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## State-level seat belt use in the United States, 2011–2016: Comparison of self-reported with observed use and use by fatally injured occupants

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### Abstract

**Introduction:** Despite 49 states and the District of Columbia having seat belt laws that permit either primary or secondary enforcement, nearly half of persons who die in passenger vehicle crashes in the United States are unbelted. Monitoring seat belt use is important for measuring the effectiveness of strategies to increase belt use.

**Objective:** Document self-reported seat belt use by state seat belt enforcement type and compare 2016 self-reported belt use with observed use and use among passenger vehicle occupant (PVO) fatalities.

**Methods:** We analyzed the Behavioral Risk Factor Surveillance System (BRFSS) self-reported seat belt use data during 2011–2016. The Pearson correlation coefficient ( $r$ ) was used to compare the 2016 BRFSS state estimates with observed seat belt use from state-based surveys and with unrestrained PVO fatalities from the Fatality Analysis Reporting System.

**Results:** During 2011–2016, national self-reported seat belt use ranged from 86–88%. In 2016, national self-reported use (87%) lagged observed use (90%) by 3 percentage points. By state, the 2016 self-reported use ranged from 64% in South Dakota to 93% in California, Hawaii, and Oregon. Seat belt use averaged 7 percentage points higher in primary enforcement states (89%) than in secondary states (82%). Self-reported state estimates were strongly positively correlated

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<sup>8</sup>Contributors

IS participated in the design of the study, performed the analysis, and drafted the manuscript; RAS conceived of the study, participated in its design, and co-wrote the manuscript; MRS participated in the design of the study, supervised the analysis, and revised manuscript drafts; LFB assisted with the study design, revised manuscript drafts, and helped shape the discussion; DAS reviewed manuscript drafts and strengthened the discussion section. All authors assisted in data interpretation, and in preparation of the manuscript.

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The findings and conclusions in this paper are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

<sup>9</sup>Declarations of interest

None.

with state observational estimates ( $r = 0.80$ ) and strongly negatively correlated with the proportion of unrestrained PVO fatalities ( $r = -0.77$ ).

**Conclusion:** National self-reported seat belt use remained essentially stable during 2011–2016 at around 87%, but large variations existed across states.

**Practical Applications:** If seat belt use in secondary enforcement states matched use in primary enforcement states for 2016, an additional 3.98 million adults would have been belted. Renewed attention to increasing seat belt use will be needed to reduce motor-vehicle fatalities. Self-reported and observational seat belt data complement one another and can aid in designing targeted and multifaceted interventions.

### Keywords

Seat belts; Motor vehicles; Behavioral risk factor surveillance system; Passenger vehicle occupant; Occupant protection

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## 1. Introduction

Motor vehicle crashes (MVCs) are a leading cause of injury-related deaths among all age groups in the United States (CDC, 2020). Seat belts reduce the risk for fatal crash injuries by 45% and moderate to serious injuries by 50% (Kahane, 2015; NCSA, 2018a). In 2016 alone, seat belt use saved an estimated 14,668 lives (NCSA, 2017a).

Monitoring seat belt use is important for measuring the effectiveness of strategies that aim to increase belt use. Although directly observed data provide an objective assessment of seat belt use, observational surveys in the United States have traditionally measured seat belt use only among front seat occupants and during daytime hours (Pickrell & Li, 2016). Also, resource considerations have limited the use of observational surveys in rural areas. While self-reported belt use surveys are less resource-intensive, they have been historically subject to over-reporting, likely due to social desirability bias (Streff & Wagenaar, 1989; Stulginskis, Verreault, & Pless, 1985). One such example of apparent over-reporting was illustrated in the 2007 Motor Vehicle Occupant Safety Survey, in which 88% of drivers reported using a seat belt “all of the time.” However, upon follow-up, 6% of these respondents reported not wearing a seat belt in the past day or week (Boyle & Lampkin, 2008).

Based on an early study comparing self-reported to observed seat belt use in the United States, Streff and Wagenaar (1989) concluded that self-reported estimates overestimated observed use by 20–100% and recommended discounting self-reported estimates by about 12 percentage points to estimate actual belt use (Streff & Wagenaar, 1989). However, as belt use in the United States has risen, estimates of self-reported and observed belt use have converged. By 1993, Nelson (1996) found that national self-reported belt use exceeded observed use by 2% to 5%, and by 2008, observed belt use exceeded self-reported use in 38 states (Ibrahimova, Shults, & Beck, 2011; Nelson, 1996).

Forty-nine states and the District of Columbia (DC) have mandatory seat belt laws that permit either primary or secondary enforcement of seat belt use. Primary enforcement

enables law enforcement officers to stop and issue citations to vehicle occupants solely for not wearing seat belts, whereas secondary enforcement enables officers to issue seat belt citations only when the vehicle is stopped for another reason. New York enacted the first primary enforcement law in 1984, and as of February 2020, 34 states and DC have primary enforcement laws (IIHS, 2020).

Seat belt use has been consistently higher in states with primary enforcement than in states with secondary enforcement (Pickrell & Li, 2016; Shults & Beck, 2012; Shults, Nichols, Dinh-Zarr, Sleet, & Elder, 2004), and a large body of literature indicates that primary enforcement is more effective in increasing seat belt use and reducing MVC fatalities (Harper, Strumpf, Burris, Davey Smith, & Lynch, 2014; Lee et al., 2015; Shults et al., 2004). However, a recent evaluation of primary seat belt enforcement laws passed since 2000 reported that upgrading to primary enforcement no longer appeared to reduce MVC death rates (Harper & Strumpf, 2017). The study did not directly measure seat belt use but offered possible reasons for the findings, such as lack of strong enforcement campaigns, changes in driving patterns related to the recent economic recession (e.g., less discretionary driving), and improved road and vehicle safety that reduced MVC death rates in both primary and secondary enforcement states.

As the U.S. economy has rebounded from the recent economic recession, MVC deaths have increased. Deaths among passenger vehicle occupants, which account for nearly two-thirds of all MVC deaths, increased by 13% from a post-recession low in 2014 of 21,050 to 23,714 in 2016 (NCSA, 2018a). According to the National Occupant Protection Use Survey (NOPUS), daytime seat belt use in 2016 reached 90%; however, nearly half (48%) of passenger vehicle fatalities with known seat belt use status were unbelted (NCSA, 2017b; Pickrell & Li, 2016).

In light of the recent increases in MVC fatalities and the high prevalence of unbelted fatalities, renewed attention to increase seat belt use is needed. To help inform these efforts, the primary purpose of this report is to present self-reported seat belt use estimates for 2011–2016 by type of seat belt enforcement for all U.S. states and the District of Columbia. To our knowledge, the BRFSS is the only source for contemporaneous, state-representative estimates of self-reported seat belt use for all 50 states and DC. Secondly, we re-examine the association between self-reported and observed belt use, both nationally and by state, and explore the relationship between self-reported belt use and unrestrained passenger vehicle fatalities by state. Lastly, we highlight some of the benefits and limitations of using either self-reported or observational surveys to assess seat belt use.

## 2. Methods

Self-reported seat belt use data were obtained from the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) (CDC, 2017). The BRFSS is an ongoing, state-based, random-digit-dialed telephone survey that collects behavioral health-related data from noninstitutionalized adults aged 18 years residing in the United States (CDC, 2017). Since 2011, both landlines and cell phones are used to gather BRFSS data. During 2011–2016, the BRFSS median response rate, based on standards set

by the American Association of Public Opinion Research Response Rate Formula #4, for all states and DC ranged from 45% in 2012 to 50% in 2011 (CDC, 2017). Seat belt use was assessed with the question, “How often do you use seat belts when you drive or ride in a car?” and response options included always, nearly always, sometimes, seldom, never, don’t know/not sure, never drive or ride in a car, or refused.

For this study, we defined a belted individual as someone who reported always wearing a seat belt. The combined data sets for 2011–2016 contained 2,817,369 observations, excluding U.S. territories. Responses for don’t know/not sure ( $n = 1,727$ , 0.1%), never drive or ride in a car ( $n = 5,979$ , 0.2%), and refused ( $n = 14,173$ , 0.5%) were excluded along with missing values ( $n = 163,148$ , 5.8%). A final sample size of 2,632,342 observations was included in the analysis. Data from the Insurance Institute for Highway Safety were used to identify states with primary or secondary seat belt enforcement and the year of enactment (IIHS, 2020). Since 2011, Rhode Island, West Virginia, and Utah upgraded from secondary to primary enforcement (IIHS, 2020). For this analysis, the three newly-upgraded states were considered as primary enforcement states beginning in the year of primary enforcement enactment in each state (i.e., 2011 for Rhode Island, 2013 for West Virginia, and 2015 for Utah), otherwise these states were included as secondary. New Hampshire, the only state without a seat belt law, was grouped with the secondary enforcement states for analysis.

Observed seat belt use data were obtained from published reports of NOPUS and state-based observational surveys, all of which are annually administered in coordination with the National Highway Traffic Safety Administration (NHTSA) (NHTSA, 2011; Pickrell, 2017; Pickrell & Li, 2016). NOPUS and state-level surveys are probability-based surveys that observe seat belt use among drivers and front seat passengers at randomly selected sites every June during the daytime hours of 7 a.m. to 6 p.m. Occupants are considered to be using a seat belt if a shoulder belt is visible across their bodies. For this analysis, we compared the 2016 BRFSS state seat belt data (including DC) with the 2016 observed state data (including DC) using the Pearson correlation coefficient ( $r$ ).

The Fatality Analysis Reporting System (FARS) is a nationwide census of fatal motor vehicle crashes that occur on public roads and lead to at least one death within 30 days of the crash (NHTSA, 2014). Sources of FARS data include, but are not limited to, police accident reports, death certificates, coroner or medical examiner reports, hospital medical records, and vital statistics (NHTSA, 2014). For this study, we included all of the 23,714 passenger vehicle occupant fatalities recorded in the 2016 FARS database; 10,428 of the fatalities were known to be unrestrained (NCSA, 2017b). Restraint use was unknown for 2,004 fatalities (NCSA, 2017b). We obtained the 2016 state-level fatalities from the FARS Encyclopedia (NHTSA, 2018). We used the Pearson correlation coefficient ( $r$ ) to compare the 2016 BRFSS state seat belt data with the 2016 FARS state data on the proportion of passenger vehicle occupant fatalities of all ages who were known to be unrestrained.

Self-reported seat belt use estimates and 95% confidence intervals (CIs) were computed using SUDAAN to account for the complex sampling design. All estimates and CIs were weighted and rounded to the nearest whole number. Pearson correlation coefficients ( $r$ ) were calculated in SAS (*version 9.3*). The 2016 seat belt use estimates were applied to the 2016

BRFSS weighted population estimates to calculate the number of people who would have been belted if seat belt use estimates in secondary enforcement states matched primary enforcement states.

### 3. Results

The BRFSS national self-reported seat belt use estimates varied from 86% to 88% during the 6-year period of 2011–2016, with estimates in both 2011 and 2016 of 87% (Table 1). Seat belt use in primary enforcement states was 89% in both 2011 and 2016, and use in secondary enforcement states was 80% in 2011 and 82% in 2016. The 2016 BRFSS self-reported national seat belt use was three percentage points lower than the 2016 NOPUS observed national seat belt estimate (87% vs. 90%) (Pickrell & Li, 2016).

The 2016 BRFSS self-reported state seat belt use ranged from 64% in South Dakota to 93% in California, Hawaii, and Oregon (Table 1 and Fig. 1). Seat belt use in primary enforcement states (89%) was 7 percentage points higher than in secondary enforcement states (82%). Seat belt use was 90% in 12 of the 34 states and DC with primary enforcement and in only one of the 16 states with secondary enforcement. Among the 10 states with seat belt use <80%, only Arkansas had primary enforcement. If seat belt use in secondary enforcement states matched use in primary enforcement states for 2016, an additional 3.98 million adults would have been belted.

The 2016 observed state seat belt use ranged from 70% in New Hampshire to 97% in Georgia (Pickrell, 2017). Observed seat belt use was higher than self-reported use in 38 states and DC. The Pearson correlation coefficient revealed a strong correlation between the state seat belt use estimates from the two data sets ( $r = 0.80$ ; Fig. 2). The percentage point differences between self-reported and observed belt use ranged from 0 to 11 points, with the largest differences (8 percentage points) seen mostly in the upper Midwestern states of North Dakota (self-report 72% vs. observed 83%), South Dakota (64% vs. 74%), Nebraska (74% vs. 83%), Iowa (84% vs. 94%), Indiana (84% vs. 92%), and Wisconsin (80% vs. 88%). Virginia was the only state in which self-reported belt use exceeded observed use by 8 percentage points (87% vs. 79%).

Nationally, 48% of all 2016 passenger vehicle occupant fatalities with known restraint use status were unrestrained (NCSA, 2017b). A strong negative correlation existed between the proportion of fatalities that were unrestrained and the 2016 BRFSS seat belt use estimates ( $r = -0.77$ ; Fig. 3). By state, the proportion of unrestrained fatalities ranged from 22% in Oregon to 72% in New Hampshire and South Dakota; in primary enforcement states the proportion ranged from 22% to 64% (median = 44%), and in secondary enforcement states from 44% to 72% (median = 55%). All 10 states with self-reported seat belt use <80% had proportions of unrestrained fatalities above 47%, the median value for all states.

### 4. Discussion

We found that during 2011–2016, BRFSS self-reported seat belt use in the United States remained essentially stable at around 87%, but large variations existed across states. In 2016, seat belt use in primary enforcement states was 7 percentage points higher than in secondary

enforcement states (89% vs. 82%), and primary enforcement states were more than five times as likely as secondary enforcement states to have seat belt use of 90%.

Consistent with previous reports (Ibrahimova et al., 2011; Nelson, 1996), the 2016 BRFSS state seat belt use estimates were strongly positively correlated with the 2016 observed seat belt use estimates ( $r = 0.80$ ). Taken together, these findings provide support for using BRFSS self-reported data to monitor seat belt use and evaluate the effectiveness of strategies to increase use. In addition, data from self-report and observational surveys can complement each other to give a more thorough understanding of seat belt use. Observational surveys provide information about seat belt use at a particular point in time, by location (rural vs. urban, type of roadway), time of day or night, and by certain observable characteristics such as seating position, number of occupants, and type of vehicle driven. Self-reported surveys can provide information about frequency of seat belt use as well as individual characteristics such as age, race/ethnicity, socioeconomic status, and other behavioral risk and protective factors. Information from the two survey methods combined can aid in designing multifaceted interventions that target messaging to specific subgroups with lower seat belt use and identify locations and times for enforcement activities.

Differences in how seat belt use was defined by the BRFSS and the state observational surveys likely contributed to our finding that self-reported seat belt use was lower than observed use in 38 states and DC. Self-reported use was defined as “always” being belted while riding in or driving a car, whereas observed seat belt use was measured only among front seat occupants during daytime hours in the month of June. Observed belt use exceeded self-reported use the most in six upper Midwestern states with sizable rural populations. One possible explanation for this finding might be that the BRFSS reaches a more representative sample of rural populations than observational surveys do, and belt use in rural areas is known to be lower than in urban areas (Beck, Downs, Stevens, & Sauber-Schatz, 2017; NCSA, 2018b; Strine et al., 2010).

Despite seat belt use in the United States being at historic highs, nearly half of all passenger vehicle fatalities with known seat belt use are unbelted, suggesting that many occupants are part-time seat belt users. Converting part-time seat belt users to full-time users could greatly reduce traffic fatalities and serious injuries. However, identifying the part-time user will be challenging. Further analysis of BRFSS demographic data from respondents who report “nearly always” or “sometimes” using seat belts could be beneficial. These response estimates ranged from 10% to 12% during 2011–2016 (data not shown).

Results from two surveys of part-time belt users found that commonly reported reasons for not buckling up include simply forgetting, driving a short distance, being in a rush, or finding the belt too uncomfortable (Boyle & Lampkin, 2008; Kidd, McCartt, & Oesch, 2014). Such barriers to transitioning from part-time to full-time seat belt use could be addressed through a variety of engineering, enforcement, and behavioral strategies. Engineering strategies might include designing seat belts to be more comfortable and modifying seat belt reminders to increase the length of tones and buzzers (Eby, Molnar, Kostyniuk, Shope, & Miller, 2004; Kidd et al., 2014; Lerner, Singer, Huey, & Jenness, 2007). A recent study of seat belt reminders concluded that strengthening U.S. safety

standards to require audible reminders to last at least 90 seconds could save up to 1,489 lives annually (Kidd & Singer, 2019).

Enforcement strategies such as primary seat belt enforcement (Harper et al., 2014; Masten, 2007; Nichols, Tippetts, Fell, Eichelberger, & Haseltine, 2014; Shults et al., 2004), increasing fines for non-use of seat belts (Nichols et al., 2014), and heightening the perceived risk of being ticketed for seat belt law violations may also encourage seat belt use (Jans et al., 2015; Retting, Ballou, Sexton, Miller, Rothenberg, Kerns, & Johnson, 2018; Shults et al., 2004). Additionally, school and workplace policies and incentive programs that require seat belt use at all times have been shown to increase seat belt use (Jans et al., 2015; McCartt, Geary, & Solomon, 2005; Segui-Gomez, 2000; Studnek & Ferketich, 2007).

Health behavior theories such as the ecologic model, which addresses strategies aimed at the intra-personal, interpersonal, and community levels, could inform the design of interventions tailored towards part-time seat belt users (Gielen & Sleet, 2003). For example, strategies such as increasing positive attitudes toward seat belt use may motivate part-time belt users at an intra-personal level (Lim et al., 2008). Interpersonal-targeted approaches might include providing family support, peer influence, and encouragement through work or school social networks (Jans et al., 2015). Community level interventions could focus on correcting inaccurate perceptions of social norms related to seat belt use and setting community standards that guide expectations for drivers and passengers to always use seat belts (Bryant-Stephens, Garcia-Espana, & Winston, 2013; Jans et al., 2015; Litt, Lewis, Linkenbach, Lande, & Neighbors, 2014).

## 5. Limitations

This study has important limitations. The study is descriptive in nature, and the correlation coefficients presented indicate relationships, not causal associations. The BRFSS annual response rates of between 45% and 50% might introduce nonresponse bias. Because the BRFSS is limited to noninstitutionalized, civilian adults, results might not be representative of seat belt use among youth, institutionalized persons, or military personnel. The 2011–2016 BRFSS data are not directly comparable with BRFSS data prior to 2011 because of changes in weighting methodology and the addition of a cell phone sampling frame (CDC, 2017). Finally, the BRFSS data and state observational data are not directly comparable because of differences in seat belt use definitions (as described above), sample design, and survey methodology (CDC, 2017; NHTSA, 2011).

## 6. Conclusion

National self-reported seat belt use remained essentially stable during 2011–2016 at around 87%, but large variations existed across states. States with primary seat belt laws continue to have higher seat belt use than states with secondary laws. Monitoring seat belt use through methods of self-report and observation can complement one another. Use of both methods might better inform the design of interventions that specifically target part-time belt users. Such interventions might lower the burden of passenger vehicle fatalities.

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## Biography

**Iju Shakya M.P.H.**, is an ORISE Fellow in the Division of Injury Prevention at CDC's National Center for Injury Prevention and Control. Her research includes the areas of older adult falls and seat belt use.

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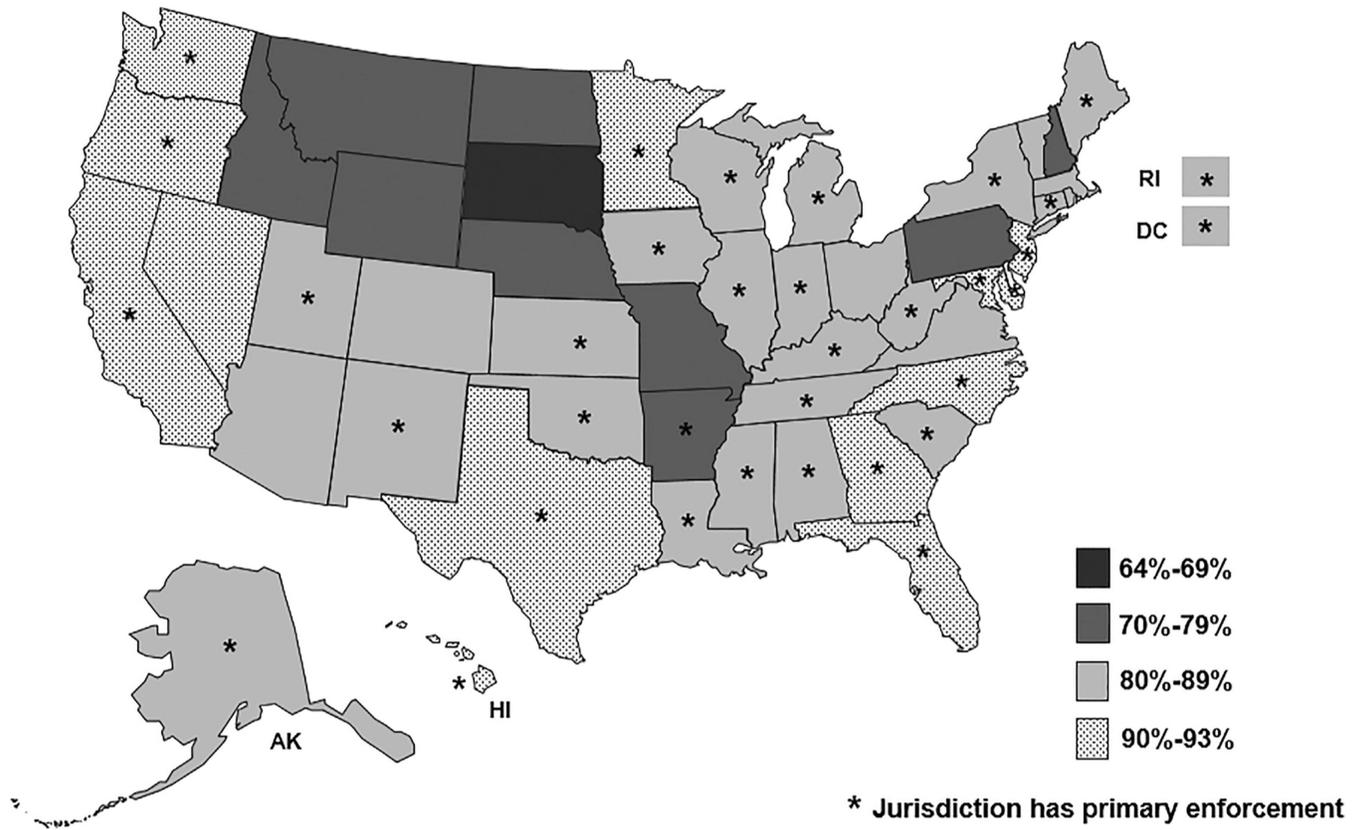
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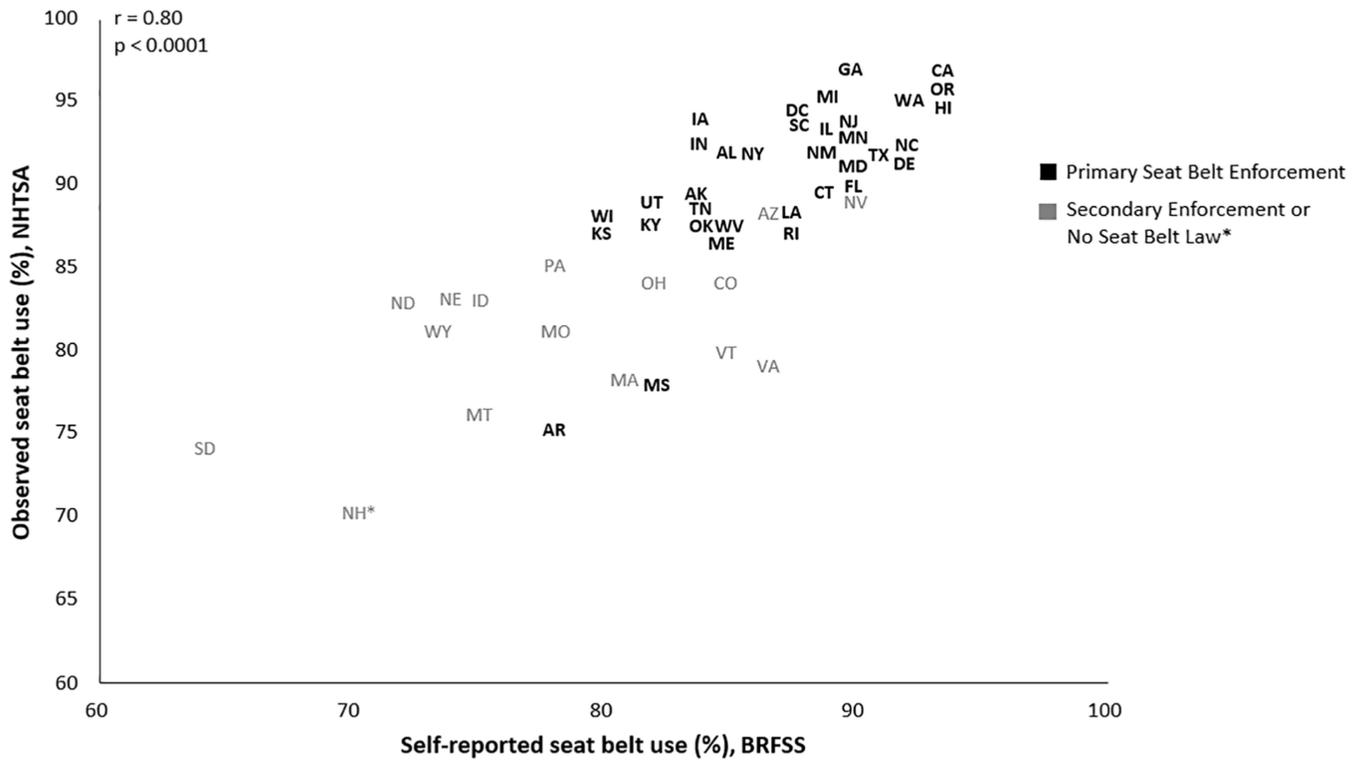
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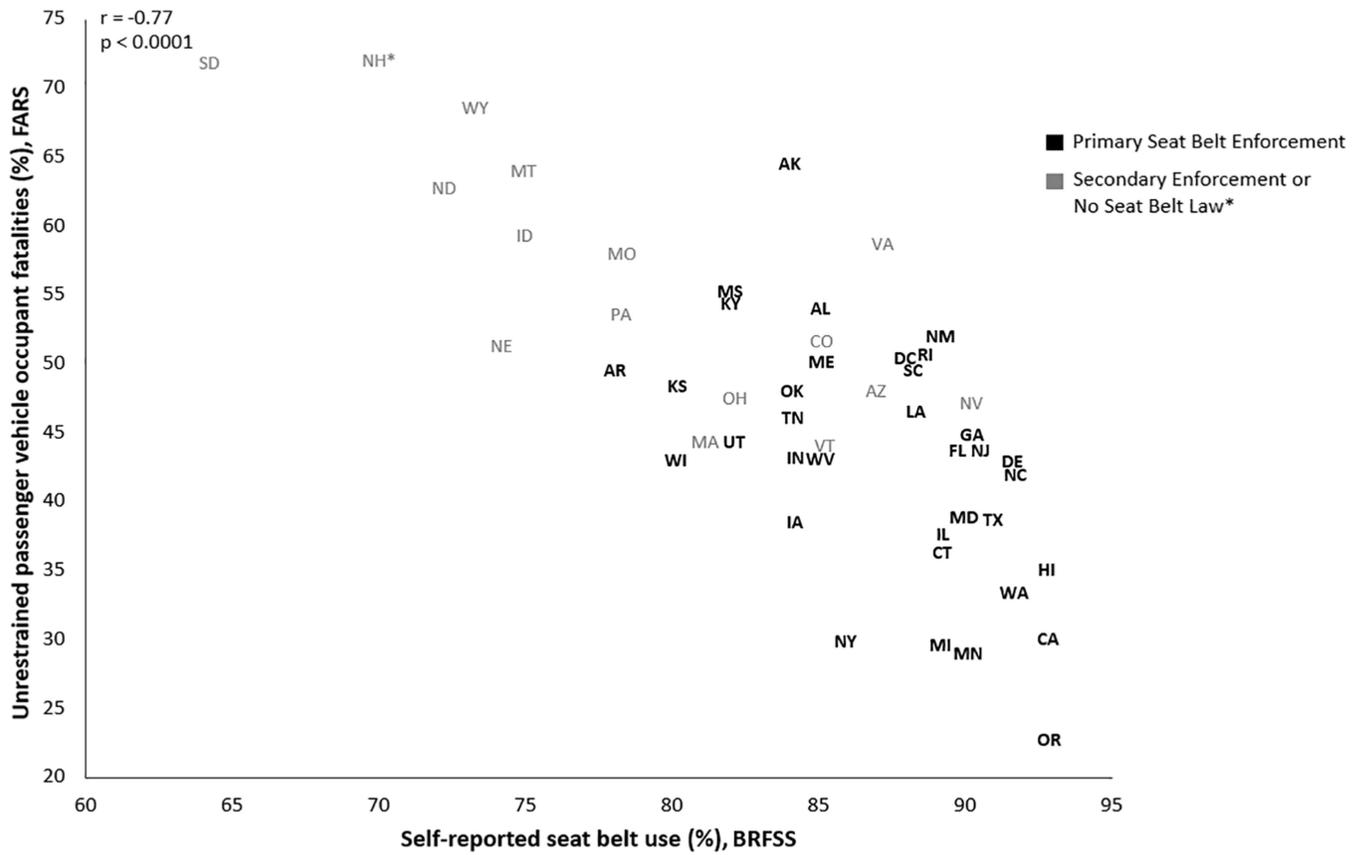
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**Fig. 1.** Prevalence of self-reported seat belt use among adults by enforcement type (primary or secondary/no law), BRFSS 2016.



**Fig. 2.** Association between self-reported and observed seat belt use by state, 2016.



**Fig. 3.** Association between self-reported seat belt use and the proportion of passenger vehicle occupant fatalities who were unrestrained by state, 2016.

**Table 1**

Prevalence of seat belt use among adults aged 18 years by enforcement type (primary or secondary/none), BRFSS 2011–2016.

State/District	2011 % (95% CI)	2012 % (95% CI)	2013 % (95% CI)	2014 % (95% CI)	2015 % (95% CI)	2016 % (95% CI)
<i>Primary Enforcement as of December 2016 (year enforcement enacted)</i>						
Alabama (1999)	87 (86–89)	86 (85–87)	89 (87–90)	87 (86–88)	87 (86–89)	85 (84–86)
Alaska (2006)	84 (82–85)	82 (80–84)	83 (81–84)	84 (82–86)	84 (82–86)	84 (81–85)
Arkansas (2009)	78 (75–80)	76 (74–78)	80 (78–82)	82 (81–84)	85 (83–87)	78 (75–80)
California (1993)	94 (93–94)	94 (93–94)	94 (93–95)	94 (93–95)	94 (94–95)	93 (93–94)
Connecticut (1986)	89 (87–90)	88 (86–89)	89 (88–90)	89 (88–90)	90 (89–91)	89 (88–90)
Delaware (2003)	91 (90–92)	92 (91–93)	92 (91–93)	92 (91–93)	93 (91–94)	92 (90–93)
District of Columbia (1997)	86 (84–88)	86 (84–88)	88 (86–90)	87 (85–89)	86 (83–89)	88 (87–90)
Florida (2009)	87 (86–88)	86 (85–87)	88 (87–89)	87 (86–88)	89 (88–90)	90 (89–91)
Georgia (1996)	88 (87–89)	87 (86–89)	87 (86–89)	89 (87–90)	89 (88–91)	90 (88–91)
Hawaii (1985)	92 (91–93)	91 (90–92)	94 (93–95)	94 (93–94)	94 (93–95)	93 (92–94)
Illinois (2003)	87 (86–89)	88 (87–89)	88 (87–90)	88 (87–90)	89 (87–90)	89 (87–90)
Indiana (1998)	87 (86–88)	85 (84–86)	86 (85–87)	85 (84–86)	86 (84–87)	84 (83–85)
Iowa (1986)	87 (86–88)	83 (82–85)	86 (85–88)	85 (84–86)	87 (85–88)	84 (83–86)
Kansas (2010)	81 (80–81)	80 (79–81)	83 (82–84)	79 (78–80)	83 (82–84)	80 (79–81)
Kentucky (2006)	81 (79–82)	80 (79–81)	83 (82–84)	83 (82–84)	85 (84–86)	82 (81–83)
Louisiana (1995)	89 (88–90)	89 (88–90)	90 (89–92)	90 (89–91)	88 (87–90)	88 (86–89)
Maine (2007)	84 (83–85)	82 (81–83)	85 (84–86)	84 (83–85)	86 (85–87)	85 (84–86)
Maryland (1997)	90 (89–91)	91 (90–91)	91 (90–92)	91 (90–92)	91 (90–93)	90 (89–91)
Michigan (2000)	89 (88–90)	88 (87–89)	90 (89–90)	88 (87–89)	90 (89–91)	89 (88–90)
Minnesota (2009)	89 (88–90)	87 (86–88)	89 (88–90)	89 (89–90)	91 (90–92)	90 (90–91)
Mississippi (2006)	79 (77–80)	80 (79–81)	82 (81–84)	81 (80–83)	85 (83–86)	82 (81–84)
New Jersey (2000)	91 (90–92)	89 (88–90)	90 (89–91)	89 (88–90)	91 (90–92)	90 (89–91)
New Mexico (1986)	91 (90–92)	89 (88–90)	90 (89–91)	91 (90–92)	91 (89–92)	89 (87–90)
New York (1984)	86 (85–87)	87 (86–88)	88 (87–89)	87 (86–88)	86 (85–87)	86 (85–87)
North Carolina (2006)	91 (90–92)	91 (90–91)	93 (93–94)	93 (92–93)	92 (91–93)	92 (91–92)
Oklahoma (1997)	82 (81–83)	82 (81–83)	85 (83–86)	83 (82–84)	85 (83–86)	84 (83–85)
Oregon (1990)	94 (93–95)	93 (92–94)	94 (93–95)	93 (91–94)	93 (92–94)	93 (92–93)

State/District	2011 % (95% CI)	2012 % (95% CI)	2013 % (95% CI)	2014 % (95% CI)	2015 % (95% CI)	2016 % (95% CI)
Rhode Island (2011)*	82 (80–83)	84 (82–85)	87 (86–88)	87 (85–88)	88 (87–90)	88 (86–89)
South Carolina (2005)	87 (85–88)	85 (84–86)	88 (86–89)	88 (87–89)	89 (88–89)	88 (87–89)
Tennessee (2004)	87 (85–89)	86 (85–87)	89 (88–91)	85 (83–87)	87 (85–88)	84 (83–86)
Texas (1985)	92 (91–93)	92 (91–92)	92 (91–93)	91 (90–92)	92 (91–93)	91 (90–92)
Utah (2015)*	82 (81–83)	79 (78–80)	81 (80–82)	80 (79–81)	83 (82–84)	82 (81–83)
Washington (2002)	93 (92–94)	91 (91–92)	92 (92–93)	92 (91–93)	93 (93–94)	92 (91–93)
West Virginia (2013)*	83 (81–84)	81 (79–82)	83 (82–85)	83 (82–84)	87 (85–88)	85 (84–86)
Wisconsin (2009)	77 (75–79)	78 (76–80)	81 (79–82)	80 (79–82)	85 (83–86)	80 (78–82)
<b>Subtotal**</b>	<b>89 (88–89)</b>	<b>88 (88–88)</b>	<b>89 (89–90)</b>	<b>89 (88–89)</b>	<b>90 (89–90)</b>	<b>89 (89–89)</b>
<i>Secondary Enforcement/No Law as of December 2016 (year enforcement enacted)</i>						
Arizona (1991)	84 (82–86)	85 (83–86)	87 (85–89)	85 (84–87)	86 (85–88)	87 (86–88)
Colorado (1987)	85 (84–86)	83 (82–84)	85 (85–86)	85 (84–86)	85 (84–86)	85 (84–86)
Idaho (1986)	78 (76–79)	74 (71–76)	78 (76–80)	76 (74–77)	78 (76–80)	75 (73–77)
Massachusetts (1994)	80 (79–81)	78 (77–79)	81 (80–82)	82 (81–83)	83 (82–84)	81 (80–83)
Missouri (1985)	77 (76–79)	75 (74–77)	78 (76–80)	78 (76–79)	80 (78–81)	78 (77–80)
Montana (1987)	73 (72–74)	70 (69–71)	74 (73–75)	72 (71–74)	77 (75–78)	74 (73–76)
Nebraska (1993)	71 (70–72)	70 (69–71)	74 (73–75)	72 (71–73)	75 (74–76)	74 (73–75)
Nevada (1987)	87 (86–89)	89 (87–90)	88 (86–90)	89 (87–90)	89 (87–91)	90 (89–91)
New Hampshire (no law)	70 (68–71)	67 (66–69)	72 (70–73)	70 (68–71)	72 (71–74)	70 (68–72)
North Dakota (1994)	68 (66–70)	65 (63–67)	69 (68–71)	70 (68–71)	72 (70–73)	72 (71–74)
Ohio (1986)	81 (80–82)	80 (79–81)	82 (81–83)	81 (80–82)	83 (82–85)	82 (81–84)
Pennsylvania (1987)	77 (76–78)	76 (75–77)	78 (77–79)	77 (76–78)	79 (77–81)	78 (76–79)
South Dakota (1995)	64 (62–66)	62 (60–64)	65 (63–67)	63 (61–65)	69 (67–71)	64 (62–66)
Vermont (1994)	83 (81–84)	82 (80–83)	85 (84–86)	84 (83–85)	86 (84–87)	85 (83–86)
Virginia (1988)	87 (85–88)	84 (83–86)	87 (86–88)	87 (86–88)	88 (87–89)	87 (86–88)
Wyoming (1989)	69 (68–71)	68 (66–70)	72 (70–74)	71 (69–73)	75 (73–77)	73 (71–75)
<b>Subtotal</b>	<b>80 (80–81)</b>	<b>79 (79–79)</b>	<b>81 (81–82)</b>	<b>81 (80–81)</b>	<b>82 (82–83)</b>	<b>82 (81–82)</b>
<b>National</b>	<b>87 (87–87)</b>	<b>86 (86–86)</b>	<b>88 (87–88)</b>	<b>87 (87–87)</b>	<b>88 (88–88)</b>	<b>87 (87–87)</b>

CI: confidence interval; Some CIs show no variance because of rounding to the nearest whole number.

\* Rhode Island (2011), West Virginia (2013), & Utah (2015) upgraded from secondary to primary enforcement between 2011–2016.

\*Subtotal includes West Virginia and Utah starting with year primary enforcement was enacted in each state, otherwise states are included as secondary.

Note: There have been no changes in primary and secondary enforcement status as of February 2020.

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