

Motor Vehicle Occupant Safety Fact Sheet

LAST UPDATED SEPTEMBER 2023

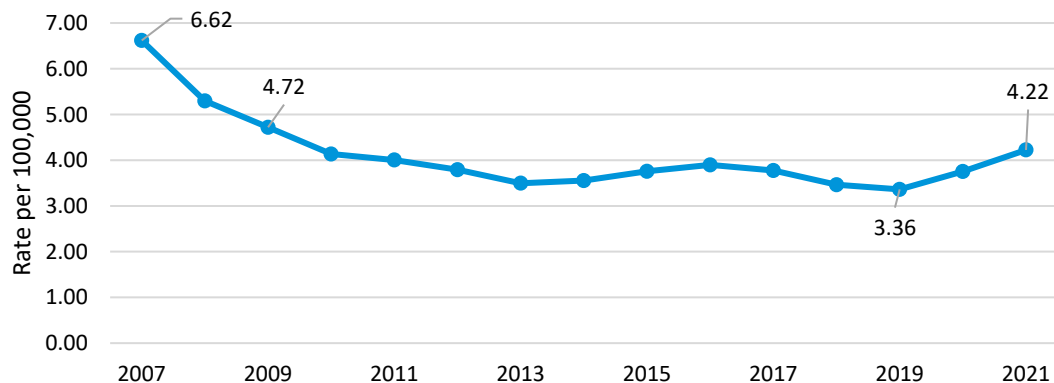
A total of 3,469 children ages 0 to 19 years were fatally injured and another 386,031 were nonfatally injured as occupants in motor vehicle crashes (MVC) in 2021.¹

This fact sheet focuses on children between the ages of 0 and 19 years who suffered fatal or nonfatal injuries as occupants in MVCs in the U.S. between 2007 and 2021. It also includes data on not-in-traffic incidents involving pediatric vehicular heatstroke deaths and fatal and nonfatal backover-related injuries.

Fatal Injuries

- A total of 3,469 child occupants were fatally injured in MVCs in 2021, for a rate of 4.22 per 100,000.^{1,2}
- The rate of fatal injuries among child occupants decreased by 36 percent between 2007 and 2021 (Figure 1). The rate decrease varied with age, with a greater decrease among older children than younger children. Rates decreased by 40 percent among children ages 13 to 19 years (14.83 to 8.95 per 100,000, respectively) compared to 21 percent for children ages 0 to 12 years (1.82 to 1.44 per 100,000, respectively).^{1,2}
- Although the overall rate of fatal injuries among child occupants decreased between 2007 and 2021, it increased by 26 percent between 2019 and 2021. During this period the rate among children ages 13 to 19 years increased by 26 percent (7.12 to 8.95 per 100,000, respectively) compared to 16 percent for children ages 0 to 12 years (1.25 to 1.44 per 100,000, respectively).^{1,2}

Figure 1. Rate of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants, Ages 0–19 Years, 2007–2021



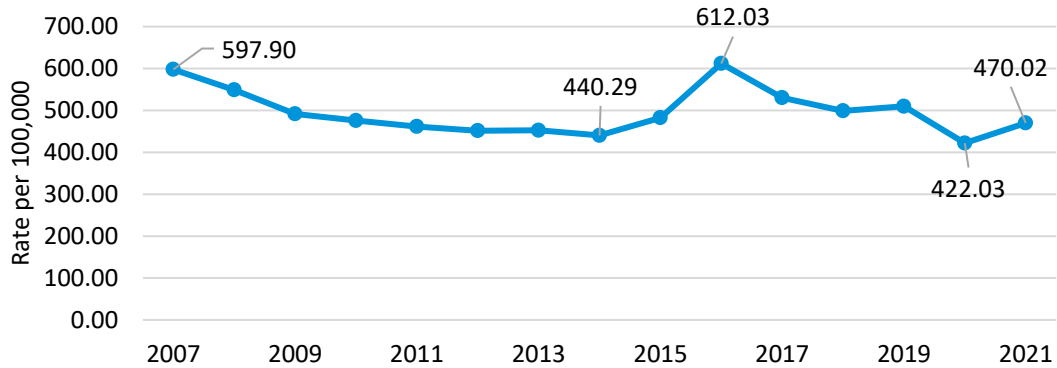
-
- In addition to children dying as occupants in MVCs, on average, 38 children die each year as a result of pediatric vehicular heatstroke (PVH) when they are left in or gain access to a hot vehicle and are unable to escape.³
 - While there was a significant decrease in the annual number of PVH deaths during the first two years of the COVID pandemic (26 and 23 deaths, respectively, in 2020 and 2021), the number increased again in 2022 to 36 deaths.³
 - More than half of PVH death occur after a parent or caregiver unknowingly leaves the child unattended in a vehicle, 15 percent occur when a child is knowingly left, and 25 percent occur when a child gains access to a vehicle without the caregiver's awareness.³
 - Children under the age of 4 years account for 88 percent of PVH deaths, with children under 2 years of age accounting for 55 percent.³
 - On average, two children die each week as a result of vehicle backover incidents.⁴ These incidents typically occur when a vehicle is backing out of a driveway or parking space and an unattended child unseen by the driver is struck. Children under the age of 5 years are at greatest risk of being killed or seriously injured as a result of backover incidents. In over 70 percent of cases, the driver is a parent or close relative.⁴

Nonfatal Injuries

- An estimated 386,031 child occupants were nonfatally injured in MVCs in 2021, for a rate of 470.02 per 100,000. This corresponds to a ratio of fatal to nonfatal injuries of 1:111.^{1,2,5}
- The rate of nonfatal injuries among child occupants decreased by 21 percent between 2007 and 2021 (Figure 2). However, the rate fluctuated over that period. There was a 26 percent decrease in the rate between 2007 and 2014, followed by a 39 percent increase between 2015 and 2016, after which point the rate decreased again by 23 percent between 2016 and 2021.^{2,5}
- The overall decrease in the rate of child occupants nonfatally injured in MVCs between 2007 and 2021 varied by age, with a greater decrease among older children than younger children. Rates decreased by 25 percent among children ages 13 to 19 years (1,150.19 to 866.75 per 100,000, respectively) compared to 14 percent for children ages 0 to 12 years (274.92 to 236.38 per 100,000, respectively).^{2,5}



Figure 2. Rate of Nonfatal Motor Vehicle Crash-Related Injuries Among Child Occupants, Ages 0–19 Years, 2007–2021

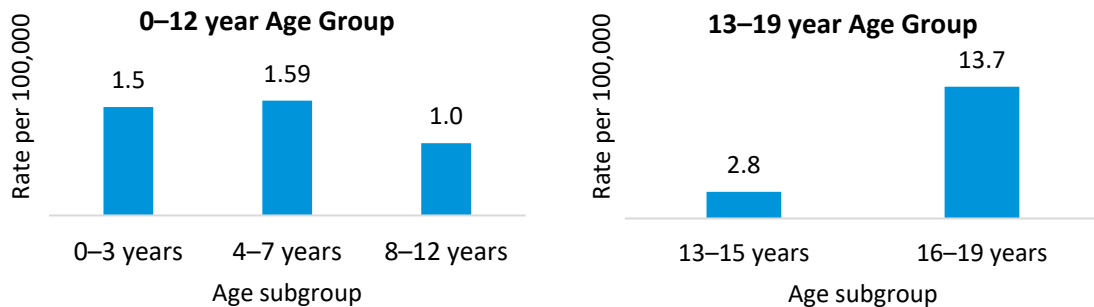


- On average, about 48 children suffer nonfatal injuries each week as a result of vehicle backover incidents.⁴

Risk Factors

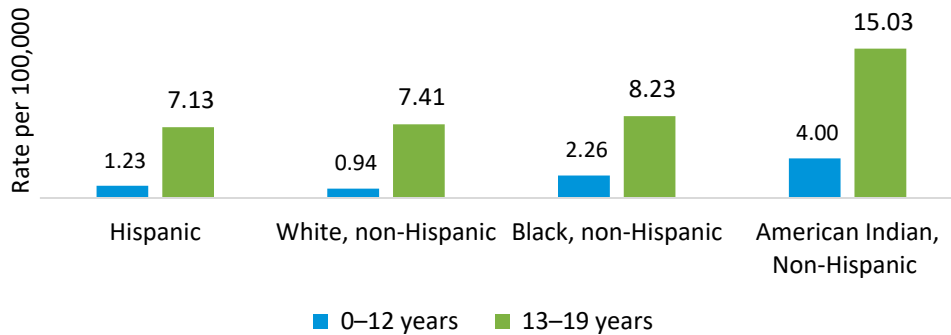
- **Age:** In 2021, the fatal child occupant injury rate was 6.2 times higher among children ages 13 to 19 years compared to children ages 0 to 12 years (8.95 and 1.44 per 100,000, respectively).^{1,2} However, rates varied within these age groups:
 - Within the 0 to 12 year age group, fatal child occupant injury rates were highest for children ages 0 to 3 and 4 to 7 years; at 1.5 and 1.6 times the rate of children ages 8 to 12, respectively (Figure 3).^{1,2}
 - Within the 13 to 19 year age group, the fatal child occupant injury rate was 4.9 times higher for older teens ages 16 to 19 years when compared to younger teens ages 13 to 15 years.^{1,2}

Figure 3. Rates of Fatal Motor Vehicle Crash-Related Injuries Among Children Comparing Children Ages 0–12 and 13–19 Years by Age Subgroup, 2021



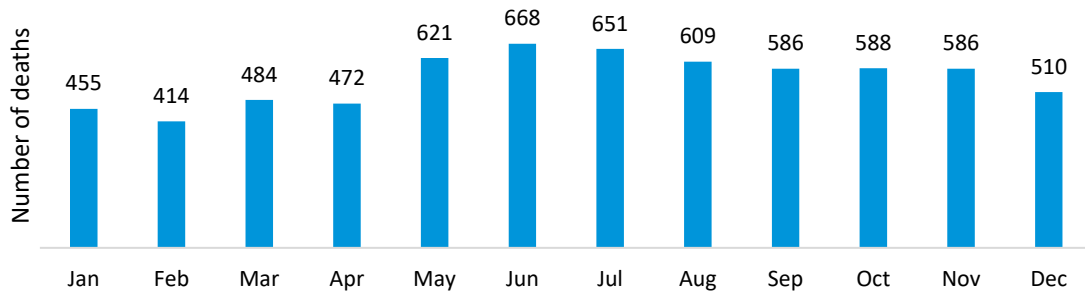
- **Sex:** In 2021, the rate of fatal child occupant injury was 1.7 times higher among males compared to females (5.3 and 3.1 per 100,000, respectively).^{1,2}
- **Race and ethnicity:** Rates of fatal child occupant injury for between 2018 and 2020 were highest among non-Hispanic American Indian/Alaska Native children followed by non-Hispanic Black children (8.06 and 4.4 per 100,000, respectively), while rates are comparatively lower and similar for non-Hispanic White and Hispanic children (3.35 and 3.28 per 100,000, respectively).^{1,2} However, these disparities varied by age:
 - Among children ages 0 to 12 years, non-Hispanic American Indian/Alaska Native, and Black children are at 4.3 and 2.4 times greater risk, respectively, than that of non-Hispanic White children (Figure 4).^{1,2}
 - Among the 13 to 19 year age group, non-Hispanic American Indian/Alaska Native and Black teens are at 2.1 and 1.2 times greater risk, respectively, than Hispanic teens.^{1,2}

Figure 4. Rates of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants by Race and Age Group, 2018–2020



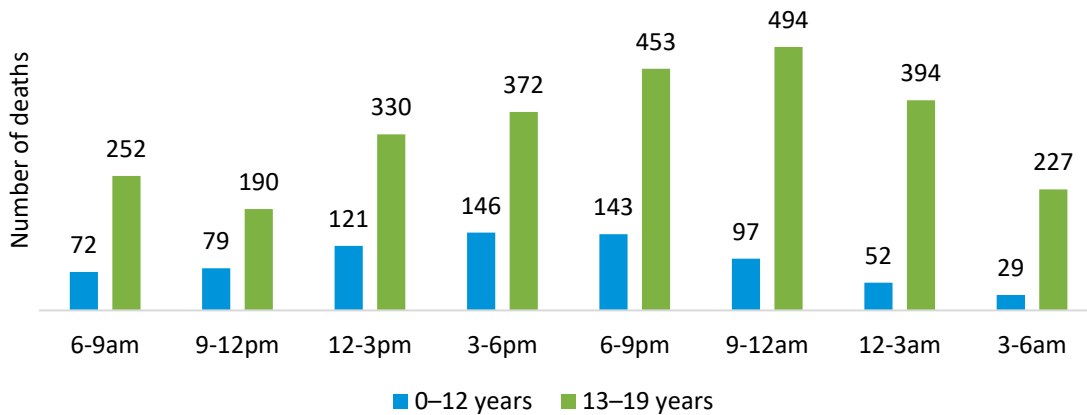
- **Season:** In 2021, fatal occupant injuries among children ages 0 to 19 years were slightly more frequent during the months of May through July (Figure 5).¹

Figure 5. Distribution of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants by Season, Ages 0-19 Years, 2021



- **Time of Day:** In 2021, fatal occupant injuries among children ages 0 to 12 years were most frequent between the hours of 3 PM to 9 PM, compared to fatal injuries among children ages 13 to 19 years which were more frequent between 6 PM and 12 AM.¹

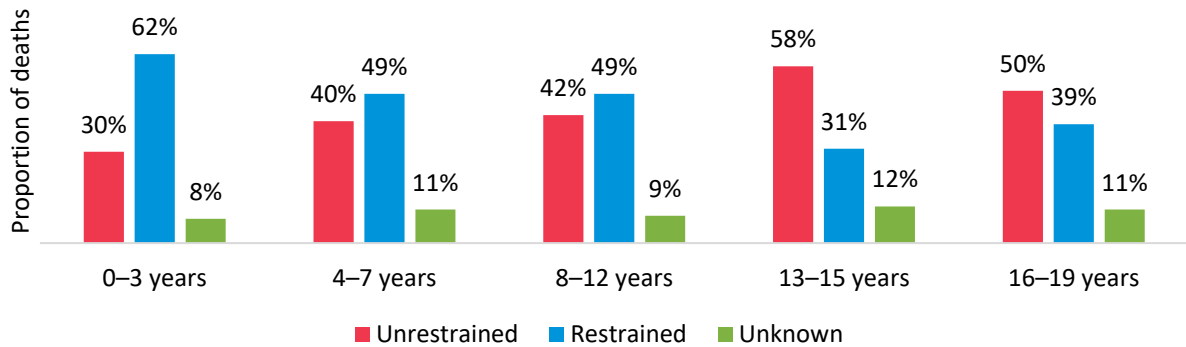
Figure 6. Distribution of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants by Time of Day and Age Group, Ages 0–19 Years, 2021



- **Restraint Use:** Among the 3,077 fatally injured child occupants in 2021 where restraint use is known, 52 percent were unrestrained. Restraint use was lowest among teens ages 13 to 15 years and 16 to 19 years (Figure 7).¹



Figure 7. Distribution of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants by Restraint Use and Age Group, Ages 0–19 Years, 2021



- Rural/Urban:** In 2021, children ages 0 to 19 years living in rural areas were fatally injured as occupants at 6.3 times the rate of children in urban areas (15.4 and 2.4 per 100,000, respectively).^{1,2} This disparity varied slightly by age. The rate among rural children ages 0 to 12 years was 7 times higher compared to their urban counterparts (5.5 and 0.8 per 100,000, respectively) and the rate among rural children ages children ages 13 to 19 years was 6.1 times higher their urban counterparts (32.1 and 5.3, respectively) ^{1,2}
- Geographic location:** Between 2017 and 2021, the rates of fatal occupant injury among children ages 0 to 19 years were highest in Montana, Wyoming, and Alabama and lowest in New York, Hawaii, and Massachussets.^{1,2}



Table 1. Number and Rate per 100,000 of Fatal Motor Vehicle Crash-Related Injuries Among Child Occupants by State, U.S., Ages 0–19 Years, 2017–2021^{1,2}

State	Number	Rate	State	Number	Rate	State	Number	Rate	State	Number	Rate
AK	29	2.92	ID	133	5.28	MT	116	9.01	RI	23	1.90
AL	457	7.42	IL	454	2.87	NC	610	4.72	SC	392	6.29
AR	252	6.45	IN	424	4.81	ND	49	4.84	SD	73	6.04
AZ	402	4.41	KS	217	5.52	NE	141	5.29	TN	488	5.78
CA	1,338	2.70	KY	305	5.41	NH	38	2.59	TX	1,789	4.35
CO	287	4.09	LA	334	5.54	NJ	157	1.43	UT	143	2.76
CT	88	2.11	MA	104	1.33	NM	169	6.32	VA	314	2.99
DC	--	--	MD	171	2.27	NV	92	2.42	VT	29	4.24
DE	46	3.98	ME	61	4.30	NY	298	1.30	WA	208	2.26
FL	1,086	4.60	MI	369	3.05	OH	501	3.45	WI	239	3.34
GA	625	4.45	MN	167	2.30	OK	314	5.90	WV	108	5.33
HI	22	1.32	MO	453	5.90	OR	186	3.85	WY	59	7.95
IA	180	4.37	MS	344	8.79	PA	373	2.48			

--- State-level counts and rates based on fewer than 10 deaths have been suppressed.

Cost of Child Occupant Injuries

- The economic cost of fatal and nonfatal child occupant injuries in MVCs is estimated to have totaled at least \$45.54 billion in the U.S. in 2020 (the latest year for which cost data are available) (Table 2).⁶
- ER treated and released injuries accounted for the highest proportion of economic costs (48 percent), followed by fatal injuries (35 percent).⁶



Table 2. Cost estimates associated with MVC-related occupant injuries among children ages 0 to 19 years in 2020

Cost	Fatal	Nonfatal		Combined (row)
		Hospitalization	ER Treated and Released	
Medical	\$10.47 million	\$2.02 billion	\$1.22 billion	\$3.25 billion
Work Loss	--	\$648.68 million	\$615.83 million	\$1.26 billion
Quality of Life Loss	--	\$5.29 billion	\$19.93 billion	\$25.22 billion
Value of Statistical Life	\$15.80 billion	--	--	\$15.80 billion
Combined (column)	\$15.81 billion	\$7.96 billion	\$21.77 billion	\$45.54 billion

For more information or questions on the information contained in this fact sheet, please contact the SKW Research Department at: mchandler@safekids.org

References

1. National Highway Traffic Safety Administration. Fatality Analysis Reporting System (FARS): 2007-2020 Final File and 2021 Annual Report File (ARF). <https://cdan.dot.gov/query>. Accessed July 1, 2023.
2. Centers for Disease Control and Prevention. US Census Bureau single-race population estimates obtained from CDC WONDER were used for calculating population rates. <https://wonder.cdc.gov/single-race-population.HTML>. Accessed July 1, 2023.
3. KidsAndCars.org. U.S. child hot car death data analysis from the Kids and Car Safety national database (1990-2022). <http://www.kidsandcars.org/wp-content/uploads/2020/07/Child-Hot-Car-Deaths-Data-Analysis.pdf>. Published 2022. Accessed August 30, 2023.
4. KidsAndCars.org. Facts - Backovers. <https://www.kidsandcars.org/backovers/facts>. Published 2023. Accessed August 30, 2023.
5. National Highway Traffic Safety Administration. National Automotive Sampling System General Estimates System (NASS-GES): 2007-2015 and Crash Report Sampling System (CRSS): 2016-2021. <https://cdan.dot.gov/query>. Accessed July 1, 2023.
6. Centers for Disease Control and Prevention (CDC). Number of Injuries and Associated Costs. <https://wisqars.cdc.gov/cost/>. Published 2023. Accessed July 1, 2023.

