Injury Epidemiology
Injury Information for Colorado

Colorado Department of Public Health and Environment

Injury Epidemiology Brief
Hospitalizations and Deaths among Teen Motor Vehicle Drivers
September 2008

Sallie Thoreson, MS, Letoynia Coombs,Ed.D., and Barbara Gabella, MSPH
Prevention Services Division

Motor vehicle crashes are the leading cause of death among U.S. teenagers. Per mile driven, crash rates among 16 to 19-year-old drivers are higher than those for all other age groups. The crash rate among 16-year-old drivers is twice as high as among 18 to 19-year-old drivers.[1] In Colorado, 43 percent of all deaths (2000-2006) and 34 percent of injury hospitalizations involving 16 to 17-year-olds result from motor vehicle crashes.[2]

Two factors commonly mentioned to account for the high motor vehicle crash rates for young drivers are inexperience and risky driving. A recommended intervention to address this problem is graduated driver licensing system, where young drivers can gain experience under controlled conditions. Colorado's graduated driver licensing provisions went into effect July 1, 1999 with additional passenger and cell phone use restrictions added in 2005. (See www.coteendriver.com for more details on the law.)

Teen Driver Deaths[3]

The number of 16 to 17-year-old drivers killed in motor vehicle traffic crashes in Colorado has remained relatively low (Table 1). To compare changes over time, a more appropriate measure is the death rate (the number of deaths per 100,000 population). The death rate takes into account any changes in the population over time. For example, there were 10,520 more 16-year-olds in Colorado in 2006 than in 1998.

The death rate for 16-year-old drivers decreased significantly in 2000-2001. (See Table 1.) However, the death rate in 2002-2003 and 2004-2006 was not significantly lower than the rate in previous years. Additional years of data are needed to see if the death rate continues to decline.

Table 1. Teen driver deaths, Colorado residents ages 16 and 17

	Time Period	1996-1997	1998-1999	2000-2001	2002-2003	2004-2006
16 year olds	Number	20	20	3	19	18
	Rate[a]	18.6	17.3	**2.4[c]**	14.8	9.2
	CI[b]	9.9-27.2	9.2-25.3	**0.5-7.1**	7.8-21.9	4.7-13.7
17 year olds	Number	17	16	16	19	26
	Rate[a]	15.4	13.6	12.8	14.6	13.2
	CI[b]	7.6-23.2	6.5-20.6	6.1-19.4	7.7-21.6	7.9-18.5

a Rates are the number of deaths per 100,000 population.

b CI=95% confidence interval. When CIs do not overlap, the difference between rates is statistically significant.

c This rate is significantly lower than the rate in 1996-97, 1998-1999, and 2002-2003 at p<0.05

Teen Driver Hospitalizations[3]

An average of 106 Colorado teen drivers ages 16 to 17 are hospitalized each year for injuries resulting from motor vehicle crashes.

Hospitalization rates for 16-year-old drivers may be decreasing. For this age group, the hospitalization rate in 2004-2006 was significantly lower than in 1998-1999 and 2002-2003. For 17-year-old drivers, there were no significant differences for any of the time periods. (See Table 2.)

Table 2. Teen drivers hospitalized for injuries due to motor vehicle crashes, Colorado residents ages 16 and 17

Year	Time Period	1998-1999	2000-2001	2002-2003	2004-2006
16 year olds	Number	128	98	105	82
	Rate[a]	110.7	78.9	81.9	63.6
	CI[b]	91.1-130.3	62.9 - 94.9	65.8-97.9	49.5-63.6[c]
17 year olds	Number	137	146	125	136
	Rate[a]	116.1	116.5	96.1	103.5
	CI[b]	96.3-136.0	97.2-135.8	78.9-113.4	85.7-121.2

a Rates are the number of hospitalizations per 100,000 population.
b CI = 95% confidence interval. When CIs do not overlap, the difference between rates is statistically significant.
c This rate is statistically lower than the rates in 1998-1999 and 2002-2003, at p<0.05.

Teen Passengers[4]

Teen passengers are at risk for death and injuries when teens are driving the vehicle. From 2001-2006 in Colorado, 156 teens (ages 13 to 17) died while riding as passengers in a motor vehicle crash**.** Forty-six percent of those teens were riding in vehicles driven by 16 -17 years olds.

The risk of fatal injury for a teen driver increases with the number of passengers.[5] From 2001-2006 in Colorado, one or more passengers were in thirty-nine percent of the crashes when the teen drivers (ages 16 to 17) were killed. Sixty percent of the passengers were teens themselves, ages 13 to 17 years old. (The rest of the passengers were over age 17.)

Seatbelt Use[6]

Seatbelts are known to be 45 percent to 60 percent effective in reducing the risk of fatal injury for adults.[6] Of the drivers ages 16 to 17 who died in 2001-2006 in Colorado, 55 percent were unrestrained.[4] Compared to other age groups, teens have the lowest rate of seatbelt use.[1] In 2007 in Colorado, the observed seatbelt use rate for 16 to 20-year-olds was 73 percent, compared to a use rate of 81 percent for all adults.[7]

Prevention Strategies

In addition to not using seatbelts, teen drivers take risks by underestimating the dangers in hazardous situations, speeding, driving after using alcohol or drugs, driving at night, and allowing distractions, such as the presence of passengers.[1,8] Overall, state GDL systems have reduced crash risk for young drivers by 20 to 40 percent. One study found a 36 to 40 percent decline in hospitalization rates for 16-year old drivers.[8] Strong GDL systems appear to work by reducing the exposure of young drivers to crash risks or by limiting their driving under the most risky conditions.[8-10] Strategies that enhance GDL systems to reduce teen deaths, injuries, and crashes include:[9,10]

- Parents setting and monitoring family rules for their teen driver, especially restrictions on passengers and nighttime driving. (See the driving contract for parents and teens at www.coteendriver.com.)
- Enforcement of driving laws, including safety belt use, speeding and all provisions of the GDL
- Driving education and supervision by both instructors and parents with more emphasis on safe driving procedures and good decision-making skills
- Involvement of school personnel, health care providers, insurance providers and other community partners in teen driving safety
- Education to teens, parents and the community that identifies and minimizes risk-taking behaviors
- Coordination with programs that reduce underage drinking and drug use
- Data collection and evaluation to determine the effective components of teen driving safety programs.

References

[1] Centers for Disease Control and Prevention. (2008). Teen Drivers: Fact Sheet. Retrieved Ausust 4, 2008, from http://www.cdc.gov/ncipc/factsheets/teenmvh.htm

[2] Colorado Department of Public Health and Environment, Injury Epidemiology Program. (2007). Unpublished data.

[3] The death numbers and rates in this section are derived from the death certificate data compiled by the Health Statistics Section at CDPHE. The death data are linked to data from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS). The hospitalization numbers and rates are derived from hospital discharge data compiled by the Colorado Health and Hospital Association. Population data for rate calculations were obtained from CoHID at http://www.cdphe.state.co.us/cohid

[4] The data in this section come from the NHTSA FARS database at http://www-fars.nhtsa.dot.gov. Due to differences in case definitions and reporting, there are slight differences between the numbers reported using FARS and the numbers reported using CDPHE databases.

[5] Chen L-H, Baker SP, Braver ER, Li G. (2000). Carrying passengers as a risk factor for crashes fatal to 16- and 17-year-old drivers. JAMA 283(12):1578-1582.

[6] National Highway Traffic Safety Administration. (2007). Traffic Safety Facts 2006: Data-Occupant Protection. Retrieved January 14, 2008, from http://www-nrd.nhtsa.dot.gov/Pubs/810807.PDF

[7] Colorado Department of Transportation. (2007). News Release: *Click It or Ticket* Seat Belt Enforcement Oct 15-21, Safety Officials Concerned about Teenagers. Retrieved June 10, 2008, from http://www.dot.state.co.us/Communications/News/Archive/OP20071015.pdf

[8] Shope JT. (2007). Graduated driver licensing: Review of evaluation results since 2002. Journal of Safety Research 38:165-175.

[9] National Highway Traffic Safety Administration. (2008). Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Third Ediction. DOT HS 810 981. Available from http://www.nhtsa.gov/staticfiles/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/HS810891.pdf

[10] Goodwin A, Foss R. Sohn J, Mayhew D. (2007). National Cooperative Highway Research Program Report 500. Guidance for Implementation of the AASHTO Strategic Highway Safety Plan, Volume 19: A guide for reducing collisions involving young drivers. Available from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v19.pdf