STATUS REPORT
INSURANCE INSTITUTE FOR HIGHWAY SAFETY
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Youngest drivers at risk

Death rate for 16 year-olds nearly doubles as older teenage driver deaths fall

There's no doubt that the first years teenagers spend as drivers are risky — young drivers have the highest death rates. But it's misleading to lump all teens into one high-risk driver group, a new Institute study indicates. Turns out, 16-year-old drivers are much different from their older peers.

The overall death rate for drivers of all ages marked a decline during 1975-96, dropping from 15 to 12 deaths per 100,000 licensed drivers. But among 16 year-olds, the death rate trended upward. The rate increased among 16-year-old drivers from 19 per 100,000 licensed drivers in 1975 to 35 per 100,000 in 1996, and there were increases for both male and female drivers.

Sixteen year-olds compared with 17-19 year-olds: Death rates didn't increase among all teenage drivers, just 16 year-

olds. Between 1975 and 1984, the driver death rate among 17-19 year-olds was higher than among 16 year-olds. But a crossover occurred as the rate declined slightly among older teenagers and increased among 16 year-olds.

"Since the mid-1980s, the death rate among 16 year-olds has been higher, and this gap is widening," explains Allan Williams, senior vice president of the Institute. "So it's misleading to lump all teenage drivers together and talk about the problem of fatal crashes in this group as a whole. The rates differ a lot within the group we call teenagers."

The driver death rate among 17-19 year-olds declined from 27 per 100,000 licensed drivers in 1975 to 25 in 1996. This rate still is substantially higher than among drivers 20+ years old but not nearly as high as among 16 year-olds.

Absolute numbers of deaths as well as death rates "present an alarming picture for 16 year-olds," Williams says. The number of deaths among drivers 16 years old increased about 50 percent during 1975-96 (from 362 to 547 annually) while deaths among 17-19 year-olds declined 27 percent (from 2,611 to 1,894). "Any way you look at it, 16-year-old drivers represent a growing problem."

Data aren't available to allow researchers to assess why the death rate for the youngest drivers is rising while rates are trending down among older drivers, even older teenagers.

"The most plausible hypothesis is that 16 year-olds are driving more in high-risk circumstances — at night for example — than they used to compared with 17-19 year-olds. Maybe 16 year-olds are getting easier access to cars than they used to," Williams says, adding "it might be tempting to associate the problem of 16-year-old drivers with the decline in high school driver education programs. This almost certainly isn't the case because research shows driver ed doesn't affect the crash experience of beginning drivers" (see *Status Report*, Vol. 32. No. 1, Jan. 11, 1997).

Population of teenagers is growing: The teenage population in the United States declined during most of the years Institute researchers studied (1975-96). But beginning in the early 1990s, the population of 16 year-olds began increasing. It is expected to continue going up throughout the next decade.

"This means the problem of deaths among 16-year-old drivers isn't going away. It will become even worse unless corrective action is taken," Williams says.

How graduated licensing works: A promising way to reduce deaths among 16-year-old drivers is to adopt graduated licensing systems that phase in driving privileges in stages as young beginners gain more experience behind the wheel. Since 1996 eight states — California, Delaware, Florida, Georgia, Iowa, Michigan, North Carolina, and Ohio — have adopted programs that include essential elements of graduated licensing (see *Status Report*, Vol. 33, No. 3, April 4, 1998).

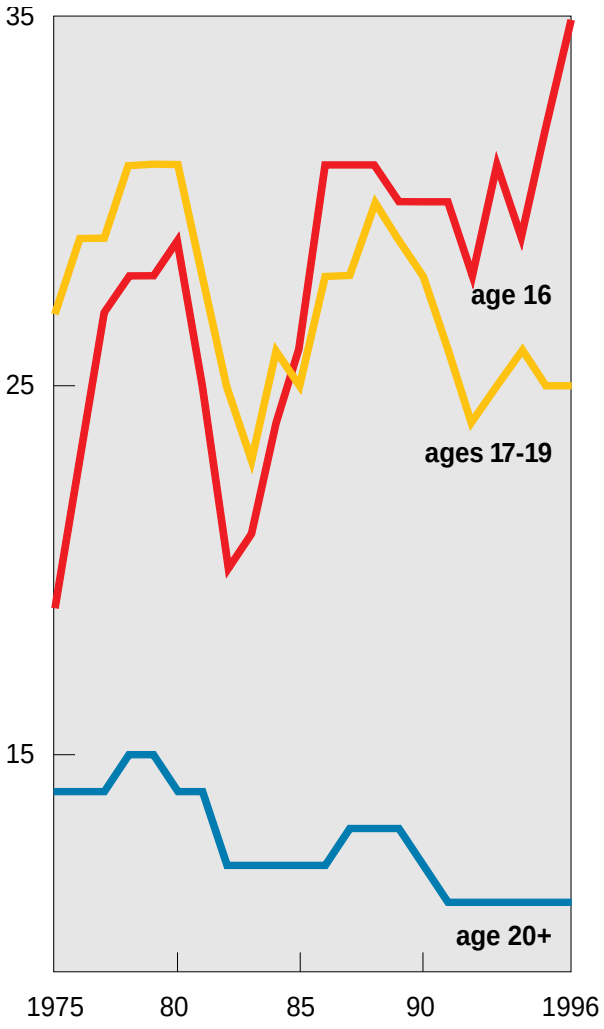
Such elements include six months or more in a learning phase, during which supervision is required. Then there's another six months to a year in an intermediate licensing phase, during which unsupervised driving isn't allowed in high-risk situations — for example, at night or with other teens in the car.

"We should be seeing the benefits of these new graduated licensing programs soon," Williams concludes. "But the majority of states still allow quick and easy access to licenses. If we're going to reverse the trend of increasing deaths among 16-year-old drivers, more states need to adopt graduated licensing."

Provisions of graduated licensing systems enacted in the United States since 1996 vary greatly. Delaware, Iowa, and Ohio are the most recent states to adopt graduated licensing. Laws in these states take effect next year. Many other states will be considering graduated licensing in the future, Williams notes. "It's important that we carefully study the early systems to see how effective and acceptable they are and to model laws on those systems found to work best," he adds.

For more information on state graduated licensing laws, visit www.highwaysafety.org.

Deaths per 100,000 licensed drivers, by driver age



Price influences car selection for teens, not safety

Because teenage drivers have such high risk of being in serious crashes, you'd think most parents would want them to drive larger cars with newer safety features instead of small, high-risk cars. A new Institute survey indicates safety is a low priority for selecting teens' vehicles.

"Graduated licensing laws and parental monitoring of teenage drivers' time at the wheel reduce the likelihood that teens will be in crashes," says Allan F. Williams, Institute senior vice president. "Another way to lower the numbers of young drivers killed in collisions each year is to improve their crash protection by emphasizing safety factors when choosing vehicles for them to drive. This step is not being taken by many parents."

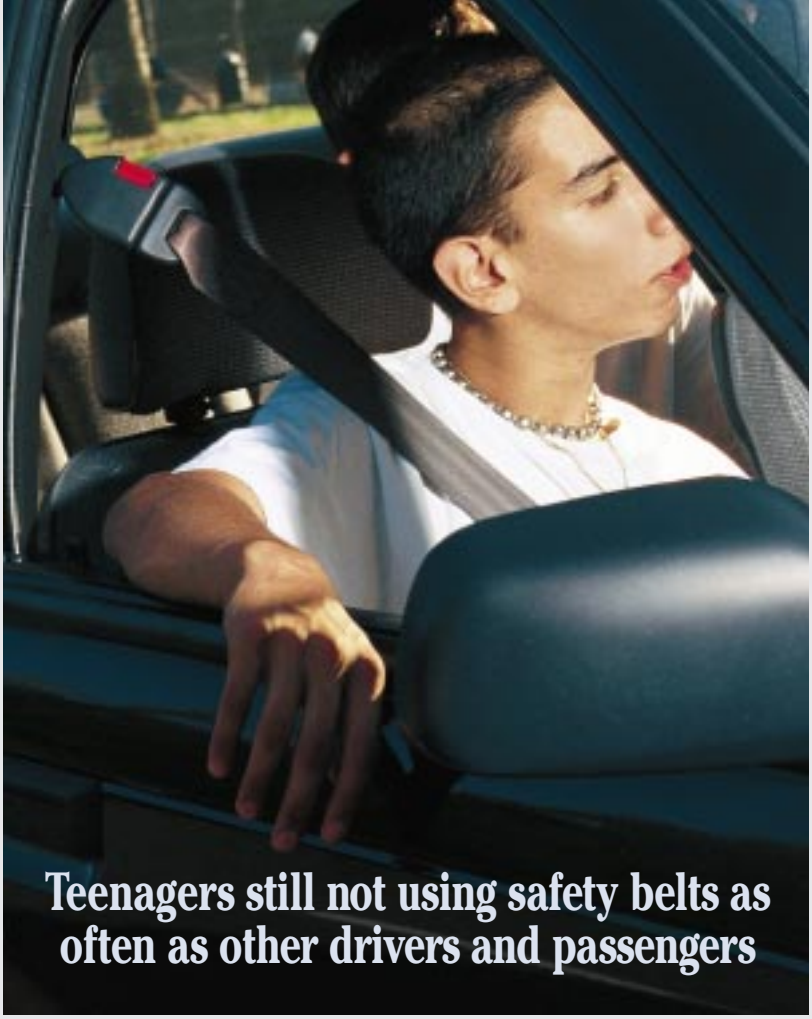
Teenagers are more likely than adults to drive older (pre-1990) and smaller vehicles, indicates the Institute survey of teenage drivers and their parents in four northeastern states — Connecticut, Delaware, New Jersey, and New York. Results of this new survey are consistent with those from a 1983 study that included California, Colorado, Louisiana, Michigan, and Mississippi as well as New Jersey and New York (see *Status Report*, Vol. 19, No. 18, Nov. 24, 1984).

Teens considered owners of the vehicles they drive are more likely than nonowners to use pre-1990 models, and they drive more frequently. Forty-seven percent of teen owners surveyed say they log more than 100 miles a week compared with 29 percent of nonowners. Teen owners are more likely to say they have engaged in risky behavior such as smoking, racing, and driving faster than 90 mph. Plus, they are more likely to have lower grades than nonowners.

Most parents say their children drive particular vehicles because the family already owns the vehicle or it is inexpensive or the one the teenager desires. Safety, airbags, and antilock brakes are the least often cited factors guiding vehicle selection for teen drivers.

"Smaller vehicles provide less crash protection than larger ones, and older vehicles don't have modern crash protection features such as airbags," Williams notes. "Parents should consider safety when selecting a family vehicle that teenagers may one day drive or when purchasing a car especially for a teenage driver's use. It's important, too, for parents to realize that allowing their children to own vehicles in the first place is associated with more driving and greater involvement in crashes."

For a copy of "Vehicles Driven By Teenagers in Four States" by M. Cammisa et. al write: Publications, Insurance Institute for Highway Safety, 1005 N. Glebe Rd., Arlington, VA 22201.



Teenagers still not using safety belts as often as other drivers and passengers

Teenagers are less likely to use safety belts than older drivers and passengers, indicates a federal observational study reinforcing findings of previous analyses.

Researchers for the National Highway Traffic Safety Administration observed belt use at selected sites in four states: Idaho, Mississippi, Texas, and Virginia. Belt use was observed in fall 1995 among 28,326 occupants in 17,411 vehicles in urban and rural locations in each state. Of these occupants, 7,384 were estimated to be 15 to 19 years old.

Teenage belt use rates were lower than that of the general population in every location studied. Texas is the only study state with a primary belt enforcement law. It had the highest observed teenage front-seat belt use, as well as the highest adult belt use rate. In Houston, the adult use rate was 71 percent. It was 57 percent for teens. The other three study states had secondary laws. Yazoo City, Mississippi, had the lowest observed belt use rate of all the sites studied — 28 percent among adults and 20 percent among teenagers.

Observed teenage belt use was highest — 65 percent — at church and church-related events. Teen belt use was 43 percent at high schools, 39 percent in shopping areas, and 37 percent in recreational areas.

Female drivers and passengers used belts more often than male drivers and passengers, researchers observed. And teenagers in cars used belts more often than teens riding in pickup trucks.

Researchers obtained the ages of people riding in a sample of stopped vehicles. Among 15 year-olds, belt use was 44 percent. Belt use was highest among 16 year-olds (49 percent). Belt use then dropped with age: 46 percent among 17 year-olds, 42 percent among 18 year-olds, and 39 percent among 19 year-olds.

For a copy of "Characteristics and Conditions of Teenage Safety Belt Use" by K. Womack et. al write: National Technical Information Service, Springfield, VA 22161.

High-mounted brake lights help prevent rear-end collisions

Analysis of police-reported crashes finds 4 percent drop between 1986 and 1995

High center-mounted brake lights, required on cars since 1986, continue to reduce crashes, prevent injuries, and save millions in property damage costs. The National Highway Traffic Safety Administration (NHTSA) estimates the brake lights have reduced rear-impact collisions by 4 percent during the last six years.

An earlier Institute study found a similar 5 percent reduction in rear-end crashes as a result of the brake lights (see *Status Report*, Vol. 30, No. 5, June 3, 1995).

The NHTSA analysis of brake lights focused on police-reported crashes in eight states during 1986-95. The Institute study was based on property damage liability insurance claims data during 1986-91.

The decrease in rear-end crashes is less than predicted in earlier studies. But the NHTSA report points out that, on an annual basis, brake lights are saving nearly $450 million in property damage costs "without considering the benefits of injury reductions." The report is the third and last evaluation of center-mounted brake lights the National Highway Traffic Safety Administration plans to issue.

High center-mounted brake lights are installed higher and midway between the rear brake lights to form a triangular pattern. When brakes are applied, these lights warn drivers of following vehicles to slow down. The lights have been standard on all new cars since model year 1986 and all new light trucks since model year 1994.

For a copy of "The Long-term Effectiveness of Center High Mounted Stop Lamps in Passenger Cars and Light Trucks" call the NHTSA Office of Public and Consumer Affairs at 202/366-9550. The report also is posted on NHTSA's Internet site located at www.nhtsa.dot.gov.

Small pickups deliver disappointing performances in 40 mph crash tests

None of the five small pickup trucks the Institute tested in a crash at 40 mph earned a good crashworthiness rating.

"These pickups sustained too much damage in our low-speed crash tests, and they don't pass muster when it comes to high-speed crashworthiness tests either," Institute President Brian O'Neill points out. Crashworthiness refers to how well vehicles protect their occupants in serious crashes.

The two best performers in the Institute's 40 mph frontal offset crash test were the Toyota Tacoma and Ford Ranger. The two worst were the Dodge Dakota and Nissan Frontier. The Tacoma and Ranger (plus the Mazda B-series, the Ranger's "twin") are rated acceptable overall. The Dakota and Nissan Frontier are poor overall. The other pickup tested — the Chevrolet S-10 — is rated marginal along with the GMC Sonoma and Isuzu Hombre, considered the S-10's "twins."

> "We're always disappointed when no vehicle in a class earns a good evaluation. There aren't any pickups with good crashworthiness performance, and three of the five are marginal or poor overall."

"We're always disappointed," O'Neill comments, "when no vehicle in a class earns a good evaluation. There aren't any pickups with good crashworthiness performance, and three of the five are marginal or poor overall."

The Institute's crashworthiness evaluations are based primarily on performance in the frontal offset crash test. All vehicles are rated in three categories and then assigned overall evaluations of good, accept-

able, marginal, or poor. Head restraint design and bumper performance in low-speed crash tests don't affect the overall evaluations but are considered when establishing vehicle rankings within each class (midsize four-door cars, small pickup trucks, etc.).

Structural performance: Manufacturers of the small pickups advertise the vehicles' energy-absorbing front-end crumple zones. "But our crash test calls into question the effectiveness of the crumple zones on these small pickups. We didn't see the kind of structural performance that would back up the manufacturers' claims," O'Neill says.

OVERALL CRASHWORTHINESS EVALUATIONS, SMALL PICKUPS

A **TOYOTA TACOMA**
1998 models

A **FORD RANGER**
MAZDA B-SERIES
1998 models

M **CHEVROLET S-10**
GMC SONOMA
ISUZU HOMBRE
1998 models

P **NISSAN FRONTIER**
1998 models

P **DODGE DAKOTA**
1997-98 models

G **GOOD**

A **ACCEPTABLE**

M **MARGINAL**

P **POOR**

The Toyota Tacoma and the Ford Ranger performed best in the Institute's frontal offset crash test. Both of these 1998 model small pickups received acceptable ratings, although they fell short of the top designation. The Dodge Dakota and Nissan Frontier performed worst. Among the three aspects of crashworthiness assessed in the offset test is how well the front-end crush zone manages crash energy and the safety cage limits occupant compartment intrusion. For example, in the Toyota Tacoma offset test the safety cage was maintained reasonably well, but intrusion at the driver footrest contributed to high forces on the dummy's left leg (left). Injury risk is measured with a 50th percentile male Hybrid III dummy positioned in the driver seat.

The Ford Ranger's driver seat tilted forward and toward the driver door during the offset test (left). Plus, intrusion into the driver footwell area contributed to high forces on the right leg. Overall, the Ranger earned an acceptable rating. The Nissan Frontier's steering column moved up sharply during the offset test (top). This contributed to the dummy's head bottoming out the airbag and striking the steering wheel. After the dummy moved forward into the airbag, it rebounded into the seat and moved toward the driver door. Then the dummy's head struck the B-pillar. The Frontier earned a poor overall evaluation.

There was too much intrusion into the footwells of the Dakota, Ranger, and S-10 pickups. Plus the floors buckled extensively under the drivers' seats in the Ranger and Dakota, causing the seats to tilt forward in the crash tests and further reduce the drivers' space.

Even in the Tacoma — the pickup truck that performed the best of the five — intrusion in the driver footrest area contributed to high forces on the dummy's left leg and the likelihood of an injury. In the Chevrolet S-10, instrument panel intrusion contributed to the possibility of leg and knee injury.

Unlike cars, pickup trucks are built on frames. "Many people think this makes the pickups tough, durable, and therefore safe. Manufacturers push this image of toughness in their advertising. But toughness doesn't necessarily translate into good performance in a high-speed crash," O'Neill explains. "The Chevrolet S-10 illustrates this. In the 40 mph offset crash test, the frame buckled in the middle of the occupant compartment, allowing significant intrusion into the driver's space. So the crash performance wasn't good."

How researchers assess performance: Institute researchers use 40 mph offset crash tests to evaluate three important aspects of passenger vehicle crashworthiness — (1) how well the front-end crush zone manages crash energy and the safety cage limits occupant compartment intrusion, (2) injury risk measured on a dummy representing an average-size male driver, and (3) how well dummy movement is controlled during impact. Vehicle structure, occupant restraints, and injury measures are evaluated separately — even though they're related — because good performance for any one of the three by itself in a single test isn't sufficient to reliably indicate good crashworthiness.

The same crash test is used to evaluate new cars by the European Union in cooperation with motor clubs and by an Australian consortium of state governments and motor clubs. In addition, the Institute's crashworthiness evaluations reflect the adequacy of front-seat head restraint designs and bumper performance in four crash tests at 5 mph.

Tests complement each other: The U.S. government has been testing new passenger vehicles in 35 mph crash tests since 1978. This New Car Assessment Program has been a major contributor to crashworthiness improvements — in particular, improved restraint systems in new passenger vehicles.

The Institute's offset test, which involves 40 percent of a vehicle's front end hitting a deformable barrier at 40 mph, complements the federal test involving the full width of the front end hitting a rigid barrier. The government test is especially demanding of restraint systems but not so much so of vehicle structure. An offset test is more demanding of vehicle structure.

Results of the Institute crash tests can be found at www.highwaysafety.org. Federal New Car Assessment Program results are at www.nhtsa.dot.gov.

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