



# Child Passenger Safety

## The problem

- In 2020, **607 children under 13** died in motor vehicle crashes in the United States, and an estimated 63,000 were injured.<sup>1</sup>
- Almost 2/3 of the children who died were under the age of 8 and roughly 1/3 were unrestrained at the time of the crash.
- Deaths and serious injuries to children are preventable.
- Children who are restrained are often not appropriately restrained—either they are in a lap/shoulder belt without a booster seat or in the incorrect car seat for their size and weight.
- Child safety restraint systems are the most effective available means of reducing a child's risk of sustaining severe injuries during a crash.

## Child safety restraint effectiveness

- Child car seats have been shown to reduce the risk of death by 71% for infants (under 1 year old) and by 54% for toddlers (1 to 4 years old) in passenger cars.<sup>2</sup>
- Too often, children who have outgrown a child car seat are transitioned to an adult seat before a lap/shoulder belt fits them correctly.<sup>3</sup> Booster seats in combination with the vehicle's lap/shoulder belts are particularly effective protection for children who have outgrown child car seats with an

1 See the National Highway Traffic Safety Administration (NHTSA) [Traffic Safety Facts](#) regarding child safety (Report No. DOT HS 813 285), and the Centers for Disease Control and Prevention (CDC) [Child Passenger Safety: Get the Facts | Transportation Safety | CDC](#).

2 Hertz, E. 1996. *Revised Estimates of Child Restraint Effectiveness*. (Report No. DOT HS 96 855) National Highway Traffic Safety Administration. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/96855>.

3 Children are usually between 8 and 12 years old when the seat belt fits them properly.

internal harness. Booster seats raise the positional height of children, ensuring the appropriate fit of the adult lap/shoulder belt. A recent study by the National Highway Traffic Safety Administration (NHTSA) found that booster seats are 65–68% effective in reducing moderate-to-critical injuries of 5- to 8-year-old vehicle occupants in all types of crashes.<sup>4</sup> The NHTSA study also found that the effectiveness of booster seats was even greater—86%—in reducing moderate-to-critical injuries for 7- to 8-year-old occupants.

- According to NHTSA 2017 data, 20.8% of children 4 to 7 years old were restrained only by lap/shoulder belts, when they should have been riding in booster seats.<sup>5</sup> State laws can make a difference. Based on a 2012 study, the crash fatality rate among 6- and 7-year-old children was 23–25% lower in states with booster seat use laws that include children of those ages compared to states without such laws.<sup>6</sup> However, even when a state requires that some children be placed in booster seats, it is up to the parents to adopt those safety measures.

## Related crash

Our recent investigation illustrates what happens when parents prematurely transition to restraint types that are not appropriate for a child’s age, height, and weight.

We investigated a multivehicle crash in Phoenix, Arizona, in which four vehicle occupants died and 11 were injured ([HWY21MH008](#)).

- One of the injured occupants was a 6-year-old who was seated in the rear seat of a 2018 Mercedes-Benz. The child was restrained by the vehicle’s lap/shoulder belt but, despite of the child’s age and 50-inch height, was not placed in a booster seat.
- Arizona law requires all children between ages 5 and 8 who are at most 57 inches tall to use a federally approved child restraint device.<sup>7</sup>
- The Mercedes-Benz was struck in the rear and pushed forward into the back of another vehicle. The lack of a booster seat resulted in the child sustaining a whiplash injury and a seat belt abrasion to the right side of the neck. The only other occupant of the Mercedes-Benz, the driver, sustained minor injuries.
- Although Arizona is one of the states that has booster seat use laws, parents are ultimately responsible for safe transport of their children.

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4 Pai, J.E. 2020. *Evaluation of Child Restraint System Effectiveness* (Report No. DOT HS 813 047). National Highway Traffic Safety Administration. ([Link](#))

5 Li, H.R. and T. Pickrell. 2018. *The 2017 National Survey of the Use of Booster Seats* (Report No. DOT HS 812 617). Washington, DC: National Highway Traffic Safety Administration.

6 Mannix, R., E. Fleegler, W. Meehan, S. Schutzman, H. Hennelly, L. Nigrovic and L. Lee. 2012. “Booster Seat Laws and Fatalities in Children 4 to 7 Years of Age.” *Pediatrics*, 130, 996–1002.

7 See Arizona Revised Statutes [28–907](#). This statute also requires all children under 5 years old to be properly secured in a child restraint system.

## What can you do?

- **Be sure all children in your vehicle are properly restrained for their age, height, and weight.**
- **Have your child safety seat inspected by a trained technician (see [www.seatcheck.org](http://www.seatcheck.org) for a technician near you).**
- **Be sure your child is ready to use a lap/shoulder belt by ensuring that the belt fits correctly. A lap/shoulder belt fits correctly when:**
  - **A child's knees bend at the edge of the seat when their backs and bottoms are against the vehicle seat back;**
  - **The vehicle lap belt fits across the upper thighs; and**
  - **The shoulder belt fits across the shoulder and chest.**



## Interested in more information?

### ■ NTSB – Child and Youth Transportation Safety Resources

<https://www.ntsb.gov/Advocacy/safety-topics/Pages/Children.aspx>



### ■ NHTSA – Car Seats and Booster Seats Finder

[www.nhtsa.gov/equipment/car-seats-and-booster-seats](http://www.nhtsa.gov/equipment/car-seats-and-booster-seats)



### ■ CDC – Child Passenger Safety: Get the Facts

[https://www.cdc.gov/transportationsafety/child\\_passenger\\_safety/cps-factsheet.html](https://www.cdc.gov/transportationsafety/child_passenger_safety/cps-factsheet.html)



### ■ Safe Kids – The Ultimate Car Seat Guide

<https://ucsg.safekids.org/>



NTSB Safety Alerts can be accessed from the [Safety Alerts](https://www.ntsb.gov) page at [www.ntsb.gov](https://www.ntsb.gov).

For additional information on the NTSB investigation in this alert, access the [public docket](#) using the investigation number HWY21MH008 cited above.

Use the [CAROL Query](#) to search NTSB safety recommendations and investigations.



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