Patterns of Seat Belt Use Among Teenagers and Effective Countermeasures

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Prevalence and factors associated with belt use
Observed daytime seat belt use rates in passenger vehicles, by estimated age and seating position

NOPUS, 2011
Seat belt use rates among fatally injured passenger vehicle occupants, by age and seating position

FARS, 2012
Seat belt use rates among fatally injured teenage passenger vehicle occupants, by age and seating position
FARS, 2011-12
Belt use rates among fatally injured passenger vehicle drivers, ages 13-19 by driver characteristics, 2012

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>male drivers</td>
<td>39</td>
</tr>
<tr>
<td>female drivers</td>
<td>48</td>
</tr>
<tr>
<td>drivers with positive BACs</td>
<td>27</td>
</tr>
<tr>
<td>drivers with zero BACs</td>
<td>47</td>
</tr>
<tr>
<td>drivers who were speeding</td>
<td>37</td>
</tr>
<tr>
<td>drivers not speeding</td>
<td>46</td>
</tr>
<tr>
<td>drivers with driver error</td>
<td>41</td>
</tr>
<tr>
<td>drivers without driver error</td>
<td>44</td>
</tr>
<tr>
<td>unlicensed drivers</td>
<td>31</td>
</tr>
<tr>
<td>drivers with permit or license</td>
<td>43</td>
</tr>
</tbody>
</table>
### Belt use rates among fatally injured passenger vehicle drivers ages 13-19 by crash characteristics, 2012

<table>
<thead>
<tr>
<th>Crash Type</th>
<th>Percent Wearing Belt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nighttime (9 p.m. – 5:59 a.m.) crash</td>
<td>33</td>
</tr>
<tr>
<td>Daytime (6 a.m. – 8:59 p.m.) crash</td>
<td>48</td>
</tr>
<tr>
<td>Zero teen passengers</td>
<td>41</td>
</tr>
<tr>
<td>1 teen passenger</td>
<td>46</td>
</tr>
<tr>
<td>2 or more teen passengers</td>
<td>38</td>
</tr>
</tbody>
</table>
Factors associated with belt use among fatally injured 16-19 year old drivers, 1995-2000
McCartt and Northrup, 2004

• Lower belt use associated with increasing age, male drivers, older vehicle, late night crash, rural roadway, pickup or van/SUV vs. car, BAC of 0.10 percent or higher, increasing number of teen passengers, passenger 20-29 vs. 30 and older or no adult passenger
Percent of telephone survey respondents reporting they always use seat belts, by age

NHTSA, 2007

- Children <16 in household
- 16-20
- 21-24
- 25-34
- 35-44
- 45-64
- 65+
## Percent of survey respondents who agree with statements about belt use, by age

**NHTSA, 2007**

<table>
<thead>
<tr>
<th>Statement</th>
<th>16-20</th>
<th>21-64</th>
<th>65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat belts just as likely to harm as help</td>
<td>44</td>
<td>34</td>
<td>31</td>
</tr>
<tr>
<td>Putting on belt makes worry more about being in accident</td>
<td>26</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Accident close to home usually not as serious as accident farther away</td>
<td>28</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>Would feel self-conscious around friends if wore belt and they did not</td>
<td>27</td>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>
Reasons that survey respondents said they sometimes do not buckle up, by age (percent)

NHTSA, 2007

<table>
<thead>
<tr>
<th>Reason</th>
<th>16-20</th>
<th>21-64</th>
<th>65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>driving short distance</td>
<td>61</td>
<td>59</td>
<td>60</td>
</tr>
<tr>
<td>forget</td>
<td>68</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>in a rush</td>
<td>44</td>
<td>39</td>
<td>35</td>
</tr>
<tr>
<td>uncomfortable</td>
<td>47</td>
<td>33</td>
<td>31</td>
</tr>
</tbody>
</table>
Youth Risk Behavior Surveillance Survey
CDC, 2011

• Nationwide, 8 percent of high school students reported rarely or never wearing a seat belt as a passenger.

• Prevalence of rarely/never wearing a seat belt was higher:
  – Among males (9%) than females (6%)
  – Among black (10%) and Hispanic (9%) than white (6%) students
  – Among 9th-grade (10%) than 10th-grade (8%), 11th-grade (6%), and 12th-grade (7%) students

• From 1991-2011, rarely/never wearing a belt declined from 26 to 8 percent.
Percent seat belt use among 8-12 year olds at four economically disadvantaged elementary schools in Virginia

Will, Dunaway, Lorek, 2013

self-reported seat belt use
Proven general population strategies
Safety belt use has increased in large part due to publicized enforcement programs.
Primary and secondary belt use laws
January 2014

- 33 + DC Primary
- 16 secondary
- 1 no law
Percent belt use reported by states
2012

<table>
<thead>
<tr>
<th>65-69</th>
<th>NH, SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-74</td>
<td>MA, AR</td>
</tr>
<tr>
<td>75-79</td>
<td>ID, MO, MT, NE, VA, WY, LA, RI</td>
</tr>
<tr>
<td>80-84</td>
<td>AZ, CO, ND, OH, PA, UT, VT, WV, KS, KY, ME, MS, OK, TN, WI</td>
</tr>
<tr>
<td>85-89</td>
<td>AK, CT, DE, FL, NJ, NC</td>
</tr>
<tr>
<td>90-98</td>
<td>NV, AL, CA, DC, GA, HI, IL, IN, IA, MD, MI, MN, NM, NY, OR, SC, TX, WA</td>
</tr>
</tbody>
</table>

Legend:
- **red**: no law
- **orange**: secondary
- **green**: primary
Primary enforcement seat belt laws raise belt use among teenagers

• Whether crash occurred in state with primary seat belt law was strong predictor of higher belt use among fatally injured 16-19 year old drivers and passengers (McCartt and Northrup, 2004)

• After controlling for driver's age and restraint status and the seating row of the occupant in crashes of insured vehicles, a 13-15 year old was over twice as likely to be unrestrained in a secondary enforcement state as compared to a primary enforcement state (Durbin, Smith, Kallan et al., 2007)
Percent driver belt use in vehicles with and without enhanced reminders

- **Ford dealers** (IIHS, 2002)
- **Honda dealers** (IIHS, 2007)
- **Observed traffic** (NHTSA, 2007)
Can enhanced reminders be used more effectively to boost safety belt use in the U.S.?

• Enhanced reminders in 2013 models: 90 percent driver, 78 percent front passenger, 3 percent rear passenger
  – About 16 percent of enhanced reminders for front seat meet Australasian and Euro NCAP criteria

• MAP-21 allows federal government to require strong belt reminders
  – Can require chime for more than 4-8 seconds
  – Cannot require ignition interlocks but can allow automakers to use interlock to comply with safety regulation
  – Must begin rulemaking to require seat belt reminders
Promising strategies directed at teens
Distribution of 16-17 year old drivers involved in police-reported crashes on weekdays during school year

By time of day, United States, 2009-12
Will a belt requirement in a high school parking permit program affect belt use?
McCartt, Geary, Solomon, 2005

• Belt requirement established by school in Connecticut (primary law state) and school in Mississippi (secondary law state)

• Required student drivers and passengers to buckle up in vehicles with parking decals

• Graduated penalties, culminating in loss of parking privileges

• Belt use observed at program and comparison schools before and 6 months after requirement
Percent morning teen belt use before and after belt requirement

Hattiesburg, Mississippi

![Graph showing the percent morning teen belt use before and after belt requirement in Hattiesburg, Mississippi. The graph compares data from a program school and a comparison school.](image-url)
Percent morning teen belt use before and after belt requirement

Danbury, Connecticut

![Graph showing percent morning teen belt use before and after belt requirement for program and comparison schools.](https://www.iihs.org)
High visibility enforcement of graduated licensing laws in North Carolina

Goodwin, Wells, Foss, Williams, 2006
Percent of drivers using seat belts at high schools
Before and after program

![Bar chart showing the percent of drivers using seat belts at high schools before and after a program, comparing program county and comparison counties in the morning and afternoon.](www.iihs.org)
Other promising approaches

- Community programs that combine education, peer-to-peer persuasion, publicized enforcement, and parental monitoring have some potential for increasing teen safety belt use (Fell, Baker, McKnight, et al., 2005)

- A Special Traffic Enforcement Program targeting teenagers in Colorado and Nevada had some success in increasing teen’s belt use (Nichols, Haire, Solomon et al., 2011)
Parental oversight
What role can parents play?

- Style of parenting can affect teens’ belt use; reported belt use higher with authoritative or authoritarian parents (Ginsburg, Durbin, Garcia-Espana, 2009)

- In a randomized study testing the effects of risky driving feedback with teens, feedback combined with parents being informed reduced risky driving, whereas immediate feedback only to teenagers did not (Simons-Morton et al., 2013)
In-vehicle mentoring devices for teens

- Computer chip
- GPS tracking on cell phone
- Video camera
- Ford MyKey
Study of in-vehicle feedback and monitoring device
Farmer, Kirley, McCartt, 2010

- Shoebox-size black box in vehicle cargo area, GPS, satellite modem, and small speaker box beneath dashboard
- Recorded location and miles driven
- Detected
  - All sudden braking and all sudden acceleration (longitudinal deceleration/acceleration more than 0.5 g)
  - Driver not using belt
  - Speed 2.5 mph faster than limit
  - Speed more than 10 mph faster than limit
Study design

• Random assignment of 85 families to study and control groups
• Vehicle monitoring: 2 weeks baseline, 20 weeks alerts and website, 2 weeks post-treatment
• Before/after changes in driving behavior (per mile driven) in 3 study groups relative to control group
  – Group 1: alerts driver and immediately notifies website
  – Group 2: alerts driver and 20 seconds later notifies website if behavior not corrected
  – Group 3: notifies website but no in-vehicle alert
  – Group 4: control group with monitoring but no alert or notification
Safety belt alert
Percent of miles driven while not using belts
By period and study group

- Alert and web
- Alert then web
- Web only
- Control
Percent reduction in risky behaviors with monitoring device

With alert in vehicle, delayed parent notification, parent report card

- seat belt non-use
- sudden braking/acceleration
- speeding by more than 10 mph
Conclusions about in-vehicle monitoring

• Hard sell and unclear how many families will accept
• Alerts improve effectiveness
• Feedback to parents improves effectiveness
  – Web access alone doesn’t assure feedback to parents
  – Works best if teenager given chance to correct behavior
• Effects may level off during treatment and fade after removal
Summary of promising countermeasures to increase teens’ belt use

- Strengthening existing seat belt laws
- Enhanced seat belt reminders
- High visibility enforcement of belt laws near schools and other locations where teens congregate
- Strong belt component of GDL law, e.g., extended delay in full licensure for seat belt citation
- Parental oversight mechanisms, including in-vehicle monitoring
Dedicated to reducing deaths, injuries, and property damage on the highway.