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The 2023 National Survey of the Use of Booster Seats

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16. Abstract

This technical report presents results from the 2023 National Survey of the Use of Booster Seats (NSUBS), the only probability-based nationwide child restraint use survey in the United States that observes restraint use and interviews an adult occupant to collect age, sex, height, weight, race, ethnicity, and other data. NHTSA's National Center for Statistics and Analysis conducts the NSUBS. The 2023 NSUBS found that 33.6 percent of 4- to 7-year-old children were restrained in booster seats in 2023 as compared to 31.0 percent in 2021, when the last NSUBS was conducted. This was not a statistically significant change. Restraint use for all children under 13 was 88.2 percent in 2023, not statistically different than the 89.8 percent estimate in 2021. There were some indications of premature transitions to restraint types that are not proper for children's age, height, and weight.

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Definitions and Categories in NSUBS

An occupant is considered to be "unrestrained" if the occupant is using no restraint type at all or is not using the restraint type as intended. This includes the seat belt not being buckled, the shoulder strap being placed behind the shoulder, or the harness straps being unbuckled. In the survey an occupant is considered to be "restrained" if the occupant meets any of the following five definitions.

Rear-Facing Car Seat

The child 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 must be secured.

Forward-Facing Car Seat

The child 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. The harness straps must be secured.

High-Backed Booster Seat

The child 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, but the child must be secured by the vehicle seat belt.

Backless Booster Seat

The child 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, but the child must be secured by the vehicle seat belt.

Seat Belt

The occupant (of any age) is sitting on the vehicle seat and the seat belt is across the front of the body (includes lap and shoulder belts or lap in the case of lap-only belts). In a lap/shoulder combination, the shoulder belt must be over the shoulder and cannot be under the occupant's arm.

Although the National Survey of the Use of Booster Seats (NSUBS) collects children's individual ages, heights, and weights, it combines these results into categories to produce reliable estimates.

Age Categories

The NSUBS uses the following age categories: 0, 1-3, 4-7, 8-12, 13-15, 16-24, 25-69, and 70 and older for interview data. The choice of these age groups is motivated by consistency with the National Occupant Protection Use Survey (NOPUS), which uses the same age groups. The age groups for the observation data are different since there is only one age group, 0-12 (referred to here as "up to 12" or "newborn to 12," depending on context) for children.

Height and Weight Categories

The NSUBS uses the following height categories: under 36 inches tall, 37 to 53 inches, 54 to 56 inches, and 57 inches or taller. The survey uses the weight categories 0 to 19 pounds (referred to as "up to 19 pounds"), 20 to 40 pounds, 41 to 60 pounds, and 61 pounds or heavier. These

categories were chosen because they are used in NHTSA's current recommendations for the choice of restraint use for children.

Regional Categories

The 30 Primary Sampling Units (PSUs) selected in the NSUBS make up a probability sample of PSUs (counties and groups thereof) in the United States. The data is not sufficient to produce State-level results. However, the NSUBS can and does produce regional estimates using the following Census Regions.

Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT
Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV
West: AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, WY

These definitions of the four NSUBS regions are the same regional definitions used in the NOPUS survey. The NSUBS regional categories were chosen to be the same as the NOPUS categories for the purpose of consistency.

Time of Day and Day of Week Categories

The NSUBS uses the following day of week and time of day categories.

Weekday Rush Hour: Before 10 a.m. and 3:30 to 6 p.m., Monday to Friday
Weekday Outside of Rush Hour: 10 a.m. to 3:30 p.m., Monday to Friday
Weekend: 8 a.m. to 6 p.m. on Saturday and Sunday

Race and Ethnicity Categories

See Section Demographic Results, for the classifications of race and ethnicity in NSUBS.

Executive Summary

This report presents results from the 2023 NSUBS, the only probability-based nationwide child restraint use survey in the United States that observes restraint use and interviews an adult occupant to collect data such as the race and ethnicity of all occupants in the vehicle. The National Highway Traffic Safety Administration's National Center for Statistics and Analysis conducts the NSUBS.

In 2000 Congress passed the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act (Pub. L. 106-414) that directed the Department of Transportation to develop, within 1 year after enactment of the TREAD Act, a 5-year strategic plan to reduce by 25 percent the deaths and injuries among 4- to 8-year-olds caused by the failure to use booster seats. In response, NHTSA began the NSUBS survey in 2006 to provide a national estimate of booster seat use to target its outreach programs. NHTSA has continued this survey to further its safety goals. Since 2009 NHTSA has conducted the NSUBS survey every other year, with the 2023 NSUBS being the eleventh administration of it. The survey was redesigned in 2015 to update the sample design.

The primary purpose of the NSUBS is to estimate booster seat use among 4- to 7-year-old children. In addition, the survey gives estimates of the extent to which children are "prematurely transitioned" to restraint types that are inappropriate for their age, height, and weight. The survey also provides child restraint use by major demographics as well as restraint use of other occupants by race and ethnicity.

Here are major findings from the 2023 NSUBS.

- Restraint use among children up to 12 months old was 95.9 percent in 2023, a statistically significant decrease from the 2021 estimate of 99.8 percent. There were several statistically significant decreases in restraint use from 2021 to 2023 among the major demographics.
    - Restraint use among children up to 12 months old who are male decreased significantly to 96.8 percent in 2023 from 100.0 percent in 2021, while for those that are female also decreased significantly to 94.8 percent in 2023 from 99.6 percent in 2021.
    - Restraint use among children up to 12 months old who are Hispanic or Latino decreased significantly to 92.0 percent in 2023 from 100 percent in 2021, while for those who are not Hispanic or Latino also decreased significantly to 96.7 percent in 2023 from 99.8 percent in 2021.
    - Restraint use among children up to 12 months old who weigh from 0 and 19 pounds decreased significantly to 97.1 percent in 2023 from 100 percent in 2021, while for those who weigh from 20 to 40 pounds also decreased significantly to 94.0 percent in 2023 from 99.5 percent in 2021.
    - Restraint use among children up to 12 months old who were at gas stations decreased significantly to 89.3 percent in 2023 from 100.0 percent in 2021.
- The proper restraint system for a 4- to 7-year-old child is either a forward-facing car seat or a booster seat, depending on the child's height and weight. Restraint use among

children 4 to 7 years old decreased to 86.8 percent in 2023 from 89.4 percent in 2021, which was not a significant decrease.

  - In 2023, the NSUBS found that the use of proper child restraint for this age group was 69.1 percent (35.5% were in forward-facing car seats and 33.6% were in booster seats), a decrease from 73.2 percent in 2021. The forward-facing car seat use decreased significantly to 35.5 percent in 2023 from 42.2 percent in 2021. Booster seat use increased to 33.6 percent in 2023 from 31.0 percent in 2021, which was not a significant increase.
  - In 2023, 30.9 percent of children 4 to 7 were not being properly restrained (0.5% were restrained by rear-facing car seats, 17.2% were restrained by seat belts, and 13.2% were unrestrained), an increase from 26.8 percent in 2021.
  - Restraint use among children 4 to 7 who are Hispanic decreased significantly to 77.3 percent in 2023 from 85.3 percent in 2021.

- Premature transition to restraint types that are not appropriate for children's age, height, and weight continued in 2023. However, there were some statistically significant improvements in the use of proper restraint types from 2021 to 2023 among some of the age, height, and weight categories.
  - Among children under 13 who are 37 to 53 inches tall, the high-backed booster car seat use statistically increased significantly to 18.9 percent in 2023 from 14.1 percent in 2021.
- Restraint use for all children under 13 was 88.2 percent in 2023, not statistically different than the 2021 estimate of 89.8 percent. However, there were some significant differences in restraint use from 2021 to 2023 among the major demographics.
- Restraint use among children under 13 who are Hispanic Black or Hispanic African American decreased significantly to 71.2 percent in 2023 from 90.0 percent in 2021.
- Restraint use among children 8 to 12 years old decreased to 83.8 percent in 2023 from 86.8 percent in 2021, which was not a significant decrease. However, there is a significant decrease in a major demographic.
  - Restraint use among children 8 to 12 for children whose height is from 54 to 56 inches decreased significantly to 84.6 percent in 2023 from 93.2 percent in 2021.

Introduction

In 2000 Congress passed the TREAD Act that directed the Department of Transportation to develop a 5-year strategic plan to reduce by 25 percent deaths and injuries among 4- to 8-year-olds caused by failure to use booster seats. Therefore, there was a need for reliable data on who was not using booster seats to direct outreach programs where they are most needed.

In 2006 NHTSA conducted the first-ever nationwide probability-based survey of booster seat use in the United States: NSUBS. The NSUBS collected data based on the observation of children in vehicles. The population of children captured by the NSUBS are children newborn to 12 years old riding in passenger vehicles that stop at the four types of data collection sites: gas stations, fast-food restaurants, day care centers, and recreation centers. Prior to the NSUBS, research sponsored by NHTSA and several other organizations have estimated booster seat use in the United States; however, these estimates were not sufficiently reliable because they used data either from non-probability samples that may not result in national estimates or from telephone interviews that may not result in reliable estimates.

NHTSA has used the NSUBS data in its outreach programs and campaigns on child passenger safety in recent years. According to NHTSA's Fatality Analysis Reporting System, the total number of occupants killed in fatal traffic crashes for passenger vehicles among children 4 to 7 years old was 171 in 2022, which is about 12 percent less than what it was 10 years ago at 195 fatalities in 2012.

In 2015 the NSUBS was redesigned. The first six surveys used the 2006 NSUBS design that was based on a subset of PSUs used for the NOPUS. The data used for designing the 2006 NSUBS was outdated and needed to be brought up to date. Additionally, conducting the study through several cycles has provided valuable knowledge on needed improvements. See the NSUBS Methodology section for details about the redesign.

The 2023 NSUBS uses the 2015 sample and was conducted from July 14 to July 29, 2023. The survey estimates were computed based on the results of 7,746 children observed in 5,190 vehicles at 550 observation sites across the country.

This report presents the survey results from the 2023 NSUBS. It includes the national estimates of the booster seat use among children 4 to 7 years old since 2006. This report also provides restraint type by age, weight, and height, along with restraint usage by major demographics. Throughout the report comparisons are made between the 2023 results and the results from the previous NSUBS, which was conducted in 2021 (Boyle, 2023). The last section describes the NSUBS methodology.

This report has classified child restraint system use into four general categories: car seats (with harness strap, including rear-facing and forward-facing), booster seats (without harness strap, including high-backed and backless), seat belts, and unrestrained. See Definitions and Categories in NSUBS on page v for detailed definitions.

Unless otherwise indicated, the terms "significant" and "statistically significant" are used interchangeably throughout this report. "Significant" always means "statistically significant" and the statistical significance level is a *p*-value of .05. In the tables below, the significant changes (those with *p*-values less than or equal to .05) are formatted in boldface type. Percentages may not add up to 100 due to rounding in figures and tables.

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The National Estimates of Booster Seat Use

Who Should Be in Booster Seats?

NHTSA's current car seat recommendation for children 4 to 7 years old is: Keep your child in a forward-facing car seat with a harness until the child reaches the top height or weight limit allowed by your car seat's manufacturer. Once your child outgrows the forward-facing car seat with a harness, it is time to travel in a booster seat, but still in the back seat.

The National Estimates

The 2023 NSUBS found that booster seat use among 4- to 7-year-old children increased from 31.0 percent in 2021 to 33.6 percent in 2023 (Figure 1 and Tables 1 and 2). This is not a statistically significant change.

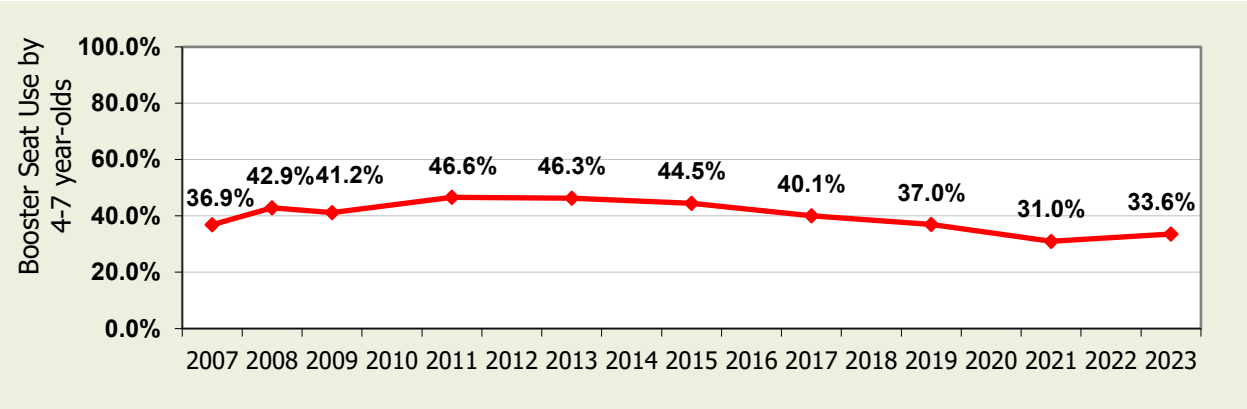

Figure 1. Booster Seat Use Among 4- to 7-Year-Old Children, National Estimates

The proper restraint system for a child 4 to 7 years old is either a forward-facing car seat or a booster seat, depending on the child's height and weight. In 2023 the NSUBS found that about 33.6 percent of children in this age group were using booster seats (either high-backed or backless), 35.5 percent were restrained in forward-facing car seats, 17.2 percent were in seat belts, and 13.2 percent were unrestrained (Figures 1 and 2, and Table 2). These results show that:

- The child restraint use for this age group was 69.1 percent (35.5% were in forward-facing car seats and 33.6% were in booster seats) in 2023, a decrease from 73.2 percent in 2021.
- In 2023, 30.9 percent (0.5% in rear-facing, 17.2% in seat belts, and 13.2% unrestrained) of children 4 to 7 were not being properly restrained, an increase from 26.8 percent in 2021.
- The percentage of children 4 to 7 restrained in forward-facing car seats significantly decreased from 42.2 percent in 2021 to 35.5 percent in 2023.
- The percentage of children 4 to 7 restrained in high-backed booster seats increased from 17.0 percent in 2021 to 21.1 percent in 2023.
- The percentage of children 4 to 7 restrained in backless booster seats decreased from 14.1 percent in 2021 to 12.6 percent in 2023.

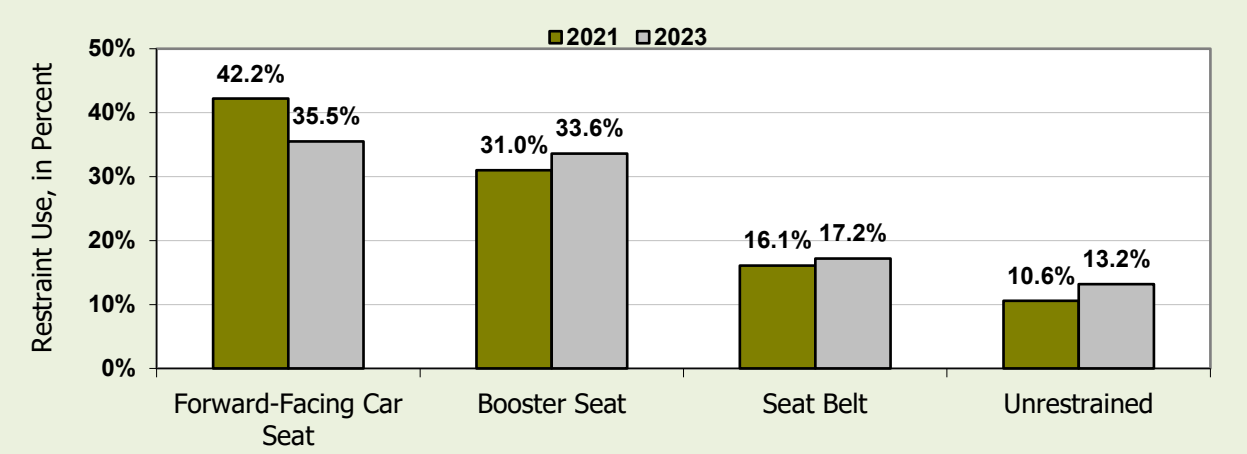

Figure 2. Restraint Use for Children 4 to 7 Years Old

The 2023 NSUBS found that among 4- to 7-year-olds, the younger children (4- and 5-year-olds) had higher forward-facing car seat use than the older (6- and 7-year-olds) children. In 2023 about 50.4 percent of children 4 and 5, as compared to 11.6 percent of children 6 and 7, were restrained in forward-facing car seats. Forward-facing car seat use for children 4 and 5 decreased from 54.9 percent in 2021 to 50.4 percent in 2023, while also significantly decreasing for children 6 and 7 from 16.7 percent in 2021 to 11.6 percent in 2023. The 2023 NSUBS also found that the 4- and 5-year-olds had lower booster seat use than the 6- and 7-year-olds. In 2023 about 27.6 percent of children 4 and 5, as compared to 43.3 percent of children 6 and 7, were restrained in booster seats. Booster seat use among children 4 and 5 increased from 26.8 percent in 2021 to 27.6 percent in 2023. In particular, high-backed booster seat use among 4- to 5-year-olds increased from 16.1 percent in 2021 to 18.6 percent in 2023, while backless booster seat use decreased from 10.8 percent in 2021 to 8.9 percent in 2023. Booster seat use among children 6 and 7 increased from 39.5 percent in 2021 to 43.3 percent in 2023. In particular, high-backed booster seat use among 6- to 7-year-olds increased from 18.9 percent in 2021 to 24.9 percent in 2023, while backless booster seat use decreased from 20.6 percent in 2021 to 18.4 percent in 2023. Seat belt use among 4- to 5-year-olds is lower than that of 6- to 7-year-olds. Seat belt use for 4- to 5-year-olds increased from 8.6 percent in 2021 to 9.4 percent in 2023, while seat belt use for 6- to 7-year-olds decreased from 31.0 percent in 2021 to 29.7 percent in 2023. No restraint use among 4- to 5-year-olds is lower than that of 6- to 7-year-olds. No restraint use for 4- to 5-year-olds increased from 9.5 percent in 2021 to 11.9 percent, while no restraint use for 6- to 7-years-olds increased from 12.8 percent in 2021 to 15.3 percent in 2023. Figures 3 and 4 and Table 2 show the distributions of restraint use for these two age sub-groups, as well as the changes from 2021 to 2023.

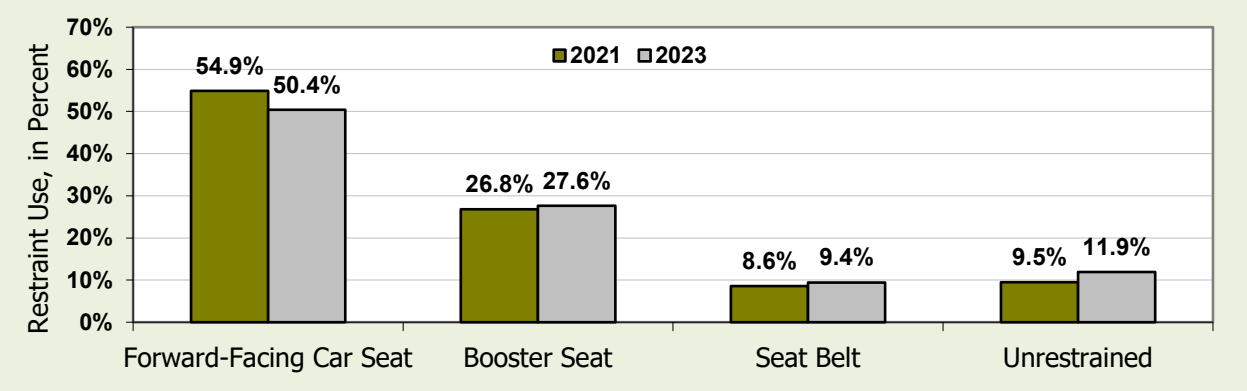

Figure 3. Restraint Use for Children 4 and 5 Years Old

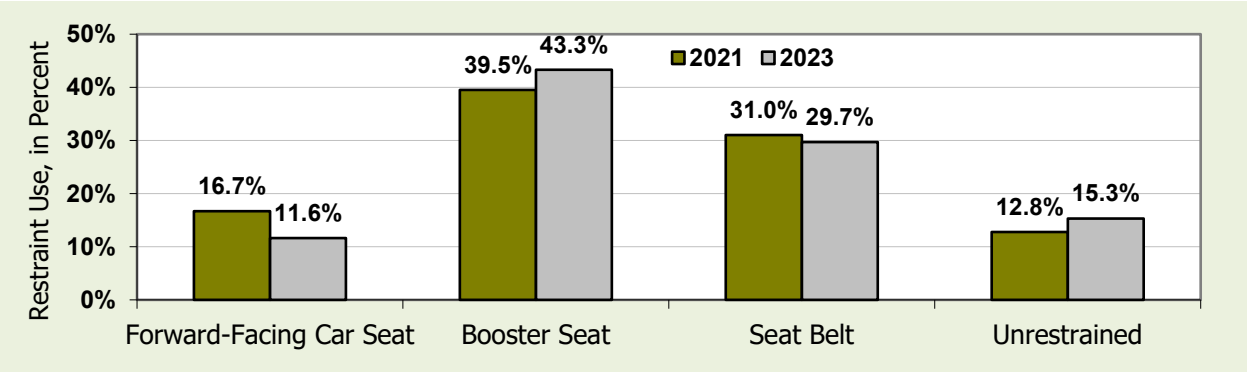

Figure 4. Restraint Use for Children 6 and 7 Years Old

Table 1. Booster Seat Use, by Age, Weight, or Height

Booster Seat Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children 1 to 3 Years Old							
Booster Seat (Overall)	4.5%	(2.9, 6.9)	5.5%	(3.9, 7.7)	1.0	(-1.5, 3.4)	0.41
High-Backed Booster Seat	3.1%	(2.0, 4.8)	4.2%	(2.7, 6.4)	1.1	(-0.9, 3.1)	0.26
Backless Booster Seat	1.4%	(0.7, 3.0)	1.3%	(0.8, 2.1)	-0.1	(-1.4, 1.2)	0.87
Children 4 to 7 Years Old							
Booster Seat (Overall)	31.0%	(27.5, 34.8)	33.6%	(28.7, 38.9)	2.6	(-3.0, 8.2)	0.35

Booster Seat Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
High-Backed Booster Seat	17.0%	(14.6, 19.7)	21.1%	(17.0, 25.8)	4.1	(-0.4, 8.5)	0.07
Backless Booster Seat	14.1%	(11.7, 16.8)	12.6%	(10.0, 15.7)	-1.5	(-4.7, 1.7)	0.35
Children 8 to 12 Years Old							
Booster Seat (Overall)	12.5%	(10.3, 15.1)	11.4%	(8.9, 14.4)	-1.1	(-4.9, 2.7)	0.56
High-Backed Booster Seat	5.0%	(3.8, 6.6)	5.5%	(4.2, 7.0)	0.5	(-1.5, 2.4)	0.65
Backless Booster Seat	7.5%	(5.8, 9.5)	5.9%	(4.2, 8.3)	-1.6	(-4.6, 1.5)	0.30
Children Who Weigh 20 to 40 Pounds							
Booster Seat (Overall)	9.5%	(7.3, 12.4)	11.3%	(9.3, 13.8)	1.8	(-1.5, 5.1)	0.27
High-Backed Booster Seat	6.3%	(4.8, 8.1)	8.1%	(6.0, 10.7)	1.8	(-1.0, 4.6)	0.20
Backless Booster Seat	3.3%	(2.0, 5.4)	3.3%	(2.4, 4.5)	0.0	(-1.8, 1.8)	0.99
Children Who Weigh 41 to 60 Pounds							
Booster Seat (Overall)	34.1%	(30.3, 38.0)	35.0%	(30.2, 40.2)	1.0	(-5.2, 7.1)	0.75
High-Backed Booster Seat	17.6%	(15.0, 20.6)	21.5%	(17.8, 25.7)	3.8	(-0.3, 8.0)	0.07
Backless Booster Seat	16.4%	(14.1, 19.0)	13.5%	(10.7, 16.9)	-2.9	(-7.0, 1.2)	0.16
Children up to 12 Years Old Who Weigh More Than 60 Pounds							
Booster Seat (Overall)	13.9%	(11.8, 16.3)	13.1%	(10.2, 16.8)	-0.7	(-4.5, 3.0)	0.69
High-Backed Booster Seat	5.6%	(4.4, 7.1)	6.1%	(4.6, 8.2)	0.6	(-1.5, 2.6)	0.59
Backless Booster Seat	8.3%	(6.6, 10.3)	7.0%	(5.1, 9.6)	-1.3	(-4.3, 1.7)	0.38

Booster Seat Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Percentage of Children Using the Booster Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Are, at Most, 36 Inches Tall							
Booster Seat (Overall)	6.7%	(4.9, 9.0)	5.6%	(4.3, 7.2)	-1.1	(-3.2, 1.0)	0.30
High-Backed Booster Seat	4.1%	(3.0, 5.6)	4.1%	(3.0, 5.7)	0.0	(-1.7, 1.8)	0.97
Backless Booster Seat	2.5%	(1.5, 4.3)	1.4%	(1.0, 2.1)	-1.1	(-2.4, 0.2)	0.08
Children up to 12 Years Old Who Are 37 to 53 Inches Tall							
Booster Seat (Overall)	26.2%	(22.4, 30.4)	30.6%	(26.7, 34.8)	4.4	(-0.2, 9.0)	0.06
High-Backed Booster Seat	**14.1%**	**(11.9, 16.7)**	**18.9%**	**(15.6, 22.8)**	**4.8**	**(1.1, 8.5)**	**0.01**
Backless Booster Seat	12.1%	(10.0, 14.6)	11.7%	(9.6, 14.3)	-0.4	(-3.2, 2.4)	0.78
Children up to 12 Years Old Who Are 54 to 56 Inches Tall							
Booster Seat (Overall)	**23.3%**	**(18.2, 29.2)**	**15.0%**	**(11.8, 18.9)**	**-8.3**	**(-14.6, -1.9)**	**0.01**
High-Backed Booster Seat	9.2%	(6.2, 13.6)	7.5%	(4.9, 11.4)	-1.8	(-6.4, 2.9)	0.45
Backless Booster Seat	**14.0%**	**(9.7, 19.8)**	**7.5%**	**(4.6, 12.1)**	**-6.5**	**(-11.3, -1.7)**	**0.01**
Children up to 12 Years Old Who Are Taller Than 56 Inches							
Booster Seat (Overall)	3.5%	(2.2, 5.7)	4.4%	(2.5, 7.8)	0.9	(-1.9, 3.6)	0.53
High-Backed Booster Seat	1.4%	(0.7, 2.6)	1.4%	(0.8, 2.4)	0.0	(-1.1, 1.2)	0.97
Backless Booster Seat	2.2%	(1.0, 4.5)	3.0%	(1.5, 6.0)	0.8	(-1.7, 3.4)	0.51

[1] Booster seats are classified into two types: those with seat backs (high-backed) and those without (backless).
[2] Estimates might not sum to totals due to rounding.
[3] Survey data is obtained for children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains. 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 Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.

[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

Note: Booster seat use rates for children newborn to 12 months old and who weigh less than 20 pounds are not provided due to the insufficient data to produce reliable estimates.

Sources: NSUBS, NCSA, 2021, 2023

Table 2. Distribution of Restraint Types Among Children 4 to 7 Years Old, by Sub-Age Groups

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed in the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed in the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	P-value[6]
Children 4 and 5 Years Old							
Rear-Facing Car Seat	NA	NA	0.7%	(0.2, 2.5)	NA	NA	NA
Forward-Facing Car Seat	54.9%	(47.8, 61.7)	50.4%	(44.2, 56.6)	-4.5	(-10.8, 1.8)	0.16
Booster Seat (Overall)	26.8%	(22.8, 31.3)	27.6%	(22.9, 32.7)	0.7	(-5.1, 6.5)	0.80
High-Backed Booster Seat	16.1%	(13.0, 19.7)	18.6%	(14.6, 23.5)	2.6	(-2.4, 7.6)	0.30
Backless Booster Seat	10.8%	(8.6, 13.4)	8.9%	(7.3, 10.9)	-1.9	(-4.5, 0.8)	0.16
Seat Belt	8.6%	(6.8, 10.9)	9.4%	(6.7, 13.2)	0.8	(-2.6, 4.2)	0.64

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed in the Restraint Type[2] [3]	**95% Confidence Interval[4]**	**Percentage of Children Observed in the Restraint Type[2] [3]**	**95% Confidence Interval[4]**	**Change in Percentage Points[7]**	**95% Confidence Interval[5]**	**P-value[6]**
No Restraint Observed	9.5%	(6.4, 13.9)	11.9%	(8.1, 17.2)	2.4	(-2.8, 7.6)	0.36
Children 6 and 7 Years Old							
Rear-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Forward-Facing Car Seat	**16.7%**	**(13.1, 21.1)**	**11.6%**	**(8.0, 16.4)**	**-5.1**	**(-9.2, -1.1)**	**0.02**
Booster Seat (Overall)	39.5%	(35.5, 43.6)	43.3%	(36.5, 50.5)	3.9	(-4.3, 12.1)	0.34
High-Backed Booster Seat	18.9%	(14.9, 23.6)	24.9%	(19.0, 32.1)	6.1	(-0.8, 13.0)	0.08
Backless Booster Seat	20.6%	(16.8, 25.1)	18.4%	(13.9, 24.0)	-2.2	(-7.4, 3.0)	0.39
Seat Belt	31.0%	(26.6, 35.7)	29.7%	(23.5, 36.7)	-1.3	(-10.1, 7.6)	0.77
No Restraint Observed	12.8%	(8.3, 19.2)	15.3%	(9.9, 22.8)	2.5	(-7.2, 12.2)	0.60
Children 4 to 7 Years Old							
Rear-Facing Car Seat	0.1%	(0.0, 0.4)	0.5%	(0.2, 1.5)	0.4	(-0.2, 1.0)	0.23
Forward-Facing Car Seat	**42.2%**	**(35.9, 48.7)**	**35.5%**	**(29.6, 41.8)**	**-6.7**	**(-11.9, -1.5)**	**0.01**
Booster Seat (Overall)	31.0%	(27.5, 34.8)	33.6%	(28.7, 38.9)	2.6	(-3.0, 8.2)	0.35
High-Backed	17.0%	(14.6, 19.7)	21.1%	(17.0, 25.8)	4.1	(-0.4, 8.5)	0.07

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed in the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed in the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	P-value[6]
Booster Seat							
Backless Booster Seat	14.1%	(11.7, 16.8)	12.6%	(10.0, 15.7)	-1.5	(-4.7, 1.7)	0.35
Seat Belt	16.1%	(13.7, 18.7)	17.2%	(13.3, 22.0)	1.2	(-3.9, 6.2)	0.65
No Restraint Observed	10.6%	(7.1, 15.4)	13.2%	(8.9, 19.1)	2.6	(-4.0, 9.2)	0.43

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven 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 Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.
[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
NA: Data not sufficient to produce a reliable estimate.
Sources: NSUBS, NCSA, 2021, 2023

Premature Transition

The primary purpose of the NSUBS is to estimate booster seat use, however it also provides estimates of the extent in which children are "prematurely transitioned" to restraint types that are inappropriate for their age, height, or weight.

NHTSA recommends that parents refer to the specific car seat manufacturer's instructions on weight and height limits. Car seats on the market have a wide variation in height and weight limits. Many height limits range from 36 to 54 inches, and many weight limits range from 40 to 60 or more pounds. These limits were considered in discussing the extent of premature transition in previous NSUBS publications. For comparison purposes with previous survey results, we will briefly discuss similar weight and height results from the 2023 NSUBS survey.

It should be noted that if a column corresponding to a data series or a data category is missing from a figure, it means that there is not sufficient data to produce a reliable estimate for the data category. Also, some estimates might not sum to totals due to rounding.

Premature Transition Based on Age

Premature Transition Among Children Under Age 1

NHTSA recommends: "Your child under age 1 should always ride in a rear-facing car seat in the back seat. There are different types of rear-facing car seats: Infant-only seats can only be used rear-facing. Convertible and 3-in-1 car seats typically have higher height and weight limits for the rear-facing position, allowing you to keep your child rear-facing for a longer period of time" (NHTSA, 2021).

As shown in Figure 5, about 11 percent of children under age 1 were not in rear-facing car seats in 2023; most of these infants were prematurely transitioned to forward-facing car seats.

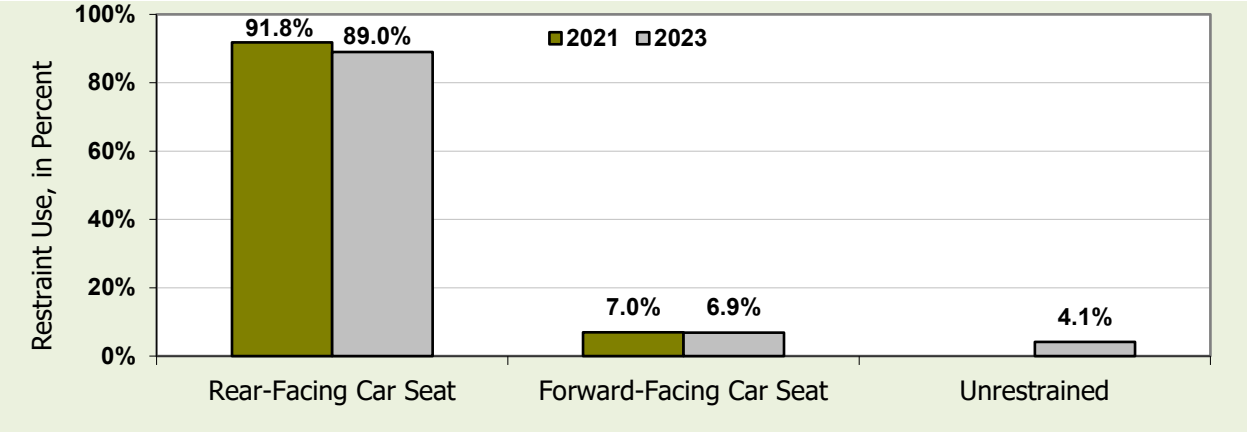

Figure 5. Restraint Use for Children Under Age 1

Premature Transition Among Children 1 to 3 Years Old

NHTSA recommends: "Keep your child rear-facing as long as possible. It's the best way to keep him or her safe. Your child should remain in a rear-facing car seat until he or she reaches the top height or weight limit allowed by your car seat's manufacturer. Once your child outgrows the rear-facing car seat, your child is ready to travel in a forward-facing car seat with a harness in the back seat" (NHTSA, 2021).

Therefore, the proper restraint types for children 1 to 3 years old should be either rear-facing car seats or forward-facing car seats. The 2023 NSUBS found that only 85.8 percent of children 1 to 3 years old were restrained either in rear-facing car seats (22.0%) or in forward-facing car seats (63.8%) in 2023. About 5.5 percent of children 1 to 3 years old were prematurely transitioned to booster seats and 2.3 percent to seat belts. Figure 6 shows the distribution of restraint types for children 1 to 3 years old in 2021 and 2023.

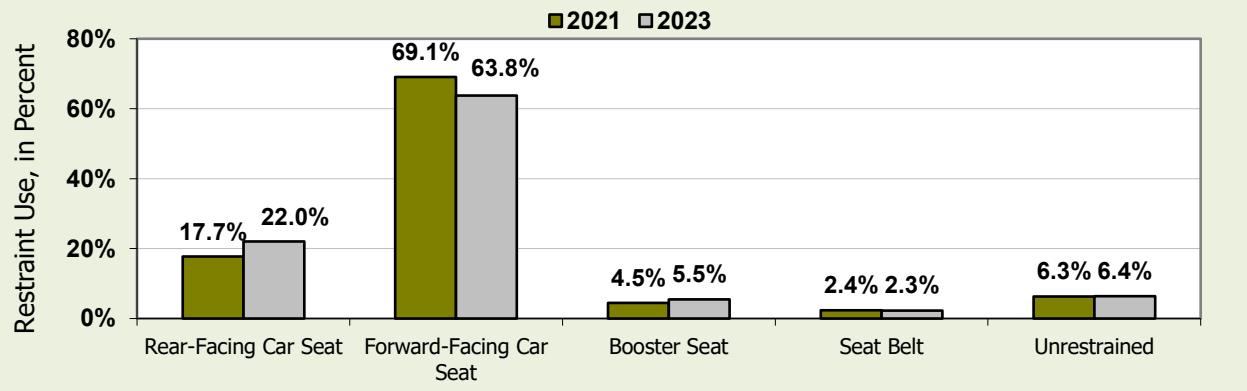

Figure 6. Restraint Use for Children 1 to 3 Years Old

While the percentage restrained in rear-facing car seats increased from 17.7 percent in 2021 to 20.0 percent in 2023, the percentage restrained in forward-facing car seats decreased from 69.1 percent in 2021 to 63.8 percent in 2023. About 2.3 percent of children were prematurely transitioned to seat belts in 2023, a slight decrease from 2.4 percent in 2021. About 6.4 percent of children were unrestrained in 2023, a slight increase from 6.3 percent in 2021.

Premature Transition Among Children 4 to 7 Years Old

Premature transition among children 4 to 7 years old was previously discussed under The National Estimates section (Figure 2). To reiterate, about 17.2 percent of children 4 to 7 were prematurely transitioned to seat belts and 13.2 percent were unrestrained.

Restraint Use Among Children 8 to 12 Years Old

NHTSA recommends: “Keep your child in a booster seat until he or she is big enough to fit in a seat belt properly. For a seat belt to fit properly the lap belt must lie snugly across the upper thighs, not the stomach. The shoulder belt should lie snug across the shoulder and chest and not cross the neck or face. Your child should still ride in the back seat because it’s safer there” (NHTSA, 2021).

Figure 7 shows the distribution of restraint types for children 8 to 12 years old in 2021 and 2023. The percentage of children 8 to 12 restrained in a booster seat decreased from 12.5 percent in 2021 to 11.4 percent in 2023. Also, the percentage in seat belts decreased from 73.3 percent in 2021 to 71.7 percent in 2023. Additionally, the percentage unrestrained in 2023 is 16.2 percent, an increase from 13.2 percent in 2021.

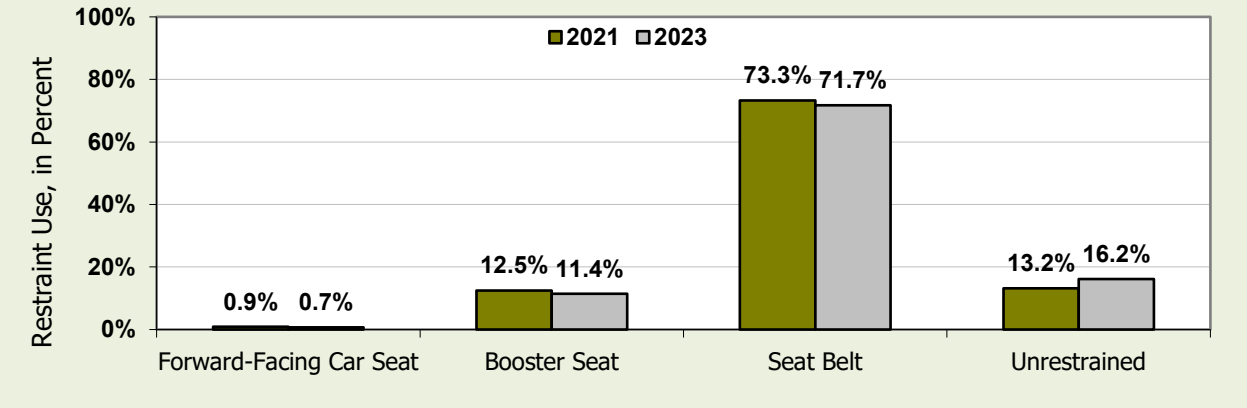

Figure 7. Restraint Use for Children 8 to 12 Years Old

Premature Transition Based on Weight and Height

NHTSA's car seat recommendations for children of all ages are:

- Select a car seat based on your child's age and size (height and weight), then choose a seat that fits in your vehicle, and use it every time.
- Always refer to your specific car seat manufacturer's instructions (check height and weight limits) and read the vehicle owner's manual on how to install the car seat using the seat belt or lower anchors and a tether, if available.
- To maximize safety, keep your child in the car seat as long as the child fits within the manufacturer's height and weight requirements.
- Keep your child in the back seat at least through age 12.

NHTSA recommends consulting the manufacturer's manual for car seat weight and height limits, as noted above.

Child car seats on the market have a wide variation in height and weight limits. Height limits range from 36 to 54 inches, and weight limits range from 40 to 60 or more pounds. Previous NSUBS publications considered these limits in assessing premature transition with respect to NHTSA's previous guidelines. This section uses the same weight and height benchmarks, referencing NHTSA's earlier guidelines, to examine any premature transition changes in 2023.

Children Weighing Less Than 20 Pounds

NHTSA's previous recommendation states 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 particular seat's height or weight limit. At a minimum, infants should be kept rear-facing until a minimum of age 1 and at least 20 pounds. According to NHTSA's current car seat recommendation, children under age 1 should be in rear-facing car seats (NHTSA, 2021).

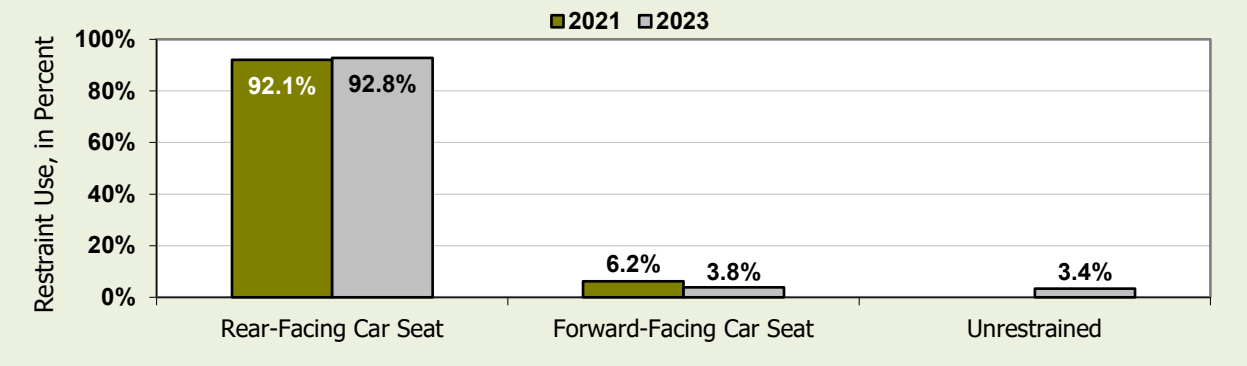

Figure 8. Restraint Use for Children Under 20 Pounds

As shown in Figure 8, the 2023 NSUBS found that 3.8 percent of children under 20 pounds were prematurely transitioned to forward-facing car seats, down from 6.2 percent in 2021. Conversely, the percentage of children weighing under 20 pounds in rear-facing car seats is up slightly from 92.1 percent in 2021 to 92.8 percent in 2023. The percentage unrestrained is 3.4 percent in 2023, while the 2021 value is not shown because there is not sufficient data to produce a reliable estimate for that data category.

Children Weighing 20 to 40 Pounds

NHTSA's previous recommendation said when children outgrow their rear-facing car seats (at a minimum age 1 and at least 20 pounds) they should ride in forward-facing car seats, in the back seat, with a harness and tether, until they reach the particular seat's upper weight or height limit, usually at around age 4 and 40 pounds. NHTSA now recommends that when children outgrow their rear-facing car seats, they should ride in forward-facing car seats with a harness in the back seat (NHTSA, 2021).

The 2023 NSUBS found that 59.3 percent of children weighing 20 to 40 pounds were in forward-facing car seats, down from 63.4 percent in 2021. However, 40.7 percent of children weighing 20 to 40 pounds were not in forward-facing car seats in 2023, an increase from 36.6 percent in 2021 (Figure 9). Note, however, that some 20- to 40-pound children could be infants who should be in rear-facing car seats, and some booster seats have weight limits as low as 30 pounds.

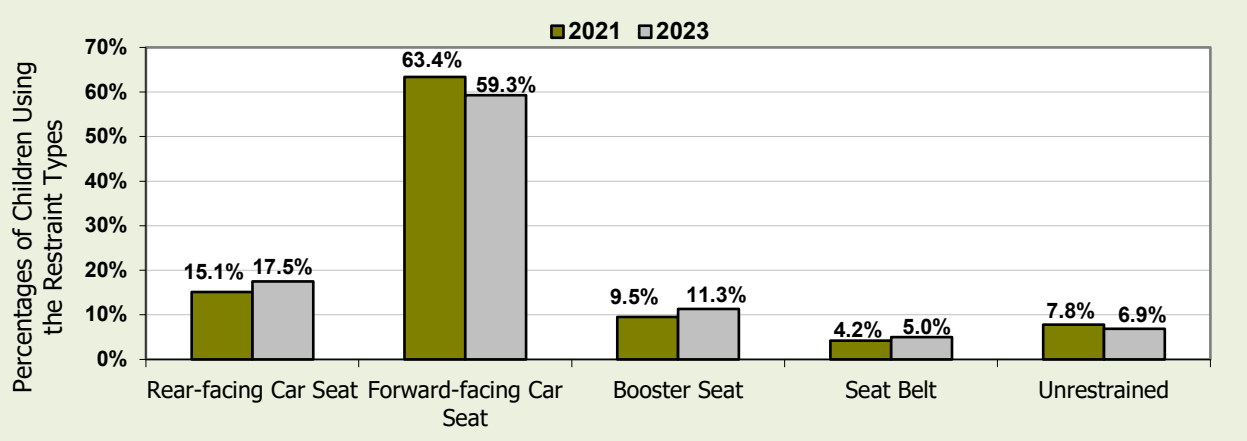

Figure 9. Distribution of Restraint Types for Children Who Were 20 to 40 Pounds

Children Less Than 57 Inches Tall

NHTSA's previous recommendation said once children outgrow their forward-facing car 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. NHTSA recommends that seat belts fit properly when the lap belt lies snugly across the upper thighs, not the stomach. The shoulder belt should lie snug across the shoulder and chest and not cross the neck or face (NHTSA, 2021).

The 2023 NSUBS found that:

- 34.4 percent of children up to 12 years old who were 37 to 53 inches tall were either unrestrained (11.8%) or prematurely transitioned to seat belts (22.6%) in 2023 (Table 5 and Figure 10).
- 83.3 percent of children up to 12 years old who were 54 to 56 inches tall were either unrestrained (14.6%) or prematurely transitioned to seat belts (68.7%) in 2023 (Table 5 and Figure 10). However, since 54 to 56 inches is marginally below NHTSA's previously set 57-inch benchmark, it might not be significant as a public safety result. The percentage in forward-facing car seats is not shown because there is not sufficient data to produce a reliable estimate for this category (Figure 10).
- Booster seat use among children up to 12 years old who were 37 to 53 inches tall increased to 30.6 percent in 2023 from 26.2 percent in 2021; however, seat belt use also increased from 20.7 percent in 2021 to 22.6 percent in 2023 (Figure 11).
- Booster seat use among children up to 12 years old who were 54 to 56 inches tall decreased significantly from 23.3 percent in 2021 to 15.0 percent in 2023; seat belt use increased from 68.0 percent in 2021 to 68.7 percent in 2023. The percentage in forward-facing car seats is not shown because there is not sufficient data to produce a reliable estimate for this category (Figure 12).

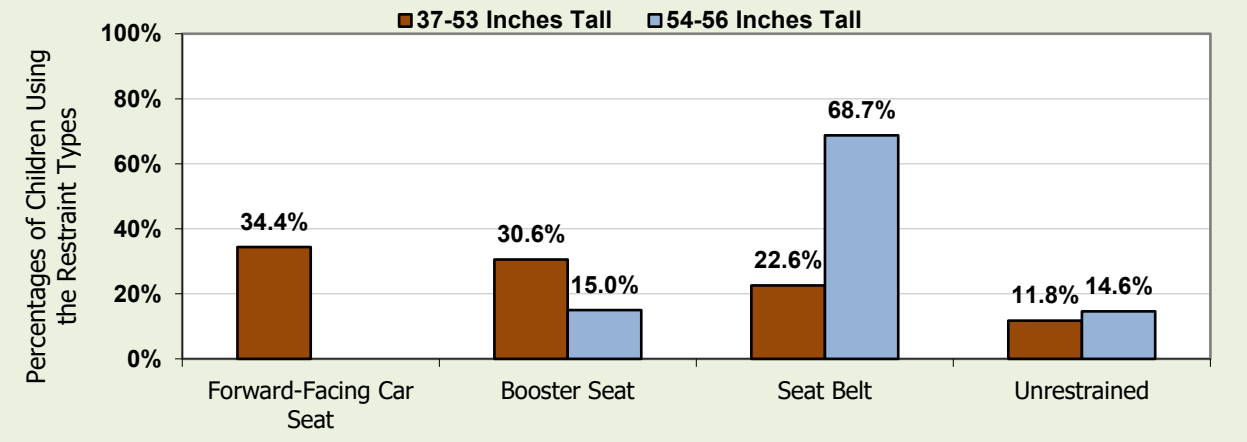

Figure 10. Distribution of Restraint Types in 2023 for Children up to 12 Years Old Who Were 37 to 56 Inches Tall

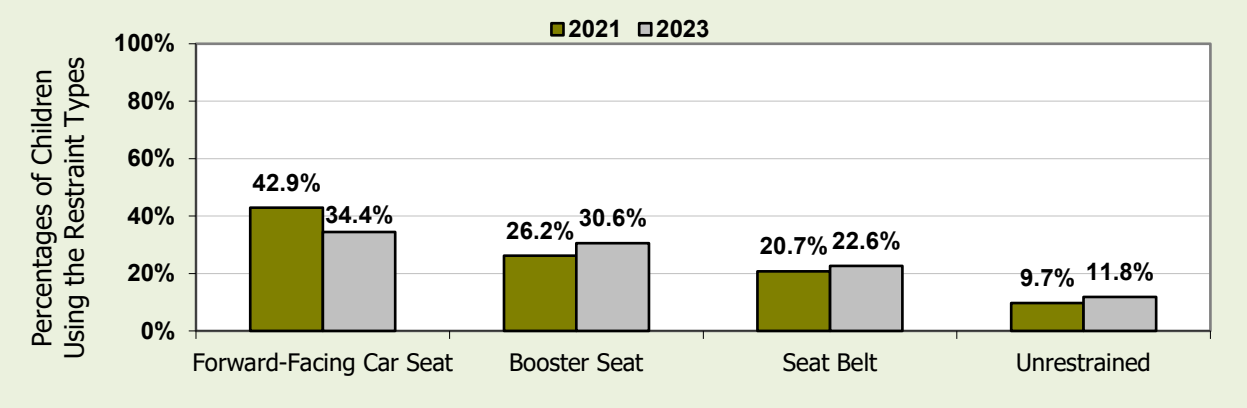

Figure 11. Distribution of Restraint Types for Children up to 12 Years Old Who Were 37 to 53 Inches Tall

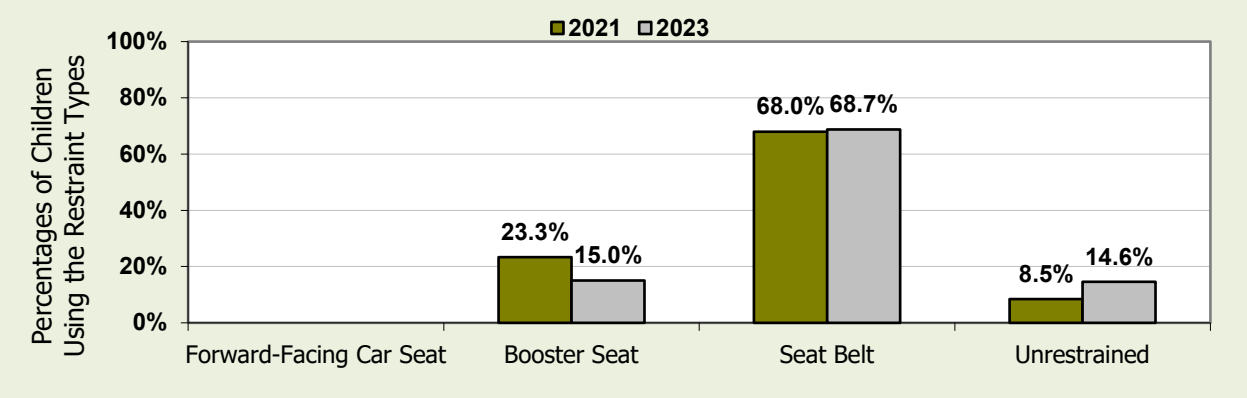

Figure 12. Distribution of Restraint Types for Children up to 12 Years Old Who Were 54 to 56 Inches Tall

Table 3. The Types of Restraints Used by Children Newborn to 12 Years Old, by Age

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Less Than 1 Year Old							
Rear-Facing Car Seat	91.8%	(87.3, 94.8)	89.0%	(84.7, 92.2)	-2.8	(-7.4, 1.8)	0.23
Forward-Facing Car Seat	7.0%	(4.3, 11.2)	6.9%	(4.2, 10.9)	-0.1	(-4.6, 4.4)	0.96
Booster Seat (Overall)	NA	NA	NA	NA	NA	NA	NA

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
High-Backed Booster Seat	NA	NA	NA	NA	NA	NA	NA
Backless Booster Seat	NA	NA	NA	NA	NA	NA	NA
Seat Belt	NA	NA	NA	NA	NA	NA	NA
No Restraint Observed	NA	NA	4.1%	(2.5, 6.7)	NA	NA	NA
Children 1 to 3 Years Old							
Rear-Facing Car Seat	17.7%	(15.0, 20.7)	22.0%	(19.0, 25.4)	4.4	(-0.2, 8.9)	0.06
Forward-Facing Car Seat	69.1%	(64.1, 73.7)	63.8%	(59.9, 67.4)	-5.3	(-11.2, 0.5)	0.07
Booster Seat (Overall)	4.5%	(2.9, 6.9)	5.5%	(3.9, 7.7)	1.0	(-1.5, 3.4)	0.41
High-Backed Booster Seat	3.1%	(2.0, 4.8)	4.2%	(2.7, 6.4)	1.1	(-0.9, 3.1)	0.26
Backless Booster Seat	1.4%	(0.7, 3.0)	1.3%	(0.8, 2.1)	-0.1	(-1.4, 1.2)	0.87
Seat Belt	2.4%	(1.4, 3.9)	2.3%	(1.4, 3.9)	-0.1	(-1.3, 1.2)	0.91
No Restraint Observed	6.3%	(3.6, 11.0)	6.4%	(4.2, 9.5)	0.0	(-5.1, 5.2)	0.99
Children 4 to 7 Years Old							
Rear-Facing Car Seat	0.1%	(0.0, 0.4)	0.5%	(0.2, 1.5)	0.4	(-0.2, 1.0)	0.23
Forward-Facing Car Seat	**42.2%**	**(35.9, 48.7)**	**35.5%**	**(29.6, 41.8)**	**-6.7**	**(-11.9, -1.5)**	**0.01**

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Booster Seat (Overall)	31.0%	(27.5, 34.8)	33.6%	(28.7, 38.9)	2.6	(-3.0, 8.2)	0.35
High-Backed Booster Seat	17.0%	(14.6, 19.7)	21.1%	(17.0, 25.8)	4.1	(-0.4, 8.5)	0.07
Backless Booster Seat	14.1%	(11.7, 16.8)	12.6%	(10.0, 15.7)	-1.5	(-4.7, 1.7)	0.35
Seat Belt	16.1%	(13.7, 18.7)	17.2%	(13.3, 22.0)	1.2	(-3.9, 6.2)	0.65
No Restraint Observed	10.6%	(7.1, 15.4)	13.2%	(8.9, 19.1)	2.6	(-4.0, 9.2)	0.43
Children 8 to 12 Years Old							
Rear-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Forward-Facing Car Seat	0.9%	(0.4, 2.0)	0.7%	(0.3, 1.4)	-0.2	(-1.1, 0.6)	0.55
Booster Seat (Overall)	12.5%	(10.3, 15.1)	11.4%	(8.9, 14.4)	-1.1	(-4.9, 2.7)	0.56
High-Backed Booster Seat	5.0%	(3.8, 6.6)	5.5%	(4.2, 7.0)	0.5	(-1.5, 2.4)	0.65
Backless Booster Seat	7.5%	(5.8, 9.5)	5.9%	(4.2, 8.3)	-1.6	(-4.6, 1.5)	0.30
Seat Belt	73.3%	(68.6, 77.5)	71.7%	(65.1, 77.6)	-1.5	(-9.4, 6.4)	0.70
No Restraint Observed	13.2%	(9.4, 18.2)	16.2%	(11.0, 23.3)	3.0	(-4.6, 10.7)	0.42

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven 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 Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.
[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
NA: Data not sufficient to produce a reliable estimate.
Sources: NSUBS, NCSA, 2021, 2023

Table 4. The Types of Restraints Used by Children Newborn to 12 Years Old, by Weight

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Weigh Less Than 20 Pounds							
Rear-Facing Car Seat	92.1%	(88.0, 94.8)	92.8%	(88.6, 95.5)	0.7	(-4.5, 6.0)	0.78
Forward-Facing Car Seat	6.2%	(3.7, 10.4)	3.8%	(2.1, 6.8)	-2.5	(-6.3, 1.4)	0.21
Booster Seat (Overall)	NA	NA	NA	NA	NA	NA	NA
High-Backed Booster Seat	NA	NA	NA	NA	NA	NA	NA
Backless Booster Seat	NA	NA	NA	NA	NA	NA	NA
Seat Belt	NA	NA	NA	NA	NA	NA	NA
No Restraint Observed	NA	NA	3.4%	(1.5, 7.8)	NA	NA	NA

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Weigh From 20 to 40 Pounds							
Rear-Facing Car Seat	15.1%	(13.2, 17.3)	17.5%	(15.6, 19.4)	2.3	(-0.2, 4.9)	0.07
Forward-Facing Car Seat	63.4%	(57.8, 68.5)	59.3%	(55.8, 62.6)	-4.1	(-8.9, 0.7)	0.09
Booster Seat (Overall)	9.5%	(7.3, 12.4)	11.3%	(9.3, 13.8)	1.8	(-1.5, 5.1)	0.27
High-Backed Booster Seat	6.3%	(4.8, 8.1)	8.1%	(6.0, 10.7)	1.8	(-1.0, 4.6)	0.20
Backless Booster Seat	3.3%	(2.0, 5.4)	3.3%	(2.4, 4.5)	0.0	(-1.8, 1.8)	0.99
Seat Belt	4.2%	(2.9, 6.0)	5.0%	(3.7, 6.7)	0.8	(-1.3, 3.0)	0.44
No Restraint Observed	7.8%	(4.7, 12.7)	6.9%	(4.7, 10.0)	-0.9	(-5.9, 4.1)	0.72
Children Who Weigh From 40 to 60 Pounds							
Rear-Facing Car Seat	NA	NA	0.6%	(0.3, 1.3)	NA	NA	NA
Forward-Facing Car Seat	**34.7%**	**(29.7, 40.2)**	**25.6%**	**(21.0, 30.9)**	**-9.1**	**(-14.3, -3.9)**	**0.00**
Booster Seat (Overall)	34.1%	(30.3, 38.0)	35.0%	(30.2, 40.2)	1.0	(-5.2, 7.1)	0.75
High-Backed Booster Seat	17.6%	(15.0, 20.6)	21.5%	(17.8, 25.7)	3.8	(-0.3, 8.0)	0.07

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Backless Booster Seat	16.4%	(14.1, 19.0)	13.5%	(10.7, 16.9)	-2.9	(-7.0, 1.2)	0.16
Seat Belt	21.5%	(18.2, 25.1)	24.9%	(21.1, 29.2)	3.5	(-2.3, 9.2)	0.23
No Restraint Observed	9.7%	(6.7, 13.8)	13.8%	(9.8, 19.1)	4.2	(-1.7, 10.0)	0.16
Children Who Weigh More Than 60 Pounds							
Rear-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Forward-Facing Car Seat	2.0%	(1.1, 3.5)	1.3%	(0.7, 2.6)	-0.6	(-1.9, 0.6)	0.31
Booster Seat (Overall)	13.9%	(11.8, 16.3)	13.1%	(10.2, 16.8)	-0.7	(-4.5, 3.0)	0.69
High-Backed Booster Seat	5.6%	(4.4, 7.1)	6.1%	(4.6, 8.2)	0.6	(-1.5, 2.6)	0.59
Backless Booster Seat	8.3%	(6.6, 10.3)	7.0%	(5.1, 9.6)	-1.3	(-4.3, 1.7)	0.38
Seat Belt	70.9%	(66.5, 74.9)	67.0%	(59.2, 74.0)	-3.9	(-13.1, 5.3)	0.39
No Restraint Observed	13.1%	(9.4, 17.9)	18.5%	(11.8, 27.9)	5.4	(-4.1, 15.0)	0.26

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven 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 Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is

the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.

[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

NA: Data not sufficient to produce a reliable estimate.

Sources: NSUBS, NCSA, 2021, 2023

Table 5. The Types of Restraints Used by Children Newborn to 12 Years Old, by Height

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Are, at Most, 36 Inches Tall							
Rear-Facing Car Seat	27.0%	(24.1, 30.2)	31.1%	(28.0, 34.5)	4.1	(-0.6, 8.8)	0.08
Forward-Facing Car Seat	54.2%	(50.7, 57.6)	51.2%	(48.5, 53.9)	-3.0	(-6.4, 0.4)	0.08
Booster Seat (Overall)	6.7%	(4.9, 9.0)	5.6%	(4.3, 7.2)	-1.1	(-3.2, 1.0)	0.30
High-Backed Booster Seat	4.1%	(3.0, 5.6)	4.1%	(3.0, 5.7)	0.0	(-1.7, 1.8)	0.97
Backless Booster Seat	2.5%	(1.5, 4.3)	1.4%	(1.0, 2.1)	-1.1	(-2.4, 0.2)	0.08
Seat Belt	4.5%	(3.5, 5.7)	3.5%	(2.6, 4.7)	-1.0	(-2.2, 0.1)	0.08
No Restraint Observed	7.6%	(4.4, 12.8)	8.6%	(6.3, 11.8)	1.0	(-4.4, 6.4)	0.71
Children Who Are 37 to 53 Inches Tall							
Rear-Facing Car Seat	0.5%	(0.2, 0.9)	0.5%	(0.3, 1.1)	0.1	(-0.4, 0.5)	0.74

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	**95% Confidence Interval[4]**	**Percentage of Children Observed Using the Restraint Type[2 3]**	**95% Confidence Interval[4]**	**Change in Percentage Points[7]**	**95% Confidence Interval[5]**	***P*-value[6]**
Forward-Facing Car Seat	**42.9%**	**(35.2, 51.0)**	**34.4%**	**(28.6, 40.7)**	**-8.5**	**(-14.9, -2.0)**	**0.01**
Booster Seat (Overall)	26.2%	(22.4, 30.4)	30.6%	(26.7, 34.8)	4.4	(-0.2, 9.0)	0.06
High-Backed Booster Seat	**14.1%**	**(11.9, 16.7)**	**18.9%**	**(15.6, 22.8)**	**4.8**	**(1.1, 8.5)**	**0.01**
Backless Booster Seat	12.1%	(10.0, 14.6)	11.7%	(9.6, 14.3)	-0.4	(-3.2, 2.4)	0.78
Seat Belt	20.7%	(17.4, 24.4)	22.6%	(17.9, 28.2)	2.0	(-4.0, 8.0)	0.51
No Restraint Observed	9.7%	(6.6, 14.2)	11.8%	(7.9, 17.2)	2.0	(-4.0, 8.1)	0.50
Children Who Are 54 to 56 Inches Tall							
Rear-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Forward-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Booster Seat (Overall)	**23.3%**	**(18.2, 29.2)**	**15.0%**	**(11.8, 18.9)**	**-8.3**	**(-14.6, -1.9)**	**0.01**
High-Backed Booster Seat	9.2%	(6.2, 13.6)	7.5%	(4.9, 11.4)	-1.8	(-6.4, 2.9)	0.45
Backless Booster Seat	**14.0%**	**(9.7, 19.8)**	**7.5%**	**(4.6, 12.1)**	**-6.5**	**(-11.3, -1.7)**	**0.01**
Seat Belt	68.0%	(61.1, 74.2)	68.7%	(61.9, 74.7)	0.7	(-7.1, 8.5)	0.85
No Restraint Observed	8.5%	(5.2, 13.6)	14.6%	(9.8, 21.1)	6.1	(-1.3, 13.6)	0.10

Restraint Type[1]	2021		2023		2021-2023 Change		
	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Percentage of Children Observed Using the Restraint Type[2 3]	95% Confidence Interval[4]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Are Taller Than 56 Inches							
Rear-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Forward-Facing Car Seat	NA	NA	NA	NA	NA	NA	NA
Booster Seat (Overall)	3.5%	(2.2, 5.7)	4.4%	(2.5, 7.8)	0.9	(-1.9, 3.6)	0.53
High-Backed Booster Seat	1.4%	(0.7, 2.6)	1.4%	(0.8, 2.4)	0.0	(-1.1, 1.2)	0.97
Backless Booster Seat	2.2%	(1.0, 4.5)	3.0%	(1.5, 6.0)	0.8	(-1.7, 3.4)	0.51
Seat Belt	82.5%	(76.1, 87.5)	79.4%	(71.6, 85.4)	-3.1	(-12.0, 5.7)	0.48
No Restraint Observed	13.0%	(8.4, 19.6)	16.0%	(9.9, 24.9)	3.0	(-5.5, 11.5)	0.48

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven 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 Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.
[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
NA: Data not sufficient to produce a reliable estimate.
Sources: NSUBS, NCSA, 2021, 2023

Demographic Results

Although its primary purpose is to estimate booster seat use among 4- to 7-year-olds, the NSUBS has information on the restraint use of all children under 13. Additionally, information on race, ethnicity, height, and weight is collected for occupants of under 13 to identify and address areas of low restraint use rates. This section reports some major demographic results of child restraint use from the 2023 NSUBS.

Note that restraint use percentages in this section include any type of restraint, even those that may be inappropriate for a child's age, weight, and height. It should also be noted that if a column corresponding to a data series or a data category is missing from a figure, it means that there is not sufficient data to produce a reliable estimate for the data category. Also, some estimates might not sum to totals due to rounding.

Overall, restraint use for all children newborn to 12 years old decreased to 88.2 percent in 2023, compared to 89.8 percent in 2021. This is not a statistically significant change (Figure 13).

Age

The restraint use rates for children from birth to 12 months old, 1 to 3 years old, 4 to 7 years old, and 8 to 12 years old in 2023 were 95.9 percent, 93.6 percent, 86.8 percent, and 83.8 percent, respectively. Figure 13 compares the restraint use of children newborn to 12 years old by age in 2021 and 2023. None of these changes from 2021 to 2023 are statistically significant.

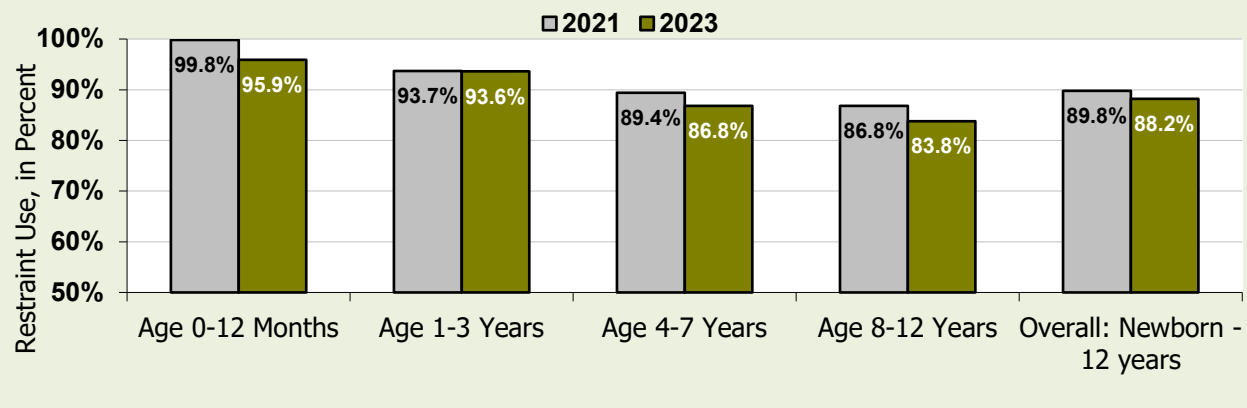

Figure 13. Child Restraint Use by Age and Year

Race and Ethnicity

NSUBS data collectors conduct interviews to obtain self-identified race and ethnicity of passenger vehicle occupants including all child occupants under 13. Figure 14 shows the overall picture of child restraint use by race and ethnicity across all age groups. Non-Hispanic Asian children 1 to 3 years old had the highest restraint use (98.4%) while Non-Hispanic Black children 8 to 12 years old had the lowest (67.8%).

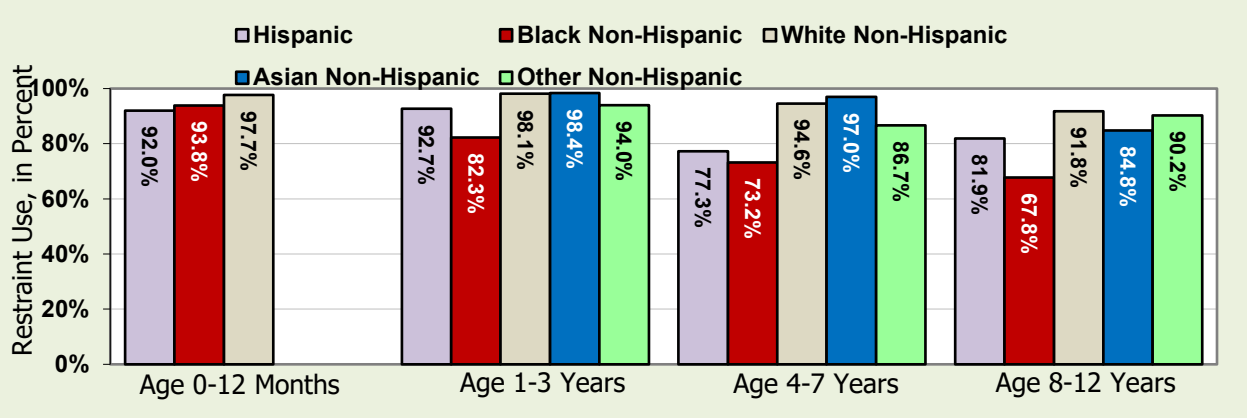

Figure 14. Child Restraint Use by Race and Ethnicity

As shown in Figure 15, Hispanics had lower restraint use rates than Non-Hispanics among all age groups.

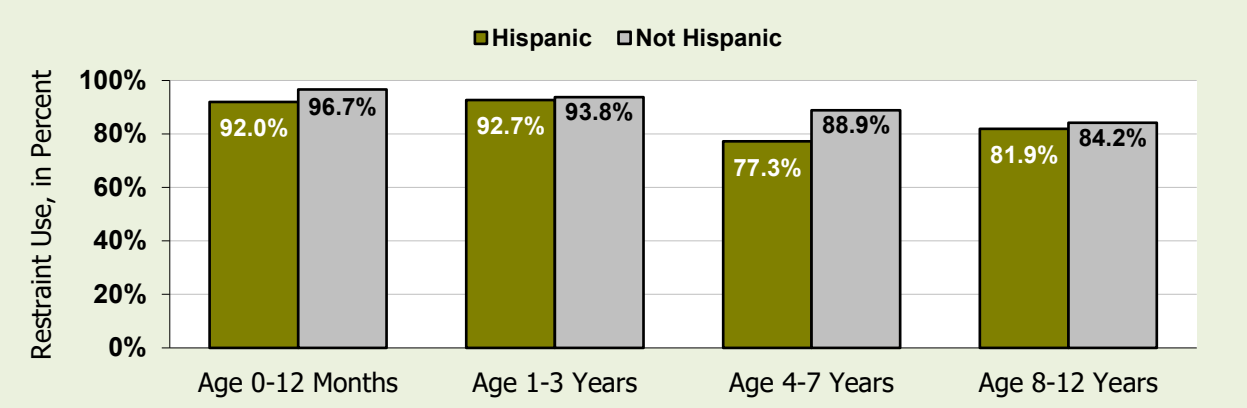

Figure 15. Child Restraint Use by Age and Hispanic Origin in 2023

The 2023 NSUBS also shows that restraint use among children 4 to 7 years old who are Hispanic decreased significantly to 77.3 percent in 2023 from 85.3 percent in 2021 (Table 8). It also shows that restraint use among children 0 to 12 months who are Hispanic decreased significantly to 92.0 percent in 2023 from 100.0 percent in 2021 (Table 6). Likewise, the restraint use among children 0 to 12 months who are Non-Hispanic/Other also decreased significantly to 96.7 percent in 2023 from 99.8 percent in 2021 (Table 6).

Race and ethnicity data in the NSUBS is collected per Federal standards set by the Office of Management and Budget (OMB). Specifically, the following 10 race/ethnicity categories are used in the survey data collection.

Not Hispanic nor Latino and

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White

Hispanic or Latino and

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White

The NSUBS data collectors ask an adult occupant of a vehicle (usually the driver) to report the race and ethnicity of all occupants. Respondents reporting themselves (or others) to be multiracial are recorded by the data collector as such. Because of insufficient numbers of children observed in certain race/ethnic groups, we report the NSUBS data using the following five collapsed race/ethnicity groups.

- Hispanic or Latino
- White Non-Hispanic
- Black or African American Non-Hispanic
- Asian Non-Hispanic
- Other Non-Hispanic (which includes people not of Hispanic origin who are American Indian, Alaska Native, Native Hawaiian, or Pacific Islander)

For information on the OMB standards for the collection of race and ethnicity data in government surveys, *see Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity*, Federal Register Notice, Volume 62, Number 210, pages 58782-58790, October 30, 1997 (F.R.N., 1997).

Sex

Figure 16 shows the restraint use rates among boys and girls for each age group in 2023. Restraint use rates among boys were higher for age groups 0 to 12 months and 4 to 7 years old. For children 0 to 12 months who are male, there was a significant decrease in restraint use rates from 100.0 percent in 2021 to 96.8 percent in 2023, while for females, there was also a significant decrease in restraint use rates from 99.6 percent in 2021 to 94.8 percent in 2023. There were no other significant changes in restraint use rates from 2021 to 2023 for all age groups (Tables 6 to 9).

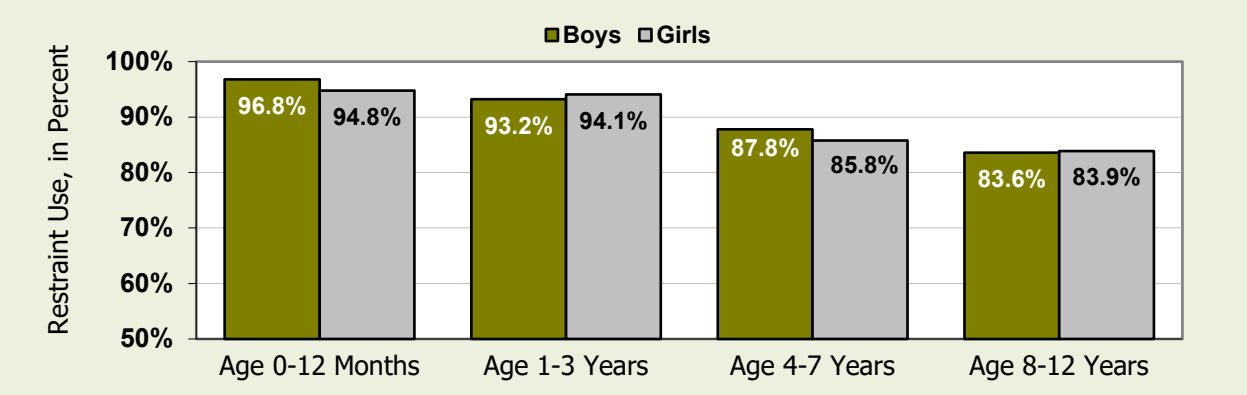

Figure 16. Child Restraint Use by Age and Sex in 2023

Table 6. Restraint Use Among Children From Birth to 12 Months Old

Subgroup of Children 0 to 12 Months[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
All Children 0 to 12 Months	**99.8%**	**(98.9, 100.0)**	**95.9%**	**(93.3, 97.5)**	**-3.9**	**(-6.1, -1.8)**	**0.00**
Children Who Are							
Boys	**100.0%**	**(100.0, 100.0)**	**96.8%**	**(92.5, 98.7)**	**-3.2**	**(-6.1, -0.4)**	**0.03**
Girls	**99.6%**	**(97.8, 99.9)**	**94.8%**	**(90.4, 97.3)**	**-4.8**	**(-8.2, -1.4)**	**0.01**
Children Who Are Reported to Be[4]							
White Non-Hispanic	100.0%	(100.0, 100.0)	97.7%	(92.8, 99.3)	-2.3	(-5.2, 0.5)	0.10
Black or African American Non-Hispanic	98.9%	(93.2, 99.8)	93.8%	(83.8, 97.8)	-5.1	(-11.9, 1.7)	0.14
Asian Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Other Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Hispanic or Latino	**100.0%**	**(100.0, 100.0)**	**92.0%**	**(80.3, 97.0)**	**-8.0**	**(-16.0, -0.0)**	**0.05**
Children Who Are Reported to Be[4]							
Hispanic or Latino	**100.0%**	**(100.0, 100.0)**	**92.0%**	**(80.3, 97.0)**	**-8.0**	**(-16.0, -0.0)**	**0.05**
Neither Hispanic nor Latino	**99.8%**	**(98.7, 100.0)**	**96.7%**	**(94.0, 98.2)**	**-3.1**	**(-5.3, -0.9)**	**0.01**
Children Whose Height Is[4]							
0 to 36 Inches	**99.8%**	**(98.9, 100.0)**	**95.9%**	**(93.3, 97.5)**	**-3.9**	**(-6.1, -1.8)**	**0.00**
37 to 53 Inches	NA	NA	NA	NA	NA	NA	NA
54 to 56 Inches	NA	NA	NA	NA	NA	NA	NA

Subgroup of Children 0 to 12 Months[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
57 Inches or More	NA	NA	NA	NA	NA	NA	NA
Children Who Weigh[4]							
Up to 19 Pounds	**100.0%**	**(100.0, 100.0)**	**97.1%**	**(93.0, 98.8)**	**-2.9**	**(-5.6, -0.2)**	**0.04**
20 to 40 Pounds	**99.5%**	**(97.4, 99.9)**	**94.0%**	**(87.1, 97.4)**	**-5.5**	**(-10.5, -0.5)**	**0.03**
41 to 60 Pounds	NA	NA	NA	NA	NA	NA	NA
61 Pounds or More	NA	NA	NA	NA	NA	NA	NA
Children Surveyed at							
Gas Station	**100.0%**	**(100.0, 100.0)**	**89.3%**	**(79.4, 94.8)**	**-10.7**	**(-18.3, -3.1)**	**0.01**
Fast-Food Restaurant	NA	NA	NA	NA	NA	NA	NA
Day Care Center	100.0	(100.0, 100.0)	99.1%	(96.5, 99.8)	-0.9	(-2.3, 0.4)	0.17
Recreation Center	NA	NA	NA	NA	NA	NA	NA

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains.

[2] Use of car seats (forward- or rear-facing), booster seats, and seat belts. 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.

[3] The Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[4] Race, ethnicity, height, weight, and age of children are obtained by asking an adult occupant.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.

[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

NA: Data not sufficient to produce a reliable estimate.

Sources: NSUBS, NCSA, 2021, 2023

Table 7. Restraint Use Among Children 1 to 3 Years Old

Subgroup of Children 1 to 3 Years Old[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
All Children 1 to 3 Years Old	93.7%	(89.0, 96.4)	93.6%	(90.5, 95.8)	0.0	(-5.2, 5.1)	0.99
Children Who Are							
Boys	94.5%	(90.4, 97.0)	93.2%	(90.4, 95.1)	-1.4	(-5.4, 2.6)	0.49
Girls	92.8%	(86.9, 96.1)	94.1%	(89.9, 96.6)	1.3	(-5.5, 8.1)	0.69
Children Who Are Reported to Be[4]							
White Non-Hispanic	97.7%	(95.5, 98.8)	98.1%	(96.4, 99.0)	0.5	(-1.9, 2.8)	0.70
Black or African American Non-Hispanic	83.6%	(63.8, 93.7)	82.3%	(73.6, 88.6)	-1.3	(-20.5, 17.8)	0.89
Asian Non-Hispanic	**94.1%**	**(90.4, 96.4)**	**98.4%**	**(87.4, 99.8)**	**4.4**	**(1.5, 7.2)**	**0.00**
Other Non-Hispanic	91.9%	(80.6, 96.9)	94.0%	(88.5, 96.9)	2.1	(-6.7, 10.8)	0.63
Hispanic or Latino	93.0%	(88.6, 95.8)	92.7%	(89.1, 95.2)	-0.3	(-4.5, 3.9)	0.88
Children Who Are Reported to Be[4]							
Hispanic or Latino	93.0%	(88.6, 95.8)	92.7%	(89.1, 95.2)	-0.3	(-4.5, 3.9)	0.88
Neither Hispanic nor Latino	93.8%	(88.1, 96.9)	93.8%	(90.2, 96.2)	0.0	(-6.0, 6.0)	0.99
Children Whose Height Is[4]							
0 to 36 Inches	92.6%	(86.2, 96.1)	93.6%	(90.9, 95.5)	1.0	(-5.0, 7.0)	0.73
37 to 53 Inches	96.9%	(95.0, 98.1)	93.7%	(86.9, 97.1)	-3.2	(-8.7, 2.4)	0.26
54 to 56 Inches	NA	NA	NA	NA	NA	NA	NA
57 Inches or More	NA	NA	NA	NA	NA	NA	NA
Children Who Weigh[4]							
Up to 19 Pounds	93.7%	(68.1, 99.0)	94.3%	(70.1, 99.1)	0.6	(-18.2, 19.4)	0.95
20 to 40 Pounds	93.7%	(89.0, 96.4)	94.5%	(92.0, 96.3)	0.9	(-3.7, 5.5)	0.70

Subgroup of Children 1 to 3 Years Old[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
41 to 60 Pounds	93.6%	(85.4, 97.3)	79.9%	(65.6, 89.2)	-13.7	(-28.2, 0.7)	0.06
61 Pounds or More	NA	NA	NA	NA	NA	NA	NA
Children Surveyed at							
Gas Station	90.7%	(86.2, 93.8)	88.4%	(80.0, 93.5)	-2.3	(-9.4, 4.7)	0.50
Fast-Food Restaurant	86.6%	(73.4, 93.8)	94.4%	(84.6, 98.1)	7.7	(-4.9, 20.3)	0.22
Day Care Center	94.7%	(88.4, 97.7)	94.4%	(90.9, 96.6)	-0.3	(-6.6, 6.0)	0.92
Recreation Center	95.8%	(89.6, 98.4)	94.0%	(86.8, 97.4)	-1.8	(-9.0, 5.4)	0.61

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains.

[2] Use of car seats (forward- or rear-facing), booster seats, and seat belts. 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.

[3] The Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[4] Race, ethnicity, height, weight, and age of children are obtained by asking an adult occupant.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.

[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

NA: Data not sufficient to produce a reliable estimate.

Sources: NSUBS, NCSA, 2021, 2023

Table 8. Restraint Use Among Children 4 to 7 Years Old

Subgroup of Children 4 to 7 Years Old[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
All Children 4 to 7	89.4%	(84.6, 92.9)	86.8%	(80.9, 91.1)	-2.6	(-9.2, 4.0)	0.43
Children Who Are							
Boys	89.5%	(84.3, 93.2)	87.8%	(81.8, 92.1)	-1.7	(-8.7, 5.3)	0.62
Girls	89.3%	(84.3, 92.8)	85.8%	(79.5, 90.4)	-3.5	(-10.2, 3.2)	0.29
Children Who Are Reported to Be[4]							
White Non-Hispanic	93.4%	(88.6, 96.3)	94.6%	(90.5, 97.0)	1.1	(-4.1, 6.4)	0.66
Black or African American Non-Hispanic	78.9%	(67.7, 87.0)	73.2%	(60.8, 82.8)	-5.7	(-22.7, 11.2)	0.49
Asian Non-Hispanic	95.9%	(88.7, 98.6)	97.0%	(85.8, 99.4)	1.1	(-2.7, 4.9)	0.57
Other Non-Hispanic	86.7%	(76.5, 92.9)	86.7%	(74.3, 93.7)	0.1	(-13.7, 13.8)	0.99
Hispanic or Latino	**85.3%**	**(78.4, 90.3)**	**77.3%**	**(68.6, 84.1)**	**-8.0**	**(-15.9, -0.2)**	**0.05**
Children Who Are Reported to Be[4]							
Hispanic or Latino	**85.3%**	**(78.4, 90.3)**	**77.3%**	**(68.6, 84.1)**	**-8.0**	**(-15.9, -0.2)**	**0.05**
Neither Hispanic nor Latino	90.4%	(85.2, 93.9)	88.9%	(82.8, 93.0)	-1.5	(-8.8, 5.8)	0.68
Children Whose Height Is[4]							
0 to 36 Inches	87.0%	(80.4, 91.6)	80.3%	(71.1, 87.2)	-6.7	(-14.5, 1.2)	0.10
37 to 53 Inches	90.3%	(85.5, 93.6)	88.1%	(82.2, 92.2)	-2.2	(-8.8, 4.4)	0.50
54 to 56 Inches	86.1%	(73.3, 93.3)	89.0%	(77.3, 95.1)	2.9	(-9.1, 15.0)	0.62
57 Inches or More	NA	NA	88.2%	(74.6, 95.0)	NA	NA	NA

Subgroup of Children 4 to 7 Years Old[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Weigh[4]							
Up to 19 Pounds	NA	NA	NA	NA	NA	NA	NA
20 to 40 Pounds	88.5%	(81.4, 93.2)	90.1%	(85.2, 93.5)	1.6	(-5.9, 9.0)	0.67
41 to 60 Pounds	91.1%	(87.1, 93.9)	86.5%	(81.0, 90.5)	-4.6	(-10.1, 1.0)	0.10
61 Pounds or More	85.2%	(76.9, 90.9)	76.8%	(62.1, 87.0)	-8.4	(-25.7, 8.8)	0.33
Children Surveyed at							
Gas Station	84.5%	(75.7, 90.5)	80.2%	(73.3, 85.6)	-4.4	(-14.8, 6.1)	0.40
Fast-Food Restaurant	85.8%	(75.5, 92.2)	82.7%	(74.8, 88.5)	-3.1	(-13.1, 6.8)	0.53
Day Care Center	91.6%	(86.7, 94.8)	89.0%	(82.3, 93.4)	-2.6	(-9.0, 3.8)	0.41
Recreation Center	88.2%	(79.4, 93.6)	91.2%	(82.5, 95.8)	3.0	(-6.3, 12.3)	0.51

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains.

[2] Use of car seats (forward- or rear-facing), booster seats, and seat belts. 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.

[3] The Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[4] Race, ethnicity, height, weight, and age of children are obtained by asking an adult occupant.

[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.

[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.

[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.

NA: Data not sufficient to produce a reliable estimate.

Sources: NSUBS, NCSA, 2021, 2023

Table 9. Restraint Use Among Children 8 to 12 Years Old

Subgroup of Children 8 to 12 Years Old[1,4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
All Children 8 to 12	86.8%	(81.8, 90.6)	83.8%	(76.7, 89.0)	-3.0	(-10.7, 4.6)	0.42
Children Who Are							
Boys	86.1%	(79.4, 90.8)	83.6%	(76.9, 88.7)	-2.4	(-10.7, 5.8)	0.55
Girls	87.6%	(83.2, 90.9)	83.9%	(75.8, 89.7)	-3.6	(-11.8, 4.5)	0.37
Children Who Are Reported to Be[4]							
White Non-Hispanic	91.9%	(86.7, 95.2)	91.8%	(86.1, 95.3)	-0.1	(-5.7, 5.5)	0.98
Black or African American Non-Hispanic	73.6%	(55.3, 86.3)	67.8%	(49.8, 81.7)	-5.8	(-34.1, 22.4)	0.68
Asian Non-Hispanic	90.7%	(81.3, 95.6)	84.8%	(70.9, 92.7)	-5.8	(-19.8, 8.2)	0.40
Other Non-Hispanic	82.9%	(65.9, 92.3)	90.2%	(79.4, 95.6)	7.3	(-7.5, 22.1)	0.32
Hispanic or Latino	83.0%	(76.3, 88.1)	81.9%	(73.6, 88.1)	-1.1	(-9.0, 6.8)	0.78
Children Who Are Reported to Be[4]							
Hispanic or Latino	83.0%	(76.3, 88.1)	81.9%	(73.6, 88.1)	-1.1	(-9.0, 6.8)	0.78
Neither Hispanic nor Latino	87.9%	(82.3, 91.8)	84.2%	(76.5, 89.7)	-3.7	(-12.4, 5.1)	0.40
Children Whose Height Is[4]							
0 to 36 Inches	NA	NA	NA	NA	NA	NA	NA
37 to 53 Inches	83.0%	(75.3, 88.6)	84.1%	(76.9, 89.4)	1.2	(-8.4, 10.7)	0.81
54 to 56 Inches	**93.2%**	**(88.2, 96.1)**	**84.6%**	**(77.3, 89.9)**	**-8.5**	**(-16.0, -1.1)**	**0.03**
57 Inches or More	87.5%	(81.5, 91.8)	83.7%	(74.4, 90.0)	-3.8	(-12.5, 4.8)	0.37

Subgroup of Children 8 to 12 Years Old[1] [4]	2021		2023		2021-2023 Change		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[7]	95% Confidence Interval[5]	*P*-value[6]
Children Who Weigh[4]							
Up to 19 Pounds	NA	NA	NA	NA	NA	NA	NA
20 to 40 Pounds	NA	NA	NA	NA	NA	NA	NA
41 to 60 Pounds	84.5%	(77.0, 89.9)	87.6%	(82.7, 91.2)	3.1	(-5.0, 11.2)	0.44
61 Pounds or More	87.3%	(82.3, 91.1)	82.7%	(74.3, 88.7)	-4.7	(-13.2, 3.8)	0.27
Children Surveyed at							
Gas Station	85.0%	(77.8, 90.2)	76.9%	(69.2, 83.1)	-8.2	(-16.8, 0.5)	0.06
Fast-Food Restaurant	86.1%	(73.7, 93.2)	92.9%	(86.0, 96.5)	6.8	(-4.1, 17.6)	0.21
Day Care Center	93.1%	(85.8, 96.8)	85.6%	(69.7, 93.9)	-7.5	(-20.5, 5.4)	0.24
Recreation Center	82.1%	(71.5, 89.3)	85.6%	(72.9, 92.9)	3.6	(-10.6, 17.7)	0.61

[1] Survey data is obtained on children newborn to 12 years old in passenger vehicles at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains.
[2] Use of car seats (forward- or rear-facing), booster seats, and seat belts. 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.
[3] The Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[4] Race, ethnicity, height, weight, and age of children are obtained by asking an adult occupant.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.
[7] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
NA: Data not sufficient to produce a reliable estimate.
Sources: NSUBS, NCSA, 2021, 2023

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Occupants Traveling With Children

Although its primary purpose is to estimate booster seat use among 4- to 7-year-olds, the NSUBS also collects information on the race and ethnicity of other occupants traveling with children. This section reports the restraint use, by race and ethnicity, of occupants traveling with children from the 2023 NSUBS.

The NSUBS data collectors approach passenger vehicles appearing to have child occupants under 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. The approximate ages of non-child occupants (expressed as an age range, such as 16 to 24 years old) and the sexes of all occupants are subjectively assessed by the data collectors. Since race and ethnicity of all occupants are obtained through interviews, NSUBS gives more accurate estimates on race and ethnicity of passenger vehicle occupants. However, it should be noted that by design and necessity, the NSUBS survey only collects restraint use of vehicle occupants who are transporting or riding with children under 13 to a restricted set of sites such as gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains, not of all vehicle occupants on the road.

The major findings from the 2023 survey on the demographic characteristics of occupants traveling with children include the following.

- Seat belt use is lower for Black non-Hispanics or African Americans than White non-Hispanics and Hispanics among passenger vehicle occupants 13 to 15 years old traveling with children (Figure 17).
- Seat belt use is lower for Hispanics than White non-Hispanics among passenger vehicle occupants 16 to 24 years old traveling with children (Figure 17).
- Seat belt use is lower for Black non-Hispanics or African Americans than Asian non-Hispanics, White non-Hispanics, Other non-Hispanics, and Hispanics among passenger vehicle occupants 25 to 69 years old traveling with children (Figure 17).
- Among occupants 13 to 15 years old, 16 to 24 years old, and 25 to 69 years old, seat belt use by non-Hispanics is higher than by Hispanics (Figure 18).
- Among occupants 13 to 15 years old, restraint use for Black non-Hispanics or African Americans occupants increased from 53.3 percent in 2021 to 63.7 percent in 2023 (Table 10), while restraint use for Hispanic occupants decreased from 93.2 percent in 2021 to 80.1 percent in 2023.
- Among occupants 16 to 24 years old, restraint use for Hispanic occupants decreased from 78.2 percent in 2021 to 76.6 percent in 2023 (Table 10).
- Among occupants 25 to 69 years old, restraint use for Black non-Hispanics or African Americans decreased from 82.9 percent in 2021 to 75.6 percent in 2023, while restraint use for Hispanic occupants also decreased from 94.1 percent in 2021 to 88.0 percent in 2023.
- Among occupants 70 years old or more, restraint use for non-Hispanic occupants decreased from 97.4 percent in 2021 to 90.2 percent in 2023.

Note that if a column corresponding to a data series or data category is missing from a figure or table in this section, it means that there is not sufficient data to produce a reliable estimate for the data category. Also, some estimates might not sum to totals due to rounding.

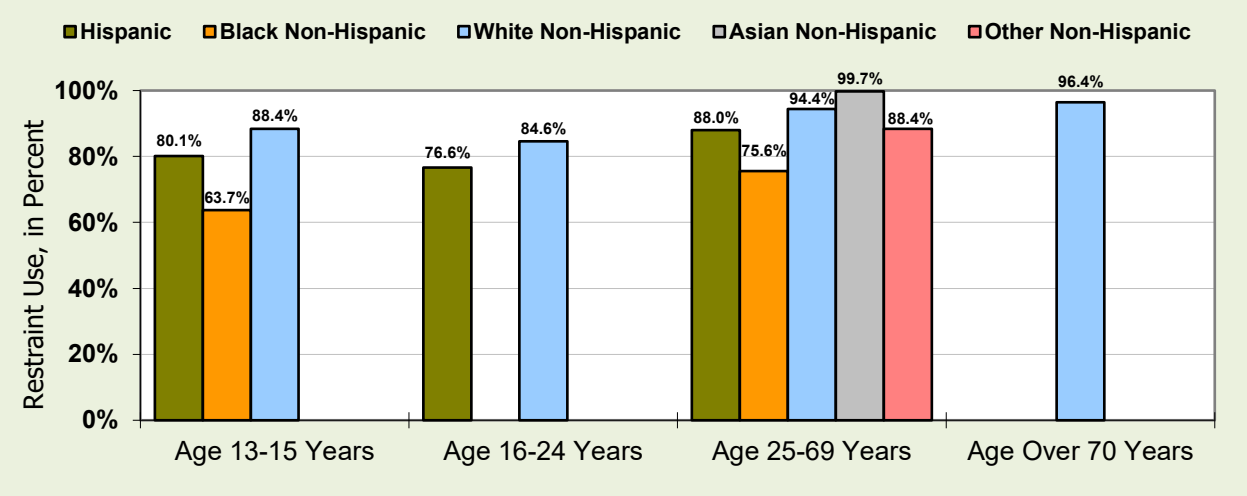

Figure 17. Restraint Use by Age and Race/Ethnicity for Occupants Traveling With Children in 2023

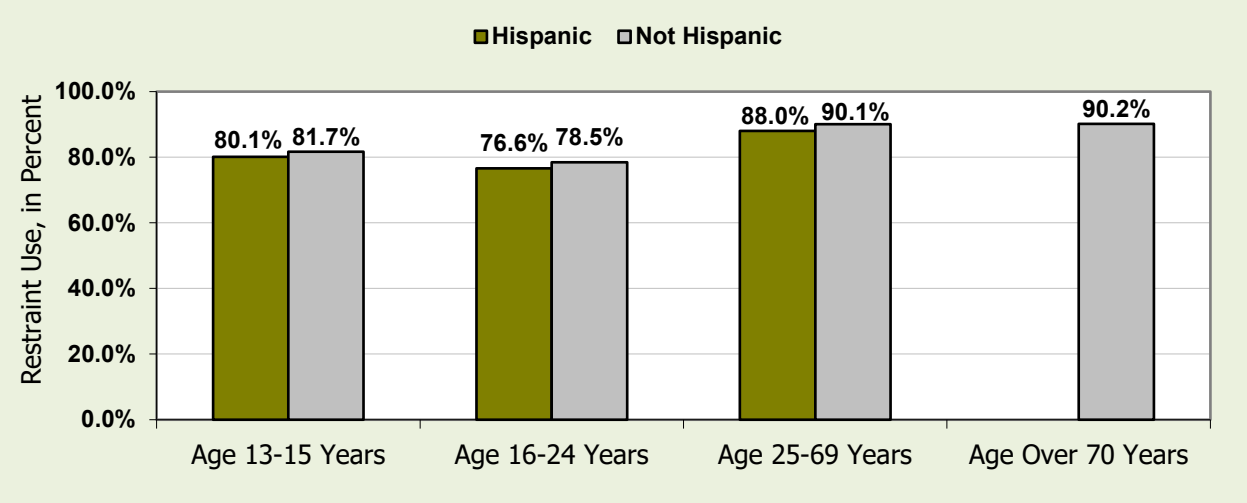

Figure 18. Restraint Use by Age and Hispanic Origin for Occupants Traveling With Children in 2023

Table 10. Restraint Use of Occupants Traveling With Children by Age and Race/Ethnicity

Subgroup of Children 13 Years and Older[1] [4]	2021		2023		2021-2023		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[8]	95% Confidence Interval[5]	*P*-value[6]
Occupants 13 to 15 Years Old							
Occupants Reported to Be[7]							
White Non-Hispanic	92.8%	(80.4, 97.6)	88.4%	(77.7, 94.3)	-4.5	(-16.3, 7.4)	0.45
Black or African American Non-Hispanic	53.3%	(39.1, 67.0)	63.7%	(33.6, 85.9)	10.4	(-25.5, 46.4)	0.56
Asian Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Other Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Hispanic or Latino	93.2%	(81.3, 97.7)	80.1%	(50.8, 94.0)	-13.1	(-37.9, 11.7)	0.29
Occupants Reported to Be[7]							
Hispanic or Latino	93.2%	(81.3, 97.7)	80.1%	(50.8, 94.0)	-13.1	(-37.9, 11.7)	0.29
Neither Hispanic nor Latino	77.0%	(64.7, 85.9)	81.7%	(70.3, 89.4)	4.7	(-9.4, 18.8)	0.50
Occupants 16 to 24 Years Old							
Occupants Reported to Be[7]							
White Non-Hispanic	84.8%	(74.8, 91.3)	84.6%	(60.5, 95.1)	-0.2	(-18.3, 17.9)	0.98
Black or African American Non-Hispanic	70.0%	(37.8, 90.0)	NA	NA	NA	NA	NA
Asian Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Other Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Hispanic or Latino	78.2%	(55.2, 91.3)	76.6%	(55.0, 89.8)	-1.6	(-25.6, 22.4)	0.89
Occupants Reported to Be[7]							
Hispanic or Latino	78.2%	(55.2, 91.3)	76.6%	(55.0, 89.8)	-1.6	(-25.6, 22.4)	0.89
Neither Hispanic nor Latino	78.9%	(61.5, 89.7)	78.5%	(65.1, 87.7)	-0.4	(-16.3, 15.6)	0.96

Subgroup of Children 13 Years and Older[1] [4]	2021		2023		2021-2023		
	Estimated Restraint Use[2]	95% Confidence Interval[3]	Estimated Restraint Use[2]	95% Confidence Interval[3]	Change in Percentage Points[8]	95% Confidence Interval[5]	*P*-value[6]
Occupants 25 to 69 Years Old							
Occupants Reported to Be[7]							
White Non-Hispanic	94.2%	(91.7, 95.9)	94.4%	(91.1, 96.5)	0.2	(-3.4, 3.8)	0.90
Black or African American Non-Hispanic	82.9%	(66.4, 92.3)	75.6%	(58.3, 87.4)	-7.3	(-30.9, 16.3)	0.53
Asian Non-Hispanic	97.0%	(85.7, 99.4)	99.7%	(98.1, 99.9)	2.7	(-2.4, 7.7)	0.29
Other Non-Hispanic	88.1%	(76.2, 94.4)	88.4%	(80.2, 93.4)	0.3	(-11.4, 12.0)	0.96
Hispanic or Latino	94.1%	(90.8, 96.2)	88.0%	(79.7, 93.2)	-6.1	(-12.9, 0.8)	0.08
Occupants Reported to Be[7]							
Hispanic or Latino	94.1%	(90.8, 96.2)	88.0%	(79.7, 93.2)	-6.1	(-12.9, 0.8)	0.08
Neither Hispanic nor Latino	92.0%	(86.7, 95.3)	90.1%	(83.8, 94.1)	-2.0	(-9.5, 5.5)	0.60
Occupants Over 70 Years Old							
Occupants Reported to Be[7]							
White Non-Hispanic	97.6%	(86.2, 99.6)	96.4%	(86.5, 99.1)	-1.2	(-8.6, 6.2)	0.74
Black or African American Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Asian Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Other Non-Hispanic	NA	NA	NA	NA	NA	NA	NA
Hispanic or Latino	NA	NA	NA	NA	NA	NA	NA
Occupants Reported to Be[7]							
Hispanic or Latino	NA	NA	NA	NA	NA	NA	NA
Neither Hispanic nor Latino	97.4%	(89.4, 99.4)	90.2%	(77.9, 96.1)	-7.2	(-17.4, 3.0)	0.16

[1] Survey data is obtained on drivers and passengers of passenger vehicles appearing to contain a child under 13 years old at a nationwide probability sample of gas stations, day care centers, recreation centers, and restaurants in seven fast-food chains.
[2] 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.
[3] The Wilson confidence interval is used in the estimated percentages in the children group (e.g., children in high-backed booster seats), which is in the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/\left(2(n_{EFF} + t^2)\right)$, where p is the estimated percentage of belt use, $n_{EFF} = n/D_{EFF}$ is the effective sample size (where n is the sample size and D_{EFF} is the design effect), $t = t_{(1-\alpha/2)}(df)$, is a multiplier from the t-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.
[4] The degree of statistical confidence in the 2023 use rate is different from the 2021 rate.
[5] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{(1-\alpha/1)}(df)\sqrt{v(p)}$, where p is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{(1-\alpha/2)}(df)$ is a multiplier from the t-distribution with df degrees of freedom. The degrees of freedom in 2023 is different from that used in 2021.
[6] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the year-over-year estimates for the group in question; **indicated with bold type**.
[7] Race and ethnicity of all occupants are obtained by interviewing an adult occupant in the vehicle (usually the driver).
[8] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the rounded estimates displayed in the table.
NA: Data not sufficient to produce a reliable estimate.
Sources: NSUBS, NCSA, 2021, 2023

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NSUBS Methodology

This section briefly discusses the sample design, sample size, data collection, and estimation used in the 2023 NSUBS. For sample design prior to the 2015 NSUBS, refer to the 2006 NSUBS – Methodology Report (Glassbrenner, 2009).

Sample Design

The 2013 and prior NSUBS surveys used a design that was based on a subset of PSUs used for the NOPUS. In 2015 NSUBS was redesigned and became totally independent from NOPUS. The 2023 NSUBS uses a three-stage design.

The first stage sampling is selecting a sample of geographic areas, called PSUs. A PSU is a single county or a group of adjacent counties within State boundaries. There are 1,601 PSUs in the sampling frame, covering the continental United States excluding Alaska and Hawaii. These PSUs are then grouped into eight strata by Census region (Northeast, Midwest, South, and West) and the status of whether the State of the PSU enacted a child restraint use law as of 2014 that covers children up to age 7 at the minimum. A PSU sample of 30 was selected from the sampling frame using the probability-proportional-to-size sampling method with the measure of size of the number of children up to age 7 based on the 2012 Census population data.

The second stage of the design is selecting a sample of data collection sites within each PSU. The site sampling frame consists of gas stations, recreation centers, day care centers, and fast-food restaurants in the NSUBS' 30 sampled PSUs. These four site types make four strata. A new site sample size was determined and allocated proportionally to each site type according to the site frame size. The total number of sites in the frame was 20,510 for the 30 selected PSUs. The NSUBS selected 942 sites using stratified systematic sampling within each site type after sorting the sites by ZIP Code for good geographic dispersion.

The third stage is the selection of all passenger vehicles with child occupants who are observed at the respondent sites.

Sample Size

The PSU sample size for the 2006 design was only 16, and it had been problematic because it caused unstable point and variance estimates. In the 2015 NSUBS redesign, an increase of the PSU sample size to 30 was achieved without substantially increasing the survey cost. The increased sample size of 30 PSUs eliminated the need of a special variance estimator and substantially simplified the variance estimation as well as improved the sampling efficiency.

To correct for the uneven distribution of PSU samples across the Census regions, the new design uses proportional allocation to the total measure of size, which calls for selecting 5, 7, 11, and 7 PSUs from the Northeast, Midwest, South, and West regions, respectively.

Due to the nature of the survey, the NSUBS data collectors must obtain cooperation from the sample sites. Cooperation with recreation centers and day care centers is obtained in advance of visiting these sites via sending letters requesting cooperation followed by phone calls to secure cooperation. For fast-food restaurants and gas stations, trained data collectors approach each establishment in person to secure cooperation.

For the 2023 NSUBS, data was collected in 550 out of 942 sampled sites. Out of the 942 sampled sites, 751 sites were eligible for the survey, which equates to a response rate of 73.2 percent (550/751). Of the 550 data collection sites, 297 were gas stations, 87 fast-food restaurants, 113 daycare centers, and 53 recreation centers.

Table 11 shows the observed sample size of the 2023 NSUBS. A total of 14,041 occupants were observed in the 5,190 vehicles at the 550 data collection sites. Of these observed occupants, 7,746 were children newborn to 12 years old. The data on 6,727 children newborn to 12 years old was obtained by interviews with adult occupants who were traveling together with those children.

Table 11. Sites, Vehicle, Occupants, and Children Newborn to 12 Years Old in NSUBS

Numbers of	2021	2023	Percentage Change
Data collection sites	510	550	7.84
Vehicles observed	5,249	5,190	-1.12
Occupants observed	14,604	14,041	-3.86
Children newborn to 12 years old observed	7,896	7,746	-1.90
Children newborn to 12 years old interviewed*	6,687	6,727	0.60

* Data obtained by interview with an adult occupant.

Data Collection

The 2023 NSUBS data collection was conducted from 7 a.m. to 6 p.m. during the period from July 14 to July 29, 2023. The data collection protocols had no major changes from the 2006 design to 2015 design.

Trained 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 and the heights, weights, and ages of child occupants appearing to be under 13. The approximate ages of other occupants (expressed as an age range, such as 16 to 24 years old) and the sexes of all occupants are subjectively assessed by the data collectors. Starting in 2019, the exact age of the driver was obtained.

Note that the data on race and ethnicity in the NSUBS is collected via self-reporting in compliance with OMB standards. NHTSA obtained approval to collect race and ethnicity data for the 2021 and 2023 surveys under OMB clearance number 2127-0644. The notice of OMB review is in the Federal Register, Volume 84, Number 24, page 1819, February 5, 2019 (84 F.R., 2019)

To capture restraint use before children unfasten the restraints, data collectors observe restraint use prior to or just as the vehicles come to a stop, except at fast-food drive-through lanes. In that case, restraint use is observed prior to the vehicles reaching the drive-through window.

To reach as many respondents as possible, the NSUBS uses some Spanish-speaking data collectors.

Estimation

There was no change in weighting from the 2006 survey design to the 2015 survey design. However, there were substantial changes in the way to estimate the variance in the 2015 survey design as compared to the 2006 survey design.

Let C denote the characteristic of occupants and R denote restraint type. The NSUBS estimates the rate of occupants restrained in restraint type R among the occupants having characteristic C by the following formula,

$$Restraint\ Use_{CR} = \frac{\sum_{i,j,k} w_{ijk} F_{ijk} CR_{ijk}}{\sum_{i,j,k} w_{ijk} F_{ijk} C_{ijk}},$$

where w_{ijk} and F_{ijk}, respectively, denote the base weight and the product of various weight adjustment factors at the site k in the stratum j of the PSU i. CR_{ijk} stands for the number of observed occupants having characteristic C and restrained in restraint type R and C_{ijk} denotes the number of observed occupants having characteristic C at the site k in the stratum j of the PSU i. For example, the booster seat use among 4- to 7-year-old children is estimated using the above formula, where CR_{ijk} is the number of observed children 4 to 7 years old in booster seat and $C_{ijk}$is the number of observed children 4 to 7 years old at the site k in the stratum j of the PSU i.

The variance estimation method used for the 2006 design is very complex due to the small PSU sample size. The PSU sample size has been increased from 16 to 30, and we expect the commonly used variance estimators would be reasonably stable. We continue to use the jackknife variance estimation method with modifications to reflect the new design.

Note that the NSUBS site sampling frame is restricted to the four site types: gas stations, day care centers, recreation centers, and fast-food restaurants as described in the sample design subsection. Since the NSUBS uses a probability sample of these site types, the NSUBS estimates are nationally representative of children who frequently visit these types of sites. For instance, 33.6 percent booster seat use among 4- to 7-year-old children as shown in Figure 1 means that among children in 2023 in this age range who were taken by passenger vehicles to gas stations, day care centers, recreation centers, or fast-food restaurants, 33.6 percent were in booster seats.

NHTSA used the following data reporting guidelines for the NOPUS and NSUBS publications: Estimates whose numerator is based on fewer than five observations in the sample, and/or whose denominator is based on fewer than 30 observations in the sample, or that are not statistically different from zero percent are reported as “NA” in publications, including any related estimates (i.e., change in use and confidence estimates). Also note that “NA” estimates do not appear in the figures throughout this report (they are displayed as missing columns in the figures).

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