Table 7). In California, for example, only 38 (17.04 percent) of the 223 vehicles that were coded with “fire or explosion” as the MHE are “questionable.” In Florida, 18 (75.00 percent) of the state’s 24 “fire or explosion” codings are “questionable.”

To better understand the “questionable” coding of MHE, photo copies of the 44 PARs describing the 46 Texas vehicles with questionable MHE’s shown in Table 7 were reviewed.

Some 260 of these 326 “questionable” vehicles (79.75 percent) contained one (and only one) occupant for whom N-codes were available-and these codes gave no indication of fire-related injuries for any of these 260 individuals. Another 51 vehicles (15.64 percent) contain exactly two occupants for whom N-codes were available. None of these 102 fatally-injured occupants were coded with fire-related injuries. Six vehicles each contained three fatally-injured occupants for whom N-codes were available-none of which were indicative of tire-related injuries. And, three vehicles contained four fatally-injured occupants with N-codes that showed no fire-related injuries.

Table 7: 1,141 Vehicles for which "Fire or Explosidn" was Cited as the Most Harmful Event, by State and by the Validity of the Most Harmful Event Code

| STATE | Validity of Most Harmful Event Code | | | Total |
|-----------------------|-------------------------------------|-----|--------------|-------|
| | Maybe | OK | Questionable | |
| A l a b a m a | 3 | 9 | 9 | 21 |
| Arizona | 1 | 19 | 2 | 22 |
| Arkansas | 5 | 7 | 24 | 36 |
| California | 12 | 173 | 38 | 223 |
| Colorado | 0 | 6 | 3 | 9 |
| Connecticut | 2 | 4 | 2 | 8 |
| Delaware | 0 | 1 | 1 | 2 |
| Florida | 2 | 4 | 18 | 24 |
| Georgia | 5 | 18 | 4 | 27 |
| Hawaii | 0 | 1 | 3 | 4 |
| Idaho | 1 | 1 | 1 | 3 |
| Illinois | 0 | 1 | 0 | 1 |
| Indiana | 3 | 22 | 16 | 41 |
| Iowa | 9 | 12 | 2 | 14 |
| Kansas | 0 | 1 | 1 | 2 |
| Kentucky | 2 | 11 | 0 | 13 |
| Louisiana | 3 | 22 | 9 | 34 |
| Maine | 0 | 4 | 3 | 7 |
| Maryland | 5 | 10 | 7 | 22 |
| Massachusetts | 0 | 6 | 7 | 13 |
| Michigan | 0 | 12 | 3 | 15 |
| Minnesota | 0 | 11 | 2 | 13 |
| Mississippi | 0 | 2 | 0 | 2 |
| Missouri | 3 | 33 | 31 | 67 |
| Montana | 1 | 3 | 6 | 10 |
| Nebraska | 0 | 3 | 3 | 6 |
| Nevada | 0 | 3 | 2 | 5 |
| New Hampshire | 0 | 0 | 1 | 1 |
| New Jersey | 0 | 2 | 1 | 3 |
| New Mexico | 0 | 5 | 0 | 5 |
| New York | 7 | 30 | 8 | 45 |
| North Carolina | 2 | 18 | 15 | 35 |
| North Dakota | 0 | 0 | 1 | 1 |
| Ohio | 1 | 1 | 1 | 3 |
| Oklahoma | 0 | 3 | 0 | 3 |
| Oregon | 0 | 12 | 3 | 15 |
| Pennsylvania | 9 | 33 | 4 | 46 |
| South Carolina | 6 | 18 | 14 | 38 |
| South Dakota | 0 | 1 | 0 | 1 |
| Tennessee | 5 | 45 | 7 | 57 |
| Texas | 16 | 86 | 46 | 148 |
| Utah | 0 | 0 | 1 | 1 |
| Virginia | 8 | 21 | 16 | 45 |
| Washington | 1 | 8 | 6 | 15 |
| West Virginia | 0 | 10 | 0 | 10 |
| Wisconsin | 5 | 15 | 5 | 25 |
| Total | 108 | 707 | 326 | 1141 |

Appendix D contains FARS/MCOD information on the 68 decedents who were riding in these 46 vehicles. Appendix E briefly summarizes each of the 44 crashes in which these 46 vehicles were involved and shows the N-codes (from MCOD) that were cited for the decedents.

From the information contained in Appendix D (and Appendix E), it should be noted that 38 (55.88 percent) of the 68 decedents had one, and only one, N-code: (959.8) "Other & unspecified injury to other specified sites, including multiple." Although this code might be used to refer to a decedent who sustained fire-related or burn-related injuries, it might also be used to describe injuries to individuals who sustained only mechanical trauma. Thus, for purposes of determining whether or not a given decedent suffered fire-related or burn-related injuries, this coding is unhelpful, and unfortunate.

It should also be noted that many of the crashes described in Appendix E were extremely violent events that resulted in multiple injuries to individual vehicle occupants, any one of which might have served as the proximal cause of death for the deceased. For the decedents riding in vehicles for which fire or explosion was the MHE, some of the injuries described in the PARs include:

| | |
|-----------------------------|--|
| "severed at torso" | "severe skull fracture" |
| "crushed skull" | "punctured heart" |
| "broken neck" | "transection of the descending thoracic aorta" |
| "crushed chest and abdomen" | "massive chest injuries" |

Finally, in reviewing the PARs shown in Appendix E, it was often difficult for the author to decide how to code MHE for a given crash-involved vehicle. Consider the following three examples:

- Example 1 (481582 in 1988): The driver of a tow truck was struck in the side by a train. His vehicle "exploded." The vehicle came to rest approximately 120 feet from impact. The driver, the lone occupant of the vehicle, sustained fatal injuries: "chest trauma - burned." Furthermore, the vehicle "overturned on deceased after being ejected - burned." The N-code for the deceased was: Other & unspecified injury to other specified sites, including multiple.

The fact that this vehicle "exploded" and that the deceased driver "burned" may be sufficient reason to code MHE as "fire or explosion." However, among the various possible codes for MHE there is another code that would seem a reasonable alternative: Railway Train.⁸

⁸The Texas accident report form (ST-3) does not contain a specific data element entitled "most harmful event," i.e., the investigating officer does not code MHE. Therefore, the FARS coders at the Texas Department of Public Safety must determine "most harmful event," based primarily upon (1) information contained in the officers' narratives, (2) supplemental descriptions of the injuries sustained by the deceased provided in the "Texas Peace Officers Accident Casualty Supplement," and (3) the death certificate.

- Example 2 (481672 in 1989): Vehicle one “crossed (the) double line” on the highway and struck vehicle two (a tractor semi-trailer) with the left front of his vehicle. Vehicle one “exploded.” The deceased driver of vehicle one, the □■●☒ occupant of the vehicle, was “severely burned.” The N-code for the deceased was: Other & unspecified injury to trunk.

Might “motor vehicle in transport” have been cited as the most harmful event in this crash?

- Example 3 (482321 in 1989): The driver of a stolen vehicle “appeared to have been going at a high rate of speed and lost control causing the vehicle to slide sideways before making impact with utility pole.” The vehicle caught fire. The fatally injured driver was “burned.” The N-code for the deceased was: Intracranial injury of other & unspecified nature.

Might “utility pole” have been cited as the most harmful event in this crash?

In summary, it was found that the 46 Texas vehicles for which “fire or explosion” was a “questionable” coding of MHE did in fact experience fires. Furthermore, the great majority of the decedents riding in these vehicles appear to have sustained fire-related or bum-related injuries. Accordingly, most of these “questionable” MHE codings are defensible. It should be added, however, that many of the 68 fatally-injured occupants identified in Appendices D and E appear to have sustained multiple injuries, and often massive injuries. For these individuals, “fire or explosion” may not have been the proximal cause of death. Stated in other words, for many of the individuals identified in Appendices D and E, even in the absence of a vehicle fire, it seems reasonable to suggest that the extent and severity of the mechanical trauma sustained would have been sufficient to result in death.

DISCUSSION

VEHICLES EXPERIENCING FIRES

In this study the states were shown to exhibit great variability in the reporting of fires for passenger cars and light trucks involved in fatal crashes. Only 0.11 percent of 888 vehicles involved in fatal crashes in Utah experienced fires while 5.30 percent of 434 vehicles involved in fatal crashes in Hawaii experienced fires. For all 50 states and the District of Columbia, 2.69 percent of passenger cars and light trucks involved in fatal crashes experienced fires. See Figure 1.

Given the inconsistency with which “fire experience” is reported by the states, the reliability of this data element is brought into question. If this data element is not reliable, it is by definition not valid.

It is possible, of course, that **different** states might in fact have somewhat different percentages of vehicles experiencing fires due to state differences in climate, roadway environment, rural/urban driving, vehicle mix, or driver characteristics. It seems unlikely, however, that the **full** extent of the observed differences among the states can be explained by these postulated climatological, environmental, vehicular, and operational factors. It seems unlikely that the climate, roadway environment, rural/urban driving, vehicle mix, or driver characteristics in Utah, for example, are sufficiently different from the rest of the nation to accept as valid the finding that only **one** vehicle in 888 involved in a fatal crash experienced a fire. The more likely and more parsimonious explanation for the observed differences in reported fires across the states is “differences in reporting procedures.”

There is great variation among the states in the collection of vehicle fire data. Six examples from Ray and Lau (1996) will serve to illustrate this variation:

Alabama: “There is no independent variable for fire in the Alabama database. Fire is identified as “first harmful event” **coded *fire or explosion*** at the accident level and as “most harmful event” ***fire or explosion*** for each vehicle. Obviously, fires that are neither the first nor the most harmful events in accidents will not be identified.”

Arkansas: “There is an independent variable “fire occurrence” for each vehicle in the Arkansas database. In 1984-1986 fire occurrence is coded **as *fire occurrence or fire did not occur***. In 1987-1993 the codes were changed to ***fire, no fire, and unknown***. In addition, ***fire or explosion*** can be identified as “first harmful event” for the entire accident and as “most harmful event” for each vehicle.”

Florida: “Fire information can be found in 2 places in the Florida database. First, fire is coded as 1 of the 36 possibilities in the 2 harmful event fields at the accident level (“first harmful event” and “subsequent harmful event”). Coded values are ***fire*** and ***explosion***. Second, fire can be coded as one of the values for “point of impact” at the vehicle level, the other values

being codes for the different regions of the vehicle (i.e., *front, left, rear*). There is no independent field in the database to capture fire information exclusively.”

Maryland: “There is no independent variable for fire in the Maryland database from 1977 to 1992. In 1993, an independent variable “caught fire,” coded yes or *no*, was added for each vehicle.”

Michigan: “An independent variable, “fuel leak or fire,” is available in calendar years 1981-1991. Michigan is the only state database that captures information on fuel leaks.”

North Carolina: “Only 1 field in the North Carolina database, “post-crash fire,” captures the occurrence of vehicle fire. This code is available starting in calendar year 1986. The possible values for this field are yes, *no*, and *not stated*. “Post-crash fire” is an independent field, and each vehicle is independently marked as to the occurrence of a post-crash fire.”

For those states whose data collection forms do not include a specific data element for the occurrence of a vehicle fire, the FARS analysts must code the occurrence of a fire (**EXP_FIRE**) based on other information contained in the PAR (e.g., first harmful event, most harmful event, the **officer’s** narrative, damage severity scale, etc.) and other supporting documentation. In this translation from the state’s PAR to the FARS form, a certain subjectivity is introduced into the data. Given the variety of forms and formats from which the FARS coders are working, the variability in state reporting of fire occurrence is understandable.

Although the absence of a specific data element for recording fire occurrence may add to the subjectivity of the coding of vehicle fires, it should be noted that even when two states have a specific data element on their PARs to record the occurrence of vehicle fires, there is no guarantee that those states will report comparable percents of passenger cars and light trucks experiencing fires in fatal crashes. Both Arkansas and North Carolina have a specific data element for reporting fires. Yet, 4.70 percent of 1,915 passenger cars and light trucks involved in fatal crashes in Arkansas experienced fires while only 1.72 percent of 5,278 passenger cars and light truck involved in fatal crashes in North Carolina experienced fires. The percent of vehicles experiencing fires in Arkansas is significantly above the national average; the percent of vehicles experiencing fire in North Carolina is significantly below the national average. See Figure 2.

VEHICLE FIRES AS MOST HARMFUL EVENTS

State reporting of “tire or explosion” as the most harmful event (**MHE**) for passenger cars and light trucks involved in fatal crashes varies widely. In Illinois, only one (0.56 percent) of 180 vehicles experiencing fires was coded with “fire or explosion” as the MHE. In Virginia, 47 (95.92 percent) of 49 vehicles experiencing fires were coded with “fire or explosion” as the MHE. For all 50 states and the District of Columbia, 30.67 percent of all vehicles experiencing fires were coded with “tire or explosion” as the MHE.

Given the inconsistency with which “fire or explosion” is reported as the MHE by the states, the reliability of this data element is brought into question. If this data element is not reliable, it is by definition not valid.

Although there may be some climatological, environmental, roadway, vehicular, or operator factors that could be advanced to explain some of the variability in state reporting of “fire or explosion” as the MHE for vehicles experiencing fire, the most parsimonious explanation of this variability is again differences in reporting procedures. Some states specifically ask the investigating officer to indicate the MHE for individual, crash-involved vehicles (e.g., North Carolina), others do not (e.g., Texas, New Mexico). Michigan does not code MHE, but it does code “sequence of events” (1 through 4) for each vehicle involved in the crash. “Fire/explosion” is an acceptable code for all four of these data elements. Illinois codes first, second, and third “involvements” for each crash-involved vehicle. “Fire/explosion” is an acceptable code for all three of these data elements. Utah codes each crash (not vehicle) by “accident type” and three “subsequent events.” Neither fire nor explosion is an acceptable code for any of these four data elements.

The FARS format for “Most Harmful Event” is presented in Table 8 as it appears in the “1988 Fatal Accident Reporting System 1988 Coding and Validation Manual.” The basic format for this data element has been maintained to the present day with but a few added values (e.g., 45 Transport ~~Device~~ Used as Equipment; 47 Vehicle Occupant Struck or Run Over by Own Vehicle, etc.). Note that the acceptable codes under MHE in 1988 (and 1997) are divided into three groups:

- Non-Collision
- Collision with Object Not Fixed
- Collision with Fixed Object

“Fire/Explosion” is listed under ‘Non-Collision.’ Granted that some states (e.g., Illinois, Ohio, Oklahoma) do not often cite fire or explosion as the MHE, the question might be asked: Are some FARS coders assuming that if a vehicle impacts a fixed object or an object that is not fixed and then catches fire, “Fire/Explosion” is an inadmissible code?

The fatal cases summarized in Appendix E clearly indicate that FARS coders in Texas are willing to use the “Fire/Explosion” code for vehicles that have previously impacted fixed objects or objects that are not fixed. But, this raises another question: When a vehicle impacts a fixed object (e.g., a bridge pier or abutment, a concrete traffic barrier, or a tree) or an object that is not fixed (e.g., a railway train, an animal, or another motor vehicle in transport) and then catches fire, how is MHE determined? The coding manual states that most harmful event is “the major event FOR THIS VEHICLE, even if different from the FIRST HARMFUL EVENT.” The manual goes on to say, “FATALITIES take precedence over INJURIES.” Furthermore, “(If this vehicle is involved in more than one event which causes fatality to its occupants or to non-motorists, choose the event which causes the greatest number of fatalities to occupants of this vehicle or to non-motorists (not occupants of other vehicles).” [emphasis added]

Table 8: Format for "Most Harmful Event" in the Fatal Accident Reporting System 1988
Coding and Validation Manual

MOST HARMFUL EVENT

Element Values:

Non-Collision

- 01 Overturn
- 02 Fire/Explosion
- 03 Immersion
- 04 Gas Inhalation
- 05 Fell from Vehicle
- 06 Injured in Vehicle
- 07 Other Non-Collision
- 16 Thrown or Falling Object
- 44 Pavement Surface Irregularity (Potholes, Grooved, Grates)

Collision with Object not Fixed

- 08 Pedestrian
- 09 Pedalcycle
- 10 Railway Train
- 11 Animal
- 12 Motor Vehicle in Transport
- 1 3 Motor Vehicle in Transport in Other Roadway
- 14 Parked Motor Vehicle
- 15 Other Type Non-Motorist
- 18 Other Object (not fixed)

Collision with Fixed Object

- 17 Boulder
- 19 Building
- 20 Impact Attenuator/Crash Cushion
- 21 Bridge Pier or Abutment
- 22 Bridge Parapet End
- 23 Bridge Rail
- 24 Guardrail
- 25 Concrete Traffic Barrier
- 26 Other Longitudinal Barrier Type
- 27 Highway/Traffic Sign Post

Table 8 (continued): Format for “Most Harmful Event” in the Fatal Accident Reporting System
1988 Coding and Validation Manual

Collision with Fixed Object (continued)

| | |
|----|---|
| 28 | Overhead Sign Support |
| 29 | Luminaire/Light Support |
| 30 | Utility Pole |
| 31 | Other Post, Other Pole, or Other Supports |
| 32 | Culvert |
| 33 | Curb |
| 34 | Ditch |
| 35 | Embankment-Earth |
| 36 | Embankment-Rock, Stone, or Concrete |
| 37 | Embankment-Material Type Unknown |
| 38 | Fence |
| 39 | Wall |
| 40 | Fire Hydrant |
| 41 | Shrubbery |
| 42 | T r e e |
| 43 | Other Fixed Object |
| 99 | Unknown |

The difficulty in applying these instructions is that the “cause or causes of the fatalities” in these crashes may be difficult to determine. When a pickup truck is struck by a train or tractor semi-trailer and subsequently “bursts into flames,” the driver of the pickup may indeed be burned or charred. To an investigating officer, the burned or charred state of the deceased may be interpreted as the cause of death. Nevertheless, the proximal cause of death may have resulted from mechanical injury, not fire-related or bum-related injury.

Conversely, some vehicles in FARS that should have received an MHE code of “fire or explosion” are receiving other codes. The following example (a 1992 fatal, Texas crash for which the autopsy report was available) illustrates this point:

Example (FARS 481995 in 1992).

From the police officer’s report:

Unit 1 (a pickup truck) was west bound on FM 1960. Union Pacific Train was north bound on tracks. Unit 1 ran into the right side of the locomotive. Fire erupted immediately. Right fuel tank of locomotive was ruptured. Crossing lights were activated and unit 1 apparently never hit the brakes.

The police officer's report further indicates that three men were riding in the pickup. None of the men were belted. The driver sustained fatal injuries. The "LF" and "LR" occupants were not injured. For the deceased driver, the injuries were described as "possible chest, severely burned."

It was the opinion of the forensic pathologist who performed the autopsy that the decedent "came to his death as a result of asphyxia due to soot and carbon monoxide inhalation, multiple rib fractures, and charred body. . ." (Carbon Monoxide: 11% Saturation)

In **FARS** the most harmful event for the occupants of this vehicle is coded as "rail train."

In his 1994 study entitled "An Analysis of Fires in Passenger Cars, Light Trucks, and Vans," Tessmer attempts to estimate the annual number of motor vehicle fatalities due to fire (his Exhibit 71 on page 53). In making this estimate, "... (t)he underlying assumption . . . is that if the most harmful event field is coded as fire, then at least one death in that vehicle was caused by fire." (p 52) The summaries in Appendix E bring this assumption into question.

Tessmer goes on to say (p 52) "**(I)**f the most harmful event field is coded as anything other than fire then at least one individual in the crash died of a cause other than fire, but the other fatalities, if there were more than one fatality, could have been due to fire." The last case cited bring this assumption into question.

RECOMMENDATIONS

Given the apparent inconsistency with which “fire occurrence” and “fire or explosion” (as MHE) were coded in FARS in 1987-1989, two additional analyses are recommended. First, the analyses that were performed to produce Figures 1 and 2 should be repeated with 1994-1996 FARS data. If the analyses performed on the newer data set replicate the inconsistencies seen across the states in the 1987-1989 data, then the reliability of these two data elements [“fire occurrence” and “fire or explosion” (as MHE)] is still of concern.

Second, the reporting of “fire occurrence” and “fire or explosion” (as MHE) for the 1987-1989 and 1994-1996 data sets should be analyzed on a state-by-state basis. If a given state was “under reporting” fires in 1987-1989, is it still “under reporting” fire in 1994-1996? If another state is “over reporting” “fire or explosion” (as MHE) in 1987-1989, is it still “over reporting” “fire or explosion” (as MHE) in 1994-1996? In essence, what is the correlation between a state’s reporting of “fire occurrence” and “fire or explosion” (as MHE) in 1987-1989 and 1994-1996? If the correlation is highly positive, there may be some systematic difference(s) among the states that would account for this correlation, including some misunderstanding or misinterpretation on the part of the states regarding the coding of these two data elements.

Further review of individual FARS cases (and their companion PARs and autopsy and toxicological reports) should be undertaken to further explore and better understand the discrepancies in state reporting. The purpose of this review is to determine the point at which inaccuracies or inconsistencies may be entering the FARS data set and to suggest why they are occurring. Is the information contained in the PARs being miscoded by the FARS coders? Or, more likely, is the information in the PARs and death certificates insufficient for accurately determining “fire occurrence” and “fire or explosion” (as MHE)?

It has been noted that there is great variability among the individual states in the recording of fire-related information on their PARs. Some states require investigating officers to record whether or not a vehicle involved in a crash experiences a fire. Others do not. Some states require investigating officers to record the “most harmful event” for the occupants of each vehicle involved in a crash. Other do not.

If the states could be prevailed upon to specifically record “fire occurrence” and “most harmful event” (with “fire or explosion” as a permissible response to MHE), it seems reasonable to expect that the fire-related information contained in FARS might be made more consistent and more reliable, particularly if uniform instructions for coding these data elements were applied by all states.’

⁹If all states were to specifically record “fire occurrence” and “most harmful event,” it is likely that these two data elements would become more reliable. The increased reliability of the coding of these two elements, however, is no guarantee that the elements would provide valid depictions of vehicle fires and most harmful events. The codes could be reliable, but inaccurate.

In the absence of comparable reporting on the part of the states, more detailed instructions (i.e., better operational definitions and more examples) should be developed for the FARS coders to promote greater consistency in interpreting the data that are currently available. As a first step in this process, it should be emphasized in these supplemental instructions that vehicles involved in crashes with fixed objects and with non-fixed objects can be coded as a “fire or explosion” under MHE, even though “fire/collision” is within that subset of crashes referred to as “non-collision” crashes.

The supplemental instructions for coding fire-related crashes should encourage the FARS coders to go beyond the injury information contained in the PAR and to pay particular attention to the death certificate and the autopsy and toxicological reports, if available. Fatal crashes involving vehicular fires are often extremely violent crashes involving massive transformations of energy. Fatally-injured occupants riding in vehicles that experience fires often sustain multiple injuries, any one of which could result in death: broken neck, crushed skull, crushed chest, charred body, etc. Because vehicular fires are relatively rare events, they are, presumably, quite salient events to an investigating officer at the scene of a fatal crash. Furthermore, the “charred body” of a fatally-injured vehicle occupant is a conspicuous physical condition that may draw the attention of an investigating officer while masquerading or rendering less salient other physical conditions, e.g., broken neck, crushed skull, crushed chest. Accordingly, some (and perhaps many) of the fatally-injured vehicle occupants whose injuries are simply described as “burns” or “burned up” in PARs may, in fact, have died from mechanical trauma. If the injury information contained in the PAR is the only source for determining “most harmful event” on the FARS form, the coding of “fire or explosion” as MHE may be overstated. Again, FARS coders should be encouraged to go beyond the PAR to determine cause of death in fatal crashes and to consider carefully the causes of death for vehicle occupants before coding MHE.

When two or more life-threatening injuries are cited for a decedent (e.g., “broken back” and “burns”), which is the proximal cause of death? When the only injuries cited for an occupant fatality in the PAR are burns, but the circumstances of the crash clearly indicate that other injuries might very well have served as the proximal cause of death (e.g., after his vehicle was struck by a train, the driver was ejected and his vehicle overturned on top of him and he was burned), which injury should the FARS coders assume caused the death? When the investigating officer says the decedent suffered “burns,” and the death certificate (for an individual who was not autopsied) says the decedent died of “other and unspecified injury to other specified sites, including multiple,” should the coders assume that “burns” was the proximal cause of death? The FARS coders should be provided with better rules for sorting out cause of death under conditions of uncertainty and ambiguity. If these rules can be developed, there is the hope that the coding of “fire or explosion” as the most harmful event in a fatal crash can be made more systematic. If MHE can be coded systematically, it at least has the potential to be a valid data element.

Finally, recalling that 11 percent of the fatally-injured occupants in this study who suffered fire-related or burn-related injuries were riding in vehicles that did not experience fires, the FARS coders should be encouraged to carefully review the death certificates when coding “fire occurrence.” Fire-related or burn-related injuries cited on the death certificate should alert the coder to the

possibility that the vehicle in which the deceased was riding may have experienced a fire. If the death certificate indicates that the deceased suffered burns, smoke inhalation, etc. the PAR should be double checked to if there is not some reference to a vehicular fire in the **officer's** narrative, the scene diagram, etc.

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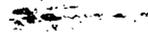
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APPENDIX A

The confidence intervals about the data points in Figure 1 were calculated by means of the following equations, where F represents vehicles experiencing fire and N represents vehicles not experiencing fire.

The log odds or logit (L) of a passenger car or light truck experiencing fire is estimated as:

$$L = \ln \left(\frac{F}{N} \right) \quad (\text{Eq A1})$$

The sampling distribution for L is asymptotically normal with a standard error that can be approximated as:

$$L_{se} = \sqrt{\frac{1}{F} + \frac{1}{N}} \quad (\text{Eq A2})$$

The upper and lower limits of the 95 percent confidence interval about L are:

$$L_{upper} = L + 1.96 (L_{se}) \quad (\text{Eq A3})$$

$$L_{lower} = L - 1.96 (L_{se}) \quad (\text{Eq A4})$$

The odds (Ω) of a vehicle experiencing a fire $\left(\frac{F}{N} \right)$ may be converted to the probability (P) of a vehicle experiencing a fire $\left(\frac{F}{F+N} \right)$ by recognizing that:

$$P = \left(\frac{\Omega}{\Omega + 1} \right) \quad (\text{Eq A5})$$

Or, the probability of a passenger car or light truck experiencing a fire may be estimated as:

$$P = \left(\frac{e^L}{e^L + 1} \right) \quad (\text{Eq A6})$$

By the same logic, the 95th percentile upper and lower limits of L may be converted to probabilities as:

$$P_{\text{upper}} = \left(\frac{e^{L_{\text{upper}}}}{e^{L_{\text{upper}}} + 1} \right) \quad (\text{Eq A7})$$

$$P_{\text{lower}} = \left(\frac{e^{L_{\text{lower}}}}{e^{L_{\text{lower}}} + 1} \right) \quad (\text{Eq A8})$$

Finally, the probabilities (P's) in Eqs 6, 7, and 8 may be multiplied by 100 to convert them to percents.

Example: Between 1987 and 1989 some 10,224 passenger cars and light trucks in Texas were involved in fatal crashes. 248 (2.43 percent) of these vehicles experienced fire; 9,976 (97.57 percent) did not.

$$L = \ln \left(\frac{248}{9,976} \right) = -3.6945$$

$$L_{\text{sc}} = \sqrt{\frac{248 \cdot 9,976}{248 + 9,976}} = 0.0643$$

$$L_{\text{upper}} = -3.6945 + 1.96(0.0643) = -3.5685$$

$$L_{\text{lower}} = -3.6945 - 1.96(0.0643) = -3.8205$$

$$P = \left(\frac{e^{-3.6945}}{e^{-3.6945} + 1} \right) = 0.0243 \quad (\text{i.e., 2.43 percent})$$

$$P_{\text{upper}} = \left(\frac{e^{-3.5685}}{e^{-3.5685} + 1} \right) = 0.0274 \quad (\text{i.e., 2.74 percent})$$

$$P_{\text{lower}} = \left(\frac{e^{-3.8205}}{e^{-3.8205} + 1} \right) = 0.0214 \quad (\text{i.e., 2.14 percent})$$

On the basis of these data from Texas, it is estimated that 2.43 percent of all passenger cars and light trucks involved in fatal crashes experience fire. Furthermore, there is 95 percent confidence that the "true" fire experience for passenger cars and light trucks involved in fatal crashes in Texas is somewhere between 2.14 and 2.74 percent.

APPENDIX B

In this appendix, F_i represents vehicles experiencing fire in the i th state (or in the District of Columbia) and N_i represents vehicles in the i th state (or DC) not experiencing fire.

-The log odds or logit (L_i) of a passenger car or light truck experiencing fire in the i th state is estimated as:

$$L_i = \ln \left(\frac{F_i}{N_i} \right) \quad (\text{Eq B1})$$

The sampling distribution for L_i is asymptotically normal with a standard error $L_{i(se)}$ that can be approximated as:

$$L_{i(se)} = \sqrt{\frac{1}{F_i} + \frac{1}{N_i}} \quad (\text{Eq B2})$$

To estimate the average (mean) logit for the several ($n=51$) L_i 's, the individual L_i 's are weighted by the reciprocals of their variances. The weight for the i th state (or DC) is:

$$w_i = \frac{1}{(L_{i(se)})^2} \quad (\text{Eq B3})$$

Or,

$$w_i = \frac{1}{\left(\frac{1}{F_i} + \frac{1}{N_i} \right)} \quad (\text{Eq B4})$$

The weighted mean logit (M) is simply:

$$M = \frac{\sum w_i L_i}{\sum w_i} \quad (\text{Eq B5})$$

The sampling distribution for M is asymptotically normal with a standard error M_{se} that can be approximated as:

$$M_{se} = \frac{1}{\sqrt{\sum w_i}} \quad (\text{Eq B6})$$

From Eqs B5 and B6, Z (the standard normal variate) can be defined to be:

$$Z = \frac{M}{M_{sc}} \quad (\text{Eq B7})$$

Squaring both sides of Eq B7, and recalling that Z^2 is equivalent to χ^2 (with one degree of freedom):

$$\chi^2 = \frac{M^2}{(M_{sc})^2} \quad (\text{Eq B8})$$

Eq B8 reduces to:

$$\chi^2 = M^2 \sum w_i \quad (\text{Eq B9})$$

This A-square (which might be referred to as “chi-square effect”) is basically a test to determine if the overall, weighted mean logit (\bar{M}) differs significantly from zero.

The total chi-square in this problem is calculated as the sum of the chi-squares for each of the ($n = 51$) states (and DC). From Eqs B1 and B2, for a given state (I):

$$Z = \frac{L_i}{L_{i(se)}} \quad (\text{Eq B10})$$

Squaring both sides of Eq B 10 yields another χ^2 (with one degree of freedom):

$$\chi^2 = \frac{L_i^2}{(L_{i(se)})^2} \quad (\text{Eq B11})$$

Eq B11 reduces to:

$$\chi^2 = w_i (L_i)^2 \quad (\text{Eq B12})$$

And chi-square total becomes simply the sum of the ($n=51$) independent estimates generated from application of Eq B 12:

$$\chi^2 = \sum w_i (L_i)^2 \quad (\text{Eq B13})$$

Granted that chi-square total (Eq B13) and chi-square effect (Eq B9) have been defined, chi-square homogeneity is defined through subtraction:

$$\chi^2 = \sum w_i (L_i - M)^2 \quad (\text{Eq B14})$$

Chi-square homogeneity (Eq B 14) is the difference between chi-square total and chi-square effect. Chi-square homogeneity is, in essence, a test to determine whether or not the overall variability of the individual estimates (L_i 's) is within chance fluctuation about a common mean (M)—or whether the individual estimators are so heterogeneous that it is unlikely that they are all measuring the same phenomenon.

Table B1 summarizes how chi-square total is partitioned into chi-square effect and chi-square homogeneity.

| Table B1: Calculation of χ^2 Effect, χ^2 Homogeneity, and χ^2 Total | | |
|--|---------------------------------|--------------------|
| Source | Chi-Square (χ^2) | Degrees of Freedom |
| Effect | $\chi^2 = M^2 \sum w_i$ | 1 |
| Homogeneity | $\chi^2 = \sum w_i (L_i - M)^2$ | n - 1 |
| Total | $\chi^2 = \sum w_i (L_i)^2$ | n |

For more details on chi-square homogeneity see Woolf (1955), Fleiss (1973), or Griffin (1989).

APPENDIX C

Six Fatally-Injured Texas Occupants with Fire-Related Injuries Who were Riding in Passenger Cars or Light Trucks that did not Experience Fire

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480062 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9424 Deep necrosis of underlying tissues due to burn [deep third degree] of trunk without mention of loss of body part

STATE: Texas | ROAD: Urban-Local Str
DATE: January 10 1987 | SPEED LIMIT: 40
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 3 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Unknown
TRAV SPEED: Unknown | MOST HARM: Veh in Transp
FIRE: No Fire | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 16 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: January 10 1987 | HOUR: 3 | HOS: 3 | No

 1987-1989 FARS/MCOO DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480226 | AUTOPSY: YES
 VEHICLE NUMBER: 2 | RACE: WHITE
 PERSON NUMBER: 1 |

 UNDERLYING CAUSE OF DEATH (E-CODE):

- 8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

- N-CODE 9490 Burn of unspecified site, unspecified degree
- N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

 STATE: Texas | ROAD: Rural-Maj Collec
 DATE: February 8 1987 | SPEED LIMIT: 55
 DAY: Sunday | MANNER OF COLL: Head-on
 HOUR: 2 | FIRST HARM: Veh in Transp
 WEATHER: Normal | NO. OF VEHs: 2

 BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 12
 VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
 TRAV SPEED: Unknown | MOST HARM: Veh in Transp
 FIRE: No Fire | ROLLOVER: No Rollover
 VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

 AGE AND SEX: 27 Male | EXTRICATION: Not Extricated
 SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

 TIME OF DEATH: February 8 1987 | HOUR: 2 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480426 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9489 Burn [any degree] involving 90 percent or more of body surface
N-CODE 9599 Other & unspecified injury to unspecified site

STATE : Texas | ROAD: Rural-Maj Collec
DATE : March 8 1987 | SPEED LIMIT: 55
DAY : Sunday | MANNER OF COLL: Head-on
HOUR : 6 | FIRST HARM: Veh in Transp
WEATHER : Normal | ND. OF VEHS: 2

BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TAAV SPEED: Unknown | MOST HARM: Veh in Transp
FIRE: No Fire | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 24 Male | EXTRICATION: Not Extricated
SEAT PDS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: March 8 1987 | HOUR: 6 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480502 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8199 Mtor vehicle traffic accident of unspecified nature (unspecified person)

N-CODE 9489 Burn [any degree] involving 90 percent or more of body surface

.....
STATE : Texas | ROAD: Rural-Pr Art Oth
DATE : March 21 1987 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Not applicable
HOUR : 3 | FIRST HARM: Culvert
WEATHER : Normal | NO. OF VEHS: 1
.....

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 11
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Culvert
FIRE: No Fire | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate .
.....

AGE AND SEX: 25 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: March 21 1987 HOUR: 3 | HOSPITAL: No
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482297 | AUTOPSY: NOT STATED
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 861 Injury to heart & lung
N-CODE 9493 Full-thickness skin loss due to burn [third degree NOS], unspecified site
N-CODE 9591 Other & unspecified injury to trunk

.....
STATE : Texas | ROAD: Rural-Local Road
DATE : October 13 1988 | SPEED LIMIT: 55
DAY : Thursday | MANNER OF COLL: Angle
HOUR : 8 | FIRST HARM Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2
.....

BODY TYPE: Truck Based SW | INITIAL IMPACT: Ck 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Undercarriage
TRAV SPEED: Unknown | MOST HARM Other Post/Pole
FIRE: No Fire | ROLLOVER: No-Rollover
VEHICLE ROLE: Both | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 58 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Tqtally E jected
.....

TIME OF DEATH: October 13 1988 HOUR: 9 | HOSPITAL: Yes
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480302 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 9410 Burn of face, head, & neck, unspecified degree

N-CODE 9430 Burn of upper limb, except wrist & hand, unspecified degree

STATE: Texas | ROAD: Rural-Maj Collec
DATE: February 17 1989 | SPEED LIMIT: 55
DAY: Friday | MANNER OF COLL: Not applicable
HOUR: 17 | FIRST HARM: Tree
WEATHER: Rain | NO. OF VEHS: 1
BODY TYPE: Picku | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Tree
FIRE: No Fire | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 19 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-mid | EJECTION: Totally Ejected
TIME OF DEATH: February 17 1989 | HOUR: 17 | HOSPITAL: No



APPENDIX D

68 Fatally-Injured Texas Occupants Riding in 46 Vehicles with “Questionable” MHE Codes of “Fire or Explosion.” note: For four of the 68 decedents shown in this appendix, seating position was unknown. That is to say, four of these 68 decedents are not represented in the tallies in Table 4.

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480115 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 869 Internal injury to unspecified or ill-defined organs

STATE: Texas | ROAD: Rural-Local Road
DATE: January 17 1987 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Angle
HOUR: 6 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 2
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Struck | DEFORMATION: Disabling/Severe
AGE AND SEX: 25 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: January 17 1987 | HOUR: 6 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480115 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9599 Other & unspecified injury to unspecified site

STATE: Texas | ROAD: Rural-Local Road
DATE: January 17 1987 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Angle
HOUR: 6 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Struck | DEFORMATION: Disabling/Severe
AGE AND SEX: 28 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A
TIME OF DEATH: January 17 1987 | HOUR: 6 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480219 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: BLACK
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8199 Motor vehicle traffic accident of unspecified nature (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

Texas | ROAD: Rural-Min Artery
February 8 1987 | SPEED LIMIT: 55
Sunday | MANNER OF COLL: Head-on
20 | FIRST HARM: Veh in Transp
Normal | NO. OF VEHS: 2
2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 1
Going Straight | PRINCIPAL IMPACT: Clock 1
Unknown | MOST HARM: Fire/Explosion
Fire in Veh | ROLLOVER: No Rollover
Striking | DEFORMATION: Functional/Moderate
23 Male | EXTRICATION: Not Extricated
Front Seat-left | EJECTION: Not Eject, N/A
February 8 1987 | HOUR: 20 | HOSPITAL: NO

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480236 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Urban-Frwy/Xprwy
DATE: February 11 1987 | SPEED LIMIT: 55
DAY: Wednesday | MANNER OF COLL: Angle
HOUR: 21 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 3

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 10
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 10
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Struck | DEFORMATION: Disabling/Severe

AGE AND SEX: 33 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: February 11 1987 | HOUR: 21 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482109 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8160 Motor vehicle traffic accident due to loss of control, without collision on the highway (driver)

N-CODE 869 Internal injury to unspecified or ill-defined organs

.....
STATE : Texas | ROAD : Urban-Interstate
DATE : October 3 1987 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Not applicable
HOUR : 22 | FIRST HARM: Guardrail
WEATHER : Normal | NO. OF VEHS: 1
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 11
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Top
TRAV SPEED: Unknown | MST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Functional/Mderate
.....

AGE AND SEX: 53 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Totally Ejected
.....

TIME OF DEATH: October 3 1987 | HOUR: 22 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482109 | **AUTOPSY:** NO
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8161 Mtor vehicle traffic accident due to loss of control, without collision on the highway (passenger)

N-CODE 869 Internal injury to unspecified or ill-defined organs

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE : Texas | **ROAD:** Urbak- Interstate
DATE : October 3 1987 | **SPEED LIMIT:** 5 5
DAY : Saturday | **MANNER OF COLL:** Not applicable
HR : 22 | **FIRST HARM** Guardrail
WEATHER : Normal | **NO. OF VEH:** 1 :

BODY TYPE: Picku | **INITIAL IMPACT:** Clock 11
VEH MANUVER: Going Straight | **PRINCIPAL IMPACT:** Top
TRAV SPEED: Unknown | **MDST HARM** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER:** Subsequent Event
VEHICLE ROLE: Striking | **DEFORMATION:** Functional/Moderate

AGE AND SEX: 37 Male | **EXTRICATION:** Not Extricated
SEAT POS: Unknown | **EJECTION:** Totally Ejected

TIME OF DEATH: October 3 1987 | **HR:** 22 | **HOSPITAL :** No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482125 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Pr Art Oth
DATE: October 4 1987 | SPEED LIMIT: 55
DAY: Sunday | MANNER OF COLL: Not applicable
HOUR: 18 | FIRST HARM: Bridge Rail
WEATHER: Normal | NO. OF VEHS: 1
BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 38 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: October 4 1987 | HOUR: 18 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482620 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE: Texas | ROAD: Rural-Maj Collec
DATE: December 5 1987 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 0 | FIRST HARM: Veh in Transp
WEATHER: Fog | NO. OF VEHS: 2
BODY TYPE: Picku | INITIAL IMPACT: CIP 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: CIP 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 15 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: December 5 1987 | HOUR: 0 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482620 | AUTOPSY: YES
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 929 Crushing injury of multiple & unspecified sites

STATE: Texas | ROAD: Rural-Maj Collec
DATE: December 5 1987 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 0 | FIRST HARM: Veh in Transp
WEATHER: Fog | NO. OF VEHS: 2
BODY TYPE: Picku | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: December 5 1987 | HOUR: 0 | HOSPITAL: No

.....
1967-1969 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 402604 | **AUTOPSY:** NO
VEHICLE NUMBER: 2 | **RACE:** WHITE
PERSON NUMBER: 2 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 654 Intracranial injury of other & unspecified nature
N-CODE 669 Internal injury to unspecified or ill-defined organs

.....
STATE : Texas | **ROAD:** Rural-Interstate
DATE : December 26 1987 | **SPEED LIMIT:** 55
DAY : Saturday | **MANNER OF COLL:** S-Swipe:Same dir
HRUR : 17 | **FIRST HARM** Ven in Transp
WEATHER : Rain | **NO. OF VEHS:** 3

.....
BODY TYPE: 2dr Sedan/HT/Coupe | **INITIAL IMPACT:** Clock 8
VEH MANUEVER: Passing/Overtaking Another Vehicle | **PRINCIPAL IMPACT:** Top
TRAV SPEED: Unknown | **MOST HARM** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER:** Subsequent Event
VEHICLE ROLE: Striking | **DEFORMATION:** Disabling/Severe

.....
AGE AND SEX: 29 Male | **EXTRICATION:** Not Extricated
SEAT POS: 2nd Seat-right | **EJECTION:** Totally Ejected

.....
TIME OF DEATH: December 26 1967 **HRUR:** 17 | **HOSPITAL :** No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482871 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 829 Fracture of unspecified bones
N-CODE 843 Sprains & strains of hip & thigh
N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Interstate
DATE: December 20 1987 | SPEED LIMIT: 65
DAY: Sunday | MANNER OF COLL: Rear-end
HOUR: 2 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 6
VEH MANUEVER: Starting in Traffic Lane | PRINCIPAL IMPACT: Clock 6
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Struck | DEFORMATION: Disabling/Severe
AGE AND SEX: 28 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: December 29 1987 | HOUR: 9 | HOSPITAL: Yes

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480152 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE : Texas | ROAD: Rural-Interstate
DATE : January 27 1988 | SPEED LIMIT: 65
DAY : Wednesday | MANNER OF COLL: Head-on
HOUR : 4 | FIRST HARM: Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 38 Male | EXTRICATION: Not Extricated
SEAT PDS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: January 27 1988 | HOUR: 5 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480178 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):
.....

8169 Motor vehicle traffic accident due to loss of control, without collision on the highway (unspecified person)

N-CODE 854 Intracranial injury of other & unspecified nature

.....
STATE: Texas | ROAD: Urban-Frwy/Xprwy
DATE: February 1 1988 | SPEED LIMIT: 55
DAY: Monday | MANNER OF COLL: Not applicable
HOUR: 2 | FIRST HARM: Guardrail
WEATHER: Normal | NO. OF VEHS: 1
.....
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Top
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....
AGE AND SEX: 19 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....
TIME OF DEATH: February 1 1988 | HOUR: 2 | HOSPITAL: NO
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480179 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 862 Injury to other & unspecified intrathoracic organs
N-CODE 068 Injury to other intra-abdominal organs

.....
STATE: Texas | ROAD: Rural-Interstate
DATE: February 1 1988 | SPEED LIMIT: 55
DAY: Monday | MANNER OF CDLL: Not applicable
HOUR: 2 | FIRST HARM: Parked Motor Veh
WEATHER: Normal | NO. OF VEHS: 1
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MDST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 22 Male | EXTRICATION: Not Extricated
SEAT PDS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: February 1 1988 HOUR: 2 | HOSPITAL: No
.....

.....
1967-1969 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 460311 | **AUTOPSY:** NO
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 1 I

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

6150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 629 Fracture of unspecified bones

N-CODE 669 Internal injury to unspecified or ill-defined organs

.....
STATE : Texas | **ROAD:** Rural-Min Artery
DATE : February 21 1966 | **SPEED LIMIT:** 55
DAY : Sunday | **MANNER OF COLL:** Not applicable
HRUR : 0 | **FIRST HARM** Culvert
WEATHER : Normal | **NO. OF VEHs:** 1

.....
BODY TYPE: Picku | **INITIAL IMPACT:** Clock 12
VEH MANUVER: Going Straight | **PRINCIPAL IMPACT:** Clock 12
TRAV SPEED: Unknown | **MST HARM :** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER :** No Rollover
VEHICLE ROLE: Striking | **DEFORMATION:** Disabling/Severe

.....
AGE AND SEX: 38 Mle | **EXTRICATION:** Not Extricated
SEAT POS: Front Seat-left | **EJECTION:** , Unknown

.....
TIME OF DEATH: February 21 1966 **HRUR:** 3 | **HOSPITAL:** Yes
.....

.....
1967-1969 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 460363 | **AUTOPSY:** YES
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

6150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 654 Intracranial injury of other & unspecified nature

.....
STATE : Texas | **ROAD:** Rural-Interstate
DATE : March 1 1966 | **SPEED LIMIT:** 65
DAY : Tuesday | **MANNER OF COLL:** Not applicable
HOUR : 22 | **FIRST HARM:** Guardrail
WEATHER : Normal | **NO. OF VEHS:** 1
.....

BODY TYPE: 2dr Sedan/HT/Coupe | **INITIAL IMPACT:** Clock 12
VEH MANUEVER: Going Straight | **PRINCIPAL IMPACT:** Clock 12
TRAV SPEED: Unknown | **MOST HARM:** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER :** No Rollover
VEHICLE ROLE: Striking | **DEFORMATION:** Disabling/Severe
.....

AGE AND SEX: 20 Mle | **EXTRICATION:** Not Extricated
SEAT POS: Front Seat-left | **EJECTION:** Not Eject, N/A
.....

TIME OF DEATH: March 1 1966 | **HOUR:** 22 | **HOSPITAL:** No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480396 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE : Texas | ROAD: Urban-Local Str
DATE : March 4 1988 | SPEED LIMIT: 35
DAY : Friday | MANNER OF COLL: Not applicable
HOUR : 22 | FIRST HARM: Tree
WEATHER : Normal | NO. OF VEH: 1

BODY TYPE: Picku | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate

AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: March 5 1988 | HOUR: 23 | HOSPITAL: Yes

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480396 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 I

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8161 Motor vehicle traffic accident due to loss of control, without collision on the highway (passenger)

N-CODE 854 Intracranial injury of other & unspecified nature

.....
STATE : Texas | ROAD: Urban-Local Str
DATE : March 4 1988 | SPEED LIMIT: 35
DAY : Friday | MANNER OF COLL: Not applicable
HOUR : 22 | FIRST HARM: Tree
WEATHER : Normal | NO. OF VEHS: 1
.....
BODY TYPE: Picku | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MDST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Mderate
.....
AGE AND SEX: 15 Mle | EXTRICATION: Not Extricated
SEAT POS: Front Seat-unk | EJECTION: Not Eject, N/A
.....
TIME OF DEATH: March 4 1988 HOUR: 23 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480396 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 3 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8161 Motor vehicle traffic accident due to loss of control, without collision on the highway (passenger)

N-CODE 9490 Burn of unspecified site, unspecified degree

STATE: Texas | ROAD: Urban-Local Str
DATE: March 4 1988 | SPEED LIMIT: 35
DAY: Friday | MANNER OF COLL: Not applicable
HOUR: 22 | FIRST HARM: Tree
WEATHER: Normal | NO. OF VEHs: 1
BODY TYPE: Picku | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate
AGE AND SEX: 15 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-unk | EJECTION: Not Eject, N/A
TIME OF DEATH: March 4 1988 | HOUR: 23 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480534 | AUTOPSY: YES
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE: Texas | ROAD: Rural-Pr Art Oth
DATE: March 22 1988 | SPEED LIMIT: 55
DAY: Tuesday | MANNER OF COLL: Head-on
HOUR: 6 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 1
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 24 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: March 22 1988 | HOUR: 6 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480566 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Urban-Frwy/Xprwy
DATE : March 27 1989 | SPEED LIMIT: 35
DAY: Monday | MANNER OF COLL: Not applicable
HOUR : 22 | FIRST HARM: Other Post/Pole
WEATHER : Normal | NO. OF VEHS: 1
.....

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 9
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 9
TRAV SPEED: Unknown | MDST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 23 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: March 27 1989 | HOUR: 23 | HOSPITAL: No
.....

.....
1987-1969 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480566 | **AUTOPSY:** NO
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 2 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 9598 Other 8 unspecified injury to other specified sites, including multiple

.....
STATE : Texas | **ROAD:** Urban-Frwy/Xprwy
DATE : March 27 1969 | **SPEED LIMIT:** 35
DAY : Monday | **MANNER OF COLL:** Not applicable
HR : 22 | **FIRST HARM:** Other Post/Pole
WEATHER : Normal | **NO. OF VEHS:** 1
.....

BODY TYPE: 2dr Sedan/HT/Coupe | **INITIAL IMPACT:** Clock 9
VEH MANUEVER: Going Straight | **PRINCIPAL IMPACT:** Clock 9
TRAV SPEED: Unknown | **MOST HARM:** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER:** No Rollover
VEHICLE ROLE: Striking | **DEFORMATION:** Disabling/Severe
.....

AGE AND SEX: 24 Mle | **EXTRICATION:** Not Extricated
SEAT POS: Front Seat-right | **EJECTION:** Not Eject, N/A
.....

TIME OF DEATH: March 27 1969 | **HR:** 23 | **HOSPITAL:** No
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480647 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):
.....

8159 Other motor vehicle traffic accident involving collision on the highway (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE: Texas | ROAD: Urban-oth Pr Art
DATE: April 8 1989 | SPEED LIMIT: 65
DAY: Saturday | MANNER OF COLL: Not applicable
HOUR: 17 | FIRST HARM: Bridge Pier
WEATHER: Normal | NO. OF VEHs: 1
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 23 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: April 8 1989 | HOUR: 17 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480680 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Pr Art Oth
DATE: April 9 1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 17 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 2
BODY TYPE: Picku | INITIAL IMPACT: Clock 1
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: April 9 1988 | HOUR: 17 | HOSPITAL: No

.....
1987.1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480680 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE: Texas | ROAD: Rural-Pr Art 0th
DATE: April 9 1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 17 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 16 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-mid | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: April 9 1988 HOUR: 17 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480680 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 3 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Pr Art Oth
DATE: April 9 1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 17 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: Picku | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh. | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 15 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-mid | EJECTION: Not Eject, N/A
TIME OF DEATH: April 9 1988 | HOUR: 17 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480680 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 4 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Pr Art Oth
DATE : April 9 1988 | SPEED LIMIT: 55
DAY : Saturday | MANNER, OF COLL: Head-on
HOUR : 17 | FIRST HARM Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 1
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MDST HARM Fire /Explosion
FIRE : Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 20 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: April 9 1988 HOUR: 17 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480680 | AUTOPSY: YES
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Pr Art Oth
DATE: April 9 1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 17 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 2
BODY TYPE: Truck Based Utility | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 25 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: April 9 1988 | HOUR: 17 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480680 AUTOPSY: NO
VEHICLE NUMBER: 2 RACE: WHITE
PERSON NUMBER: 2

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)
N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas ROAD: Rural-Pr Art Oth
DATE: April 9 1988 SPEED LIMIT: 55
DAY: Saturday MANNER OF COLL: Head-on
HOUR: 17 FIRST HARM: Veh in Transp
WEATHER: Normal NO. OF VEHS: 2
BODY TYPE: Truck Based Utility INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown MOST HARM: Fire/Explosion
FIRE: Fire in Veh ROLLOVER: No Rollover
VEHICLE ROLE: Striking DEFORMATION: Disabling/Severe
AGE AND SEX: 24 Female EXTRICATION: Not Extricated
SEAT POS: Front Seat-right EJECTION: Not Eject, -A
TIME OF DEATH: April 9 1988 HOUR: 17 HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480844 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE: Texas | ROAD: Rural-Interstate
DATE: April 23:1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Not applicable
HOUR: 2 | FIRST HARM: Bridge Rail
WEATHER: Normal | NO. OF VEHS: 1
BODY TYPE: Picku | INITIAL IMPACT: Unknown
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Top
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 22 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: April 23 1988 | HOUR: 4 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480855 | AUTOPSY: YES
 VEHICLE NUMBER: 2 | RACE: WHITE
 PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

- 8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)
- N-CODE 805 Fracture of vertebral column without mention of spinal cord injury
- N-CODE 862 Injury to other & unspecified intrathoracic organs
- N-CODE 868 Injury to other intra-abdominal organs

STATE: Texas | ROAD: Rural-Pr Art Oth
 DATE: April 29 1988 | SPEED LIMIT: 50
 DAY: Friday | MANNER OF COLL: Rear-end
 HOUR: 19 | FIRST HARM: Veh in Transp
 WEATHER: Rain | NO. OF VEHS: 2
 BODY TYPE: Picku | INITIAL IMPACT: Clock 12
 VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 12
 TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
 FIRE: Fire in Veh | ROLLOVER: No Rollover
 VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
 AGE AND SEX: 30 Female | EXTRICATION: Not Extricated
 SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
 TIME OF DEATH: April 29 1988 | HOUR: 19 | HOSPITAL: No

1987.1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480879 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Maj Collec
DATE: May 2 1988 | SPEED LIMIT: 55
DAY: Monday | MANNER OF COLL: Not applicable
HOUR: 0 | FIRST HARM: Culvert
WEATHER: Normal | NO. OF VEH: 1

BODY TYPE: Truck Based Utility | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Top
TRAV SPEED: Unknown | MST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate

AGE AND SEX: 35 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: May 2 1988 | HOUR: 0 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480879 | **AUTOPSY:** NO
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 2 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | **ROAD:** Rural-Maj Collec
DATE : May 2 1988 | **SPEED LIMIT:** 55
DAY : Mnday | **MANNER OF COLL:** Not applicable
HOUR : 0 | **FIRST HARM:** Culvert
WEATHER : Normal | **NO. OF VEHS:** 1
.....

BODY TYPE: Truck Based Utility | **INITIAL IMPACT:** Clock 12
VEH MANUEVER : Going Straight | **PRINCIPAL IMPACT:** Top
TRAV SPEED: Unknown | **MDST HARM** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER:** Subsequent Event
VEHICLE ROLE: Striking | **DEFORMATION:** Functional/Mbderate
.....

AGE AND SEX: 23 Male | **EXTRICATION:** Not Extricated
SEAT POS: Front Seat-right | **EJECTION:** Totally Ejected
.....

TIME OF DEATH: May 2 1988 | **HOUR:** 0 | **HOSPITAL:** No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 480879 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 3 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Maj Collec
DATE: May 2 1988 | SPEED LIMIT: 55
DAY: Monday | MANNER OF COLL: Not applicable
HOUR: 0 | FIRST HARM: Culvert
WEATHER: Normal | NO. OF VEHS: 1
BODY TYPE: Truck Based Utility | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Top
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate
AGE AND SEX: 32 Male | EXTRICATION: Not Extricated
SEAT POS: Unknown | EJECTION: Totally Ejected
TIME OF DEATH: May 2 1988 | HOUR: 0 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481267 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Local Road
DATE: June 20 1988 | SPEED LIMIT: 55
DAY: Monday | MANNER OF COLL: Head-on
HOUR: 13 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 2

BODY TYPE: Truck Based SW | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate

AGE AND SEX: 84 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A

TIME OF DEATH: June 20 1988 | HOUR: 13 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481380 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Runal-Min Artery
DATE: June 30 1988 | SPEED LIMIT: 55
DAY: Thursday | MANNER OF COLL: Not applicable
HOUR: 4 | FIRST HARM: Tree
WEATHER: Normal | NO. OF VEHs: 1
BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate
AGE AND SEX: 18 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A
TIME OF DEATH: June 30 1988 | HOUR: 4 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481582 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8100 Motor vehicle traffic accident involving collision with train (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Local Road
DATE: July 28 1988 | SPEED LIMIT: 55
DAY: Thursday | MANNER OF COLL: Not applicable
HOUR: 7 | FIRST HARM: Rail Train
WEATHER: Normal | NO. OF VEHs: 1
BODY TYPE: Cab chassis Based | INITIAL IMPACT: Clock 3
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Struck | DEFORMATION: Disabling/Severe
AGE AND SEX: 37 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Totally Ejected
TIME OF DEATH: July 28 1988 | HOUR: 7 | HOSPITAL: NO

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 481773 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Mn Artery
DATE : August 3 1988 | SPEED LIMIT: 55
DAY : Wednesday | MANNER OF COLL: Head-on
HOUR : 17 | FIRST HARM: Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MDST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 24 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: August 3 1988 HOUR: 17 | HOSPITAL: No
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 481773 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Mn Artery
DATE : August 3 1988 | SPEED LIMIT: 5 5
DAY : Wednesday | MANNER OF COLL: Head-on
HOUR : 17 | FIRST HARM Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 12
VEH MANUVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MOST HARM Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling Severe
.....

AGE AND SEX: 17 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject N/A
.....

TIME OF DEATH: August 3 1988 HOUR: 17 | HOSPITAL : No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481879 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8129 Other motor vehicle traffic accident involving collision with motor vehicle (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Urban-Frwy/Xprwy
DATE: August 24 1988 | SPEED LIMIT: 55
DAY: Wednesday | MANNER OF COLL: Angle
HOUR: 20 | FIRST HARM: Veh in Trans Oth
WEATHER: Normal | NO. OF VEHs: 4

BODY TYPE: Convertible | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Unknown
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 48 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: August 24 1988 | HOUR: 20 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482412 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 803 Other & unqualified skull fractures

N-CODE 853 Other & unspecified intracranial hemorrhage following injury

STATE: Texas | ROAD: Urban-Minor Art
DATE: October 14 1988 | SPEED LIMIT: 55
DAY: Friday | MANNER OF COLL: Angle
HOUR: 22 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A

TIME OF DEATH: October 14 1988 | HOUR: 22 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: **482696** | AUTOPSY: **YES**
VEHICLE NUMBER: **1** | RACE: **WHITE**
PERSON NUMBER: **1 I**
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 **Other motor** vehicle traffic **accident** involving collision **on the highway (driver)**

N-CODE 854 Intracranial **injury of other & unspecified nature**
N-CODE 9599 **Other & unspecified injury to utispecified site**

.....
STATE : **Texas** | ROAD : **Urban-oth Pr Art**
DATE : **November 28 1988** | SPEED LIMIT: **55**
DAY : **Mnday** | MANNER OF COLL **Not applicable**
HOUR : **20** | FIRST HARM **Overturn**
WEATHER : **Normal** | NO. OF VEHS: **1**
.....

BODY TYPE: **Picku** | INITIAL IMPACT: **Unknown**
VEH MANUVER : **Going Straight** | PRINCIPAL IMPACT: **Unknown**
TRAV SPEED: **Unknown** | MOST HARM **Fire/Explosion**
FIRE: **Fire in Veh** | ROLLOVER : **First Event**
VEHICLE ROLE: **Striking** | DEFORMATION: **Disabling/Severe**
.....

AGE AND SEX: **35 Mle** | EXTRICATION: **Not Extricated**
SEAT POS: **Front Seat -left** | EJECTION: **Not Eject, N/A**
.....

TIME OF DEATH: **November 28 1988** | HOUR: **20** | HOSPITAL: **No**
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482801 | AUTOPSY: YES
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE: Texas | ROAD: Rural-Min Artery
DATE: December 10 1988 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 19 | FIRST HARM: Veh in Transp
WEATHER: Rain | NO. OF VEHS: 2

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT POS: Unknown | EJECTION: Totally Ejected

TIME OF DEATH: December 12 1988 | HOUR: 15 | HOSPITAL: Yes

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482801 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE : Texas | ROAD: Rural-Mn Artery
DATE : December 10 1988 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Head-on
HOUR : 19 | FIRST HARM: Veh in Transp
WEATHER : Rain | NO. OF VEHS: 2

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER : No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 23 Male | EXTRICATION: Not Extricated
SEAT POS: Unknown | EJECTION: Totally Ejected

TIME OF DEATH: December 10 1988 HOUR: 20 | HOSPITAL: No

.....
1987. 1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482801 | **AUTOPSY:** NO
VEHICLE NUMBER: 2 | **RACE:** WHITE
PERSON NUMBER: 3 I

.....
UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | **ROAD:** Rural-Mn Artery
DATE : December 10 1988 | **SPEED LIMIT:** 55
DAY : Saturday | **MANNER OF COLL:** Head-on
HOUR : 19 | **FIRST HARM:** Veh in Transp
WEATHER : Rain | **NO. OF VEHS:** 2

.....
BODY TYPE: 4dr Sedan/HT | **INITIAL IMPACT:** Clock 11
VEH MANUEVER: Going Straight | **PRINCIPAL IMPACT:** Clock 11
TRAV SPEED: Unknown | **MDST HARM:** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER:** No Rollover
VEHICLE ROLE: Striking | **DEFORMATION:** Disabling/Severe

.....
AGE AND SEX: 15 Male | **EXTRICATION:** Not Extricated
SEAT POS: 2nd Seat-unk | **EJECTION:** Not Eject, N/A

.....
TIME OF DEATH: December 10 1988 **HOUR:** 20 | **HOSPITAL:** No
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482801 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 4 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Min Artery
DATE : December 10 1988 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Head-on
HOUR : 19 | FIRST HARM: Veh in Transp
WEATHER : Rain | NO. OF VEHS: 2
.....

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER : Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER : No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 21 Male | EXTRICATION: Not Extricated
SEAT POS: 2nd Seat-unk | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: December 10 1988 HOUR: 20 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482890 | AUTOPSY: YES
 VEHICLE NUMBER: 1 | RACE: WHITE
 PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Local Road
 DATE: December 22 1988 | SPEED LIMIT: 55
 DAY: Thursday | MANNER OF COLL: Head-on
 HOUR: 1 | FIRST HARM: Veh in Transp
 WEATHER: Normal | NO. OF VEHs: 2
 BODY TYPE: Picku | INITIAL IMPACT: Clock 12
 VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
 TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
 FIRE: Fire in Veh | ROLLOVER: No Rollover
 VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
 AGE AND SEX: 26 Male | EXTRICATION: Not Extricated
 SEAT POS: Front Seat-left | EJECTION: Totally Ejected
 TIME OF DEATH: December 22 1988 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 480281 | AUTOPSY: YES
VEHICLE NUMBER: 3 | RACE: BLACK
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 854 Intracranial injury of other 8 unspecified nature
N-CODE 9590 Other 8 unspecified injury to face & neck
N-CODE 9591 Other & unspecified injury to trunk

.....
STATE : Texas | ROAD: Rural- Interstate
DATE : February 15 1989 | SPEED LIMIT: 65
DAY : Wednesday | MANNER OF COLL: Rear-end
HOUR : 10 | FIRST HARM Veh in Transp
WEATHER : Rain | NO. OF VEHs: 3
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 6
VEH MANUEVER: Stopped in Traffic Lane | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Stopped Vehicle | MDST HARM Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Both | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 75 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: February 15 1989 HOUR: 11 | HOSPITAL: Yes
.....

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 461613 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

6150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 9596 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Maj Collec
DATE : August 4 1969 | SPEED LIMIT: 55
DAY : Friday | MANNER OF COLL: Not applicable
HOUR : 5 | FIRST HARM Culvert
WEATHER : Normal | NO. OF VEH: 1
.....
BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 9
VEH MANUEVA: Going Straight | PRINCIPAL IMPACT: Clock 9
TRAV SPEED: Unknown | MST HARM Fire/Explosion
FIRE: Fire in Veh | ROLLOVER : Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate
.....
AGE AND SEX: 57 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....
TIME OF DEATH: August 4 1989 | HOUR: 5 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481638 | AUTOPSY: NO
VEHICLE NUMBER: 4 | RACE: BLACK
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-InterState
DATE: August 6 1989 | SPEED LIMIT: 55
DAY: Sunday | MANNER OF COLL: Rear-end
HOUR: 1 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 4
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 6
VEH MANUEVER: Stopped in Traffic Lane | PRINCIPAL IMPACT: Clock 6
TRAV SPEED: Stopped Vehicle | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Both | DEFORMATION: Functional/Moderate
AGE AND SEX: 34 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: August 6 1989 | HOUR: 2 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481638 | AUTOPSY: NO
VEHICLE NUMBER: 4 | RACE: BLACK
PERSON NUMBER: 3 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Interstate
DATE: August 6 1989 | SPEED LIMIT: 55
DAY: Sunday | MANNER OF COLL: Rear-end
HOUR: 1 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 4

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 6
VEH MANUEVER: Stopped in Traffic Lane | PRINCIPAL IMPACT: Clock 6
TRAV SPEED: Stopped Vehicle | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Both | DEFORMATION: Functional/Moderate

AGE AND SEX: 4 Female | EXTRICATION: Not Extricated
SEAT POS: 2nd Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: August 6 1989 | HOUR: 2 | HOSPITAL: Yes 4

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481638 | AUTOPSY: NO
VEHICLE NUMBER: 4 | RACE: BLACK
PERSON NUMBER: 4 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Interstate
DATE: August 6 1989 | SPEED LIMIT: 55
DAY: Sunday | MANNER OF COLL: Rear-end
HOUR: 1 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 4

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 6
VEH MANUEVER: Stopped in Traffic Lane | PRINCIPAL IMPACT: Clock 6
TRAV SPEED: Stopped Vehicle | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Both | DEFORMATION: Functional/Moderate

AGE AND SEX: 2 Female | EXTRICATION: Not Extricated
SEAT POS: 2nd Seat-right | EJECTION: Not Eject, N/A

TIME OF DEATH: August 6 1989 | HOUR: 3 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481672 | AUTOPSY: NOT STATED
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 I

UNOERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor veh.c.e traffic accident involving collision with motor vehicle (driver)

N-CODE 9591 Other & unspecified injury to trunk

STATE : Texas | ROAD: Rural-Pr Art Dth
DATE : August 9 1989 | SPEED LIMIT: 45
DAY : Wednesday | MANNER OF COLL: Head-on
HOUR : 13 | FIRST HARM: Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2

BODY TYPE: Auto Picku | INITIAL IMPACT: Clock 11
VEH MANUVER: Going Straight | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 33 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: August 9 1989 HOUR: 13 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 481695 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 5 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE : Texas | ROAD: Rural-Maj Collec
DATE : August 12 1989 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Not applicable
HOUR : 1 | FIRST HARM: Tree
WEATHER : Normal | NO. OF VEH: 1

BODY TYPE: Convertible | INITIAL IMPACT: Clock 12
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Unknown
TRAV SPEED: 83mph | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 17 Male | EXTRICATION: Not Extricated
SEAT POS: 2nd Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: August 12 1989 | HOUR: 1 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 481963 | AUTOPSY: NO
VEHICLE NUMBER: 2 | RACE: WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8199 Mtor vehicle traffic accident of unspecified nature (unspecified person)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Pr Art Oth
DATE : September 11 1989 | SPEED LIMIT: 55
DAY : Monday | MANNER OF COLL: Head-on
HOUR : 7 | FIRST HARM Veh in Transp
WEATHER : Rain | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 2
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 2
TAAV SPEED: Unknown | MOST HARM Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 23 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: September 11 1989 HOUR: 7 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482076 | AUTOPSY: NOT STATED
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9947 Asphyxiation & strangulation

STATE : Texas | ROAD: Rural-Local Road
DATE : September 23 1989 | SPEED LIMIT: 55
DAY : Saturday | MANNER OF COLL: Head-on
HOUR: 0 | FIRST HARM Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2

BODY TYPE: 3dr/2dr Hatchback | INITIAL IMPACT: Clock 2
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 2
TRAV SPEED: Unknown | MST HARM Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 19 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: September 23 1989 HOUR: 0 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482076 | AUTOPSY: NOT STATED
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8199 Motor vehicle traffic accident of unspecified nature (unspecified person)

N-CODE 9947 Asphyxiation & strangulation

STATE: Texas | ROAD: Rural-Local Road
DATE: September 23 1989 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 0 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: 3dr/2dr Hatchback | INITIAL IMPACT: Clock 2
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 2
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 19 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Partially Eject
TIME OF DEATH: September 23 1989 | HOUR: 0 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 462161 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 862 Injury to other & unspecified intrathoracic organs
N-CODE 666 Injury to other intra-abdominal organs

STATE : Texas | ROAD: Rural-Maj Collec
DATE : October 6 1969 | SPEED LIMIT: 55
DAY : Friday | MANNER OF COLL: Not applicable
HOUR : 0 | FIRST HARM: Guardrail
WEATHER : Normal | NO. OF VEHS: 1

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 26 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: October 6 1989 HDUR: 1 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482181 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

- 8151 Other motor vehicle traffic accident involving collision on the highway (passenger)
- N-CODE 862 Injury to other & unspecified intrathoracic organs
- N-CODE 868 Injury to other intra-abdominal organs

STATE: Texas | ROAD: Rural-Maj Collec
DATE: October 6 1989 | SPEED LIMIT: 55
DAY: Friday | MANNER OF COLL: Not applicable
HOUR: 0 | FIRST HARM: Guardrail
WEATHER: Normal | NO. OF VEHS: 1
BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 26 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A
TIME OF DEATH: October 6 1989 | HOUR: 1 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482181 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 3 I

UNDERLYING CAUSE OF DEATH (E-CODE):

8151 Other motor vehicle traffic accident involving collision on the highway (passenger)

N-CODE 862 Injury to other & unspecified intrathoracic organs

N-CODE 868 Injury to other intra-abdominal organs

STATE : Texas | ROAD: Rural-Maj Collec
DATE : October 6 1989 | SPEED LIMIT: 55
DAY: Friday | MANNER OF COLL: Not applicable
HOUR : 0 | FIRST HARM: Guardrail
WEATHER : Normal | NO. OF VEHs: 1

BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 11
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 11
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: Subsequent Event
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe

AGE AND SEX: 2 Male | EXTRICATION: Not Extricated
SEAT POS: 2nd Seat-right | EJECTION: Not Eject, N/A

TIME OF DEATH: October 6 1989 | HOUR: 1 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482293 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 803 Other & unqualified skull fractures

N-CODE 901 Injury to blood vessels of thorax

STATE: Texas | ROAD: Rural-Interstate
DATE: September 30 1989 | SPEED LIMIT: 55
DAY: Saturday | MANNER OF COLL: Head-on
HOUR: 3 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 3
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional/Moderate

AGE AND SEX: 19 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A

TIME OF DEATH: September 30 1989 | HOUR: 3 | HOSPITAL: No

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1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482321 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: BLACK
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 854 Intracranial injury of other & unspecified nature

STATE: Texas | ROAD: Urban-Local Str
DATE: October 22 1989 | SPEED LIMIT: 35
DAY: Sunday | MANNER OF COLL: Not applicable
HOUR: 3 | FIRST HARM: Utility Pole
WEATHER: Normal | NO. OF VEHS: 1
BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 3
VEH MANUEVER: Negotiating a Curve | PRINCIPAL IMPACT: Clock 3
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 22 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: October 22 1989 | HOUR: 3 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482347 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8120 Other motor vehicle traffic accident involving collision with motor vehicle (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Urban-Frwy/Utility
DATE: October 24 1989 | SPEED LIMIT: 55
DAY: Tuesday | MANNER OF COLL: Rear-end |
HOUR: 11 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHS: 2
BODY TYPE: Truck Based Utility | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: 62mph | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 49 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Not Eject, N/A
TIME OF DEATH: October 24 1989 | HOUR: 13 | HOSPITAL: No

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482347 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Urban-Frwy/Xprwy
DATE: October 24 1989 | SPEED LIMIT: 55
DAY: Tuesday | MANNER OF COLL: Rear-end
HOUR: 11 | FIRST HARM: Veh in Transp
WEATHER: Normal | NO. OF VEHs: 2
BODY TYPE: Truck Based Utility | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: 62mph | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 47 Female | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A
TIME OF DEATH: October 24 1989 | HOUR: 13 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482591 | AUTOPSY: YES
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | ROAD: Rural-Maj Collec
DATE: October 15 1989 | SPEED LIMIT: 55
DAY : Sunday | MANNER OF COLL: Angle
HOUR : 21 | FIRST HARM Veh in Transp
WEATHER : Normal | NO. OF VEHS: 2
.....

BODY TYPE: Picku | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM Fire/Explosion
FIRE : Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
.....

AGE AND SEX: 18 Male | EXTRICATION: Not Extricated
SEAT PDS: Front Seat-right | EJECTION: Not Eject, N/A
.....

TIME OF DEATH: October 15 1989 HOUR: 21 | HOSPITAL: No
.....

1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482800 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 1 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8150 Other motor vehicle traffic accident involving collision on the highway (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE: Texas | ROAD: Rural-Min Artery
DATE: December 21 1989 | SPEED LIMIT: 55
DAY: Thursday | MANNER OF COLL: Not applicable
HOUR: 8 | FIRST HARM: Tree
WEATHER: Normal | NO. OF VEHs: 1
BODY TYPE: 4dr Sedan/HT | INITIAL IMPACT: Clock 1
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 1
TRAV SPEED: Unknown | MOST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Disabling/Severe
AGE AND SEX: 45 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-left | EJECTION: Partially Eject
TIME OF DEATH: December 21 1989 | HOUR: 8 | HOSPITAL: No

.....
1987-1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS
.....

STATE CASE: 482839 | **AUTOPSY:** NO
VEHICLE NUMBER: 1 | **RACE:** WHITE
PERSON NUMBER: 1 I
.....

UNDERLYING CAUSE OF DEATH (E-CODE):

8160 Motor vehicle traffic accident due to loss of control, without collision on the highway (driver)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

.....
STATE : Texas | **ROAD :** Urban-Interstate
DATE : December 26 1989 | **SPEED LIMIT:** 55
DAY : Tuesday | **MANNER OF COLL:** Not applicable
HR : 1 | **FIRST HARM** Guardrail
WEATHER : Normal | **NO. OF VEH:** 1
.....
BODY TYPE: 2dr Sedan/HT/Coupe | **INITIAL IMPACT:** Clock 12
VEH MANUEVER: Going Straight | **PRINCIPAL IMPACT:** Clock 12
TRAV SPEED: Unknown | **MOST HARM** Fire/Explosion
FIRE: Fire in Veh | **ROLLOVER :** No Rollover
VEHICLE ROLE: Striking | **DEFORMATION:** Functional/Moderate
.....
AGE AND SEX: 21 Mle | **EXTRICATION:** Not Extricated
SEAT POS: Front Seat-left | **EJECTION:** Not Eject, N/A
.....
TIME OF DEATH: December 26 1989 **HR:** 1 | **HOSPITAL:** No
.....

1987.1989 FARS/MCOD DATA: DRIVER AND PASSENGER FATALITIES IN PASSENGER CARS AND LIGHT TRUCKS

STATE CASE: 482839 | AUTOPSY: NO
VEHICLE NUMBER: 1 | RACE: WHITE
PERSON NUMBER: 2 |

UNDERLYING CAUSE OF DEATH (E-CODE):

8121 Other motor vehicle traffic accident involving collision with motor vehicle (passenger)

N-CODE 9598 Other & unspecified injury to other specified sites, including multiple

STATE : Texas | ROAD: Urban- Interstate
D A T E : December 26 1989 | SPEED LIMIT: 55
DAY : Tuesday | MANNER OF COLL: Not applicable
HOUR : 1 | FIRST HARM: Guardrail
WEATHER : Normal | NO. OF VEHs: 1

BODY TYPE: 2dr Sedan/HT/Coupe | INITIAL IMPACT: Clock 12
VEH MANUEVER: Going Straight | PRINCIPAL IMPACT: Clock 12
TRAV SPEED: Unknown | MST HARM: Fire/Explosion
FIRE: Fire in Veh | ROLLOVER: No Rollover
VEHICLE ROLE: Striking | DEFORMATION: Functional /Mderate

AGE AND SEX: 19 Male | EXTRICATION: Not Extricated
SEAT POS: Front Seat-right | EJECTION: Not Eject, N/A

TIME OF DEATH: December 26 1989 HOUR: 2 | HOSPITAL: Yes

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APPENDIX E

Summaries of 44 Texas Police Accident Reports (PARs) for 46 Vehicles that Experienced Fires and for which Fire or Explosion was a “Questionable” Coding of Most Harmful Event

| FARS Case No | Veh No. | Per No. | Description |
|--------------|---------|---------|--|
| 480115 | 1 | 1 2 | <p>PAR: Vehicle one crossed the center line and skidded sideways into an on-coming vehicle two. The driver and passenger in vehicle one were killed. The driver sustained "head injuries, internal injuries." The passenger was "severed at torso, partially-burned, massive internal injuries"</p> <p>MCOD: (Driv) Internal injury to unspecified or ill-defined organs (Pass) Other & unspecified injury to unspecified site</p> |
| 480219 | 2 | 1 | <p>PAP: Vehicle two "traveling at a high rate of speed" crossed the center line and was sideswiped by another vehicle. Approximately 200 feet after the initial impact, vehicle two struck a "large tree" and "exploded." The fatally-injured driver was simply described as "burned."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 480236 | 2 | 1 | <p>PAP: A vehicle (a diesel tractor) was being towed down a divided US highway at what may have been "at an unsafe speed." The towed vehicle broke loose from the towing vehicle, crossed the median and struck vehicle two in the side. Vehicle two "burst into flames." The driver sustained burns: "subject burnt."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

| | | | |
|--------|---|--------|---|
| 482109 | 1 | 1 2 | <p>PAR: Vehicle one (a pickup) was towing a gooseneck semi-trailer on an interstate highway. The vehicle left the road, "...traveling down a steep embankment and crossing Loop 340 Northbound I-35 entrance ramp driving through a metal guardrail, knocking the rear axle out from underneath #1 (the pickup). Both 1 and 2 (the gooseneck semi-trailer) then continued east down another steep embankment where #1 jackknifed toward the south causing #2 to break loose. #1 then overturned one time, ejecting the driver and passenger out of the vehicle and then came to rest headed south on the west shoulder..." There was a "tire in vehicle" with the deceased driver (who was totally ejected) suffering "severe head lacerations, multiple lacerations" at least in part from the "rear window and front of towed vehicle." The deceased passenger (who was also totally ejected) sustained "severe head injuries" at least in part from the "top right door."</p> <p>MCOD: (Driv) Internal injury to unspecified or ill-defined organs (Pass) Internal injury to unspecified or ill-defined organs: Other & unspecified injury to other specified sites, including multiple</p> |
| 482125 | 1 | 1 | <p>PAR: This crash involved a single vehicle leaving the roadway and striking "the corner of a bridge guard rail." "Upon impact Unit 1 burst into flames killing the driver inside the cab of the vehicle. The vehicle then slid down the culvert burning completely..." The deceased driver's injuries were described as "burned, head, chest."</p> <p>MCOD: Other and unspecified injury to other specified sites, including multiple</p> |
| 482620 | 1 | 1 | <p>PAR: "The explosion tore the cab from the frame of unit 1." The decedent suffered "Thermal Burns."</p> <p>MCOD: Intracranial injury of other & unspecified nature</p> <p>"Fire or explosion" is a defensible characterization of most harmful event. MCOD information may be incomplete.</p> |

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| 482620 | 2 | 1 | <p>PAR: “Unit 2 was westbound on FM 53. Unit 1 was eastbound on FM 53 driving in the westbound lane. The driver of unit 1 did not know how to drive the vehicle, and was allowed to drive by the owner who was in the vehicle. Visibility because of a heavy fog. The two units collided FL to FL eight feet North of the center stripe in the westbound lane. Unit 1 drove onto unit 2 causing the left gas tank of unit 1 to rupture and explode, which tore the cab from the frame of unit 1.” The deceased driver of vehicle two suffered a “crushed skull, thermal burns”</p> <p>MCOD: Crushing injury of multiple & unspecified sites</p> |
| 482804 | 2 | 2 | <p>PAR: The second vehicle in this crash investigation (Unit #2) first sideswiped another vehicle (Unit #3) in the eastbound lanes of an interstate highway. Unit #2 then went across the median (over a guardrail and chain link fence) and struck another vehicle (Unit #1) sideways. “Unit #2 overturned and burned in the middle of westbound lanes. Occupants of Unit #2 ejected from vehicle.” The deceased passenger (who was ejected) suffered “head injuries.”</p> <p>MCOD: Intracranial injury of other & unspecified nature; Internal injury to unspecified or ill-defined organs</p> |
| 482871 | 1 | 1 | <p>PAR: Vehicle one was pulling onto an interstate highway from the right shoulder when he was struck by vehicle three (a tractor trailer or semi-trailer). Vehicle one then struck vehicle two which was on the right shoulder. Vehicles one and two both burned. The injuries sustained by the deceased driver of vehicle one were coded as “chest & head” caused by the “steering wheel & dash.”</p> <p>MCOD: Fracture of unspecified bones; Sprains & strains of hip & thigh; Other & unspecified injury to other specified sites, including multiple</p> |

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| 480152 | 1 | 1 | <p>PAR: Vehicle two (a tractor and trailer or semi-trailer) jackknifed on an interstate highway, came across the median, and slid into vehicle one. The left side of vehicle two struck the front of vehicle one. "Both vehicles became engulfed in flames." The deceased driver of vehicle one suffered "head and chest injuries; burnt in fire."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 480178 | 1 | 1 | <p>PAR: In this single vehicle crash, this vehicle struck a guardrail, maintained contact with the guardrail for 128 feet, was then airborne for 88 feet before landing on its top. Upon the investigating officer's arrival at the scene, the vehicle was "totally engulfed in flames." The injuries to the deceased driver were defined as "head, upper torso," caused by the top of the vehicle.</p> <p>MCOD: Intracranial injury of other & unspecified nature</p> |
| 480179 | 1 | 1 | <p>PAR: The driver of vehicle one, "traveling at a high rate of speed (no brakes applied)," rear ended a parked tractor trailer or semi-trailer, displacing the tractor trailer or semi-trailer six feet and "bursting into flames." The fatally-injured driver of vehicle one sustained "multiple trauma and burned."</p> <p>MCOD: Injury to other & unspecified intrathoracic organs; Injury to other intra-abdominal organs.</p> |
| 480311 | 1 | 1 | <p>PAR: The driver vehicle one "either passed out or fell asleep" and struck a "concrete culvert head-on," suffering "multiple wounds on a!! parts of body with 2nd and 3rd degree burns." There were no other occupants in this vehicle.</p> <p>MCOD: Fracture of unspecified bones; Internal injury to unspecified or ill-defined organs</p> |

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|--------|---|-------------|--|
| 480363 | 1 | 1 | <p>PAR: “The vehicle ran off the right side of the road and ran onto and over a guard rail just before coming to a bridge. It then traveled on the grass beside the guard rail and bridge 173’ 4” before becoming airborne and collided into a street that ran — underneath the bridge. It then bounced off the street and went airborne another 88’6” and collided into the embankment on the other side of the bridge and exploded into flames.” The deceased driver’s “body was burned.”</p> <p>MCOD: Intracranial injury of other & unspecified nature</p> |
| 480396 | 1 | 1 2 3 | <p>PAR: “According to witness, MV#1 (vehicle one) passed him north-bound, ‘at about a hundred miles an hour.’” For some unknown reason, MV#1's driver lost control of his truck. The vehicle ran up on the grass, after striking the curb. The truck careened back across the road & ran up on a center median. The truck appears to have been traveling sideways as it struck a large oak tree. The truck spun around after the impact, coming to rest next to the tree. The truck burst into flames as it came to rest. The witness was able to pull the driver out of the burning wreckage, but could not get to the passengers.” For the three decedents, the driver was coded as having suffered “severe head trauma/burns,” while the two deceased passengers sustained “severe burns.”</p> <p>MCOD: (Driv) Intracranial injury of other & unspecified nature (Pass) Intracranial injury of other & unspecified nature (Pass) Burn of unspecified site, unspecified degree</p> |
| 480534 | 2 | 1 | <p>PAR: Vehicle two was eastbound when it crossed the center line of a US highway and moved into the westbound lane. Vehicle one was in the westbound lane. The two vehicles collided on the shoulder to the westbound lane. Both vehicles burned. The deceased driver of the second vehicle was “burned in vehicle.”</p> <p>MCOD: Intracranial injury or other & unspecified nature</p> <p>[Note: The right-front passenger in the first vehicle involved in this crash was also fatally injured, “burned in vehicle.” There was no MCOD information for this decedent.]</p> |

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| 480680 | 1 | 1 2 3 4 | <p>Note: Six people riding in two vehicles were killed in this crash (480680). "Fire or Explosion" was the most harmful event for both vehicles.</p> <p>-----</p> <p>PAR: Vehicle one crossed the centerline of a US highway and struck vehicle two head on. The driver and a!! three passengers in the first vehicle were killed with the following ascribed injuries:</p> <p>(Driv) "crushed on impact-burned, broken neck" (Pass) "crushed on impact and burned" (Pass) "crushed on impact and burned" (Pass) "crushed and burned"</p> <p>MCOD: A!! four of the deceased were coded as: Other & unspecified injury to other specified sites, including multiple</p> |
| | 2 | 1 2 | <p>PAR: The driver and passenger in the second vehicle were killed with the following ascribed injuries:</p> <p>(Driv) "crushed on impact and burned, broken neck" (Pass) "crushed on impact and burned"</p> <p>MCOD: Both of the deceased were coded as: Other & unspecified injury to other specified sites, including multiple</p> |
| 480844 | 1 | 1 | <p>PAR: In this single vehicle crash, the vehicle "...struck bridge rail and bridge rail broke. Veh #1 plunged approx. 35 ft to ground hit nose first and then onto top. After veh #1 came to rest it burst into flame. Driver trapped in vehicle." The stated injury to the driver, the lone occupant of the vehicle, was: "burnt entire body."</p> <p>MCOD: Intracranial injury or other & unspecified nature</p> |

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| 480855 | 2 | 1 | <p>PAR: The driver of the second vehicle (with a BAC of 0.29 and “traveling at a greater speed than the posted limit of 50 mph) rear-ended another (first) vehicle that had just turned onto the highway from a private drive. The first vehicle “burst into flames.” While the two vehicles were in contact, it appears that the second vehicle caught fire. The injuries sustained by the driver and sole occupant of the second vehicle were: “broken neck, left arm & leg/crushed chest & abdomen/head & upper torso-burned.”</p> <p>MCOD: Injury to other & unspecified intrathoracic organs; Injury to other intra-abdominal organs</p> |
| 480879 | 1 | 1 2 3 | <p>PAR: “Veh #1 traveled off roadway and into ditch. Veh traveled 130’ in ditch and struck culvert. Veh 1 was airborne another 40’ and struck concrete culvert. Veh then rolled once before coming to rest. Veh then caught fire after impact.” All three occupants were killed. (Driv) “Burned” (Pass) “Burned - Head Injuries - Chest Injuries” (Pass) “Burned”</p> <p>MCOD: All three of the deceased were coded: “Other & unspecified injury to other specified sites, including multiple”</p> |
| 481267 | 2 | 2 | <p>PAR: “Unit #1 was descending a small hill and approaching a right curve at an unsafe speed. Vehicle failed to yield ½ of roadway in the curve and struck Unit #2 which was northbound. Vehicles met front left to front left. Unit #2 was on right side of roadway. Point of impact was 3.5 feet from east edge of road.” There is no mention of either vehicle in this crash experiencing fire. However, the deceased front-right passenger riding in the second vehicle was said to have “burned to death.” The driver and back-right passenger sustained A-level and B-level injuries, respectively.</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

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|--------|---|--------|--|
| 481380 | 1 | 2 | <p>PAR: "Vehicle ran off roadway on the right. Vehicle traveled down grassy roadside for approximately 300 A., traveling unobstructed. At a culvert (vehicle) struck some trees. Vehicle crossed the culvert being partially supported by left wheels traveling on culvert. Vehicle top was ripped off by more trees part-way across creek bed. Vehicle then struck east bank of creek and came to rest. At some point in time following this impact the vehicle caught fire." The fatally-injured passenger in this vehicle was "burned - unable to determine any additional due to condition of body."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 481582 | 1 | 1 | <p>PAR: This vehicle was struck in the right side by a train and "exploded." The vehicle came to rest approximately 120 feet from impact. Furthermore, the vehicle "overturned on deceased after being ejected - burned." Driver injuries were listed as: "chest trauma - burned."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple.</p> |
| 481773 | 1 | 1 2 | <p>PAR: The first vehicle crossed the center line on a curve a US highway posted at 55 mph and collided head on with a tractor semi-trailer. The fuel tank on the first vehicle (a pickup) ruptured and the first vehicle was engulfed in flames. The driver and passenger of the first vehicle were both killed. Both decedents "... had multiple blunt impact injuries and were severely burnt beyond recognition."</p> <p>MCOD: The injuries for both decedents were listed as: Other & unspecified injury to other specified sites, including multiple</p> |
| 481879 | 1 | 1 | <p>PAR: Vehicle 1 crossed a divided median on a US highway posted at 55 mph, struck two tractor semi-trailers, and "caught on fire." The deceased driver of the first vehicle "burned."</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

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| 482412 | 1 | 2 | <p>PAR: The first vehicle collided with a second vehicle at a stop-controlled intersection. Subsequent to impact, the first vehicle rolled over (as indicated by the officer's sketch). Neither vehicle is said to have experienced a fire. However, the deceased front-right passenger of vehicle 1 "burned" and the part of the vehicle causing injury was listed as "engine - fuel." The driver of the vehicle sustained a B-level injury.</p> <p>MCOD: Other & unqualified skull fracture; Other & unspecified intracranial hemorrhage following injury.</p> |
| 482696 | 1 | 1 | <p>PAR: "The vehicle traveled in the drainage ditch until reaching Stevens Rd. When reaching Stevens the vehicle skipped and then flipped over upside down. It continued skipping and turning possibly counter clockwise then hit a guardrail pole. On impact vehicle caught fire. It skipped to a stop. Driver tried to exit right door by window but was burned quickly and killed."</p> <p>MCOD: Intracranial injury of other & unspecified nature; Other & unspecified injury to unspecified site.</p> |

| | | | |
|---------|---|------------------|--|
| 48280 1 | 2 | 1 2 3 4 | <p>Note: Six people riding in two vehicles were killed in this crash (48280 1). Both occupants of vehicle one were killed, but vehicle one apparently did not experience a fire. All four occupants of vehicle two died. Vehicle two experience a fire which was coded as the most harmful event.</p> <p>-----</p> <p>PAR: "Unit 1 apparently saw unit 2 on wrong side of road. Unit 1 pulled right, applied brakes, skidding approx. 28' on paved shoulder to POI (point of impact). Unit 1 rested upright headed south east approx. 38' east of POI. Unit 2 rested upright on fire, headed north approx. 80' east of POI." Officer was unable to determine which of the four decedents was driving. Recorded injuries were: (Pass 1) "head - internal" (ejected) (Pass 2) "head - chest - internal" (ejected) (Pass 3) "bums from vehicle fire" (Pass 4) "burned from vehicle fire - injuries unknown"</p> <p>MCOD: (Pass 1) Intracranial injury of other & unspecified nature (Pass 2) Other & unspecified injury to other specified sites, including multiple (Pass 3) Other & unspecified injury to other specified sites, including multiple (Pass 4) Other & unspecified injury to other specified sites, including multiple</p> |
| 482890 | 1 | 1 | <p>PAR: The first vehicle (unit one) struck a parked vehicle on the right side of a dirt, county road. Subsequent to impact, the driver of unit one was ejected. The vehicle then "... rotated ¼ time and slid in the loose dirt bouncing one time and came to rest on top of driver of unit one. Unit one burnt where it came to rest and also burned driver.," Injuries to driver: "severe skull fracture, punctured heart, burned beyond recognition"</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

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| 480281 | 3 | 1 | <p>PAR: Vehicle three was stranded without power in a north bound traffic lane on an interstate highway. Vehicle one came over a hill crest and struck the disabled vehicle (i.e., vehicle three) which was ‘knocked into’ vehicle two on the service road beside the interstate highway. Vehicle three “burst into flames.” The fatally-injured driver of this vehicle “burned” and sustained “unknown other injuries.”</p> <p>MCOD: Intracranial injury of other & unspecified nature; Other & unspecified injury to face & neck; Other & unspecified injury to trunk</p> |
| 480566 | 1 | 1 2 | <p>PAR: In this single vehicle crash, the vehicle was “traveling at a high rate of speed” when it “lost control” sliding sideways into a sign post. Point of impact was the driver side of the vehicle. The driver and right front passenger were both killed. Both “burned.”</p> <p>MCOD: Both driver and passenger sustained: Other & unspecified injury to other specified sites, including multiple</p> |
| 480647 | 1 | 1 | <p>PAR: A single vehicle traveling “at a high rate of speed” ran off the road, traveled in the median for 301 ft before striking a concrete support pillar for a railroad overpass. The vehicle “caught on fire.” The driver was “trapped in the vehicle” and “burned.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 481613 | 1 | 1 | <p>PAR: In this single vehicle crash: “The driver fell asleep and ran off the left side of the road. The driver then woke up and attempted to steer unit #1 back onto the road. Unit #1 slid sideways and hit a culvert broadside. Unit #1 rolled onto its top and caught fire.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

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| 481638 | 4 | 1 3 4 | <p>PAR: Vehicle four was the last vehicle in a queue stopped on an interstate highway due to a previous crash. Vehicle one struck vehicle four from the rear. Vehicle four struck the vehicle in front of it and then turned over beside the road. Vehicle four burned. The driver and two of the three passengers were killed. All three decedents were coded to have “internal” injuries and to have “burned.”</p> <p>MCOD: A!! three decedents were coded: Other & unspecified injury to other specified sites, including multiple</p> |
| 481672 | 1 | 1 | <p>PAR: Vehicle one “crossed double line” and struck a tractor semi-trailer with the left front of the vehicle. Vehicle one “exploded.” The driver was “severely burned.”</p> <p>MCOD: Other & unspecified injury to trunk</p> |
| 481695 | 1 | 5 | <p>PAR: The vehicle (Unit 1) “... traveling at a high rate of speed, failed to negotiate a left curve partially leaving roadway to right. Driver cut back to left & Unit 1 travels onto eastbound lane & into westbound lane. Driver, unable to maneuver” vehicle properly because of crowded seating, cuts back to right. (At this point speed mathematically computed to 83 mph). Veh. continues off roadway to right & strikes a tree, spins around backwards and strikes a second tree, flipped over once, landing on its top and catches fire. The driver and three passengers were ejected from Unit. One passenger (#5) was killed when pinned inside and underneath Unit 1. Unit 1 then caught fire and burned.” The decedent was “crushed by vehicle and burned.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |

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| 481963 | 2 | 1 | <p>PAR: The second vehicle (a pickup truck) was struck head on by a tractor semi-trailer that crossed the centerline of a US highway posted at 55 mph. No mention is made of either vehicle catching fire, exploding, or burning. However, the driver of the pickup was “burned over 100% of body.”</p> <p>note: The driver of the tractor semi-trailer (a vehicle type not considered in this study) also had “bums over 100% of body.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 482076 | 1 | 1 2 | <p>PAR: Vehicle one “came around right hand curve at a high rate of speed” and “lost control and swerved off onto the N/B shoulder. The driver then over corrected and slid sideways in a counter clockwise direction back onto the road” where it struck a second vehicle. No mention is made of either vehicle catching on fire, exploding, or burning. The injuries sustained by the deceased driver and passenger: “unable to determine due to bums.”</p> <p>MCOD: Both decedents were coded: Asphyxiation & strangulation</p> |
| 482181 | 1 | 1 2 3 | <p>PAR: “Unit #1 was east bound on TX 185 when for unknown reason, drifted left onto the opposite lane, continuing forward thus striking and straddling a guard-rail. As Unit #1 continued forward, it started to overturn, turning counter clockwise. Unit #1 then went airborne falling into a deep ditch, landing on it’s top then was engulfed in flames.” A!! three vehicle occupants were killed. The driver sustained “fatal bum injuries.” One passenger sustained “fatal bum injuries, head injuries” and the other was “burned.”</p> <p>MCOD: A!! three decedents received the same codes: Injury to other & unspecified intrathoracic organs; Injury to other intra-abdominal organs</p> |

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| 482293 | 1 | 1 | <p>PAR: Vehicle one was headed in the wrong direction on an interstate highway when he collided with a tractor trailer. "After initial impact both vehicle(s) exploded and burned." "Both units were totally destroyed by fire." Injuries to the deceased driver of vehicle one were listed as: "skull fracture, transection of the descending thoracic aorta, burned beyond recognition."</p> <p>MCOD: Other & unqualified skull fracture; Injury to blood vessels of thorax</p> |
| 482321 | 1 | 1 | <p>PAR: The driver of a stolen vehicle "appeared to have been going at a high rate of speed and lost control causing the vehicle to slide sideways before making impact with utility pole." The vehicle caught fire. The fatally injured driver was "burned."</p> <p>MCOD: Intracranial injury of other & unspecified nature</p> |
| 482347 | 1 | 1 2 | <p>PAR: Vehicle one (pulling a 34' travel trailer and estimated to have been traveling in excess of 62 mph prior to braking) struck the rear of a second vehicle stopped in the highway due to a traffic backup resulting from construction. The trailer hitch on vehicle one broke, the tongue on the travel trailer moved forward rupturing the fuel tank on vehicle one and producing a fire that engulfed the vehicle in flames. Both the fatally-injured driver and passenger in vehicle one sustained "blunt fore chest injuries, burns."</p> <p>MCOD: Both decedents were coded: Other & unspecified injury to other specified sites, including multiple</p> |

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| 482591 | 1 | 2 | <p>Note: Five people riding in two vehicles were killed in this crash (482591). Four people were killed in vehicle two (which did not experience a fire); one person was killed in vehicle one (which did experience a fire)</p> <p>-----</p> <p>PAR: Vehicles one and two collided at the intersection of two farm-to-market roads. Following this initial impact, vehicle one “went down an embankment and caught fire,” The driver of vehicle one was ejected and sustained A-level injury. The fatally-injured passenger in vehicle one (who was not ejected) sustained “massive chest injuries - 3rd degree burns.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 482800 | 1 | 1 | <p>PAR: “Unit #1 south on US 79 on straight stretch of roadway when vehicle went into slide. Vehicle left road to the right, entered ditch line struck tree and caught fire.” Injuries to the fatally-injured driver: “compound fracture of right ankle; unable to determine due to burned condition.”</p> <p>MCOD: Other & unspecified injury to other specified sites, including multiple</p> |
| 482839 | 1 | 1 2 | <p>PAR: Driver of vehicle one was racing with another vehicle when he lost control, skidded 174 feet, struck a median rail and then struck a second vehicle parked in the median. “Upon impact both vehicles caught on fire.” The injuries sustained by the deceased driver and front-right passenger in vehicle one were described, respectively, as: “internal and bum” and “head and internal.”</p> <p>MCOD: Both decedents were coded: Other & unspecified injury to other specified sites, including multiple</p> |

An Addendum to an Assessment of
the Reliability and Validity of
the Information on Vehicle Fires Contained in
the Fatal Accident Reporting System (FARS)

by

Lindsay I. Griffin, III

January 1998

Safety Division
Texas Transportation Institute
The Texas A&M University System
College Station, Texas 77843

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INTRODUCTION

A previous report (Griffm, 1997) considered the consistency with which two, fire-related variables in the Fatal Accident Reporting System (FARS)-fire experience (FIRE-EXP) and “fire or explosion” as the most harmful event (MHE)—were reported by the states (for crash-involved passenger cars and light trucks). This report compares some of the findings from the previous report (based on 1987-1989 FARS data) to a newer data set (FARS 1994-1996).

In the previous report, the 1987-1989 data set of passenger cars and light trucks was defined on body type (BODY-TYP = 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 50, 51, 53, 54, 55, 56, 58, 59, 67, 68, 69, or 79). Due to changes in the coding of body type, it was necessary to redefine the codes representative of passenger cars and light trucks in 1994-1996 to produce a comparable set of data. Twenty-six codes (i.e., body types) were selected to represent passenger cars and light trucks in the 1994-1996 dataset (BODY-TYP = 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 14, 19, 29, 30, 31, 32, 33, 39, 40, 41, 15, 16, 45, 48, or 79). These 26 codes were chosen for their comparability to the vehicle codes contained in the previous data set.

Of the 185,409 vehicles contained in FARS in 1987-1989, some 147,253 (79.42 percent) were classified as passenger cars or light trucks in the previous report. Of the 168,532 vehicles contained in FARS 1994-1996, some 133,928 (79.47 percent) were classified as passenger cars or light trucks by the definition used in this report. The frequencies and percentages of the different body types included in the 1987-1989 data set and the 1994-1996 data set are shown in Table 1.

Two basic analyses are undertaken in this report. The first considers how consistently the states report the “fire experience” (FIRE EXP) of crash-involved passenger cars and light trucks in 1994-1996 and, granted that a vehicle experienced a fire, how consistently the states report “fire or explosion” to be the most harmful event (MHE) for the occupants of vehicles that experience fire. The second analysis considers how consistently the states report vehicle fires (FIRE_EXP) and “fire or explosion” as the most harmful event for a vehicle’s occupants in 1994- 1996 when compared to their reports in 1987-1989.

Table 1: Passenger Cars and Light Trucks Selected from FARS by Body Type, 1987- 1989 vs. 1994- 1996

| Body Type | {1987-1989} | | {1994-1996} | |
|---------------------------------|-------------|---------|-------------|---------|
| | Frequency | Percent | Frequency | Percent |
| Convertible | 729 | 0.5 | 807 | 0.6 |
| 2dr Sedan/HT/Coupe | 54153 | 36.8 | 31453 | 23.5 |
| 3dr/2dr Hatchback | 3896 | 2.6 | 6051 | 4.5 |
| 4dr Sedan/HT | 37124 | 25.2 | 44122 | 32.9 |
| 5dr/4dr Hatchback | 1000 | 0.7 | 1592 | 1.2 |
| Station Wagon | 6750 | 4.6 | 4103 | 3.1 |
| Hatchback/unk drs | 214 | 0.1 | 171 | 0.1 |
| Other auto | 11 | 0.0 | 714 | 0.5 |
| Unk auto type | 4495 | 3.1 | 2380 | 1.8 |
| Auto Pickup | 568 | 0.4 | 309 | 0.2 |
| Auto Panel | 22 | 0.0 | 7 | 0.0 |
| Short Util/not Trk Based | 1399 | 1.0 | | |
| Truck Based Utility | 3677 | 2.5 | | |
| Compact Utility | | | 7536 | 5.6 |
| Large Utility | | | 1577 | 1.2 |
| Utility Station Wagon | | | 877 | 0.7 |
| Utility Unk Body | | | 38 | 0.0 |
| Unknown Van type | | | 193 | 0.1 |
| Pickup | 29831 | 20.3 | | |
| Compact Pickup | | | 12701 | 9.5 |
| Standard Pickup | | | 18253 | 13.6 |
| Pickup w/Canper | 92 | 0.1 | 266 | 0.2 |
| Convertible Pickup | | | 4 | 0.0 |
| Unknown Pickup | | | 303 | 0.2 |
| Cab Chassis Based | 305 | 0.2 | 412 | 0.3 |
| Truck Based Panel | 13 | 0.0 | 1 | 0.0 |
| Truck Based SW | 647 | 0.4 | | |
| Other Lt Conventional | 46 | 0.0 | 3 | 0.0 |
| Unk Lt Conventional | 1130 | 0.8 | 34 | 0.0 |
| SW Base Body Unk | 5 | 0.0 | | |
| Utility, Base Body Unk | 47 | 0.0 | | |
| Unknown Light Truck | 195 | 0.1 | | |
| Unk Trk Type | 904 | 0.6 | | |
| Unknown Truck | | | 21 | 0.0 |
| | ----- | ----- | ----- | ----- |
| | 147253 | 100.0 | 133928 | 100.0 |

ANALYSIS AND FINDINGS

VEHICLES EXPERIENCING FIRES

Table 2 depicts the 147,253 crash-involved vehicles from 1987-1989 and the 133,928 crash-involved vehicles from 1994-1996, by state. In 1987-1989, some 3,963 vehicles (2.69 percent) experienced fires. In 1994-1996, some 3,552 vehicles (2.65 percent) experienced fires. The percent (PCT) of vehicles experiencing fires in each state is shown.

Figure 1 depicts the 1994-1996 percent of vehicles that experience fires in each of the 50 states and the District of Columbia, with 95 percent confidence intervals placed around each estimated percent.¹ The vertical line in this figure represents the national average “fire experience” for passenger cars and light trucks in fatal crashes: 2.65 percent. Fifteen states have “fire experiences” that are significantly below the national average (UT, MS, NM, ID, MT, FL, MD, VA, SC, CO, NJ, NY, MI, AL, and TX) and 12 states have “fire experiences” that are significantly above the national average (OR, IN, ND, OH, AR, OK, MO, WI, IL, NC, AZ, and CA).

The variability in the individual state expressions (estimates) of vehicles experiencing fires is great. A chi-square (χ^2) analysis of these data suggests that it is highly unlikely that all of the states and the District of Columbia are consistently measuring the same phenomenon, i.e., a common 2.65 percent of vehicles experiencing tires [$\chi^2 = 473.77$ (with 50 df); $pr = 0.000$].²

Returning to Table 2 and considering the last column in this table: the Z statistics presented in this table compare the proportion of vehicles experiencing fires in 1987-1989 and 1994-1996 for each state. Using Arizona as an example, note that the proportion of vehicles experiencing fires in Arizona in 1994-1996 is greater than the proportion of vehicles experiencing fires in Arizona in 1987-1989. This increase in the proportion of vehicles experiencing fires is significant at $\alpha = 0.05$ ($Z = 3.21$). For Hawaii, the proportion of vehicles experiencing fires in 1994-1996 is smaller than the proportion experiencing fires in 1987-1989. This reduction is significant at $\alpha = 0.05$ ($Z = -2.84$)³

¹ See Appendix A to Griffin, 1997 for the derivation of these confidence intervals.

² See Appendix B to Griffin 1997 for the derivation of this χ^2

³ Z was calculated as:

$$Z = \frac{p_2 - p_1}{\sqrt{p(1-p)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Where,

p = proportion of vehicles experiencing fires in a given state (across all years)

p_1 = proportion of vehicles experiencing fires in a given state in 1987- 1989

p_2 = proportion of vehicles experiencing fires in a given state in 1994- 1996

n_1 = number of crash-involved vehicles in a given state in 1987-1989

n_2 = number of crash-involved vehicles in a given state in 1994-1996

Table 2: Vehicle Fires Reported in FARS by State, 1987- 1989 vs. 1994- 1996

| STATE | [1987-1989] | | | | I I | [1994-1996] | | | | Z |
|------------------|-------------|--------|------|--------|------|-------------|------|--------|---------|---|
| | FIRE | FIRE | PCT | TOTAL | | FIRE | FIRE | PCT | TOTAL | |
| ALABAMA | 92 | 3331 | 2.69 | 3423 | 77 | 3688 | 2.05 | 3765 | -1.80 | |
| ALASKA | 4 | 275 | 1.43 | 279 | 8 | 227 | 3.40 | 235 | 1.47 | |
| ARIZONA | 54 | 2710 | 1.95 | 2764 | 101 | 2949 | 3.31 | 3050 | 3.21 A | |
| ARKANSAS | 90 | 1825 | 4.70 | 1915 | 81 | 1831 | 4.24 | 1912 | -0.69 | |
| CALIFORNIA | 575 | 16413 | 3.38 | 16988 | 409 | 12889 | 3.08 | 13298 | -1.51 | |
| COLORADO | 37 | 1636 | 2.21 | 1673 | 36 | 1920 | 1.84 | 1956 | -0.79 | |
| CONNECTICUT | 54 | 1353 | 3.84 | 1407 | 25 | 940 | 2.59 | 965 | -1.66 | |
| DELAWARE | 15 | 450 | 3.23 | 465 | 11 | 394 | 2.72 | 405 | -0.44 | |
| DIST OF COLUMBIA | 4 | 191 | 2.05 | 195 | 3 | 199 | 1.49 | 202 | -0.43 | |
| FLORIDA | 131 | 10027 | 1.29 | 10158 | 111 | 9123 | 1.20 | 9234 | -0.55 | |
| GEORGIA | 165 | 5075 | 3.15 | 5240 | 151 | 4916 | 2.98 | 5067 | -0.50 | |
| HAWAII | 23 | 411 | 5.30 | 434 | 6 | 372 | 1.59 | 378 | -2.84 ▼ | |
| IDAHO | 9 | 709 | 1.25 | 718 | 9 | 772 | 1.15 | 781 | -0.18 | |
| ILLINOIS | 180 | 5397 | 3.23 | 5577 | 174 | 4752 | 3.53 | 4926 | 0.86 | |
| INDIANA | 112 | 3232 | 3.35 | 3344 | 147 | 2986 | 4.69 | 3133 | 2.76 A | |
| IOWA | 79 | 1477 | 5.08 | 1556 | 35 | 1548 | 2.21 | 1583 | -4.29 ▼ | |
| KANSAS | 43 | 1329 | 3.13 | 1372 | 45 | 1405 | 3.10 | 1450 | -0.05 | |
| KENTUCKY | 99 | 2516 | 3.79 | 2615 | 87 | 2652 | 3.18 | 2739 | -1.22 | |
| LOUISIANA | 99 | 2650 | 3.60 | 2749 | 75 | 2546 | 2.86 | 2621 | -1.53 | |
| MAINE | 13 | 713 | 1.79 | 726 | 12 | 537 | 2.19 | 549 | 0.50 | |
| MARYLAND | 47 | 2559 | 1.80 | 2606 | 27 | 2216 | 1.20 | 2243 | -1.70 | |
| MASSACHUSETTS | 81 | 2088 | 3.73 | 2169 | 46 | 1378 | 3.23 | 1424 | -0.80 | |
| MICHIGAN | 161 | 5516 | 2.84 | 5677 | 104 | 5072 | 2.01 | 5176 | -2.79 ▼ | |
| MINNESOTA | 93 | 1727 | 5.11 | 1820 | 65 | 1893 | 3.32 | 1958 | -2.75 ▼ | |
| MISSISSIPPI | 29 | 2301 | 1.24 | 2330 | 21 | 2713 | 0.77 | 2734 | -1.71 | |
| MISSOURI | 125 | 3310 | 3.64 | 3435 | 133 | 3443 | 3.72 | 3576 | 0.18 | |
| MONTANA | 15 | 549 | 2.66 | 564 | 7 | 590 | 1.17 | 597 | -1.86 | |
| NEBRASKA | 20 | 829 | 2.36 | 849 | 23 | 800 | 2.79 | 823 | 0.57 | |
| NEVADA | 22 | 826 | 2.59 | 848 | 27 | 906 | 2.89 | 933 | 0.39 | |
| NEW HAMPSHIRE | 15 | 525 | 2.78 | 540 | 10 | 378 | 2.58 | 388 | -0.19 | |
| NEW JERSEY | 51 | 3325 | 1.51 | 3376 | 46 | 2419 | 1.87 | 2465 | 1.05 | |
| NEW MEXICO | 23 | 1504 | 1.51 | 1527 | 13 | 1362 | 0.95 | 1375 | -1.36 | |
| NEW YORK | 123 | 6897 | 1.75 | 7020 | 101 | 5024 | 1.97 | 5125 | 0.88 | |
| NORTH CAROLINA | 91 | 5187 | 1.72 | 5278 | 160 | 4641 | 3.33 | 4801 | 5.18 A | |
| NORTH DAKOTA | 4 | 282 | 1.40 | 286 | 2 | 245 | 4.67 | 257 | 2.25 A | |
| OHIO | 164 | 5411 | 2.94 | 5575 | 196 | 4203 | 4.46 | 4399 | 4.02 A | |
| OKLAHOMA | 90 | 1917 | 4.48 | 2007 | 96 | 2202 | 4.18 | 2298 | -0.49 | |
| OREGON | 83 | 1908 | 4.17 | 1991 | 77 | 1541 | 4.76 | 1618 | 0.86 | |
| PENNSYLVANIA | 171 | 6244 | 2.67 | 6415 | 125 | 4725 | 2.58 | 4850 | -0.29 | |
| RHODE ISLAND | 8 | 373 | 2.10 | 381 | 3 | 211 | 1.40 | 214 | -0.61 | |
| SOUTH CAROLINA | 44 | 3153 | 1.38 | 3197 | 50 | 2697 | 1.82 | 2747 | 1.37 | |
| SOUTH DAKOTA | 14 | 368 | 3.66 | 382 | 17 | 418 | 3.91 | 435 | 0.18 | |
| TENNESSEE | 120 | 3779 | 3.08 | 3899 | 120 | 4052 | 2.88 | 4172 | -0.53 | |
| TEXAS | 248 | 9976 | 2.43 | 10224 | 238 | 10555 | 2.21 | 10793 | -1.06 | |
| UTAH | 1 | 887 | 0.11 | 888 | 3 | 1035 | 0.29 | 1038 | 0.85 | |
| VERMONT | 9 | 342 | 2.56 | 351 | 12 | 260 | 4.41 | 272 | 1.27 | |
| VIRGINIA | 49 | 3243 | 1.49 | 3292 | 37 | 2894 | 1.26 | 2931 | -0.76 | |
| WASHINGTON | 55 | 2408 | 2.23 | 2463 | 53 | 2110 | 2.45 | 2163 | 0.49 | |
| WEST VIRGINIA | 34 | 1407 | 2.36 | 1441 | 32 | 1095 | 2.84 | 1127 | 0.76 | |
| WISCONSIN | 90 | 2379 | 3.65 | 2469 | 87 | 2261 | 3.71 | 2348 | 0.11 | |
| WYOMING | 5 | 350 | 1.41 | 355 | 8 | 391 | 2.01 | 399 | 0.63 | |
| | 3963 | 143290 | | 147253 | 3552 | 130376 | | 133928 | | |

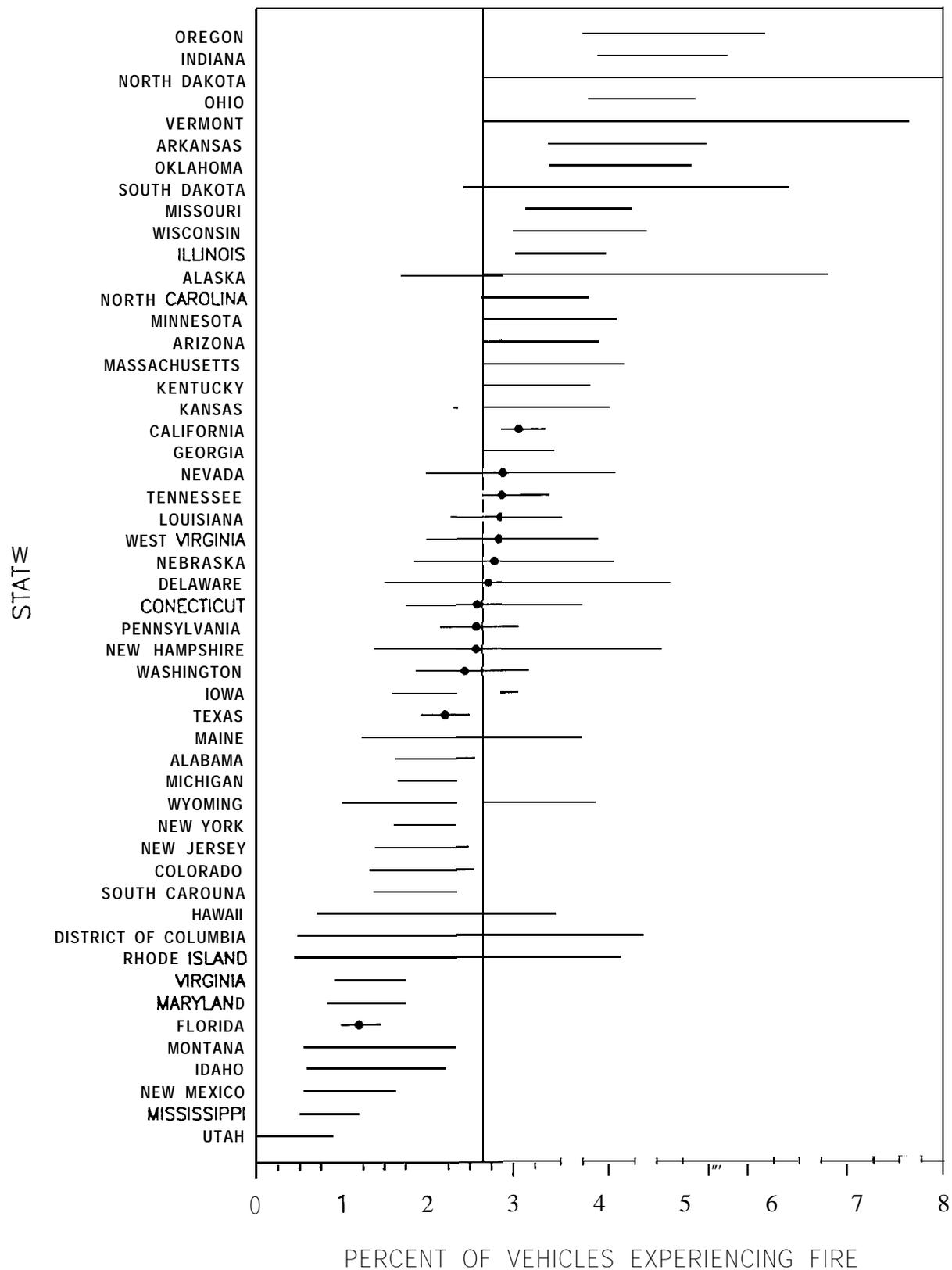


Figure 1: Percent of Vehicles Experiencing Fire, by State

Triangles pointing up (▲) in Table 2 indicate a significant increase in the proportion of vehicles experiencing fires (at $\alpha = 0.05$); triangles pointing down (▼) indicate a significant decrease in the proportion of vehicles experiencing fires (at $\alpha = 0.05$).

Figure 2 depicts the odds of a crash-involved vehicle experiencing a fire in 1994-1996 relative to the odds of a crash-involved vehicle experiencing a fire in 1987-1989, by state. That is to say, the individual data points in Figure 2 represent the 50 states and the District of Columbia.

To understand this figure, consider the data point in the lower right portion of this figure that represents Hawaii. In 1987-1989 Hawaii reported that 23 vehicles experienced fires and 411 did not. In 1994-1996 Hawaii reported that 6 vehicles experienced fires and 372 did not. Or, the odds of a vehicle fire in Hawaii in 1987-1989 were 0.0560 (23/411). In 1994-1996 the odds were 0.0161 (6/372).

The dashed line in Figure 2 is the best estimate of the overall change in the odds of a vehicle experiencing fire in 1994-1996 relative to 1987-1989. The slope on the dashed line is 0.9862. Or, generally speaking, the odds of a fire in 1994-1996 are 0.9862 times as large as the odds of a fire in 1987-1989. This 1.38 percent reduction in the odds of a fire in 1994-1996 (relative to 1987-1989), however, is not significant, [$\chi^2 = 0.35$ (with 1 df); $p = 0.554$]. See the Appendix.

If the odds of a fire had been reduced by 1.38 percent in each of the 50 states and the District of Columbia, all 51 data points would have fallen on the dashed line. But, the data points are highly scattered around the dashed line, indicating that the reduction in the odds of a fire was inconsistent from state to state between 1987-1989 and 1994-1996. The variability (or inconsistency) among the states is significant, [$\chi^2_{(50)} = 149.66$; $p = 0.000$]. See the Appendix.

FIRE AND EXPLOSION AS MOST HARMFUL EVENT

Table 3 depicts the 3,963 crash-involved vehicles that experienced fires between 1987 and 1989 and the 3,552 crash-involved vehicles that experienced fires between 1994 and 1996, by state. In 1987-1989, some 1,207 vehicles (30.46 percent) were coded with “fire or explosion” as the MHE. In 1994-1996, some 927 vehicles (26.10 percent) were coded with “fire or explosion” as the MHE. The percent (PCT) of vehicles for which “fire or explosion” was coded as the MHE are shown.

The proportions of vehicles for which “fire or explosion” was coded as the MHE varied by state from 1987-1989 to 1994-1996. Those states with upward-pointing triangles (▲) saw a significant increase (at $\alpha = 0.05$) in the proportion of vehicles for which “fire or explosion” was coded as MHE; those states with downward-pointing triangles (▼) saw a significant reduction (at $\alpha = 0.05$).

Figure 3 depicts the percents of vehicles for which “fire or explosion” was the most harmful event in 1994-1996 in 40 states and the District of Columbia, with 95 percent confidence intervals placed around each estimated percent. The vertical line in this figure represents the national average: 26.10 percent of all vehicles experiencing fire were also classified with “fire or explosion” as the MHE. Nine states are significantly above the national average (NE, LA, MD, ME, NY, FL, MO, AL,

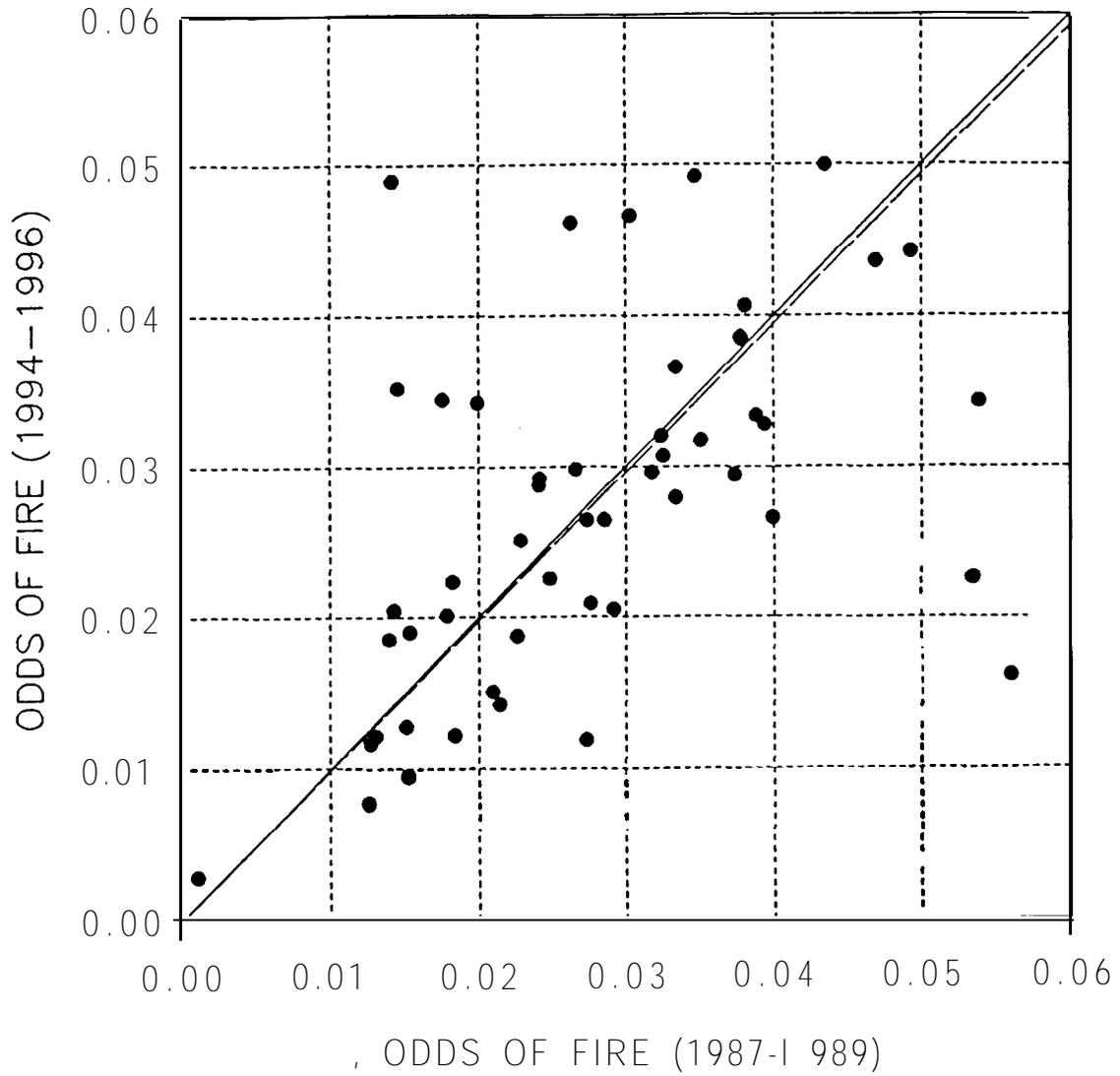


Figure 2: Odds of a Passenger Car or Light Truck Involved in a Fatal Crash Experiencing a Fire (1987-1989 vs 1994-1996), by State

Table 3: Fires as First Harmful Events in FARS by State, 1987- 1989 vs. 1994- 1996

| STATE | [1987-1989] | | | | I I | [1994-1996] | | | | Z |
|------------------|-------------|------|-----|--------|------|-------------|------|--------|-------|---------|
| | FIRE | FIRE | PCT | TOTAL | | FIRE | FIRE | PCT | TOTAL | |
| | 22 | | | | | | | | | |
| ALABAMA | 0 | 22 | 70 | 23.91 | 92 | 31 | 46 | 40.26 | 77 | 2.28 A |
| ALASKA | | 4 | | 0.00 | 4 | 0 | 8 | 0.00 | 8 | . |
| ARIZONA | 40 | 30 | | 44.44 | 54 | 24 | 77 | 23.76 | 101 | -2.65 ▼ |
| ARKANSAS | 230 | 50 | | 44.44 | 90 | 23 | 58 | 28.40 | 81 | -2.17 ▼ |
| CALIFORNIA | | 345 | | 40.00 | 575 | 164 | 245 | 40.10 | 409 | 0.03 |
| COLORADO | 9 | 28 | | 24.32 | 37 | 11 | 25 | 30.56 | 36 | 0.60 |
| CONNECTICUT | 8 | 46 | | 14.81 | 54 | 0 | 25 | 0.00 | 25 | -2.03 ▼ |
| DELAWARE | 2 | 13 | | 13.33 | 15 | 0 | 11 | 0.00 | 11 | -1.26 |
| | | | | | | 1 | | | 3 | 1.25 |
| DISCORD COLUMBIA | 20 | 107 | | 18.00 | 134 | 54 | 52 | 38.83 | 111 | 5.03 A |
| GEORGIA | 27 | 138 | | 16.36 | 165 | 7 | 144 | 4.64 | 151 | -3.36 ▼ |
| HAWAII | 13 | 4 | 19 | 17.39 | 23 | 1 | 5 | 16.67 | 6 | -0.04 |
| IDAHO | | 6 | | 33.33 | 9 | 5 | 4 | 55.56 | 9 | 0.95 |
| ILLINOIS | 1 | 179 | | 0.56 | 180 | 11 | 163 | 6.32 | 174 | 3.00 A |
| INDIANA | 44 | 68 | | 39.29 | 112 | 25 | 122 | 17.01 | 147 | -4.02 ▼ |
| IOWA | 14 | 65 | | 17.72 | 79 | 0 | 35 | 0.00 | 35 | -2.66 ▼ |
| KANSAS | 2 | 41 | | 4.65 | 43 | 1 | 44 | 2.22 | 45 | -0.63 |
| KENTUCKY | 13 | 86 | | 13.13 | 99 | 24 | 63 | 27.59 | 87 | 2.46 A |
| LOUISIANA | 17 | 63 | | 36.36 | 99 | 55 | 20 | 73.33 | 75 | 4.84 A |
| MAINE | 23 | 6 | | 53.85 | 13 | 8 | 4 | 66.67 | 12 | 0.65 |
| MARYLAND | | 24 | | 48.94 | 47 | 19 | 8 | 70.37 | 27 | 1.79 |
| MASSACHUSETTS | 14 | 67 | | 17.28 | 81 | 3 | 43 | 6.52 | 46 | -1.71 |
| MICHIGAN | 15 | 146 | | 9.32 | 161 | 25 | 79 | 24.04 | 104 | 3.27 A |
| MINNESOTA | 2 | 80 | | 13.98 | 93 | 7 | 58 | 10.77 | 65 | -0.60 |
| MISSISSIPPI | 84 | 27 | | 6.90 | 29 | 9 | 12 | 42.86 | 21 | 3.03 A |
| MISSOURI | | 41 | | 67.20 | 125 | 56 | 77 | 42.11 | 133 | -4.04 ▼ |
| MONTANA | 10 | 5 | | 66.67 | 15 | 0 | 7 | 0.00 | 7 | -2.92 ▼ |
| NEBRASKA | 7 | 13 | | 35.00 | 20 | 17 | 6 | 73.91 | 23 | 2.56 A |
| NEVADA | 6 | 16 | | 27.27 | 22 | 0 | 27 | 0.00 | 27 | -2.90 ▼ |
| NEW HAMPSHIRE | 1 | 14 | | 6.67 | 15 | 2 | 8 | 20.00 | 10 | 1.01 |
| NEW JERSEY | 5 | 48 | | 5.88 | 51 | 14 | 32 | 30.43 | 46 | 3.18 A |
| NEW MEXICO | 45 | 18 | | 21.74 | 23 | 4 | 9 | 30.77 | 3 | 0.60 |
| NEW YORK | | 78 | | 36.59 | 123 | 50 | 51 | 49.50 | 101 | 1.95 |
| NORTH CAROLINA | 36 | 55 | | 39.56 | 91 | 8 | 152 | 5.00 | 160 | -6.92 ▼ |
| NORTH DAKOTA | 1 | 3 | | 25.00 | 4 | 2 | 10 | 16.67 | 12 | -0.37 |
| OHIO | 3 | 161 | | 1.83 | 164 | 8 | 188 | 4.08 | 196 | 1.24 |
| OKLAHOMA | 17 | 87 | | 3.33 | 90 | 1 | 95 | 1.04 | 96 | -1.08 |
| OREGON | | 66 | | 20.48 | 83 | 12 | 65 | 15.58 | 77 | -0.80 |
| PENNSYLVANIA | 48 | 123 | | 28.07 | 171 | 35 | 90 | 28.00 | 125 | -0.01 |
| RHODE ISLAND | 0 | 8 | | 0.00 | 8 | 0 | 3 | 0.00 | 3 | . |
| SOUTH CAROLINA | 40 | 4 | | 90.91 | 44 | 50 | 0 | 100.00 | 50 | 2.18 A |
| SOUTH DAKOTA | 1 | 13 | | 7.14 | 14 | 2 | 15 | 11.76 | 17 | 0.43 |
| TENNESSEE | 65 | 55 | | 54.17 | 120 | 42 | 78 | 35.00 | 120 | -2.99 ▼ |
| TEXAS | 114 | 97 | | 60.89 | 248 | 79 | 159 | 33.19 | 238 | -6.11 ▼ |
| UTAH | 0 | 0 | | 100.00 | 1 | 0 | 3 | 0.00 | 3 | -2.00 ▼ |
| VERMONT | | 9 | | 0.00 | 9 | 4 | 8 | 33.33 | 12 | 1.93 |
| VIRGINIA | 47 | 2 | | 95.92 | 49 | 3 | 34 | 8.11 | 37 | -8.17 ▼ |
| WASHINGTON | 12 | 40 | | 27.27 | 55 | 9 | 44 | 16.98 | 53 | -1.29 |
| WEST VIRGINIA | 29 | 22 | | 35.29 | 34 | 7 | 25 | 21.88 | 32 | -1.20 |
| WISCONSIN | | 61 | | 32.22 | 90 | 14 | 73 | 16.09 | 87 | -2.50 ▼ |
| WOMING | 0 | 5 | | 0.00 | 5 | 0 | 8 | 0.00 | 8 | . |
| | 1207 | 2756 | | | 3963 | 927 | 2625 | | 3552 | |

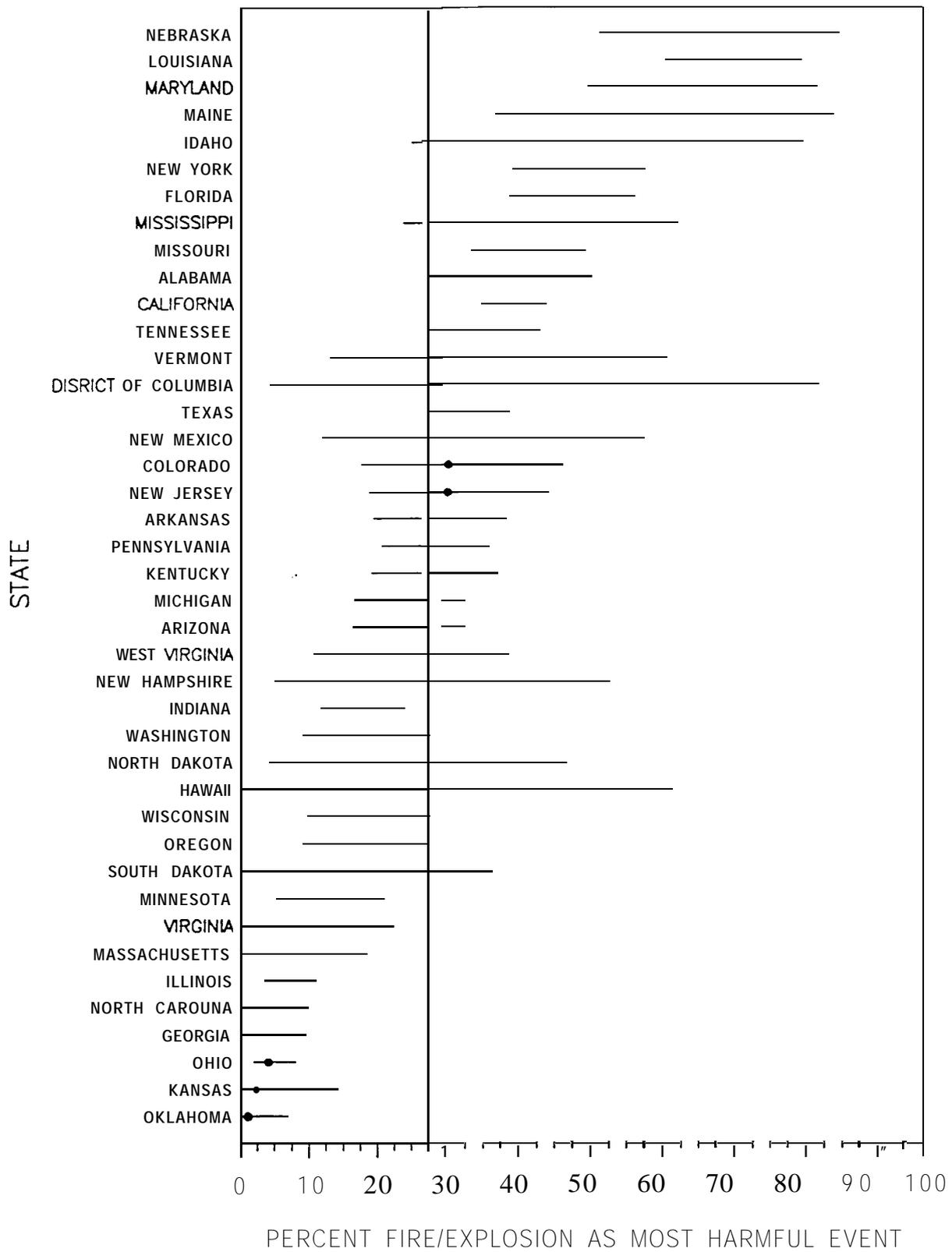


Figure 3: Percent “Fire or Explosion” Coded as the Most Harmful Event, by State

CA); 12 states are significantly below the national average (IN, WS, OR, MN, VA, MA, IL, NC, GA, OH, KS, and OK).⁴

The variability in the individual state codings of “fire or explosion” as the MHE is great. A chi-square (χ^2) analysis of these data suggests that it is highly unlikely that all of these states and the District of Columbia are consistently measuring the same phenomenon, i.e., a common 26.10 percent of vehicles coded with “fire or explosion” as MHE [$\chi^2 = 391.00$ (with 40 df); $pr = 0.000$].⁵

Figure 4 depicts the odds of a vehicle being coded with “fire or explosion” as MHE in 1994-1996 relative to 1987-1989, by state.⁶ The dashed line in Figure 4 is the best estimate of the overall change in the odds of a vehicle being coded with “fire or explosion” as MHE. The slope on the dashed line is 0.7899. Or, generally speaking, the odds of a vehicle being coded with “fire or explosion” as the MHE in 1994-1996 are 0.7899 times as large as the odds of a vehicle being coded with “fire or explosion” as the MHE in 1987-1989. This 21.01 percent reduction in the odds of MHE being a “fire or explosion” between 1987-1989 and 1994-1996 is significant, [$\chi^2 = 17.34$. (with 1 df); $pr = 0.000$]. See the Appendix for the derivation of this χ^2 .

⁴ Ten states were omitted from this figure to avoid dividing by zero or taking the natural logarithm of zero when calculating the confidence intervals. For nine of the states that were omitted from Figure 3, no vehicles were coded with “fire or explosion” as the MHE. For one state (SC), all 50 vehicles that experienced a fire were coded with “fire or explosion” as the MHE.

| STATE | MOST HARMFUL EVENT | |
|-------|--------------------|------------|
| | FIRE | OTHER |
| AK | 0 | 8 |
| CT | 0 | 25 |
| DE | 0 | 11 |
| IA | 0 | 35 |
| ME | 0 | 7 |
| NV | 0 | 27 |
| RI | 0 | 3 |
| SC | 50 | 0 |
| UT | 0 | 3 |
| WV | 0 | 8 |
| | <u>50</u> | <u>127</u> |

⁵ See Appendix B to Griffin 1997 for the derivation of this χ^2 .

⁶ Three states were omitted from Figure 4:

SC: the odds of “fire or explosion” in 1994-1996 were infinite

UT: the odds of “fire or explosion” in 1987-1989 were infinite

VA: the odds of “fire or explosion” in 1987-1989 were 23.5, off the scale used in Figure 4

It should be quickly pointed out, however, that the apparent 21.01 percent reduction in the odds of a vehicle being coded with “fire or explosion” as the MHE is not consistent across the states. That is to say, the data points in Figure 4 are widely scattered about the dashed line. Different states are showing significantly different “rates of change” in the odds of a vehicle being coded with “fire or explosion” as the MHE between 1987-1989 and 1994-1996, [$\chi^2_{(47)} = 408.40$; $pr = 0.000$]. See the Appendix for the derivation of this χ^2 .⁷

⁷ Three states were omitted from this analysis (AK, RI, and WY), None of these states coded any vehicles in the 1987-1989 or the 1994-1996 data with “fire or explosion” as the MHE. Thus the degrees of freedom in this analysis were reduced from 50 to 47.