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A COMPARISON OF MAINE CRASHES INVOLVING OLDER DRIVERS USING CODES

(Crash Outcome Data Evaluation System)

LINKED DATA

Technical Report Documentation Page

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16. Abstract Using Maine police crash reports linked to statewide emergency medical service (EMS), hospital inpatient, and death certificate files (CODES), we analyzed 1996 crashes for older drivers (age 65 and over) compared to middle-aged (age 25-64) drivers. Whi less likely to be involved in crashes, Maine older drivers were more likely to be hospitalized or die if they were in a crash; their ra of hospitalization or death per licensed driver was 1.7 times that of middle-aged drivers. While older Maine drivers represented 10% of the drivers involved in crashes, they accounted for 21% of the Maine drivers who were hospitalized or died. Older female drivers were 1.6 times more likely to be hospitalized or die during a crash than were older male drivers. Older drivers were more likely to be involved in crashes at intersections, driveways, making a left turn, or have failure to yield, driver inattention or driver distraction noted on the crash record than middle-aged drivers. While older drivers had a higher proportion of crash involvement urban areas, the highest proportion of hospitalization or deaths were in crashes in rural areas. Crash locations and driver factors associated with the highest volume of crashes were not always associated with the highest proportion of the hospitalizations or deaths; these findings illustrate the advantage of incorporating linked medical records, inpatient hospitalizations, in the analysis o motor vehicle crashes.			
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A COMPARISON OF MAINE CRASHES INVOLVING OLDER DRIVERS: RESULTS OF THE ANALYSIS OF THE MAINE CODES (CRASH OUTCOME DATA EVALUATION SYSTEM) LINKED DATA

MAINE HEALTH INFORMATION CENTER

February 2002

Table of Contents

Executive Summary

Using Maine police crash reports linked to statewide emergency medical service (EMS), hospital inpatient, and death certificate files (CODES), we analyzed 1996 crashes for older drivers (age 65 and over) compared to middle-aged (age 25-64), and young drivers (age 15-24).

- While less likely to be involved in crashes, Maine's older drivers were more likely to be hospitalized or die if they were in a crash; their rate of hospitalization or death per licensed driver was 1.7 times that of middle-aged drivers.

- While older Maine drivers represented 10% of the drivers involved in crashes, they accounted for 21% of the Maine drivers who were hospitalized or died.

- Within the older driver group rates of injury, hospitalization or death increased with age; drivers age 75 and over accounted for 42% of the older drivers involved in crashes but 55% of older drivers hospitalized.

- Older drivers were more likely than middle-aged drivers to be involved in crashes in urban areas (68.6% vs 62.7%), at intersections (45.1% vs 39.8%), driveways (23.2% vs 18.0%), and at lower speeds of 25-35 m.p.h. (67.1% vs 60.4%) than middle-aged drivers.

- Older drivers were more likely than middle-aged drivers to be making a left turn (15.1% vs 8.4%), have failure to yield (16.9% vs 6.8%), or have driver inattention or distraction (17.9% vs 14.4%) noted on the crash record.

- While older drivers had a higher proportion of crash involvement in urban areas (68.6%), the highest proportion of hospitalization or deaths were in crashes in rural areas (62.3%).

- Crashes where the vehicle ran off the road were a small proportion of older driver crashes (9.4%), but a high proportion of older driver hospitalization or death (33.3%).

- For older drivers the risk of hospitalization or death increased by 3.5% for every one-year increase in age.

- Older female drivers were 1.6 times more likely to be hospitalized or die during a crash than were older male drivers.

- Older drivers not wearing seat belts were 77 percent more likely to be hospitalized or die than were older drivers who were wearing seat belts during a crash.

Background

Nationally, older drivers represent an increasing percentage of licensed drivers; the fatality rate per 100,000 vehicle miles traveled for older drivers is similar to that of young teenage drivers and significantly higher than the rate for middle aged drivers (source: Older Population, Traffic Safety Facts 1999, NHTSA document DOT HS 809 091). This is an important issue in Maine, which has a higher proportion of population age 65 and over (14.0%) compared to the national average (12.7%). The number of Maine residents age 65 and over has increased from 163,373 during 1990 to 183,402 during 2000 (source: Profile of General Demographic Characteristics for Maine, U.S. Census, May, 2001). During 1996, 134,092 (15%) of the licensed drivers in the state of Maine were age 65 or older (source: Federal Highway Administration. Highway Statistics, 1996. Licensed drivers by state, sex, age group, Table DL-22. http://www/fhwa.dot.gov/ohim/1996/section3.html).

Methods

The Maine CODES (Crash Outcome Data Evaluation System) database for 1996 crashes was utilized for this report. The database was prepared by the Maine Health Information Center and is based on statewide police crash reports linked to statewide emergency medical services (EMS), hospital discharge, and death certificate data. During 1996, of the 99,712 persons reported in crash records, 10,364 were linked to EMS, 866 to hospital discharge and 156 to death certificate records.

The study selected Maine-licensed drivers of passenger cars, vans, and light trucks (N=54,769) involved in crashes on Maine highways during 1996. Non-Maine licensed drivers, 10% of the total, were excluded from the analysis.

For comparative purposes, driver's age was grouped into three age groups: 16-24 (young drivers), 25-64 (middle-aged drivers), and 65 and over (older drivers). A variety of crash (rural/urban location, road type, light conditions, pavement conditions) and driver behavior factors (failure to yield, handicap) were evaluated. Outcome measures were constructed from the linked data at cut-points on the injury severity scale; the analysis focused on comparisons of the number of Maine drivers involved in crashes with the number who were hospitalized (based on the linked data) or died.

The analysis consisted of population-based rates per licensed driver and bivariate analysis of crash demographics, characteristics, and driver behavior. In addition a multivariate logistic analysis of hospitalization and death outcomes in crashes was prepared.

An observational study of seat belt use in Maine during 1997 reported a 61% use rate, yet the police reported seat belt use rate in this study was over 85% for those drivers in crashes. Therefore, some proportion of seat belt use reported on the police crash reports is not accurate and results in an overestimate of the effectiveness of seat belts in reducing injuries. Our methods for adjusting the belt use data are described elsewhere (Analysis of Seat Belt Use and Outcomes in 1996 Maine Crashes, NHTSA DOT HS 808 888, April, 1999). The logistic regression analysis reports an odds ratio for seat belt use that has been adjusted for the over-reporting of belt use.

In the absence of unique identifiers, CODES linked data were based on probabilistic linkage methods. These methods were dependent on the completeness and accuracy of other information (date and time of crash, date of birth, zip code of residence, and town code of crash location) which were available in the police crash reports, EMS, hospital discharge, and death certificate records. The Maine CODES 1996 linkage was based on automated linkage without clerical review for individual records. We made an evaluation of the false negatives, which are records that should have linked but did not. For the crash to EMS linkage, using the Motor Vehicle Accident (MVA) check box on the EMS record, we estimated that 35% of EMS records that were MVAs did not link. We do not know the percentage of the unlinked MVA designated EMS records that were not linked because there was no crash report. Thus the numbers provided in this report, while useful in comparing patterns of injury and medical cost, underestimate the full burden of injury and medical cost.

Results – Crash Involvement Factors

Of the 54,769 Maine licensed drivers involved in crashes during 1996, 5,568 were age 65 or older (Table 1). Per 100,000 licensed drivers, the rate of crash involvement was lower (4,152.4) than the rate for young (13,610.6) or middle-aged drivers (5,445.3).

Older drivers were more vulnerable to serious injury resulting in a rate of hospitalization or death per 100,000 that was much higher (85.0) than for middle-aged drivers (49.0). While older Maine drivers represented 10% of the drivers involved in crashes, they accounted for 21% of the Maine drivers who were hospitalized or died. Within the older driver group rates of injury, hospitalization or death increased with age; drivers age 75 and over accounted for 42% of the

older drivers involved in crashes but 55% of older drivers hospitalized. Within the older driver group, drivers age 75 and over accounted for $931,100 (61%) of the $1,517,183 inpatient charges.

Results of our assessment of crash and driver factors are reported in Tables 2-5. While older drivers did not differ by crash day of week, they were less likely (49.6%) to be involved in crashes during the colder months, October-March, than middle-aged drivers (59.2%) (Table 2). Since these were Maine crashes, this could be related to older drivers who reside in the south for parts of the winter or older drivers actually driving less during the winter months. Older driver crashes were more likely to occur during daylight hours (83.6%) compared to middle-aged drivers (69.3%). Older drivers were less likely to be involved in crashes on wet, snow covered, or icy roads (31.8%) than middle-aged drivers (42.6%); this result correlated with fewer crashes during the winter months.

Table 3 provides information on the road locations where the crashes took place. Older drivers were more likely than middle-aged drivers to be involved in crashes in urban areas (68.6% vs 62.7%), at intersections (45.1% vs 39.8%), driveways (23.2% vs 18.0%), and at lower speeds of 25-35 m.p.h. (67.1% vs 60.4%).

Table 4 provides information on other crash and vehicle characteristics. Older drivers were less likely to hit an animal (3.8%) than middle-aged drivers (8.1%); this result correlated with fewer crashes during the night when most animal-related crashes take place. Older drivers were more likely to be involved in multiple-vehicle crashes (86.5% vs 77.1%) than were middle-aged drivers. Older drivers were less likely to be driving a light truck or van (20.5% vs 38.3%) than were middle-aged drivers. The rate of passengers riding with older drivers during

crashes (30.8%) was similar to middle-aged drivers (30.7%), but lower than the rate for young drivers (41.9%).

Table 5 provides information on the characteristics and behavior of drivers before and during the crash. Older drivers in crashes were more likely to be male (58.7%) which was only slightly different from middle-aged drivers (56.6%). Seat belt use, as reported to or by the police, was also similar (85.3% vs 86.8%). Older drivers were more likely than middle-aged drivers to be making a left turn (15.1% vs 8.4%), have failure to yield (16.9% vs 6.8%), or have driver inattention or distraction (17.9% vs 14.4%) noted on the crash record.

Older drivers were less likely to be driving at an illegal or unsafe speed (3.0% vs. 6.5%) or using drugs or alcohol (1.6% vs. 3.3%) than middle-aged drivers. A function of their age, older drivers were more likely to be ill, handicapped, and have license restrictions (special equipment, medication, daylight only, corrective lenses) than middle-aged drivers involved in crashes.

Results – Hospitalization or Death Outcomes

As reported above, older drivers had higher rates of more serious injuries resulting in hospitalization or death. Tables 2-5 also report the distribution of the 114 older drivers who died or were linked to a hospital inpatient record. Using hospitalization or death as an outcome measure provided a very different view of the important crash factors for the older drivers.

While older drivers had a higher proportion of crash involvement in urban areas (68.6%), the highest proportion of hospitalization or deaths were in crashes in rural areas (62.3%) (Table 3). While a high proportion of crashes occurred at

intersections (45.1%) and driveways (23.2%), a high proportion of crashes resulting in hospitalization or death were on straight (41.2%) or curved (16.7%) road locations. While the highest volume of crashes occurred on roads with posted speed limits of 25-35 m.p.h. (67.1%), the majority of crashes resulting in hospitalization or death were on roads with posted speed limits of 40-45 m.p.h. (27.2%) and 50-55 m.p.h. (33.3%).

Crashes where the vehicle ran off the road were a small proportion of older driver crashes (9.4%), but a high proportion of older driver hospitalization or death (33.3%) (Table 4). Further information on this important problem in Maine is available in another Maine CODES report (Analysis of 1996 Maine Crashes Involving Vehicles That Ran Off the Road. DOT HS 808 889, NHTSA Report, April 1999.)

Older drivers in vans and pickups were less likely to be hospitalized or die than were older drivers in passenger cars. While older drivers with passengers in the vehicle represented 30.8% of crashes they represented only 21.1% of those where hospitalization or death occurred.

While older female drivers were less likely than males to be involved in a crash (41.3%), they were more likely than males to be hospitalized or die (53.5%) (Table 5). Older driver's inattention or distraction, having a license restriction for medication or corrective lenses, or reported as not wearing a seat belt were all associated with a higher proportion of hospitalization or death than would be predicted by the rate of crash involvement.

The multivariate logistic regression supported most of these findings (Table 6). During crashes of older Maine drivers the odds ratios of hospitalization or death

was higher due to the driver not being belted (1.767), a rural crash location (1.982), a speed limit increase of 10 m.p.h. (1.395), a head on collision (2.868), or driver inattention or distraction (1.883). License restrictions for medication (1.798) or corrective lenses (1.487) were also associated with increased risk; these results were close to statistical significance (p=0.077, p=0.088). For older drivers the risk of hospitalization or death increased by 3.5% for every one-year increase in age. Older female drivers were 1.6 times more likely to be hospitalized or die during a crash than were older male drivers. Intersection-driveway crashes had lower risk (0.316).

Summary and Recommendations

Per licensed driver, Maine older drivers were slightly less likely to be involved in Maine crashes than middle-aged drivers during 1996. We think that older drivers drive fewer miles than middle-aged drivers, and a rate based on miles driven would be higher for older drivers. However, data on miles traveled by age and gender were not available from NHTSA or Maine state agencies; we recommend that these data be captured for future reporting of rates per miles traveled.

While less likely to be involved in crashes, Maine's older drivers were more likely to be hospitalized or die if they were in a crash; their rate of hospitalization or death per licensed driver was 1.7 times that of middle-aged drivers. The medical cost burden, primarily paid through Medicare, was disproportionately higher for older Maine drivers. Current Maine CODES linked data, hospital inpatient charges, represents only a portion of the medical and other costs resulting from older driver crashes. Maine has recently developed a statewide hospital

outpatient data file that contains emergency department visits and associated charges; we recommend adding this file to future linkage projects.

Compared to middle-aged drivers, crashes involving older drivers were more likely to occur during daylight hours, under dry conditions, in urban areas, at intersections and driveways, on roads with lower speed limits, and involve a collision with another vehicle. The driver was more likely to be making a left turn, have failed to yield, or be inattentive or distracted. These results are similar to those reported in other studies (McGwin, G. and Brown, D. Characteristics of Traffic Crashes Among Young, Middle-Aged, and Older Drivers. *Accident Analysis and Prevention*. 1999 May;31(3):181-198.). Perceptual problems and difficulty judging and responding to traffic flow are issues for older drivers. These findings suggest that efforts to reduce the total volume of crashes should focus on older driver training on intersection movements in lower speed traffic areas.

However, our analysis of the linked CODES outcome results (hospitalization or death) also provided another view. Crashes resulting in hospitalization or death were more likely to be on rural, higher speed roads, and often involved a vehicle that ran off the road. Since a large proportion of Maine roads do not have a paved shoulder or have a gravel shoulder, efforts have been made to expand to add paved shoulders to more Maine roads.

Older drivers not wearing seat belts were 77 percent more likely to be hospitalized or die than were older drivers who were wearing seat belts during a crash. There was some evidence that license restrictions for medication or corrective lenses were positively associated with more serious crash outcomes. Crashes with animals, alcohol, and speeding, while an important problem in

Maine, were less common in older driver crashes, hospitalizations, or deaths than for young or middle-aged drivers.

This study provided evidence that older drivers were at increased risk for hospitalization or death during a crash; this risk increased with age within the older driver group. We recommend that miles traveled data be captured for subsets of older drivers to use in future analyses; rates per mile driven may be more significant for older drivers than those reported in this study.

A limitation of this study derives from linkage, which does not capture all hospitalizations due to limitations in the underlying data. This means that the numbers of hospitalizations and hospital charges reported here represent minimum counts; therefore, the data are useful for comparative purposes but they do not represent the full burden of injury outcome and cost.

This study underscores the importance of CODES data. Crash locations and driver factors associated with the highest volume crashes were not always associated with the highest proportion of the hospitalizations or deaths; these findings illustrate the advantage of incorporating linked medical records, inpatient hospitalizations, in the analysis of motor vehicle crashes.

Table 1
Comparison of CODES Outcome Measures by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CODES Measure	Age 16-24	Age 16-24 Rate per 100,000 Drivers	Age 25-64	Age 25-64 Rate per 100,000 Drivers	Age 65 and Over	Age 65 and Over Rate Per 100,000 Drivers
LICENSED MAINE DRIVERS	109,319		630,302		134,092	
MAINE LICENSED DRIVERS INVOLVED IN CRASHES	14,879	13,610.6	34,322	5,445.3	5,568	4,152.4
INJURY OUTCOME MEASURES						
INJURED	2,538	2,321.6	4,706	746.6	893	666.0
EMS TRANSPORTED, HOSPITALIZED OR DIED	1,063	972.4	2,053	325.7	410	305.8
HOSPITALIZED OR DIED	130	118.9	309	49.0	114	85.0
DIED	18	16.5	38	6.0	23	17.2
HOSPITALIZED OR DIED WITH A HEAD INJURY	49	44.8	104	16.5	27	20.1
HOSPITALIZATION MEASURES						
LINKED HOSPITALIZATIONS	115		280		98	
TOTAL CHARGES	$1,713,782		$4,185,633		$1,517,183	
AVERAGE CHARGES	$14,902		$14,949		$15,481	
MEDIAN CHARGES	$7,252		$7,220		$6,814	
TOTAL PATIENT DAYS	583		1,627		572	
AVERAGE LENGTH OF STAY	5.1		5.8		5.8	
MEDIAN LENGTH OF STAY	3.0		3.0		4.0	

Table 1 (continued)
Comparison of CODES Outcome Measures by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CODES Measure	Age 65-69	Age 65-69 Rate per 100,000 Drivers	Age 70-74	Age 70-74 Rate per 100,000 Drivers	Age 75 and Over	Age 75 and Over Rate Per 100,000 Drivers
LICENSED MAINE DRIVERS	44,918		37,800		51,374	
MAINE LICENSED DRIVERS INVOLVED IN CRASHES	1,723	3,835.9	1,517	4,013.2	2,328	4,531.5
INJURY OUTCOME MEASURES						
INJURED	253	563.2	235	621.7	405	788.3
EMS TRANSPORTED, HOSPITALIZED OR DIED	111	247.1	100	264.6	199	387.4
HOSPITALIZED OR DIED	29	64.6	22	58.2	63	122.6
DIED	4	8.9	5	13.2	14	27.3
HOSPITALIZED OR DIED WITH A HEAD INJURY	5	11.1	9	23.8	13	25.3
HOSPITALIZATION MEASURES						
LINKED HOSPITALIZATIONS	26		18		54	
TOTAL CHARGES	$156,978		$429,105		$931,100	
AVERAGE CHARGES	$6,038		$23,839		$17,243	
MEDIAN CHARGES	$3,837		$5,913		$9,666	
TOTAL PATIENT DAYS	81		142		349	
AVERAGE LENGTH OF STAY	3.1		7.9		6.5	
MEDIAN LENGTH OF STAY	2.0		4.0		6.5	

Table 2
Crash Time and Road Condition by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CRASH VARIABLE	Age 16-24	Age 16-24 % of Total Involved	Age 25-64	Age 25-64 % of Total Involved	Age 65 and Over	Age 65 and Over % of Total Involved	Hospitalized or Died Age 65 and Over	Hospitalized or Died Age 65 and Over % of Total Involved
TOTAL DRIVERS INVOLVED	14,879	100.0%	34,322	100.0%	5,568	100.0%	114	100.0%
DAY OF WEEK								
SUNDAY	1,614	10.8%	3,073	9.0%	481	8.6%	10	8.8%
MONDAY	2,021	13.6%	4,934	14.4%	869	15.6%	22	19.3%
TUESDAY	2,163	14.5%	5,376	15.7%	946	17.0%	21	18.4%
WEDNESDAY	2,130	14.3%	5,386	15.7%	802	14.4%	11	9.6%
THURSDAY	1,993	13.4%	4,886	14.2%	837	15.0%	17	14.9%
FRIDAY	2,669	17.9%	5,898	17.2%	956	17.2%	20	17.5%
SATURDAY	2,274	15.3%	4,733	13.8%	670	12.0%	13	11.4%
UNKNOWN	15	0.1%	36	0.1%	7	0.1%	0	0.0%
MONTH OF CRASH								
JANUARY	1,599	10.7%	4,141	12.1%	492	8.8%	12	10.5%
FEB	1,239	8.3%	2,966	8.6%	397	7.1%	10	8.8%
MAR	1,322	8.9%	3,447	10.0%	411	7.4%	11	9.6%
APRIL	917	6.2%	2,278	6.6%	404	7.3%	4	3.5%
MAY	1,040	7.0%	2,244	6.5%	470	8.4%	4	3.5%
JUNE	1,158	7.8%	2,442	7.1%	554	9.9%	9	7.9%
JULY	1,189	8.0%	2,387	7.0%	478	8.6%	10	8.8%
AUGUST	1,149	7.7%	2,298	6.7%	439	7.9%	12	10.5%
SEPT	1,066	7.2%	2,357	6.9%	459	8.2%	11	9.6%
OCT	1,275	8.6%	2,924	8.5%	545	9.8%	11	9.6%
NOV	1,504	10.1%	3,495	10.2%	448	8.0%	10	8.8%
DEC	1,420	9.5%	3,343	9.7%	471	8.5%	10	8.8%
OCTOBER-MARCH COMBINED	8,359	56.2%	20,316	59.2%	2,764	49.6%	64	56.1%
APRIL-SEPTEMBER COMBINED	6,519	43.8%	14,006	40.8%	2,804	50.4%	50	43.9%
LIGHT CONDITIONS								
DAWN	419	2.8%	1,392	4.1%	140	2.5%	4	3.5%
DAYLIGHT	9,497	63.8%	23,784	69.3%	4,655	83.6%	95	83.3%
DUSK	663	4.5%	1,437	4.2%	174	3.1%	3	2.6%
DARK STREET LIGHTS ON	1,935	13.0%	3,463	10.1%	304	5.5%	6	5.3%
DARK NO STREET LIGHTS	2,132	14.3%	3,844	11.2%	256	4.6%	5	4.4%
DARK STREET LIGHTS OFF	206	1.4%	360	1.0%	33	0.6%	1	0.9%
OTHER	27	0.2%	42	0.1%	6	0.1%	0	0.0%
ROAD SURFACE								
DRY	8,437	56.7%	19,689	57.4%	3,797	68.2%	76	66.7%
WET, SNOW/, ICE, OTHER	6,442	43.3%	14,633	42.6%	1,771	31.8%	38	33.3%

Table 3
Type of Road Where Crash Occurred by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CRASH VARIABLE	Age 16-24	Age 16-24 % of Total Involved	Age 25-64	Age 25-64 % of Total Involved	Age 65 and Over	Age 65 and Over % of Total Involved	Hospitalized or Died Age 65 and Over	Hospitalized or Died Age 65 and Over % of Total Involved
TOTAL DRIVERS INVOLVED	14,879	100.0%	34,322	100.0%	5,568	100.0%	114	100.0%
URBAN/RURAL								
URBAN	8,730	58.7%	21,506	62.7%	3,821	68.6%	43	37.7%
RURAL	6,149	41.3%	12,816	37.3%	1,747	31.4%	71	62.3%
ROAD LOCATION								
STRAIGHT ROAD	4,373	29.4%	10,427	30.4%	1,338	24.0%	47	41.2%
CURVED ROAD	2,066	13.9%	3,089	9.0%	320	5.7%	19	16.7%
INTERSECTION	5,497	36.9%	13,651	39.8%	2,513	45.1%	31	27.2%
DRIVEWAY	2,609	17.5%	6,193	18.0%	1,292	23.2%	14	12.3%
OTHER	334	2.2%	962	2.8%	105	1.9%	3	2.6%
FEDERAL ROAD CLASSIFICATION								
UNKNOWN/OTHER	732	4.9%	1,727	5.0%	248	4.5%	8	7.0%
LOCAL	2,625	17.6%	4,282	12.5%	585	10.5%	15	13.2%
INTERSTATE	686	4.6%	2,086	6.1%	223	4.0%	6	5.3%
PRINCIPAL ARTERIAL	3,667	24.6%	9,729	28.3%	1,692	30.4%	31	27.2%
MINOR ARTERIAL	3,266	22.0%	8,073	23.5%	1,428	25.6%	31	27.2%
COLLECTOR	3,903	26.2%	8,425	24.5%	1,392	25.0%	23	20.2%
ROAD SPEED LIMIT								
MISSING	593	4.0%	1,398	4.1%	182	3.3%	4	3.5%
<25 MPH	101	0.7%	197	0.6%	26	0.5%	0	0.0%
25-35 MPH	8,780	59.0%	20,720	60.4%	3,735	67.1%	37	32.5%
40-45 MPH	3,619	24.3%	7,226	21.1%	915	16.4%	31	27.2%
50-55 MPH	1,489	10.0%	3,951	11.5%	613	11.0%	38	33.3%
65 MPH	297	2.0%	830	2.4%	97	1.7%	4	3.5%
ROAD CONSTRUCTION OR MAINTENANCE ZONE								
NO	14,655	98.5%	33,722	98.3%	5,458	98.0%	112	98.2%
YES	224	1.5%	600	1.7%	110	2.0%	2	1.8%

Table 4
Other Crash and Vehicle Characteristics by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CRASH VARIABLE	Age 16-24	Age 16-24 % of Total Involved	Age 25-64	Age 25-64 % of Total Involved	Age 65 and Over	Age 65 and Over % of Total Involved	Hospitalized or Died Age 65 and Over	Hospitalized or Died Age 65 and Over % of Total Involved
TOTAL DRIVERS INVOLVED	14,879	100.0%	34,322	100.0%	5,568	100.0%	114	100.0%
HIT ANIMAL								
NO	14,154	95.1%	31,527	91.9%	5,356	96.2%	113	99.1%
YES	725	4.9%	2,795	8.1%	212	3.8%	1	0.9%
RAN OFF ROAD								
NO	11,621	78.1%	29,933	87.2%	5,047	90.6%	76	66.7%
YES	3,258	21.9%	4,389	12.8%	521	9.4%	38	33.3%
MULTIPLE VEHICLES INVOLVED								
NO	4,338	29.2%	7,862	22.9%	754	13.5%	36	31.6%
YES	10,541	70.8%	26,460	77.1%	4,814	86.5%	78	68.4%
VEHICLE TYPE								
PASSENGER CAR	11,055	74.3%	21,187	61.7%	4,425	79.5%	100	87.7%
VANS AND LIGHT TRUCKS	3,824	25.7%	13,135	38.3%	1,143	20.5%	14	12.3%
NUMBER OF OCCUPANTS IN VEHICLE								
DRIVER ALONE	8,639	58.1%	23,793	69.3%	3,854	69.2%	90	78.9%
2 OR MORE OCCUPANTS	6,240	41.9%	10,529	30.7%	1,714	30.8%	24	21.1%

Table 5
Driver Characteristics and Behavior by Age Group
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CRASH VARIABLE	Age 16-24	Age 16-24 % of Total Involved	Age 25-64	Age 25-64 % of Total Involved	Age 65 and Over	Age 65 and Over % of Total Involved	Hospitalized or Died Age 65 and Over	Hospitalized or Died Age 65 and Over % of Total Involved
TOTAL DRIVERS INVOLVED	14,879	100.0%	34,322	100.0%	5,568	100.0%	114	100.0%
DRIVER GENDER								
MALE	8,782	59.0%	19,426	56.6%	3,268	58.7%	53	46.5%
FEMALE	6,097	41.0%	14,896	43.4%	2,300	41.3%	61	53.5%
DRIVER'S BELTUSE								
NO	2,192	14.7%	4,546	13.2%	820	14.7%	46	40.4%
YES	12,687	85.3%	29,776	86.8%	4,748	85.3%	68	59.6%
DRIVER'S CONTRIBUTING FACTORS								
OTHER/UNKNOWN	2,032	13.7%	3,067	8.9%	482	8.7%	21	18.4%
NO IMPROPER ACTION	5,180	34.8%	17,898	52.1%	2,181	39.2%	21	18.4%
FAILURE TO YIELD	1,260	8.5%	2,350	6.8%	943	16.9%	12	10.5%
ILLEGAL OR UNSAFE SPEED	1,887	12.7%	2,224	6.5%	166	3.0%	7	6.1%
OTHER VIOLATIONS	1,774	11.9%	3,540	10.3%	745	13.4%	13	11.4%
DRIVER INATTENTION - DISTRACTION	2,633	17.7%	4,951	14.4%	995	17.9%	28	24.6%
DRIVER PHYSICAL IMPAIRMENT	113	0.8%	292	0.9%	56	1.0%	12	10.5%
DRIVER MAKING LEFT TURN								
UNKNOWN	443	3.0%	1,037	3.0%	147	2.6%	3	2.6%
NO	13,047	87.7%	30,391	88.5%	4,581	82.3%	99	86.8%
YES	1,389	9.3%	2,894	8.4%	840	15.1%	12	10.5%
DRIVER'S PHYSICAL CONDITION								
OTHER/UNKNOWN	501	3.4%	1,209	3.5%	212	3.8%	15	13.2%
NORMAL	13,627	91.6%	31,606	92.1%	5,158	92.6%	82	71.9%
ALCOHOL OR DRUGS	538	3.6%	1,143	3.3%	89	1.6%	4	3.5%
ASLEEP OR FATIGUED	198	1.3%	263	0.8%	54	1.0%	6	5.3%
ILL	11	0.1%	64	0.2%	26	0.5%	6	5.3%
HANDICAPPED	4	0.0%	37	0.1%	29	0.5%	1	0.9%
LICENSE RESTRICTIONS								
SPECIAL EQUIPMENT (S)	21	0.1%	135	0.4%	85	1.5%	0	0.0%
MEDICATION (M)	133	0.9%	690	2.0%	466	8.4%	15	13.2%
DAYLIGHT ONLY (B)	7	0.0%	24	0.1%	41	0.7%	2	1.8%
CORRECTIVE LENSES (A)	2,670	17.9%	7,977	23.2%	2,757	49.5%	68	59.6%

Table 6
Results of Logistic Regression Predicting Hospitalization or Death
Older Drivers Age 65 and Over Only
1996 Maine Licensed Drivers in Passenger Cars and Light Trucks

CRASH VARIABLE	Odds Ratio	95% Lower Confidence Limit	95% Upper Confidence Limit	P-Value
SEAT BELT NOT USED (Adjusted for over-reporting)	1.767	1.113	2.806	0.016
AGE	1.035	1.001	1.072	0.046
FEMALE	1.618	1.012	2.587	0.044
RURAL	1.982	1.104	3.558	0.022
SPEED LIMIT (per 10 m.p.h. increase)	1.395	1.098	1.772	0.006
WET ROAD	0.694	0.415	1.159	0.163
ALCOHOL RELATED	1.952	0.563	6.772	0.292
INTERSECTION OR DRIVEWAY	0.316	0.190	0.526	0.000
MULTIPLE VEHICLE-HEAD ON CRASH	2.868	1.714	4.799	0.000
PASSENGER CAR vs LIGHT TRUCK	1.473	0.760	2.854	0.251
ILLEGAL, UNSAFE SPEED	1.601	0.634	4.043	0.319
DRIVER INATTENTION, DISTRACTION	1.883	1.145	3.096	0.013
PASSENGERS IN VEHICLE vs DRIVER ALONE	0.708	0.424	1.182	0.187
DAYLIGHT	1.530	0.811	2.889	0.189
LICENSE RESTRICTION-MEDICATION	1.798	0.939	3.442	0.077
LICENSE RESTRICTION-CORRECTIVE LENSES	1.487	0.943	2.345	0.088