Special issue: older drivers

STATUS REPORT

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

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Older drivers up close

they aren't dangerous

except maybe to themselves

Ann Landers says "the mail keeps pouring in" on older drivers. Relating horror stories about crashes involving seniors at the wheel, she says she's "outraged" about these "semi-capacitated" drivers. She's not alone, but is her concern warranted? By many measures, no. The nation's seniors don't drive much, compared with younger people, and they pose little threat to others on the road. But a problem does exist for the older drivers themselves. They injure more easily than younger people. They're more likely to die when they get injured. The result is that seniors have higher death rates per mile driven. As the population ages and older people drive more, they'll represent a bigger proportion of the total highway safety problem.

"To get a full picture of what's happening, you have to look at their crash experience from different perspectives," says Institute chief scientist Allan Williams. "Whether seniors have an excessive crash rate depends on how you measure it."

Seniors have very low crash rates per capita, especially compared with teenagers. One reason is that many older people don't drive, and

those who do don't spend much time on the road. In 1995, drivers 65 and older accounted for 14 percent of licensed drivers but only 8 percent of miles driven.

"It's when you look at fatal crashes and measure them per mile driven, controlling for differences in exposure, that it becomes clear that older drivers are at increased risk," Williams explains. "Teenagers and older drivers have the highest per-mile fatal crash rates."

The main reason older drivers are dying is their physical fragility, not overinvolvement in crashes (see accompanying story). The chance a driver will die in a given crash increases starting at ages 60-64.

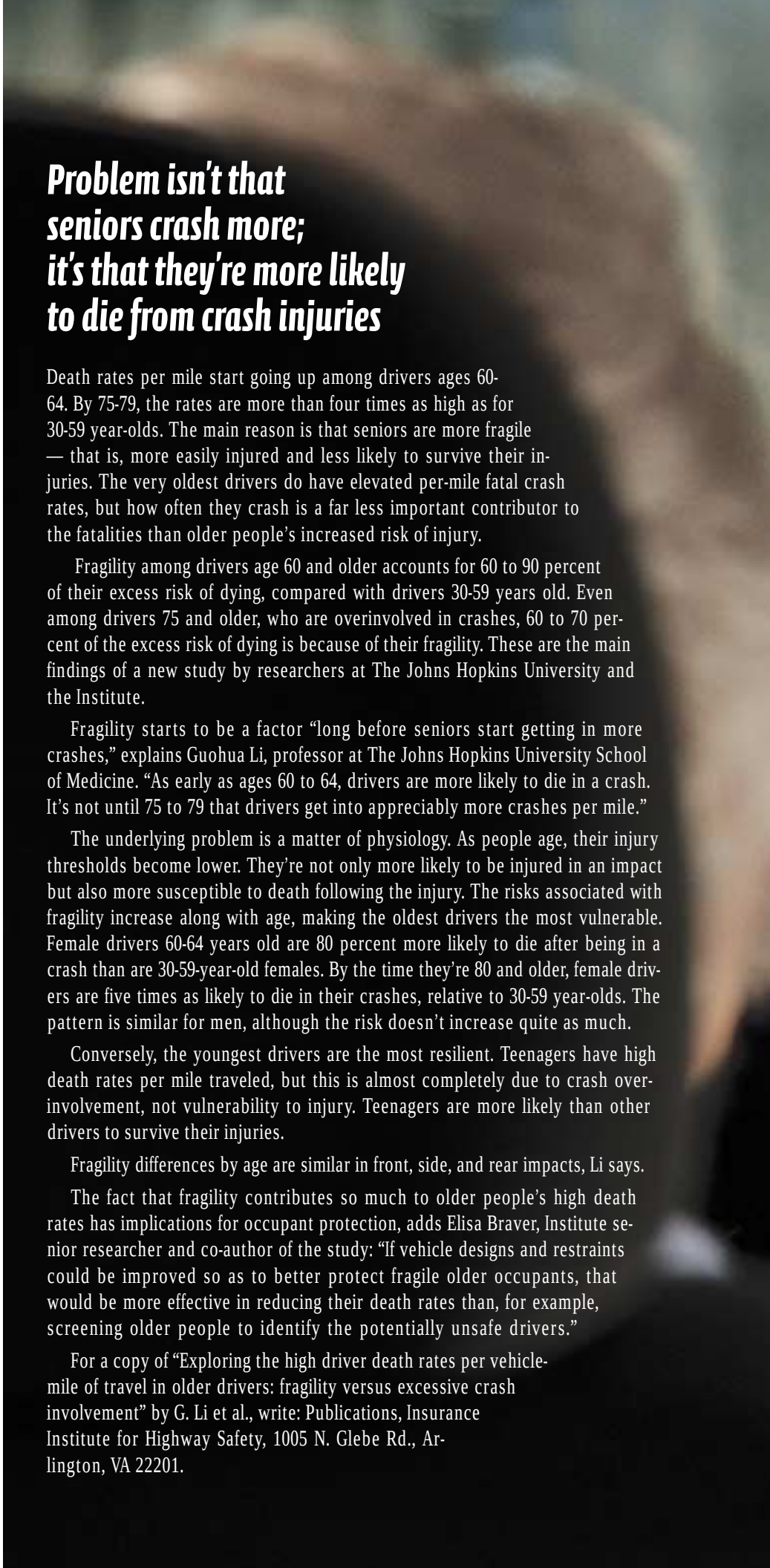
Even measuring death rates on a mileage basis, older drivers are better off than they used to be. Per-mile fatal crash rates have been declining, especially among the oldest and youngest drivers. This reflects improved vehicle and road safety plus changes in driver behavior.

So there's no public safety crisis now, but what about in the future? The number of people 65 and older is expected to double to 70 million by the year 2030. Licensure and mileage are going up among seniors. Seventy-five percent of people 65 and older were licensed to drive in 1995, up from 63 percent in 1983, while rates for drivers of other ages remained stable. Annual mileage increased 44 percent among older drivers, compared with 25 percent for the whole driving population.

This means that, by 2030, drivers 65 and older are expected to account for 16 percent of all crashes and 25 percent of all fatal crashes. The annual number of older driver fatal crashes is expected to more than double.

These projections come from a new Institute study of the present and future impact of older drivers. Because they represent a growing share of the highway safety problem, "it's important to make travel safer for the seniors themselves, who are more frail and whose abilities may be reduced," Williams says.

For a copy of "Older driver involvements in police-reported crashes and fatal crashes: trends and projections" by S. Lyman et al., write: Publications, Insurance Institute for Highway Safety, 1005 N. Glebe Rd., Arlington, VA 22201.



Problem isn't that seniors crash more; it's that they're more likely to die from crash injuries

Death rates per mile start going up among drivers ages 60-64. By 75-79, the rates are more than four times as high as for 30-59 year-olds. The main reason is that seniors are more fragile — that is, more easily injured and less likely to survive their injuries. The very oldest drivers do have elevated per-mile fatal crash rates, but how often they crash is a far less important contributor to the fatalities than older people's increased risk of injury.

Fragility among drivers age 60 and older accounts for 60 to 90 percent of their excess risk of dying, compared with drivers 30-59 years old. Even among drivers 75 and older, who are overinvolved in crashes, 60 to 70 percent of the excess risk of dying is because of their fragility. These are the main findings of a new study by researchers at The Johns Hopkins University and the Institute.

Fragility starts to be a factor "long before seniors start getting in more crashes," explains Guohua Li, professor at The Johns Hopkins University School of Medicine. "As early as ages 60 to 64, drivers are more likely to die in a crash. It's not until 75 to 79 that drivers get into appreciably more crashes per mile."

The underlying problem is a matter of physiology. As people age, their injury thresholds become lower. They're not only more likely to be injured in an impact but also more susceptible to death following the injury. The risks associated with fragility increase along with age, making the oldest drivers the most vulnerable. Female drivers 60-64 years old are 80 percent more likely to die after being in a crash than are 30-59-year-old females. By the time they're 80 and older, female drivers are five times as likely to die in their crashes, relative to 30-59 year-olds. The pattern is similar for men, although the risk doesn't increase quite as much.

Conversely, the youngest drivers are the most resilient. Teenagers have high death rates per mile traveled, but this is almost completely due to crash overinvolvement, not vulnerability to injury. Teenagers are more likely than other drivers to survive their injuries.

Fragility differences by age are similar in front, side, and rear impacts, Li says.

The fact that fragility contributes so much to older people's high death rates has implications for occupant protection, adds Elisa Braver, Institute senior researcher and co-author of the study: "If vehicle designs and restraints could be improved so as to better protect fragile older occupants, that would be more effective in reducing their death rates than, for example, screening older people to identify the potentially unsafe drivers."

For a copy of "Exploring the high driver death rates per vehicle-mile of travel in older drivers: fragility versus excessive crash involvement" by G. Li et al., write: Publications, Insurance Institute for Highway Safety, 1005 N. Glebe Rd., Arlington, VA 22201.


PER CAPITA
All crashes and fatal crashes per population show no big societal problem caused by older drivers.
10
8
6
4
2
all crashes per 100 people, 1995
fatal crashes per 10,000 people, 1995
Driver age: 16- 20- 25- 30- 35- 40- 45- 50- 55- 60- 65- 70+
PER MILE TRAVELED
Deaths per mile show a problem for older drivers themselves but not for others on the road.
10
8
6
4
2
driver deaths per 100 million miles, 1995
deaths of pedestrians, motorcyclists, bicyclists, and other vehicle occupants in 2-vehicle collisions, per 100 million miles, 1995
Driver age: 16- 20- 25- 30- 35- 40- 45- 50- 55- 60- 65- 70- 75+

Changes at intersections might help seniors

When it comes to making roads safer for older drivers, reducing intersection crashes is a top priority. Drivers 85 and older are more than 10 times as likely as 40-49 year-olds to be in fatal multiple-vehicle crashes at intersections.

This reflects mainly the fact that seniors get injured more easily and are less likely to survive their injuries (see p.2). But among the oldest drivers, who also get in more crashes, the problem may involve age-related declines in sensory functions. Many seniors find their vision isn't as acute. Sorting out visual distractions while driving becomes more difficult. Because of cognitive changes, many seniors need more time to recognize hazards and respond.

"Intersections can be complex and dangerous, especially for older drivers and pedestrians," says Richard Retting, senior Institute transportation engineer. "Anything we can do to simplify intersections is going to be a benefit."

Stop signs: Converting two-way-stop intersections into four-way stops reduces crashes by about 50 percent.

Roundabouts: Circular intersections known as roundabouts (see *Status Report*, July 28, 2001; on the web at www.highwaysafety.org) significantly reduce crashes, too, especially those that involve injuries.

Signal timing: A short all-red phase helps to reduce crashes by clearing intersections of late-crossing traffic. Longer all-red phases could give pedestrians more time to cross.

Walk signals: Among people 80 and older, the pedestrian death rate is 2-3 times as high as among younger people. Longer walk signals for pedestrians could provide more time to cross. Another approach is to build islands in the middle of streets to let people cross in two stages.

Protected left turn signals: Green arrows that permit turning only when other traffic is stopped put less burden on drivers to determine when it's safe to turn. Adding turn lanes can reduce left-turn and rear-end crashes, but a trade-off is that this measure widens intersections, which could increase the risk for older pedestrians.

Vehicle design changes might keep seniors in cars longer, safer

The starting point to improving vehicle safety for older drivers is to enhance occupant protection. "Fortunately there are some newer technologies that promise to offer older occupants better protection," says Institute president Brian O'Neill.

Belt force limiters: Already available in many new cars, force limiters are intended to reduce the risk of rib fractures caused by shoulder belt forces, a kind of injury that's much more likely among older people. Mechanical force limiters play out the belt when the force levels exceed a certain threshold. This allows an occupant to move forward more than would be possible with a standard safety belt system, but the airbag on the driver side (an essential feature for force limiting) should prevent this movement from resulting in a head impact with the steering wheel.

Improved safety belt systems: Automakers are developing new types of safety belts that could help distribute forces across more of the body. Ford, Volvo, and TRW are joining to develop two versions of a four-point safety belt. Saab and the Lear Corporation also have prototypes. An issue is user acceptance. "With current safety belt designs, some older people have a hard time reaching behind them to grab the belt," O'Neill notes. "This could be a problem with some of the new safety belts as well, depending on how they're designed."

Advanced airbag technology: A driver or occupant identifier could be used to let a vehicle's airbag control module know when an older occupant is in the vehicle. Then the airbag would inflate with less force. Auto manufacturers also are exploring some entirely new airbag-like devices including inflatable neck collars, belts, and knee restraints that could benefit more fragile occupants, including older people. But devices like these are in the conceptual phases. They aren't yet on the market.

Vehicle ergonomics: In the meantime, some companies are tackling the issue of ergonomics. At Ford, engineers have been using a "third age suit" for insight about the effects of aging. The suit approximates an older person's diminished vision, range of motion, and sense of touch. The first car to be developed using the suit is the Focus, which comes equipped with

Buses and subways don't help many seniors get around, perhaps because mass transit can be inconvenient to use or require a substantial amount of walking. A promising alternative for older people who have stopped driving but still want to get around by car is Portland, Maine's Independent Transportation Network, which offers trips anytime of the day or night.

features such as larger controls and nonreflective interior surfaces to reduce glare. Lear has designed a concept car, the TransG, around the needs of mature drivers. The car includes powered seats that swivel out for easier access, high-contrast displays, and larger controls. New safety features also are included — four-point belts, air curtains and inflatable head/neck collars, and cushion restraints in the seats to keep people from sliding underneath belts in a crash.

Alternative ways of getting about might help older people

America has long been a nation of drivers dependent on their own cars for transportation. Even after older people age out of driving, reliance on cars carries over. Seniors who don't drive themselves often like to be driven by friends and family.

But it's not just a matter of preference. It also may be necessary for seniors to go by car because they might not have many transportation alternatives.

Walking often isn't practical, even in urban areas, because distances may be too great. Roads often aren't designed to accommodate pedestrians. And in collisions at any speed, older pedestrians are far more likely than younger people to die (see *Status Report*, May 13, 2000; on the web at www. highwaysafety.org).

Mass transit might not help much, either. It favors the needs of commuters, not older people who no longer drive. Only 3 percent of seniors' trips are on mass transit, according to the Nationwide Personal Transportation Survey. Routes and schedules can be inconvenient, and the physical impairments that prevent driving or walking may make it impossible to use transit.

Other services include Dial-A-Ride and community ride-share programs. But these can be expensive to administer and aren't extensively used. They're not always convenient for older people because trips may be restricted to certain hours or purposes.

A program that has attracted attention is Portland, Maine's Independent Transportation Network, a nonprofit membership service. Seniors pay in advance for rides by the mile anytime, day or night. Like a taxi service, members have the option to ride alone or share for a reduced fare. Cars may be traded in for mileage credits. Six years into operation, this enterprise is still relatively small. But it's viewed as a model, and there's interest in replicating it elsewhere.

Older drivers aren't a serious threat, noted researcher says

As society ages, the safe mobility of older people will be an increasingly vital area of research. The head of the National Highway Traffic Safety Administration's older driver research program, John Eberhard is one of the foremost researchers in the field. In response to questions, he provided *Status Report* with his perspectives.

STATUS REPORT: Are older drivers a significant public health problem?

JOHN EBERHARD: They are *not* a serious threat to the health and safety of other motorists. They kill fewer motorists and pedestrians than drivers of any other age group. They have the lowest crash involvement rates per licensed driver, the lowest rates of alcohol impairment, and the highest rates of seat belt use among adults. The real public health issue is the health and safety of older drivers and occupants themselves .... There are more older occupants dying each year in crashes than there are occupants of all ages killed in rollovers or in crashes attributed to distracted driving — two high-profile areas that receive a great deal of public attention and funding. What is a problem for older drivers is their increasing exposure and the reduced ability to protect frail occupants in a crash. Since there will be more older people licensed and driving than ever before, they will be in more fatal crashes.

SR: Which older drivers are at highest risk?

JE: The healthiest and wealthiest probably are the ones most likely to get into crashes. They drive much more, which is the best predictor of crashes.

SR: Are there any good screening tests to identify older drivers who should reduce or stop driving?

JE: There are a number of research efforts under way to develop screening tests, and some have shown some effectiveness. Whether we can develop screening tests that can be given cost-effectively to the overall driving population or drivers over a certain age is another issue. A key problem is that it's very difficult to predict such rare events as traffic crashes. Some investigators claim that we would have to take over 500 drivers off the road to prevent one crash. Since driving is so important, we don't want to needlessly deny safe older people this means of getting around .... Because of the infrequency of crashes it is difficult, if not impossible, to develop tests with sufficient sensitivity to identify those who will crash yet specific enough not to unduly deny those who will not. Over my 30 years with the National Highway Traffic Safety Administration, I have not yet seen any test that is sufficiently valid to fairly identify the at-risk driver.

SR: If screening tests were useful and necessary, should DMVs do the screening?

JE: Screening tests may be more useful in the hands of clinicians, such as driver rehabilitation specialists. Whether licensing agencies should engage in aged-based testing is another issue. It's very difficult to design tests that will pick out those who will crash from the numerous ones who will not. There are a number of activities going on right now to look at testing of older people .... We should evaluate these programs to determine whether they can identify those who are unsafe with enough sensitivity and specificity that they don't take safe older drivers off the road. We should also determine whether these programs can keep functionally limited older people safely on the road as drivers or alternative transportation users.

SR: Are there enough alternatives to driving available to older people?

JE: This should actually be two questions — whether enough alternatives exist and whether older people use them. There are a few major efforts under way to address the availability area that will develop best practices and identify good current programs .... The other issue is whether older people are using the programs. Use is rather low, as has been repeatedly shown by the Nationwide Personal Transportation Survey, which shows less than 3 percent usage by people age 65 and older. Most older people don't use, don't know how to use, and don't care to use other options, according to focus groups I conducted a couple of years ago.

SR: Are there ways to change vehicle design and safety features to better protect older occupants?

JE: Yes, we need to work with the manufacturers to have them get ready for this

population. We need to improve safety belts and airbag systems so that they are not aggressive to the older occupant's more fragile head and chest. For example, airbags with dual-stage inflator technology could provide a depowered, or a lower level of, inflation for an older driver or other occupant. A driver and occupant identifier (a key sensor, touch pad sensor, or an electronic driver's license) would be needed to let the control module know an older occupant is in the vehicle. Force-limited belts or belts with high elongation webbing also could work in conjunction with airbags to reduce the loads on an occupant's chest. Futuristic four-point belts, such as those in the Volvo concept car, or inflatable belts may also work to distribute the loading on the occupant's chest. Other improvements to minimize the risk to older occupants could include adjustable pedals and improved seat and steering column adjustments to allow more room between the driver's chest and the airbag and better visibility of the road.

Don't look for screening tests to make a big difference

Tests aren't sensitive enough to distinguish the drivers who will crash from those who won't

There's a longstanding debate about whether states should be doing more to screen older drivers. Screening for some medical conditions should be feasible — seriously deteriorated vision, for example. But more general screening of driving ability isn't likely to make any significant difference.

Researcher John Eberhard (see facing page) says he has "not yet seen any test that is sufficiently valid to fairly identify the at-risk driver."

Despite decades of research, no screening tests for driving abilities have been developed that are sensitive enough to accurately identify the people who will crash without falsely identifying other drivers who won't. As Eberhard explains, "it's very difficult to predict such rare events as traffic crashes. Some investigators claim that we would have to take over 500 drivers off the road to prevent one crash."

Taking away someone's license without solid evidence of a problem "isn't a decision to be taken lightly," adds Susan Ferguson, Institute senior vice president for research. "For many older adults, their licenses are synonymous with freedom."

The licensing agencies in most states treat older drivers the same as drivers of other ages. A number of states have shorter renewal cycles for older drivers and may require an in-person appearance to renew after a specified age. Illinois and New Hampshire require drivers 75 and older to re-take the on-road driving test. A few states including California, Florida, and Maryland are studying the possibility of screening tests.

"Many older drivers already screen themselves to some extent," Ferguson says. "They tend to modify driving habits in response to their reduced abilities — driving less at night and avoiding congested traffic, for example."

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