

Traffic Safety Facts

Research Note

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Child Restraint Use in 2007 – Use of Correct Restraint Types

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In 2007, more children under 1 year old were restrained in rear-facing child safety seats than in 2006 – the appropriate child restraint for this age group. This result is from the National Survey of the Use of Booster Seats (NSUBS), the only probability-based nationwide child restraint survey that observes restraint use and collects age, height, and weight information. The NSUBS is conducted by the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration.

Although the primary purpose of the NSUBS is to estimate booster seat use, the survey also provides estimates of the extent to which children are “prematurely graduated” to restraint types that are inappropriate for their height or weight. The 2007 survey found substantial evidence of premature graduation for all restraint types. In the following sections, we present the 2007 findings in three areas:

- Premature graduation out of rear-facing safety seats;
- Premature graduation out of front-facing safety seats; and
- Premature graduation into seat belts.

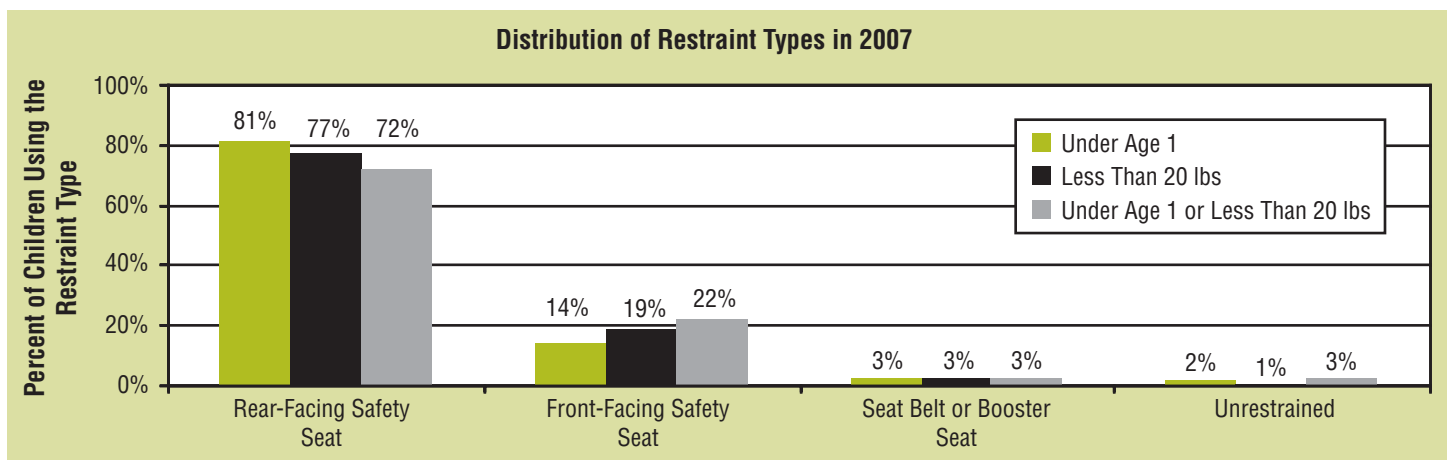
Premature Graduation Out of Rear-Facing Safety Seats

NHTSA recommends that for the best possible protection, infants should be kept in the back seat, in rear-facing child safety seats, as long as possible up to the height or weight limit of the particular seat. At a minimum, infants should be kept rear-facing until a minimum of age 1 and at least 20 pounds (source: www.nhtsa.gov).

In particular, children who are under age 1 or less than 20 pounds should be in rear-facing safety seats. However, the 2007 NSUBS found that

- About one-fifth (19%) of children under age 1 were not in rear-facing seats.
- About one-quarter (23%) of children less than 20 pounds were not in rear-facing seats.
- Over one-quarter (28%) of children who are under age 1 or less than 20 pounds were not in rear-facing seats.

Most of the premature graduation for these children was to front-facing safety seats.



Note: Percentages may not total to 100 percent due to rounding

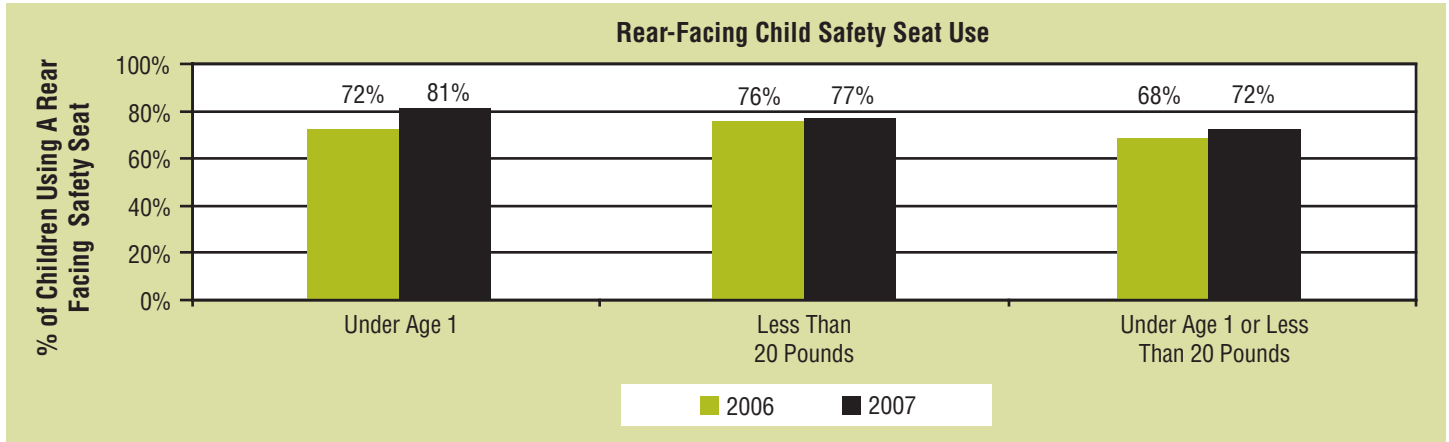
Source: The National Survey of the Use of Booster Seats, NHTSA, National Center for Statistics and Analysis, 2007

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However, the good news is that more children under age 1 were restrained in rear-facing child safety seats in 2007 than

in 2006 and this 9-percentage-point increase from 72 percent in 2006 to 81 percent in 2007 is statistically significant.



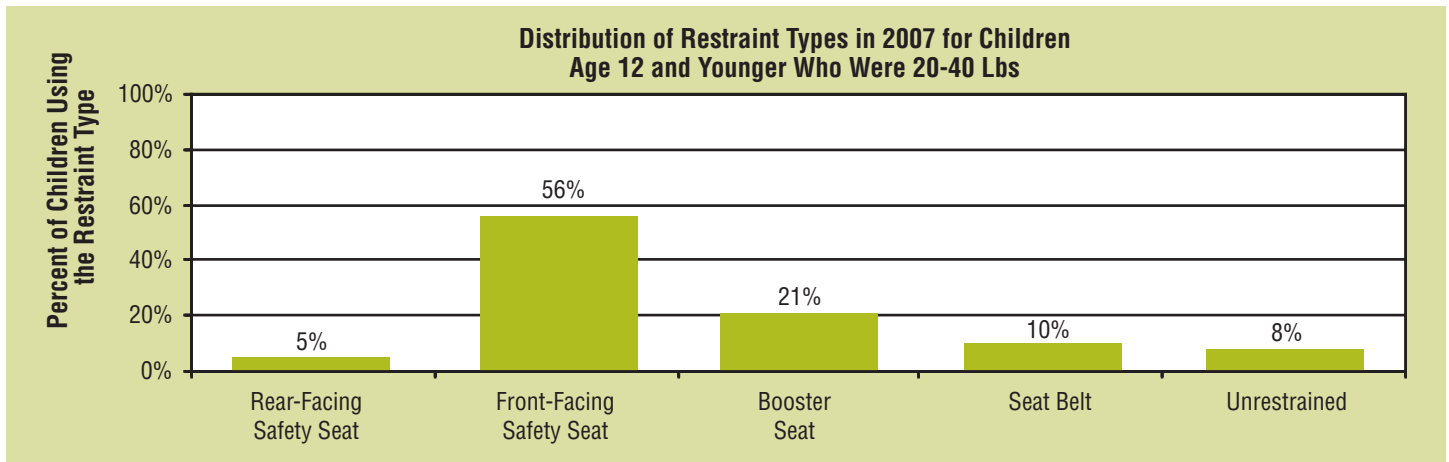
Source: The National Survey of the Use of Booster Seats, 2006-2007, NHTSA, National Center for Statistics and Analysis

Premature Graduation Out of Front-Facing Safety Seats

NHTSA recommends that when children outgrow their rear-facing seats (at a minimum age 1 and at least 20 pounds) they should ride in forward-facing child safety seats, in the back seat, until they reach the upper weight or height limit of the particular seat (usually at around age 4 and 40 pounds). (Source: www.nhtsa.gov)

The 2007 NSUBS found that:

- Almost half (44%) of children who are 20-40 pounds were not in front-facing safety seats. Note, however, that some 20-40 pound children could be infants who should be in rear-facing safety seats, and note that some booster seats have weight limits as low as 30 pounds.



Source: The National Survey of the Use of Booster Seats 2007, NHTSA, National Center for Statistics and Analysis

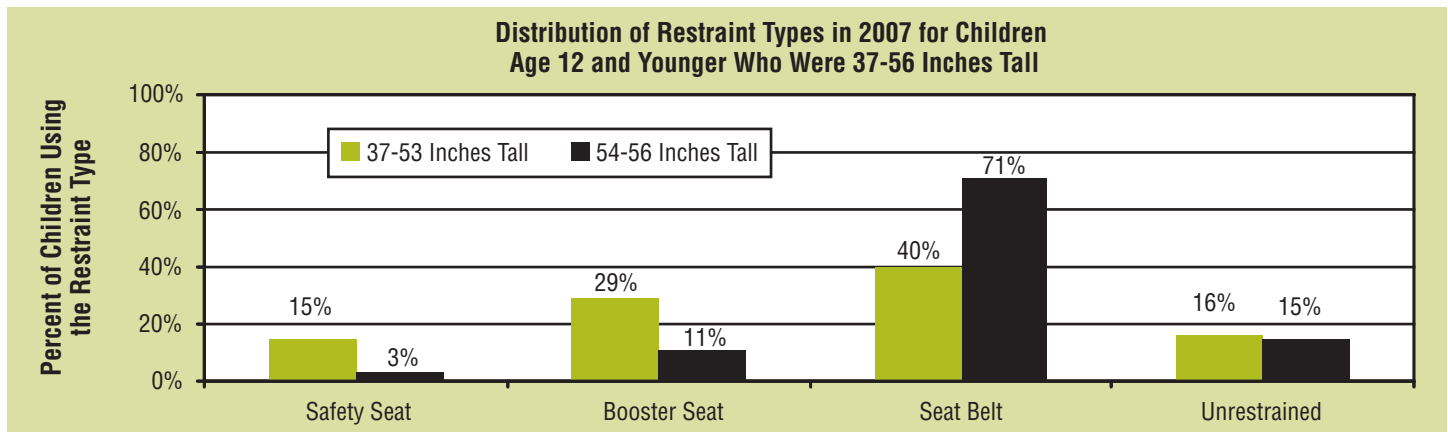
Premature Graduation to Seat Belts

NHTSA recommends that once children outgrow their forward-facing seats (usually at around age 4 and 40 pounds), they should ride in booster seats, in the back seat, until the vehicle seat belts fit properly. Seat belts fit properly when the lap belt lays across the upper thighs and the shoulder belt fits across the chest (usually at age 8 or when they are 4'9" tall). (Source: www.nhtsa.dot.gov)

However, the 2007 NSUBS found that:

- Over half (56%) of children age 12 and younger who are 37 to 53 inches tall were not in safety seats or boosters.
- About 8 in 10 (86%) of children age 12 and younger who are 54 to 56 inches tall were not in safety seats or boosters. Note however that these children are within 2 inches of the 4'9" recommendation.

Many of these children were in seat belts and a fair number were unrestrained.



Source: The National Survey of the Use of Booster Seats 2007, NHTSA, National Center for Statistics and Analysis

Survey Methodology

The National Survey of the Use of Booster Seats obtains its data by sending trained data collectors to a probability sample of gas stations, day care centers, recreation centers, and restaurants in five national fast-food chains across the United States. The choice of these types of data collection sites stems from the necessity of observing restraint use from a close range in a slow-moving or stopped vehicle (as is required in order to distinguish a seat belt being used in conjunction with a backless booster seat from a seat belt being used alone), combined with the desire to capture large numbers of children.

Data collectors approach passenger vehicles appearing to have child occupants under the age of 13, observe the restraint use of up to nine occupants in the first three rows of seats and conduct interviews to obtain the race and ethnicity of all occupants (obtained in compliance with OMB standards for such data) and the heights, weights, and ages of child occupants appearing to be under age 13. (The approximate ages of other occupants (expressed as an age range, such as 16 to 24 years old), and the genders of all occupants, are subjectively assessed by the data collectors.)

In order to capture restraint usage before children unfasten the restraints, restraint use is observed by the data collectors prior to or just as the vehicle comes to a stop, except in the case of observation at fast-food drive-through lanes, where restraint use is observed prior to the vehicle reaching the drive-through window.

In order to reach as wide an audience as possible, the NSUBS uses some Spanish-speaking data collectors.

This (2007) is the second year for the NSUBS survey. The 2007 survey data is based on the observation of 14,000 occupants, 7,500 of whom were under age 13, in 4,800 vehicles at 38 day care centers, 134 fast-food restaurants, 218 gas stations, and 40 recreation centers nationwide. The survey interviews covered 6,560 children under age 13, including 330 infants under 1 year old, 1,494 children 1 to 3 years old, 2,471 children 4 to 7 years old, and 2,265 children 8 to 12 years old. The data was collected between July 19 and August 2, 2007, while the 2006 data was collected between July 17 and July 29, 2006.

The Types of Restraints Used by Children 12 and Younger, by Weight

Restraint Type ¹	2006		2007		2006-2007 Change	
	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Change in Percentage Points	Confidence in a Change in Percentage ⁴
Children Who Weigh Less Than 20 Pounds						
Rear-Facing Child Safety Seat	76%	15%	77%	6%	1	7%
Front-Facing Child Safety Seat	18%	13%	19%	7%	1	7%
High-Backed Booster Seat	NA	NA	NA	NA	NA	NA
Backless Booster Seat	NA	NA	NA	NA	NA	NA
Seat Belt	4%	4%	NA	NA	NA	NA
No Restraint Observed	2%	1%	1%	1%	-1	10%
Children Who Weigh Between 20 and 40 Pounds						
Rear-Facing Child Safety Seat	4%	1%	5%	1%	1	11%
Front-Facing Child Safety Seat	56%	5%	56%	5%	0	7%
High-Backed Booster Seat	16%	7%	14%	2%	-2	26%
Backless Booster Seat	9%	5%	7%	1%	-2	57%
Seat Belt	10%	3%	10%	3%	0	5%
No Restraint Observed	4%	1%	8%	3%	4	86%
Children Who Weigh Between 41 and 60 Pounds						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	14%	6%	10%	2%	-4	70%
High-Backed Booster Seat	23%	6%	17%	3%	-6	78%
Backless Booster Seat	16%	5%	15%	3%	-1	22%
Seat Belt	35%	8%	43%	4%	8	90%
No Restraint Observed	11%	3%	14%	4%	3	63%
Children Who Weigh More Than 60 Pounds						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	0%	0%	1%	1%	1	95%
High-Backed Booster Seat	4%	1%	2%	1%	-2	65%
Backless Booster Seat	4%	2%	3%	1%	-1	68%
Seat Belt	77%	4%	77%	3%	0	3%
No Restraint Observed	15%	3%	17%	3%	2	41%

¹ Survey data was obtained on children age 12 and younger in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in five fast-food chains.

² Estimates might not sum to totals due to rounding.

³ Restraint use is observed by trained data collectors prior to or just as the vehicle comes to a stop, except in the case of observation at fast-food drive-through lanes, where restraint use is observed prior to the vehicle reaching the drive-through window

⁴ The degree of statistical confidence that the 2007 use rate is different from the 2006 rate. Confidence levels that meet or exceed 90 percent are formatted in boldface type.

Note: Decreases in restraint use from 2006 to 2007 could be due in part to improved training in the 2007 survey. For more information see "A Change to the 2007 Survey That Could Affect Results" on Page 8.

NA: Data not sufficient to produce a reliable estimate.

Source: The National Survey of the Use of Booster Seats, NHTSA, National Center for Statistics and Analysis

The Types of Restraints Used by Children 12 and Younger, by Height

Restraint Type ¹	2006		2007		2006-2007 Change	
	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Change in Percentage Points	Confidence in a Change in Percentage ⁴
Children Who Are at Most 36 Inches Tall						
Rear-Facing Child Safety Seat	14%	3%	12%	2%	-2	44%
Front-Facing Child Safety Seat	55%	4%	55%	5%	0	2%
High-Backed Booster Seat	12%	7%	11%	2%	-1	23%
Backless Booster Seat	8%	6%	5%	1%	-3	69%
Seat Belt	6%	2%	11%	6%	5	55%
No Restraint Observed	5%	1%	6%	2%	1	50%
Children Who Are Between 37 and 53 Inches Tall						
Rear-Facing Child Safety Seat	0%	0%	NA	NA	NA	NA
Front-Facing Child Safety Seat	21%	5%	15%	3%	-6	89%
High-Backed Booster Seat	20%	4%	17%	3%	-3	63%
Backless Booster Seat	13%	3%	12%	2%	-1	42%
Seat Belt	37%	5%	40%	4%	3	57%
No Restraint Observed	9%	3%	16%	5%	7	92%
Children Who Are Between 54 and 56 Inches Tall						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	NA	NA	3%	2%	NA	NA
High-Backed Booster Seat	9%	5%	3%	2%	-6	91%
Backless Booster Seat	4%	5%	8%	2%	4	63%
Seat Belt	65%	9%	71%	4%	6	57%
No Restraint Observed	18%	5%	15%	4%	-3	42%
Children Who Are Taller Than 56 Inches						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
High-Backed Booster Seat	1%	1%	1%	1%	0	42%
Backless Booster Seat	NA	NA	3%	2%	NA	NA
Seat Belt	84%	4%	83%	4%	-1	33%
No Restraint Observed	13%	4%	13%	2%	0	14%

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Note: Decreases in restraint use from 2006 to 2007 could be due in part to improved training in the 2007 survey. For more information see "A Change to the 2007 Survey That Could Affect Results" on Page 8.

NA: Data not sufficient to produce a reliable estimate.

Source: The National Survey of the Use of Booster Seats, National Highway Traffic Safety Administration, National Center for Statistics and Analysis

The Types of Restraints Used Children 12 and Younger, by Age

Restraint Type ¹	2006		2007		2006-2007 Change	
	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Percentage ² of Children ³ Observed Using the Restraint Type	Standard Error	Change in Percentage Points	Confidence in a Change in Percentage ⁴
Children Younger Than 1 Year						
Rear-Facing Child Safety Seat	72%	10%	81%	4%	9	93%
Front-Facing Child Safety Seat	21%	7%	14%	2%	-7	84%
High-Backed Booster Seat	NA	NA	NA	NA	NA	NA
Backless Booster Seat	NA	NA	NA	NA	NA	NA
Seat Belt	2%	3%	NA	NA	NA	NA
No Restraint Observed	1%	1%	2%	1%	1	52%
Children Age 1-3 Years						
Rear-Facing Child Safety Seat	4%	2%	3%	1%	-1	32%
Front-Facing Child Safety Seat	69%	4%	73%	4%	4	58%
High-Backed Booster Seat	12%	5%	9%	2%	-3	47%
Backless Booster Seat	6%	5%	5%	1%	-1	60%
Seat Belt	5%	2%	6%	3%	1	11%
No Restraint Observed	3%	1%	4%	2%	1	41%
Children Age 4-7 Years						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	17%	4%	13%	3%	-4	79%
High-Backed Booster Seat	25%	7%	22%	4%	-3	34%
Backless Booster Seat	16%	5%	15%	2%	-1	30%
Seat Belt	33%	6%	35%	4%	2	26%
No Restraint Observed	9%	2%	15%	4%	6	91%
Children Age 8-12 Years						
Rear-Facing Child Safety Seat	NA	NA	NA	NA	NA	NA
Front-Facing Child Safety Seat	0%	0%	1%	0%	1	83%
High-Backed Booster Seat	4%	1%	2%	1%	-2	97%
Backless Booster Seat	4%	3%	3%	1%	-1	56%
Seat Belt	75%	4%	77%	4%	2	30%
No Restraint Observed	16%	3%	17%	4%	1	17%

¹ Survey data was obtained on children age 12 and younger in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in five fast-food chains.

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Source: The National Survey of the Use of Booster Seats, National Highway Traffic Safety Administration, National Center for Statistics and Analysis

Sites, Vehicles, Occupants, and Children Age 12 and Younger in NSUBS

Numbers of	2006	2007	Percentage Change
Data Collection Sites	390	430	9%
Vehicles Observed	3,500	4,800	38%
Occupants Observed	10,000	14,000	42%
Children Age 12 and Younger Observed	5,300	7,500	42%
Children Age 12 and Younger Interviewed*	4,400	6,600	48%

* Data obtained by interview with an adult occupant.

The 2007 survey yielded nearly a 50-percent increase in the number of occupants observed. This could be due in part to dropping certain questions from the occupant interviews, shortening the interview time per vehicle from about 5 minutes in 2006 to about 2 minutes in 2007, thus allowing for the collection of data on more vehicles per site. The increase in observations in 2007 could also be due to the addition of some sites to the survey and increased site participation rates.

The NSUBS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation and variance estimation procedures. See the NHTSA Technical Report referenced below for more information on these procedures, as well as for more information on the survey's data collection protocols.

The design of the survey, survey preparation activities, data collection, estimation, and variance estimation for the NSUBS were conducted by Westat, Inc., under the direction of the National Center for Statistics and Analysis in NHTSA under Federal contract number DTNH22-07-D-00057. The OMB clearance number for the NSUBS is 2127-0644.

What Do the Survey Results Tell Us? Are the Results Representative?

By design and necessity, the NSUBS survey data is obtained from a restricted set of site types, namely gas stations, day care centers, recreation centers, and restaurants in five fast-food chains. However the survey uses a probability sample of these site types, and so its results are representative of children who frequent these types of sites.

For instance, the survey result that 40 percent of children between 37 and 53 inches tall were in seat belts means that among children in this height range who were taken by passenger vehicles to gas stations, day care centers, recreation centers, and fast-food restaurants in 2007, 40 percent were in seat belts. Whether or not the seat belt use rate for children in this height range who do not frequent these site types is higher or lower is an open question, and not one that the NSUBS (or any other available survey) can answer.

How Do These Results Compare With NOPUS?

NHTSA conducts another survey, the National Occupant Protection Use Survey (NOPUS), which examines some aspects of premature graduation. The NOPUS observes children in vehicles stopped at stop signs and stop lights on a probability sample of roadways, and, as necessitated by roadside observation, assesses age subjectively, does not collect height or weight, and its data collectors do not attempt to decipher whether a child in a shoulder belt is in a backless booster seat. Thus the NOPUS is conducted at a set of sites that is representative of U.S. roadways, but its age data is subject to observer misjudgment, its restraint type data is less complete, and it cannot provide restraint use distributions by height or weight.

The restraint use distributions NOPUS can provide (the distributions by age) are sometimes comparable to those in NSUBS, and sometimes not. Differences between the NOPUS and NSUBS estimates could be due to the different populations of vehicles captured by the two surveys (stemming from the different site types used) and/or different sources of age information (which is visually estimated in NOPUS versus obtained by interview in NSUBS). For more information on the NOPUS data, see the publication "Child Restraint Use in 2006" available at <http://www-nrd.nhtsa.dot.gov/CMSWeb/ViewCatalogbyCategory.aspx>.

A Change to the 2007 Survey That Could Affect Results

The year 2007 constitutes the second year in which the NSUBS was conducted. In response to requests from data collectors after the 2006 survey, additional training was conducted on what constitutes "use" for front-facing seats and booster seats, particularly regarding that the harness or seat belt must be across the front of the child's body. This improved training could have contributed to the decrease in restraint use among 4- to 7-year-olds in the 2007 survey, compared to the 2006 survey findings.

Restraint Types and Definition of Use

The NSUBS uses the following definitions of restraint use:

Rear-Facing Child Safety Seat - The child occupant is in a seat that sits on top of the vehicle seat in such a way that the child faces the rear of the vehicle, and the harness straps are across the child's front. The harness straps might be secured or not.

Front-Facing Child Safety Seat - The child occupant is in a seat that sits on top of the vehicle seat in such a way that the child faces the front of the vehicle, and with harness straps that are across the child's front.

High-Backed Booster Seat - The child occupant is in a seat with a seat back that sits on top of the vehicle seat, and has a seat belt across the front of the child's body, whether lap or lap/shoulder. No harness is in use.

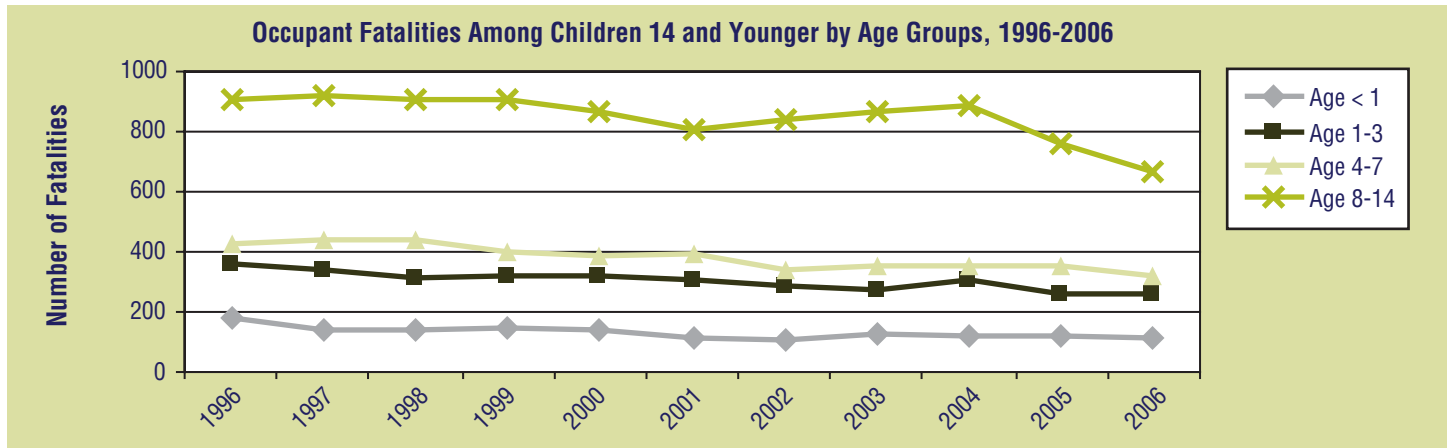
Backless Booster Seat - The child occupant is sitting on a platform with no seat back that sits on top of the vehicle seat, and has a seat belt across the front of the child's body, whether lap or lap/shoulder. No harness is in use.

Seat Belt - Child (or adult) is sitting on the vehicle seat and the seat belt is across front of the body (includes lap belts).

Unrestrained - All other cases

Progress in Reducing Child Fatalities

We note that child occupant fatalities have declined in the past decade, as demonstrated by NHTSA's Fatality Analysis Reporting System (FARS). Booster seats, child safety seats, and seat belts provide key tools to achieve further fatality reductions.



Source: Fatality Analysis Reporting System (FARS), NHTSA's National Center for Statistics and Analysis, 1996-2006

For More Information

The NSUBS provides a rich data source for information on the restraint use of children under age 13. In particular, the NSUBS provides the agency's estimate of booster seat use among 4- to 7-year-olds and provides data on child restraint use by race and ethnicity. This publication is part of a series that presents overall results from the survey on these topics. Please see the companion publications "Booster Seat Use in 2007" and "Child Restraint Use in 2007—Demographic Results" for the latest data on these topics. Detailed information on the NSUBS survey design and analysis procedures

are provided in the NHTSA Technical Report "The 2007 National Survey of the Use of Booster Seats— Methodology Report." These publications will be available at the Web site <http://www-nrd.nhtsa.dot.gov/CMSWeb/ViewCatalogby-Category.aspx> in 2007 or 2008.

For more information on NHTSA's recommended child restraint types for children of various heights and weights, and for information on the campaign by NHTSA to increase child restraint use, see www.nhtsa.gov.



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