



United States

Consumer Product Safety Commission

Consumer Product Safety: Investigation of Racial and Socioeconomic Safety Differences

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This report was prepared by the CPSC staff. It has not been reviewed or approved by, and may not represent the views of, the Commission.

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Executive Summary

The Consumer Product Safety Commission (CPSC) is the U.S. federal agency responsible for protecting the public from unreasonable risks of injury or death associated with consumer products. The CPSC has regulations focused on ensuring the safety of products designed for or commonly used by young children.

In this report, CPSC staff provide the results of a retrospective study that analyzed deaths of infants ages 12 months old or younger from 2013 through 2022 in the five U.S. states that the Centers for Disease Control and Prevention (CDC) identifies as having the highest rate of sudden unexpected infant deaths (SUIDs) (Alabama, Arkansas, Louisiana, Mississippi, and West Virginia). A key finding from the study is that Black or African American infants have twice the risk of SUIDs compared to White infants.

The report transitions to product safety statistics from CPSC National Electronic Injury Surveillance System (NEISS) injuries (emergency department (ED) visits) and fatalities from annual studies published by CPSC. The highlights of the epidemiological studies section provide details about consumer product hazards, comparing injuries and deaths with population estimates from the U.S. Census.

Some of the findings of the studies are summarized below:

- Carbon monoxide (CO) poisoning from portable generators and other non-fire engine-driven tools (EDTs)
 - For deaths, from 2012 through 2022, when race and ethnicity were known, Non-Hispanic Whites constitute around 61 percent of EDT CO poisoning deaths (N=588), compared to an estimated 61 percent of the U.S. population at that time. Black or African American victims constitute 22 percent of such deaths (N=180), compared to estimated 13 percent of the U.S. population at that time.
- Carbon monoxide (CO) poisoning deaths associated with the use of consumer products (non-fire)
 - For deaths, from 2018 through 2022, when race and ethnicity were known, Non-Hispanic Whites constitute 66 percent of all race and ethnicity CO poisoning deaths (N=448 total, an annual average of 149), compared to estimated 60 percent of the U.S. population at that time. Black or African American victims make up around 12 percent of such deaths (N=84 total, an annual average of 28), compared to estimated 13 percent of the U.S. population at that time.
- Electrocutions
 - For deaths, from 2011 through 2020, when race and ethnicity were known, Non-Hispanic Whites constitute around 74 percent of electrocution deaths (N=238 of 321), compared to estimated 62 percent of the U.S. population at that time. Non-Hispanic Black or African American victims make up around 7 percent of such deaths (N=21), compared to estimated 13 percent of the U.S. population.

- Micromobility products
 - For deaths, from 2017 through 2022, where race is known, Non-Hispanic White deaths constitute 56 percent of micromobility deaths (N=28 of 50), compared to estimated 60 percent of the population at that time. Non-Hispanic Black or African American deaths make up 18 percent of such deaths (N=9), compared to estimated 13 percent of the U.S. population.

- Nursery products
 - For deaths, from 2018 through 2020, where race is known, White children (of all ethnicities) under 5 years old constitute 62 percent of nursery product deaths (N=240 of 386), compared to estimated 70 percent of the population for that age, at that time. Black or African American children under 5 years old make up 29 percent of such deaths (N=112), compared to estimated 16 percent of the U.S. population for that age.

- Off-highway vehicles (OHVs)
 - For the 2,056 deaths, from 2018 through 2020, where race is known, Whites (of all ethnicities) constitute around 89 percent of OHV deaths (N=1,835), while making up around 76 percent of the U.S. population at that time. In contrast, Black or African Americans constitute around 6 percent of such deaths (N=118), while making up around 13 percent of the U.S. population.

Introduction

CPSC has jurisdiction over thousands of types of consumer products, from children's toys to portable generators, bicycles, cribs, and toasters. CPSC works to mitigate potential hazards associated with consumer products by collecting and analyzing hazard data, developing safety standards, ensuring compliance and enforcement, and providing consumer safety information and education. This report examines how race, ethnicity, and socioeconomic status are associated with health and safety risks from consumer products.

One of CPSC's fiscal year (FY) 2024 Operating Plan priority activities was to continue the implementation of equity-enhancing mandates in United States (U.S.) Executive Order (EO) 13985: Advancing Racial Equity and Support for Underserved Communities through the Federal Government. The purpose of this executive order is to "pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality." In addition, on March 28, the Office of Management and Budget (OMB) published a set of revisions to Statistical Policy Directive No. 15: Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity (SPD 15), the first since 1997. These revisions will enhance the ability to compare information and data across federal agencies. This report will include efforts made in furtherance of those two directives.

Starting in fiscal year 2021 (FY 2021), CPSC staff began systematically including race and ethnicity characterizations in annual epidemiological reports, reflecting the Agency's commitment to the investigation of and reporting on various demographic characteristics, including race, ethnicity, and socioeconomic status, to understand the magnitude of injury and death disparities.

CPSC staff execute these efforts through collection and analysis of data to identify hazard patterns and trends associated with consumer products. The CPSC receives thousands of reports of consumer product incidents per year, collecting data and generating analytics for product safety evaluation through the Consumer Product Safety Risk Management System (CPSRMS), including death certificates, medical examiner reports, SaferProducts.gov reports, CPSC hotline reports, in-depth investigation files, news clippings, and hospital data through the National Electronic Injury Surveillance System (NEISS).

Population, Demographics, and Other Characteristics

The demographic characteristics of race, ethnicity, and socioeconomic status represent a continuum of social determinants. As defined by the U.S. Department of Health and Human Services (HHS), "social determinates of health (SDOH) are conditions in the environments where people are born, live, learn, work, play, worship, that affect a wide range of health, functioning, and quality-of-life outcomes and risks." A community's overall risk of injury-related morbidity and mortality is significantly impacted by its social determinates (Möller et al., 2015; Shimony-Kanat et al., 2024; Wulz et al., 2023). While CPSC cannot directly influence these factors faced by consumers, understanding the potential risks and vulnerabilities consumers face can provide insight into where opportunities exist to develop effective community-level risk mitigation and reduction strategies.

Specifically, a variety of demographic factors, including socioeconomic dimensions (see, e.g., Karb et al., 2016) have the potential to be a predictor of the risk of death rates. To better understand differences in safety between demographic groups, CPSC staff focused on five variables related to race and ethnicity, race and ethnic minority, poverty, educational attainment, employment, and income from the 2016-2020 U.S. Census 5-Year American Community Survey (ACS) as comparison indicators for this report, each of which is expanded upon in turn:

- *Race and ethnic minority* are represented as reported from people who identify as the following: Hispanic (any race), Black or African American (Non-Hispanic), American Indian and Alaska Native (Non-Hispanic), Asian (Non-Hispanic), Native Hawaiian and Other Pacific Islander (Non-Hispanic), Two or More Races (Non-Hispanic), Other Races (Non-Hispanic). (*U.S. Census Demographic and Housing Estimates, Table DP05*).
- *Below 150% poverty* is a federal threshold by state based upon income (before taxes) and family size. It is used to determine eligibility for government assistance programs, for example, energy assistance programs (electric, gas), water utilities, Medicaid, and other subsidies. The 150% threshold considers what families slightly above the poverty line may need in support to meet basic needs. (*U.S. Census Poverty Status in the Past 12 Months, Table S1701*).
- *Persons with no high school diploma* represent the percentage of adults aged 25 years and older who have not completed, graduated from, or received a high school diploma or equivalent. This is a standard indicator used to measure the population with less than a basic level of skills essential for the workplace. (*U.S. Census Selected Characteristics of the Total and Native Populations in the United States, Table S0601*).
- *Unemployment* represents the proportion of individuals 16 years or older who are not working, but are actively seeking employment and are available to start work. (*U.S. Census Selected Economic Characteristics, Table DP03*).
- *Median household income* is used from the U.S. Census Income in the Past 12 Months (in *U.S. Census 2020 Inflation-Adjusted Dollars Table S1901*).

The recent 2020 U.S. Census recorded more than 331.4 million people living in the U.S. The most prevalent racial or ethnic group in the United States is the White Non-Hispanic population. However, the U.S. has become more diverse racially and ethnically over the last two decades. Hispanic, Asian, and Black or African American population growth collectively outpaces the White Non-Hispanic population. The U.S. population growth is largely driven by the U.S. South region where there is increasing population diversity.¹ Population increases in Florida, South Carolina, and Texas have outpaced other states. The racial and ethnic make-up of these communities vary across the country. For example, the rural areas in the South have a higher percentage of Black or African American residents, while the rural areas in the West have more

¹ The U.S. Census Regions can be found here: [us_regdiv.pdf \(census.gov\)](https://www.census.gov/regions/division1/regdiv.pdf).

Hispanic or Native American residents. A predominately White population lives in rural areas in the Midwest.

In addition to leading the nation in population growth and diversity, the U.S. South is one of the poorest regions in the nation and has the most persistent poverty. The U.S. Census poverty measures provide percentages of people living below income thresholds based on peoples' financial resources or lack thereof. A person is considered statistically poor if their income falls below the threshold- this report uses the below 150% poverty level. Poverty as measured by the U.S. Census represents the extent of an inability to purchase or provide for a basic level of needs. It is a representation of economic hardship as an indication of lack or loss of basic resources people need to live. High and persistent levels of poverty are also in rural counties concentrated in historically poor areas of the Mississippi Delta (Mississippi, Arkansas, Louisiana, Tennessee, and Missouri), portions of the eastern region of the U.S, including West Virginia, the U.S. southeast states (with high percentages of Blacks or African Americans) and the U.S. states along the southern border of Mexico (California, Arizona, New Mexico, Texas), as well as areas with high densities of Native Americans (Davis et al.,2023). This is important as an estimated one in five people live in a rural area in the U.S.

Poverty is unequally distributed and can result in excessive strain and disruption of social supports in the United States. Research indicates low-income people and families living in county-level poverty encounter challenges contributing to the rise of unintentional injury mortality (Karb,2016). Depending upon the individual and population, a variety of experiences relative to race, discrimination, income and education levels and poor residential environments can play a role in the cumulative effect of the ability to withstand risks of harm and death (Marmot, 2005, Forde et al.,2019, Williams et al.,2016). Poor children are more likely to grow up to become poor adults (Wagmiller & Adelman,2009). Black or African American, Hispanic, and Native American households disproportionately live in higher-poverty neighborhoods than White households. For example, Black or African American and Hispanic families are more likely than White families to live in areas where more than 20% of the population lives below the poverty line (Crowder et al.,2015). High school graduation rates in the U.S. differ across racial and ethnic groups. White Americans graduate at a rate of around 94 percent. Black or African Americans have a rate of 88 percent. Hispanic Americans have a lower graduation rate of approximately 71 percent, whereas Asian Americans lead with about 96 percent While the overall U.S. high school completion rate in the U.S. is one of the highest in the world, educational attainment varies by age, race, and ethnicity (U.S. Census,2021). People with more education are associated with a higher income. Education influences risk levels through cultural, social, and psychological means. Education can also be linked to high-risk behavior activities (Mahboob et al.,2019). According to the U.S. Census, White Americans have a higher percentage of high school graduates but a lower percentage of college graduates than Asian Americans. More than half of lower income households are headed by someone without a college degree. Among individuals without college degrees, poverty rates are significantly higher for Black or African Americans compared to White Americans (U.S. Census,2021).

Racial disparities in employment and income can also be attributed to racial disparities in educational attainment. As employment provides a level of financial security with the ability to provide housing, food, and transportation for a family, it also most often offers access to health care. Employed people are more likely to have healthcare coverage, visit a dentist, and are least likely to be unable to see a doctor due to cost. (Silver et al.,2022)

Greater income is associated with a higher likelihood of living a longer life. (Chetty et al.,2016, Chetty et al.,2020). The U.S. Census Bureau offers insight into the income distribution across different geographic areas and demographic groups with the U.S. Census American Community (ACS) Survey. The ACS is a monthly survey of a sample of households that provides annual estimates and period estimates of income, education, employment, health insurance coverage, and housing costs and conditions for U.S. residents in all 3,141 counties in the 50 states and the District of Columbia. It is a tool for describing community-level characteristics over time.

Research suggests socioeconomic opportunities vary more for low-income groups across geographic regions within the U.S. compared to high-income groups (Chetty et al.,2016). The disparities in income which exist by race and ethnicity in turn can further exacerbate poverty (Iceland, 2014). The 2016-2020 ACS reports the median household income for Asians (\$94,903), White (Non-Hispanic) (\$74,912), two or more races (\$66,504), and Native Hawaiian or Other Pacific Islander (\$66,128) are higher than the 2016-2020 ACS median income national average of \$64,994. Whereas, Hispanics (\$55,321), Black or African Americans (\$45,870), and Native American or Alaska Natives (\$43,825) had significantly lower median incomes. Both education and income have shown a profound net impact on childhood mortality at the individual-level, while structural-level effects of income and poverty is especially pronounced for younger children and accounts for some of the racial disparities in childhood mortality, including unintentional injuries (Singh et al.,1996). A study of drownings of 5–24-year-olds showed an association between race and ethnicity; when race was removed, income was significantly associated with higher drowning rates among low-income groups (Saluja et al.,2006). Income and education also inform incidence of fire and fire risk. Studies of U.S. areas found lowest income census tracts were more likely to have high fire activity (Fahy and Maheshwari,2021; Shai,2006).

This report includes U.S. state and county-level data presented by demographic, social, and economic characteristics such as gender, race and ethnicity, income, and education. The CPSC staff used data from CPSRMS and the National Center for Health Statistics (NCHS) to gain insight into a focus hazard area in consumer product safety. The 2016-2020 ACS (5-Year Estimates) Survey was used for demographic, and socioeconomic data at the country, state, and county-levels. Staff used the 2016-2020 U.S. Census 5-Year American Community Survey for percentage of poverty and median household income as well as cost-of-living data to adjust for location (see the Appendix for more details).

Child Sleep-Associated Deaths

CPSC staff examined fatal incident information on child sleep-associated deaths. The death data set consists of reported incidents and are not U.S. nationally representative estimates, but rather a count based upon reported deaths in NCHS national statistics and CPSC's death certificate database. Sudden unexpected infant deaths (SUIDs) are a contributor to the higher infant mortality rates in parts of the U.S. SUIDs is a term used to describe the sudden and unexpected death of a baby less than 1 year old in which the cause was not obvious before investigation. These deaths often happen during sleep or in the infant's sleep area. There are approximately 3,400 sudden unexpected infant deaths each year in the United States (NCHS, 2024). The three categories commonly reported under SUIDs are sudden infant death syndrome, accidental suffocation and strangulation in bed, and unknown cause. The National Center for Health Statistics (2024) reports about 1,389 deaths due to sudden unexpected infant

death, 1,062 deaths due to unknown causes, and 905 deaths due to accidental suffocation and strangulation in bed for infants less than 1 year old in 2020.

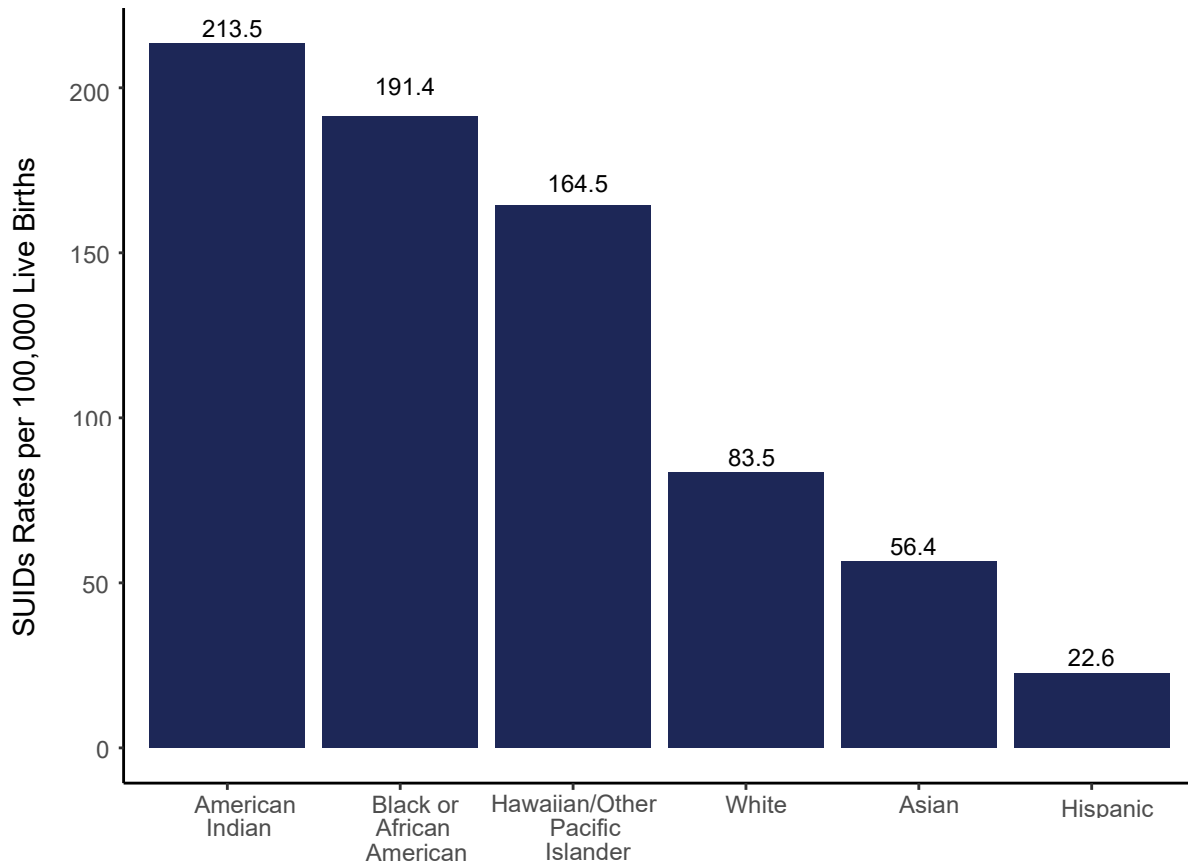
Given the persistence of child sleep-associated deaths, and to better understand risk factors related to SUIDs, CPSC staff undertook an exploratory data study² on the potential influence of income distribution and other related factors on SUIDs using a selective sample, relatively small size, of U.S. counties. Staff expects these findings to raise awareness of potential SUIDs risk profiles and the need for awareness, consumer safety education campaigns and future studies. The study of child deaths informs policies, regulatory measures, and education campaigns aimed at improving child safety and saving lives.

The correlation between child safety and socioeconomic status is well researched (Bradley et al.,2002). Studies report socioeconomic and sociodemographic variables, such as poverty and less parental education, are associated with an increased risk of child death (Allen et. al, 2021, Braveman et al.,2010, Spencer & Logan,2004). SUIDs rates are disproportionately higher among certain racial and ethnic groups, for example, Blacks or African Americans and Native American communities—making it an important topic for addressing disparities in infant deaths (Parks SE, et al.,2021). Blacks or African Americans have been shown to have worse outcomes regarding infant deaths than Whites at each level of income or education (Braveman et al., 2010). Even though some U.S. states have made significant progress in reducing SUIDs rates, state-specific differences in SUIDs deaths persist (Mitchell, et al.,2020). Studies have investigated the characteristics and demographics of SUIDs (Erck et al.,2024; Moon et al.,2022). There are factors that caregivers can control to lower an infant’s risk of dying while sleeping. Caregiver-infant bed sharing can increase the risk of infant deaths from sleep-related causes, as most SUIDs occur in an unsafe sleep environment (Parks et al.,2021). The American Academy of Pediatrics recommends reducing sleep-related infant deaths by placing an infant in a body position in which the infant lies flat on their back, with face and torso facing upward and avoid the use of surfaces not intended for infant sleep, and the presence of people (bed sharing) or objects (bedding) in the sleep environment.

Infant death disparities among race and ethnic groups are widely recognized (Parks, et. al, 2021; Haider, 2014). Figure 1 shows the overall SUIDs rates by race and ethnicity in the U.S. from 2016 through 2020, revealing that the U.S. national rates of SUIDs are twice as high in American Indian/Alaska Native, Black or African American, and Hawaiian/Other Pacific Islander infants compared with White infants (NCHS,2024). From 2016 through 2020, the SUIDs rate of American Indian/Alaska Native infants was 213.5 per 100,000 live births, for Black or African Americans infants 191.4 per 100,000 live births, and for Hawaiian/Other Pacific Islander infants 164.5 per 100,000 live births. In comparison, the SUIDs rate of White infants was 83.5 per 100,000 live births, for Hispanic infants was 56.4 per 100,000 live births, and for Asian infants it was 22.6 per 100,000 live births.

² See Appendix for details on the methodology used in this study.

Figure 1. SUIDs Rates per 100,000 Live Births in the U.S., By Race and Ethnicity, 2016 – 2020



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 1999-2020 on CDC WONDER Online Database, released in 2021.

Table 1 shows the 5 U.S. states with the highest SUIDs rates from 2016 through 2020 according to the CDC. The estimated five-year average SUIDs deaths for all 5 states combined is 167.0 per 100,000 live births—almost twice the overall U.S. rate of 91.7 deaths per 100,000 live births. All 5 states have a median household income significantly lower than the nation’s median household income, which, according to the 2016-2020 ACS, was \$64,994. The grand median household income for the 5 states with the highest SUIDs rates (Alabama, Arkansas, Louisiana, Mississippi, West Virginia) was \$49,475, \$15,519 below the national median household income. Similarly, all 5 states have higher percentages living below the 150% poverty threshold, compared to the overall U.S. population. Three of the five states have lower percentages of minorities than the overall population.

Table 1. Demographic and Socioeconomic Characteristics of the Five U.S. States with the Highest SUIDs Rates per 100,000 Live Births, 2016 – 2020

	Total Number of Infant Deaths	Annual Average Deaths	Deaths* per 100,000	Median Household Income	Poverty (Below 150% Poverty)	Minority (% Race/Ethnicity)
United States	17,387	3,477	91.7	\$64,994	21.1%	42.5%
Alabama	510	102	174.6	\$52,035	25.8%	40.7%
Arkansas	297	59	160.9	\$49,475	27.3%	28.6%
Louisiana	468	94	156.0	\$50,800	29.3%	41.3%
Mississippi	347	69	188.2	\$46,511	30.8%	43.5%
West Virginia	142	28	155.3	\$48,037	27.4%	45.7%

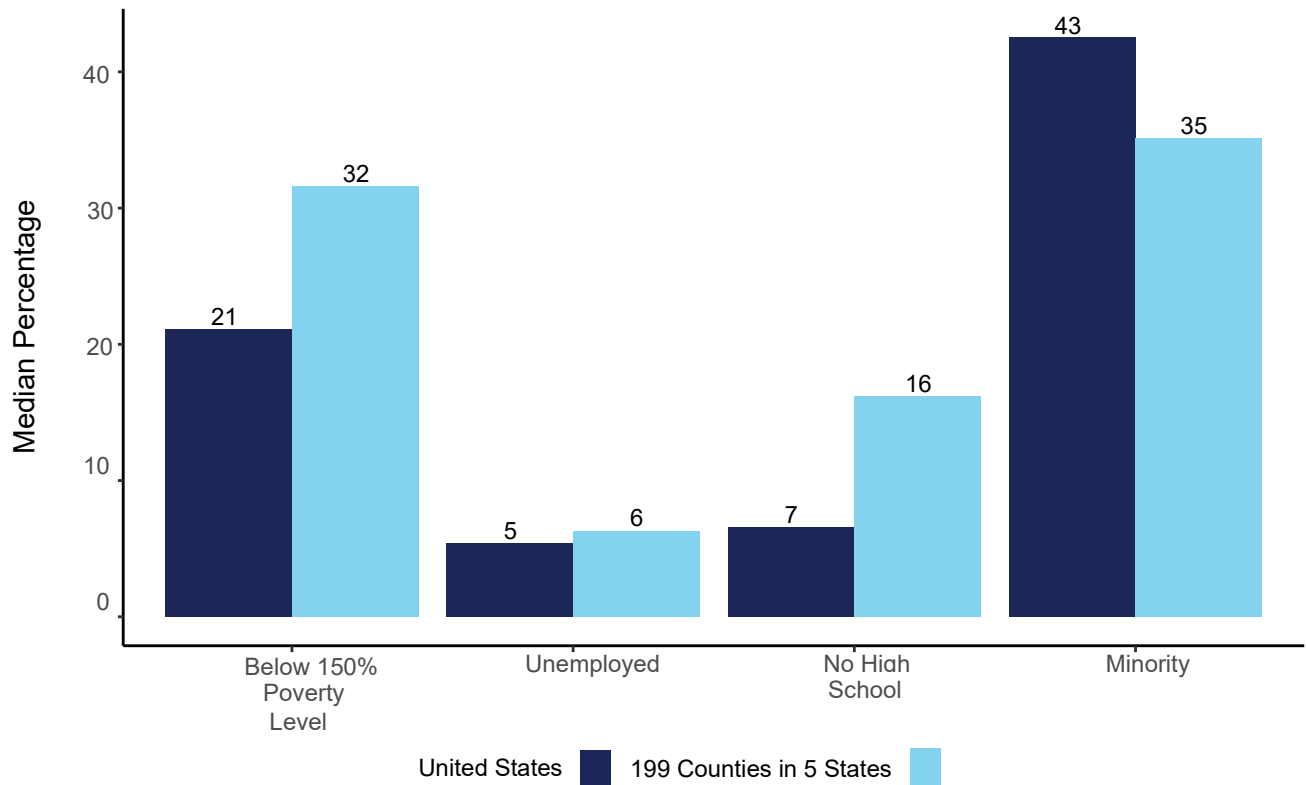
Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, CDC WONDER Online Database. *The infant deaths per 100,000 are based upon the CDC Live Births Population data. The median household income, poverty (below 150%), and minority (% race and ethnicity) are from the US Census 2016-2020 American Community Survey.

Given these demographic and socioeconomic differences in SUIDs rates overall, and especially among the 5 states identified by the CDC as having the highest SUIDs rates, CPSC staff conducted an analysis of child sleep-associated deaths reported under SUIDs, accidental suffocation and strangulation in bed, and unknown causes for a 10-year period (2013-2022) using death certificates where cause of death was associated with the following International Classification of Disease (ICD) codes: (W75) Accidental suffocation and strangulation in bed (ASSB), (W76) Other unintentional strangulation, (W80) Inhalation and ingestion of other objects causing obstruction of respiratory tract, (W83) Other specified threats to breathing, and (Y20) Undetermined – suffocation (the Appendix contains methodological details). CPSC staff analyzed the SUIDs mortality data from NCHS³. There are data limitations to the analysis due to the selective, relatively small, sample size and because the majority of the death certificates are from one state. The death certificate data include Alabama (N=101; 11%); Arkansas (N=92;10%); Louisiana (N=502; 57%); Mississippi (N=168;19%); West Virginia (N=21; 2%). The results of this analysis cannot be applied to the entire United States population.

For these 5 states with the highest SUIDs rate per 100,000 live births as reported by the Centers for Disease Control and Prevention, National Center for Health Statistics, CPSC staff analysis complemented the death certificate data with socioeconomic and demographic data on poverty, educational attainment (high school diploma), employment, and race and ethnicity minority composition. These 5 states include 343 counties, 199 of which experienced at least one SUIDs from 2013 through 2022 known to CPSC.

³ Wonder, C. D. C. (2023). CDC/NCHS, National Vital Statistics System, Sudden Unexpected Infant Death and Sudden Infant Death Syndrome Mortality Files. *Centers for Disease Control. Atlanta, GA*. Retrieved April 10 2024 from <https://www.cdc.gov/sids/data.htm#map>

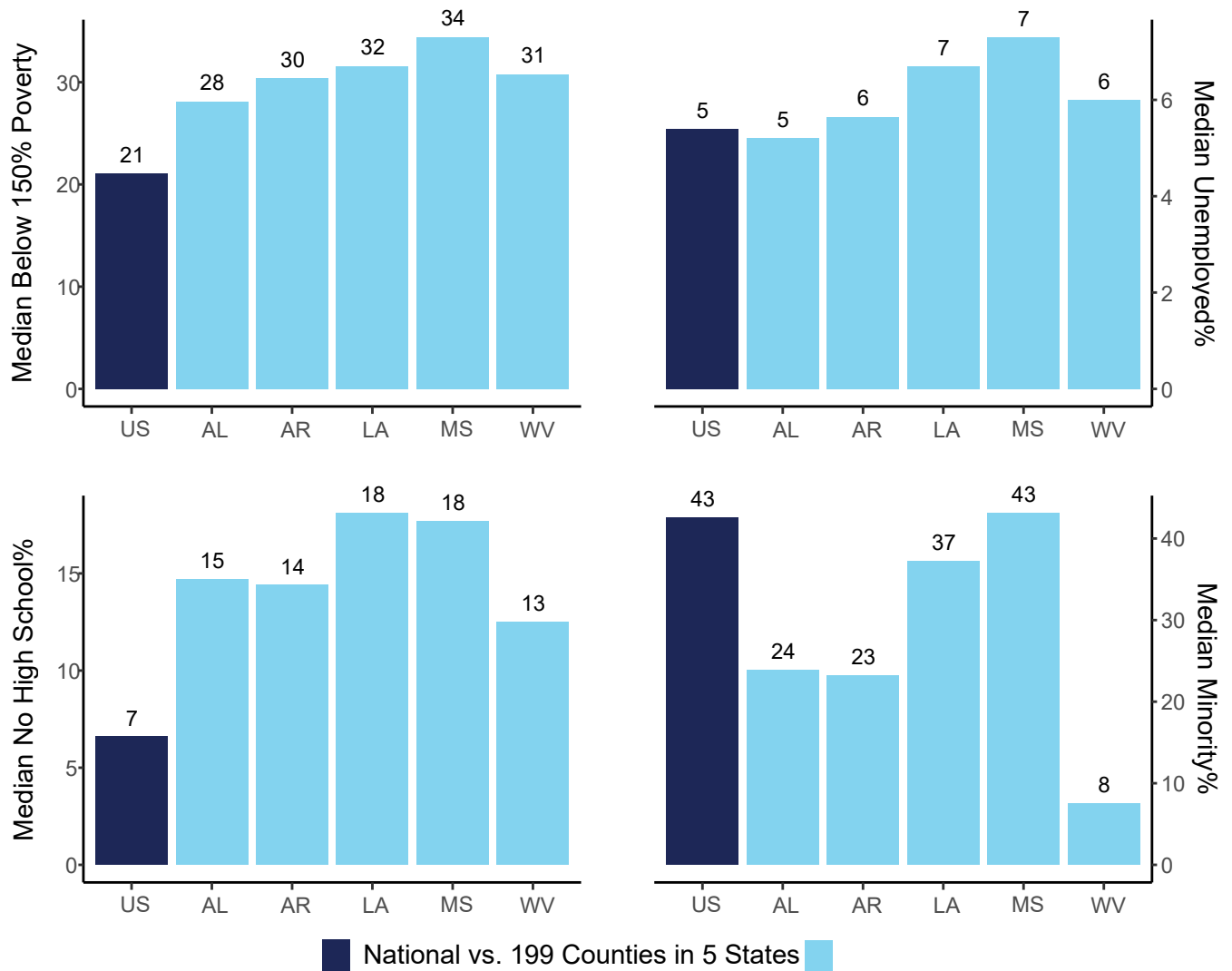
Figure 2. Socioeconomic Characteristics of the 199 Counties with SUIDs Cases (2013 – 2022) Within the Five States with the Highest SUIDs Rates Compared to U.S. Averages



Source: The median percentage for the 5 States represents the 199 U.S. counties identified from the CPSC death certificated for the years 2013 through 2022 available within the CPSC Death Certificate Files purchased from the U.S. state programs and the U.S. state health departments. The poverty (below 150%), % unemployed (16 years old and older in the labor force), % persons with no high school diploma and minority (% race and ethnicity) are from the U.S. Census 2016-2020 American Community Survey.

Figure 2 presents the median percentages of poverty, unemployment, and education across these 199 counties, which are higher than the national average while the median percent minority (race and ethnicity) is lower. Among the 199 counties, the median percent of the population below 150% poverty is more than double the national rate. In addition, the populations in these counties have a combined median household income \$9,418 less than the national average (\$55,576 versus \$64,994). Figure 3 expands on Figure 2 by enabling state-level comparisons. Comparing to the results in Table 1, it can also be seen that these counties with SUIDs incidents have greater poverty but fewer minority citizens than the states they are in.

Figure 3. Socioeconomic Characteristics of the 199 counties with SUIDs Cases (2013 – 2022) within the 5 States with the Highest SUIDs Rates compared to the U.S. Averages



Source: The median percentage for the 5 States represents the 199 U.S. counties identified from the CPSC death certified for the years 2013 through 2022 available within the CPSC Death Certificate Files purchased from the U.S. state programs and the U.S. state health departments. The poverty (below 150%), % unemployed (16 years old and older in the labor force), % persons with no high school diploma and minority (% race and ethnicity) are from the U.S. Census 2016-2020 American Community Survey. The percentages are rounded.

Table 2 shows the cumulative SUIDs frequencies within the 5 U.S. states—Alabama (24 counties), Arkansas (40 counties), Louisiana (57 counties), Mississippi (65 counties), and West Virginia (13 counties)—totaling 884 deaths in 199 counties from 2013 through 2022. The range of SUIDs across the 199 counties are from 1 to 58 infant deaths. To provide an overview of how SUIDs frequencies vary across socioeconomic and demographic groups, Table 2 employs economic and population data to allocate counties into tertiles (Mounsey et al., 2017) of similar-sized populations, based on income and expenses (in 2020 dollars, for a two-parent-one-child household). First, to adjust for cost of living, counties were sorted by the ratio of their median annual household expenses to their median annual household income. Second, to control for population size, those counties, sorted by the economic data, were then divided into three groups with approximately equal populations of infants 12 months old or younger (Tertile 1 = 118 counties with a population of 54,137; Tertile 2 = 51 counties with a population of 55,878;

Tertile 3 = 30 counties with a population of 55,297). See the Appendix for methodological details.

Annual household income and annual household expenses are provided for each of these tertiles, and the expense-to-income ratio calculated for each. The expense-to-income ratio offers insight into the general ability for financial stability in a geographic area, where counties with a ratio of 1.0 would have equality between median household income and median household expenses, whereas a ratio above 1.0 would indicate a surplus of income while a ratio below 1.0 would indicate a deficit. In Table 2, this ratio increases from 0.82 in Tertile 1 to 0.99 in Tertile 2 to 1.14 in Tertile 3, reflecting financial disparity.

Similar disparities in the frequencies of SUIDs are evident across tertiles as well, with 43 percent of the 884 total deaths occurring in counties allocated to Tertile 1, compared to 33 percent and 27 percent in Tertile 2 and Tertile 3, respectively.

Demographically, there are notable disparities by gender and race. Male infants account for 59 percent of all SUIDs, compared to 41 percent for female infants, despite having nearly even populations. Black or African American infants constitute 47 percent of all SUIDs, compared to 39 percent of White infants, despite having a smaller population (an average annual population of 50,035 vs. 87,708). Population-adjusted comparisons are the focus of Table 3.

Table 2. Demographic and Socioeconomic Characteristics for Income-based Tertiles of 199 Counties with SUIDs Case (2013-2022) within 5 States with the Highest SUIDs Rates

(AL, AR, LA, MS, WV)	Total	Tertile 1	Tertile 2	Tertile 3
Number of Counties	199	118	51	30
Income versus Expenses				
Grand Median Annual Household Income (in 2020 dollars)	\$55,576	\$50,410	\$59,784	\$77,569
Grand Median Annual Household Expenses (in 2020 dollars)	\$61,636	\$61,322	\$60,716	\$67,257
Income-to-Expense Ratio (Income/Expenses)	0.92	0.82	0.99	1.14
SUIDs Deaths				
Total	884	380	302	202
Gender				
Female	362 (41%)	146 (38%)	118 (39%)	98 (49%)
Male	522 (59%)	234 (62%)	184 (61%)	104 (51%)
Race				
Black or African American	413 (47%)	180 (47%)	129 (43%)	104 (51%)
White	347 (39%)	173 (46%)	105 (35%)	69 (34%)
Asian/Pacific Islander	5 (1%)	2 (1%)	0 (0%)	3 (1%)
American Indian/Alaska Native	1 (0%)	0 (0%)	0 (0%)	1 (0%)
Unknown/Other/Multiracial	118 (13%)	25 (7%)	68 (23%)	25 (12%)
Ethnicity				
Hispanic	14 (2%)	5 (1%)	6 (2%)	3 (1%)
Non-Hispanic	702 (79%)	331 (87%)	211 (70%)	160 (79%)
Unknown	168 (19%)	44 (12%)	85 (28%)	39 (19%)

Note: As reported by CDC/NCHS, National Vital Statistics System, Mortality Files (2016-2020) Alabama (AL), Arkansas (AR), Louisiana (LA), Mississippi (MS), West Virginia (WV) had the highest SUIDs rates. Counties, number of deaths, age of deaths, and deaths by race and ethnicity are from 2013-2022 death certificates (N=884) provided to CPSC through state programs and state health departments. Population data are from the U.S. Census Bureau; economic data are from the Economic Policy Institute (see the Appendix for more details).

Table 3 shows the incidence rates of SUIDs per 100,000 population—overall, by group, by tertile, and by group within tertile—for the 199 counties, from 2013 through 2022. Incidence rates are calculated by dividing the number of deaths by the population at risk, and then multiplying that quotient by one-hundred thousand, to produce standardized comparisons of groups with different populations. For example, the overall incident rate of 53.5 SUIDs per 100,000 population for these 199 counties is calculated as follows: 884 deaths divided by 165,312 population, multiplied by 100,000. In this case, the incidence rates in Table 3 represent the sum of SUIDs from 2013 through 2022 divided by the sum of the estimated population of infants in the 199 counties from this same ten-year period. As the at-risk population are infants ages 12 months or younger, though, meaning those in the at-risk group in one year age out the

following year, the incidence rates in Table 3 can essentially be thought of as an annual average during this period, given that the time period covers the entirety of each year.

Table 2 suggested potential economic disparities in SUIDs, with counties with less favorable socioeconomic for example, those in Tertile 1) experiencing a higher frequency of SUIDs counties with more favorable socioeconomic conditions (i.e. those in Tertile 2 and, especially, Tertile 3) despite approximately even populations. The incidence rates in Table 3 support this, revealing higher SUIDs rates per 100,000 population (70 vs. 54 vs. 37 in Tertiles 1 through 3, respectively).

Likewise, Table 2 suggested potential demographic disparities in SUIDs by gender and race—that is, males overrepresented compared to females and Black or African American overrepresented compared to Whites. The incidence rates corroborate this, revealing that males experience 62 sudden unexpected infant deaths for every 100,000 male infants (i.e. 12 months old or younger) compared to 45 for females. Among the two racial groups with the largest frequency of SUIDs, Black or African American infants experience 83 such deaths per 100,000 black infants whereas White infants experience 40 per 100,000 White infants.

Group comparisons can be further illuminated by calculating their incidence rate ratio (IRR). Corresponding to the calculation and interpretation of the income-to-expense ratio explained above, the IRR is calculated by dividing the incidence rate of the comparison group by the incidence rate of the reference group. For example, the IRR of males to females is 1.38 ($61.9/44.7 = 1.38$), indicating that male infants have a 38 percent higher risk of SUIDs.

In addition to making clearer how much more or less common the risk of SUIDs is for one group compared to another, an additional benefit of IRRs is that they can reveal whether the difference is statistically significant (i.e. whether the difference is likely due to chance or likely represent true differences in risk). Following that, for each of the IRRs in Table 3, 95-percent confidence intervals were calculated, indicating we can be 95-percent confident that the true IRR lies in that range. Confidence intervals (CIs) that straddle 1.0 suggest that the difference between the incidence rates of the two groups is likely due to chance, whereas CIs with both lower and upper bounds completely below or above 1.0 suggest the difference is likely representative of a true risk). Here we can see that the IRR comparing the overall incidence rates for males to females has a CI ranging from 1.2 to 1.6—notably above 1.0 and revealing statistical significance. This is reaffirmed via its corresponding p-value, which is well below the standard 0.05 level.

The IRR comparing Black or African American infants to White infants of 2.1 indicates that Black or African American infants have more than double the risk of SUIDs than their White counterparts in these 199 counties. The 95-percent CI of 1.8 to 2.4 and corresponding p-value (< 0.001) indicates this difference is statistically significant.

Interestingly, the magnitudes of the gender-based discrepancies decrease across tertiles into with better socioeconomic conditions. That is, the IRRs for male: female drop from 1.5 to 1.0 as we progress from Tertile 1 to Tertile 3, meaning the gap between males and females is larger in financially less well-off tertiles compared to financially better off tertiles. In fact, the male: female IRR in Tertile 3 is the only IRR in Table 3 that is not statistically significant.

In contrast, the magnitudes for race-based discrepancies increase across tertiles, indicating a larger gap in the risk of SUIDs in counties with more favorable socioeconomic conditions for

Black or African American infants versus white infants, compared to that same comparison in lower socioeconomic status counties.

Table 3. Incidence Rates and Ratios (IRR) of SUIDs per 100,000 population by Demographic and Socioeconomic Characteristics for SUIDs Cases (2013-2022) by Income-based Tertiles in the 5 States with the Highest SUIDs Rates

	Total	Tertile 1	Tertile 2	Tertile 3
Overall (N = 199 counties)	53.5	70.2	54.0	36.5
Race				
Black or African American	82.5	87.1	80.4	78.1
White	39.6	64.6	35.0	22.3
Incidence Rate Ratio (B:W)	2.1	1.3	2.3	3.5
IRR Confidence Interval (95%)	[1.8-2.4]	[1.1-1.7]	[1.8-3.0]	[2.6-4.8]
IRR p-value	0.000	0.005	0.000	0.000
Gender				
Male	61.9	84.8	64.5	36.8
Female	44.7	55.0	43.1	36.2
Incidence Rate Ratio (M:F)	1.4	1.5	1.5	1.0
IRR Confidence Interval (95%)	[1.2-1.6]	[1.3-1.9]	[1.2-1.9]	[0.8-1.3]
IRR p-value	0.000	0.000	0.001	0.907

Note: Deaths are based upon estimated counts of deaths. Counties, number of deaths, race and ethnicity and sex from CPSC DTHS 2013-2022 death certificates (N= 884) provided to CPSC through state programs and state health departments. As reported by CDC/NCHS, National Vital Statistics System, Mortality Files (2016-2020) Alabama (AL), Arkansas (AR), Louisiana (LA), Mississippi (MS), West Virginia (WV) had the highest SUID rates. Source: County population from the U.S. Census Bureau's County Population by Characteristics file; income-based tertile allocations based on data from the Economic Policy Index (see the Appendix for more details).

Annual Epidemiological Reports

Epidemiological Reports and Key Findings

CPSC publishes statistical and technical reports on hazard types and CPSC product categories. These reports provide data on injuries and deaths from injury surveillance systems and databases. This section summarizes consumer product injury data relating to race and ethnicity and gender from reports published during the period of 2023-2024. The topic areas include carbon monoxide poisonings from consumer products (including generators and other engine-driven tools), electrocutions, micromobility products, off-highway vehicles, nursery products, and pediatric poisonings.

Non-Fire Carbon Monoxide Poisoning from Engine-Driven Generators and Other Engine Driven Tools

The CPSC staff published the report, *Fatal Incidents Associated with Non-Fire Carbon Monoxide Poisoning from Engine-Driven Generators and Other Engine-Driven Tools* (O'Connor, 2023), providing statistics on injuries and fatalities associated with the estimated number of unintentional, non-fire deaths attributed to carbon monoxide (CO) poisoning that were associated with the use of these products from 2012 to 2022. CPSC records 699 incidents involved in Engine-Driven Tools (EDT) resulting in 872 deaths due to non-fire CO exposure.

Of these 872 deaths, CPSC staff reports there were a total of 824 deaths where race and ethnicity are known, as shown in Table 4. For race, there were 710 deaths of known, Non-Hispanic race; and there were 114 deaths of known Hispanic ethnicity. As can be seen, the percentage of EDT-related deaths by demographic group did not match their population distributions, with Black or African Americans having a disproportionately higher portion of the fatalities, and Asian Americans and Hispanics having a disproportionately lower portion of fatalities. Table 4 also shows that men have a disproportionately higher portion of the fatalities.

Table 4. Race/Ethnicity and Gender Data Collected and Reported on CO Poisoning Deaths from Engine-Driven Generators and Other Engine Driven Tools, 2012 – 2022

2012-2022 All-Engine Driven Tools (EDTs)	Deaths	Deaths ¹ (%)	Estimated Percentage of U.S. Population [@]
Race (Non-Hispanic)¹²	710	100	100
White	502	61	61
Black	178	22	12
Asian	15	2	5
American Indian/Alaska Native	12	1	<1
Native Hawaiian/Pacific Islander	1	<1	<1
Other/Multiple	2	<1	3
Hispanic	114	14	18
Gender	872	100	100
Male	696	80	49
Female	176	20	51

@ Based on estimated U.S. Census U.S. population statistics for the approximate mid-range of the 11-year average (2015-2019)

1. These are percentages of deaths where race is known.

2. Race and ethnicity are categorized separately (i.e. Non-Hispanic race groups, Hispanic ethnicity group).

Note: Totals may not add up to 100 percent due to rounding; race, ethnicity, and gender totals represent when race, ethnicity, and gender were known.

Sources, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

5-Year Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin in the United States: January 1, 2015 to December 31, 2019

Table 4a shows a more detailed distribution of deaths categorized by all engine-driven tools, generators, and other engine-driven tools. The table shows where race and ethnicity are known. While the U.S. population for Black or African Americans is reported as 13%, the total percentage of deaths by Black or African Americans for generators is 24%, For other engine-driven tools, Whites accounted for 95% of deaths compared to 72% of their share of the population.

Table 4a. Number of Reported Non-Fire CO Fatalities Associated with All Engine-Driven Tools (EDTs), Generators, and Other Engine-Drive Tools (OEDTs) by Race and Ethnicity, 2012–2022

Ethnicity	Race	2019 5-Year Estimated U.S. Population ¹	All Engine-Driven Tools (EDTs)		Generators		Other Engine-Driven Tools (OEDTs)	
			Deaths	%	Deaths	%	Deaths	%
All	Total Known	100%	824	100%	747	100%	77	100%
	White	72%	588	71%	517	69%	71	95%
	Black	13%	180	22%	176	24%	4	5%
	Asian	6%	15	2%	15	2%	0	0%
	American Indian/Alaska Native	<1%	12	1%	12	2%	0	0%
	Native Hawaiian/Pacific Islander	<1%	1	<1%	1	<1%	0	0%
	Other Multiple	8%	28	3%	26	3%	2	3%
Non-Hispanic	Total	18%	114	14%	112	15%	2	3%
	White	12%	86	10%	86	12%	0	0%
	Black	<1%	2	<1%	2	<1%	0	0%
	Asian	<1%	0	0%	0	0%	0	0%
	American Indian/Alaska Native	<1%	0	0%	0	0%	0	0%
	Native Hawaiian/Pacific Islander	<1%	0	0%	0	0%	0	0%
	Other Multiple	6%	26	3%	24	3%	2	3%
Hispanic	Total	82%	710	86%	635	85%	75	97%
	White	61%	502	61%	431	58%	71	92%
	Black	12%	178	22%	174	23%	4	5%
	Asian	5%	15	2%	15	2%	0	0%
	American Indian/Alaska Native	<1%	12	1%	12	2%	0	0%
	Native Hawaiian/Pacific Islander	<1%	1	<1%	1	<1%	0	0%
	Other Multiple	3%	2	<1%	2	<1%	0	0%
Unknown	Unknown	-	48	-	42	-	6	-

1. This percentage represents the 2015-2019 Census-estimated percentage of the U.S. population, an approximate mid-point range of the 11-year range. Sources, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023
[Fatal Incidents Associated with Non-Fire Carbon Monoxide Poisoning from Engine-Driven Generators and Other Engine-Driven Tools, 2012–2022](https://www.cpsc.gov/fatal-incidents-associated-with-non-fire-carbon-monoxide-poisoning-from-engine-driven-generators-and-other-engine-driven-tools-2012-2022) | [CPSC.gov](https://www.cpsc.gov)

Table 4b shows a more detailed distribution of deaths categorized by age for all engine-driven tools, generators, and other engine-driven tools. While the U.S. population for ages 45-64 is 26%, the percent of deaths for all engine-driven tools is 40%. While the U.S. population for ages 65 and over is 16%, the percent of deaths is 46% for other engine-driven tools.

Table 4b. Number of Reported Non-Fire CO Fatalities Associated with All Engine-Driven Tools (EDTs), Generators, and Other Engine-Drive Tools (OEDTs) by Age of Victim, 2012–2022

Age	2019 5-Year Estimated U.S. Population ¹	All Engine-Driven Tools (EDTs)		Generators		Other Engine-Driven Tools (OEDTs)	
		Deaths	Percentage	Deaths	Percentage	Deaths	Percentage
Total	100%	872	100%	789	100%	83	100%
Under 5	6%	7	1%	7	1%	0	0%
5-14	13%	33	4%	33	4%	0	0%
15-24	13%	62	7%	62	8%	0	0%
25-44	26%	250	29%	236	30%	14	17%
45-64	26%	352	40%	321	41%	31	37%
65 and over	16%	167	19%	129	16%	38	46%
Unknown	-	1	<1%	1	<1%	0	0%

1. This percentage represents the 2015-2019 Census-estimated percentage of the U.S. population, an approximate mid-point range of the 11-year range. Sources, [Fatal Incidents Associated with Non-Fire Carbon Monoxide Poisoning from Engine-Driven Generators and Other Engine-Driven Tools, 2012–2022](#) | CPSC.gov U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

Non-Fire Carbon Monoxide Poisoning Deaths Associated with the Use of Consumer Products

The CPSC staff published the report, *Non-Fire Carbon Monoxide Deaths Associated with Use of Consumer Product 2020 Report* (Topping, 2024) providing statistics on injuries and fatalities associated with the estimated number of unintentional, non-fire deaths attributed to carbon monoxide (CO) poisoning that were associated with the use of consumer products from 2010 to 2020. CPSC staff found evidence of a statistically significant upward trend in non-fire CO deaths for the 11-year period from 2010 to 2020. The estimated number of consumer product-related CO deaths rose to an all-time high in 2019. Since 2010, portable generators alone have been associated with an estimated 796 non-fire CO poisoning deaths, accounting for 40 percent of all non-fire CO deaths related to consumer products under CPSC jurisdiction. For 2020 CPSC staff reported 166 incidents resulting in an estimated 211 unintentional non-fire CO poisoning deaths. It is estimated 92 of those deaths were associated with portable generators only. Twenty-four (14 percent) percent of the 166 reported incidents involved multiple deaths.

CPSC staff reports there were an average of 225 deaths where race and ethnicity are known between 2018-2020. The data are shown in Table 5. As can be seen, the percentage of deaths did not match the population distributions, with Whites having a disproportionately high portion of the fatalities, and Blacks or African Americans, Asian Americans and Hispanics having a disproportionately low portion of deaths. It can also be seen that males have a disproportionately high portion of the deaths which were confirmed to be statistically significant (p-value <0.0001).

Table 5. Race/Ethnicity and Gender Data Collected and Reported on Non-Fire CO Poisoning Deaths Involving all Consumer Products, 2018 – 2020

2018-2020 Non-Fire CO Poisoning	Average Annual Estimated Deaths	Average Percent	Estimated Percentage of U.S. Population@
Race (Non-Hispanic) ¹	225	100	100
Unknown/Other/Mixed ^{1,4}	5	2	2
White ¹	149	66	60
Black or African American ¹	28	12	13
Asian/Pacific ^{1,2}	6	3	6
American Indian ^{1,3}	4	2	1
Hispanic (All races)	32	14	18
Gender	225	100	100
Male	172	76	49
Female	53	23	51

@ Based on estimated U.S. Census U.S. population statistics for the 3-year average (2018-2020)

1. These are percentages of deaths where race, ethnicity, and gender are known.

2. Only includes Non-Hispanic ethnicities and decedents unknown whether Hispanic.

3. Includes Asian, Pacific Islander, and Native Hawaiian

4. Includes American Indian, Native American, and Native Alaska/Includes Non-Hispanic, Unknown races, Other races, and Multiple races.

Note: As reported the data collection for 2018, 2019, and 2020 is only partially complete. Total may not add up to 100 percent due to rounding. Sources, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

5-Year Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin in the United States: April 1, 2010 to July 1, 2020. June 2021.

Electrocutions

The CPSC staff published the report, *Electrocutions Associated with Consumer Products: 2011-2020 (Hanway et al, 2023)* providing statistics on injuries and deaths associated with the estimated number of unintentional, non-work electrocutions with the use of consumer products from 2011 through 2020. There were an estimated 100 electrocution deaths with consumer products per year over the 3-year period from 2018 through 2020 with an estimated 110 consumer product-related electrocutions in 2018, 100 in 2019, and 90 in 2020. During the entire 10-year period (2011 to 2020) covered by the report there were more electrocutions to victims 18 through 44 years old and 45 to 64 years old than would be expected if the deaths were proportionate to population totals.

CPSC staff reports there were a total of 321 deaths where race and ethnicity were known. The data are shown in Table 6. As can be seen, the percentage of deaths did not match the population distributions, with Whites having a disproportionately high portion of the fatalities, and Blacks or African Americans having a disproportionately low portion of deaths. In addition, it can be seen that males had a disproportionately high portion of the deaths, with nearly nine times as many estimated consumer product-related electrocutions to males than to females.

Table 6. Race/Ethnicity and Gender Data Collected and Reported on Electrocution Deaths, 2011 – 2020

2011-2020 Electrocutions	Deaths	Deaths (%) ¹	Estimated Percentage of U.S. Population [@]
Race (Non-Hispanic)²	321	99.8	100.2
White	238	74.1	61.5
Black or African American	21	6.5	12.5
Asian	2	0.6	5.5
Pacific Islander	1	0.3	0.2
American Indian	3	0.9	0.7
More than one race	1	0.3	2.1
Hispanic	55	17.1	17.7
Gender	410	100	100
Male	365	89	49.3
Female	45	11	50.7

[@] Based on estimated U.S. Census U.S. population statistics for the approximate midpoint years of

2015 and 2016

1. These are percentages of deaths where race, ethnicity, and gender are known.

2. Race and ethnicity are categorized separately (i.e. Non-Hispanic race groups, Hispanic ethnicity group).

Total may add up to more than 100 percent due to the inclusion of ethnicity.

Source, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

5 Year Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin in the United States: April 1, 2010, to July 1, 2020. June 2021.

Micromobility

The CPSC staff published the report, *Micromobility Products-Released Related Deaths, Injuries, and Hazard Patterns: 2017-2022 (Tark, 2023)* providing statistics on injuries and fatalities associated with micromobility products from 2017 through 2022. The micromobility products covered in this report are electric scooters (e-scooters: electric-powered, motorized standing scooters), including ride-sharing dockless/rental e-scooters; hoverboards (also referred to as self-balancing e-scooters that are electric-powered, two-wheeled standing scooters with no handlebars); and low-speed electric bicycles (defined in section 38 of the Consumer Product Safety Act, 15 U.S.C. § 2085, as a two- or three-wheeled vehicle with fully operable pedals and an electric motor of less than 750 watts (1 h.p.), whose maximum speed on a paved level surface, when powered solely by such a motor while ridden by an operator who weighs 170 pounds, is less than 20 mph).

A total of 233 deaths related to micromobility products were reported from 2017 to 2022. The number of deaths has been increasing steadily from 5 in 2017 to 76 in 2022. E-scooters accounted for 111 fatalities, with motor vehicle accidents being the leading cause. Hoverboards were associated with 18 fatalities, primarily due to fire hazards. E-bikes were linked to 104 fatalities, with collisions with motor vehicles being the predominant cause.

CPSC staff reports there were a total of 50 deaths where race and ethnicity were known. The data are shown in Table 7. As can be seen, the percentage of deaths did not match the population distributions, with Blacks or African Americans having a disproportionately high portion of the fatalities, and Whites and Hispanics having a disproportionately low portion of deaths. Where gender was known, the data show that males have a disproportionately high

portion of deaths across all micromobility products, although for hoverboards, females had a disproportionately high portion of the deaths.

Table 7. Race/Ethnicity and Gender Data Collected and Reported on Micromobility Deaths, 2011 – 2020

2017-2022 Micromobility	Deaths	Deaths (%) ¹²	Estimated Percentage of U.S. Population [@]
Race (Non-Hispanic)	50	100	100
White	28	56	59.6
Black or African American	9	18	12.6
Other	6	12	9.1
Hispanic	7	14	18.7
Gender	221	100	100
Male	178	81	49.3
Female	43	19	50.7

[@] Based on estimated U.S. Census population statistics corresponding to the average of 6 years (2017-2022).

1. These are percentages of deaths where race and ethnicity and gender, in the Gender section, are known.

2. Total may add up to more than 100 percent due to the inclusion of ethnicity.

Source, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

Nursery Products

The CPSC staff published the report, *Injuries and Deaths Associated with Nursery Products Among Children Younger than Age Five* (Yang, 2023) providing statistics on injuries and fatalities associated with nursery product-related injury estimates. CPSC staff reported 490 deaths during the 3-year period from 2018-2020 with an annual average of 163 deaths. The deaths are associated with use of, but not necessarily caused by, nursery products. The causes of deaths included positional asphyxia, strangulation, and drowning among others. In some instances, the fatalities were attributed to the product. In other cases, the fatalities resulted from a hazardous environment in or around the product, or a combination of contributions.

CPSC staff reports there were a total of 386 deaths associated with nursery products where race was known from 2018 through 2020. The data are shown in Table 8. There were an additional 104 nursery product deaths (21 percent of the total 490 deaths) where race was not stated. As can be seen, the percentage of deaths did not match the population distributions, with Blacks or African Americans having a disproportionately high portion of the fatalities, and Whites, American Indian/Alaska Natives, and Asian Americans having a disproportionately low portion of fatalities. Similarly, in 2020, males have a disproportionately high portion of the fatalities, also shown in Table 8.

Table 8. Race/Ethnicity and Gender Data Collected and Reported on Nursery Products Deaths, 2018-2020

2018-2020 Nursery Products	Deaths	State of Deaths (%) ¹	Estimated Percentage of U.S. Population [@]
Race (all ethnicities)	386	100	100
White	240	62	70
Black or African American	112	29	16
Asian	5	1	6
Native Hawaiian/Pacific Islander	2	1	<1
American Indian/Alaska Native	5	1	2
Other	22	6	6
Gender (2020 only)	176	100	100
Male	106	60	51
Female	70	40	49

[@] Based on estimated U.S. Census U.S. population statistics Demographic percentages are based on <https://www2.census.gov/programs-surveys/popest/datasets/2010-2020/national/asrh/NC-EST2020-ALLDATA-R-File18.csv>, <https://www2.census.gov/programs-surveys/popest/datasets/2010-2020/national/asrh/NC-EST2020-ALLDATA-R-File20.csv>, and <https://www2.census.gov/programs-surveys/popest/datasets/2010-2020/national/asrh/NC-EST2020-ALLDATA-R-File22.csv>.

¹. These are percentages of deaths where gender and race are known and includes both Hispanic and Non-Hispanic individuals in each category. 5-Year Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin in the United States: January 1, 2015 to December 31, 2019

Source, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023

Off-Highway Vehicles Fatalities and Injuries

The CPSC staff published the report, *Report of Deaths, and Injuries Involving Off-Highway Vehicles with More than Two Wheels* (Zhang, 2024) providing statistics on injuries and fatalities associated off-highway vehicles with two or more wheels from 2018-2020. For these three years CPSC records 2,384 reported incidents resulting in 2,448 deaths associated with all OHVs. Of those 2,448 reported deaths there is an association of 1,643 with all-terrain vehicles (ATVs), 635 with recreational off-highway vehicles (ROVs), and 56 with utility terrain vehicles (UTVs). For the remaining 114 deaths, the vehicle classification was unknown other than that it was either a ROV or a UTV. Deaths occurred due to overturns and collisions with another vehicle or a stationary object, for example, a tree. OHVs occupant(s) were frequently ejected in these types of incidents.

The data are shown in Table 9. As can be seen, the percentage of deaths did not match the population distributions, with Whites having a disproportionately high portion of the fatalities, and Other racial groups having a disproportionately low portion of deaths. Similarly, males have a disproportionately high portion of the deaths as shown in Table 9.

Table 9. Race/Ethnicity and Gender Data Collected and Reported on OHVs Deaths, 2018 – 2020

2018-2020 OHVs	Deaths	Death (%)	Estimated Percentage of U.S. Population [@]
Race (all ethnicities)¹	2050	100	100
White	1,835	89	75
Black or African American	118	6	14
Other ²	97	5	11
Hispanic¹	196	8	18
Gender⁴	2448	100	100
Male	2007	82	50
Female	441	18	50

@ Based on annual U.S. Census U.S. population statistics corresponding to annual July 1 U.S. population estimates by race published by the U.S. Census Bureau. Estimates for 2018 and 2019. Estimates for 2020-2022.

1. These are the frequencies and percentages of deaths where race and ethnicity are known; race includes both Hispanic and Non-Hispanic individuals in each category.

2. Other is classified as Asian, Alaska Native/Hawaiian Pacific and American Indian combined.

3. Note: Total may not sum to 100 percent due to rounding

4. These are the frequencies and percentages of deaths where gender is known.

Source, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2024

Pediatric Poisoning Fatalities and Injuries

The CPSC staff published the report, *Annual Report on Pediatric Poisoning Fatalities, and Injuries (Bragg, 2024)* providing statistics on injuries and fatalities associated with unintentional poisonings from drugs and other household chemical substances for children younger than 5 years of age. Based on mortality data from the National Center for Health Statistics, CPSC staff identified that pediatric poisonings involving child under 5 resulted in 59 fatalities in 2021, a 37 percent increase from 2020. The report also noted a 66-percent increase from 2021 to 2022, with 98 fatalities in 2022. The increases in deaths in 2021 and 2022 are largely due to narcotics and unspecified drugs (ICD-10 codes X42 and X44). The historical data show a decline in fatalities since 1972, but in the last two years there have been increased levels as compared to 1991. CPSC staff only reported estimated ED-treated injuries from unintentional pediatric poisonings for gender, as race and ethnicity estimates were below reporting thresholds. The data by gender for 2022 are shown in Table 10, where it can be seen that males have a disproportionately high portion of the fatalities as compared to their portion of the population.

Table 10. Race/Ethnicity and Gender Data Collected and Reported on Pediatric Poisonings Injuries, 2022

2022 Pediatric Poisonings	Injuries	Injuries (%) ¹	Estimated Percentage of U.S. Population [@]
Gender Total Known	68,600	100	100
Male	37,800	55	51
Female	30,800	45	49

[@] Based on estimated U.S. Census U.S. population statistics corresponding to the average of 6 years 2017 to 2022. NEISS (injury) estimates are considered unstable and potentially unreliable when the estimate is less than 1,200 or the number of cases is less than 20, or CV exceeds 33%.

¹. Total may add up to more than 100 percent due to the inclusion of ethnicity.

Sources, U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2024

Gender Data Collected and Reported

Table 11 and 12 shows the distribution of deaths categorized by gender, by years and age ranges covered by the data along with total death counts and the share of those death counts, by gender. The tables facilitate comparison of death rates between females and males, although it should be emphasized that different reports cover different years and different age ranges (e.g. 11 years and all ages for EDT CO-associated deaths vs. 1 year and under 5-year-olds for nursery product-associated deaths). That said, the gender-based fatality comparisons in these reports indicate a pattern: males account for a notably larger share of deaths (60 to 89 percent), despite having approximately equal population shares (for example, estimated 50/50). This gender disparity could stem from a number of different causes, such as men being more likely to engage in risky behavior (for example, riding OHVs or doing electrical work), or they may be less likely to seek out medical treatment. However, given that the gender-based discrepancy is evident in those under age 5 as well, future studies could explore the potential root causes.

Table 11. Total Number Gender Death Data Collected and Reported by Selected CPSC Annual Reports: Non-Fire CO (2018-2020), CO (EDTs) 2012-2022), Electrocutions (2011-2020), Micromobility (2017-2022), Nursery Products (2018-2020), and Off-Highway Vehicles (2018-2020)

Total Number of Deaths Collected by Gender						
CPSC Annual Report	Years Covered	Total Years	Ages	Total Deaths	Male	Female
CO Deaths (Non-Fire)	2018-2020	3	All	225	172 (76%)	53 (23%)
CO Deaths (EDTs)	2012-2022	11	All	872	696 (80%)	176 (20%)
Electrocutions	2011-2020	10	All	410	365 (89%)	45 (11%)
Micromobility	2017-2022	6	All	221	178 (81%)	43 (19%)
Nursery	2020	1	Under 5	176	106 (60%)	70 (40%)
Off-Highway Vehicles	2018-2020	3	All	2,448	2007 (82%)	441 (18%)

Note: Totals may not sum to 100 due to rounding, if fatalities are based on estimates rather than reports.

Source: U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023, 2024

Table 12. Annual Averages Gender Death Data Collected and Reported by Selected CPSC Annual Reports: Non-Fire CO (2018-2020), CO (EDTs) (2012-2022), Electrocutions (2011-2020), Micromobility (2017-2022), Nursery Products (2018-2020), and Off-Highway Vehicles (2018-2020)

Annual Averages of Deaths Collected by Gender						
CPSC Annual Report	Years Covered	Total Years	Ages	Total Deaths	Male	Female
CO Deaths (Non-Fire)	2018-2020	3	All	75	57 (76%)	18 (23%)
CO Deaths (EDTs)	2012-2022	11	All	79	63 (80%)	16 (20%)
Electrocutions	2011-2020	10	All	46	41 (89%)	5 (11%)
Micromobility	2017-2022	6	All	37	30 (81%)	7 (19%)
Nursery	2020	1	Under 5	176	106 (60%)	70 (40%)
Off-Highway Vehicles	2018-2020	3	All	816	669 (82%)	147 (18%)

Note: Totals may not sum to 100 due to rounding, if fatalities are based on estimates rather than reports

Source: U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023, 2024

Race and Ethnicity Data Collected and Reported

Table 13 shows CPSC Annual Reports where the distribution of deaths or injuries categorized by race and ethnicity is overrepresented or disproportionate. An overrepresentation or disproportionate percent is defined as that demographic group's share of deaths or estimated injuries is notably greater than their share of the U.S. population.

Table 13. Summary of Findings from Selected CPSC Annual Reports with Overrepresentation by Race and Ethnicity: CO (EDT) (2012-2022), Electrocutions (2011-2020), Micromobility (2017-2022), Nursery Products (2018-2020), Pediatric Poisoning (2022), and Off-Highway Vehicles (2018-2020)

CPSC Annual Report	Years Covered	Ages	Ethnicity	Race	Type	Findings
CO Deaths (EDTs)	2012-2022	All	Non-Hispanic	Black	Fatalities	Overrepresented for generator-related CO fatalities
			Non-Hispanic	White	Fatalities	Overrepresented for OEDT-related CO fatalities
Electrocutions	2011-2020	All	Non-Hispanic	White	Fatalities	Disproportionate share of electrocution fatalities
Micromobility	2017-2022	All	-	Black	Injuries	Disproportionate share of micromobility-related injuries
Nursery	2018-2020	Under 5	-	Black	Fatalities	Overrepresented for nursery product-related fatalities
Off-Highway Vehicles	2018-2020	All	-	White	Fatalities	Overrepresented for all OHV-related fatalities
			-	White	Injuries	Disproportionate share of OHV-related injuries
Pediatric Poisoning	2022	Under 5	Non-Hispanic	White	Injuries	Disproportionate share of pediatric poisoning-related injuries

Sources: U.S. Consumer Product Safety Commission, Directorate for Epidemiology, 2023, 2024 ; The reports cited are:

- [Fatal Incidents Associated with Non-Fire Carbon Monoxide Poisoning from Engine-Driven Generators and Other Engine-Driven Tools, 2012-2022 | CPSC.gov](#)
- [Electrocutions 2011 to 2020 | CPSC.gov](#)
- [Micromobility Products-Related Deaths, Injuries, and Hazard Patterns: 2017-2022 | CPSC.gov](#)
- [Injuries and Deaths Associated with Nursery Products Among Children Younger than Age Five | CPSC.gov](#)
- [Annual Report on Pediatric Poisoning Fatalities and Injuries - March 2024 | CPSC.gov](#)
- [2023 Report of Deaths and Injuries Involving Off-Highway Vehicles with More than Two Wheels | CPSC.gov](#)
- [Annual Report on Pediatric Poisoning Fatalities and Injuries - March 2024 | CPSC.gov](#)

Future Direction for Consideration

CPSC staff works to equitably advance improvements in consumer safety and investigate differences in populations at all levels. Staff will continue to explore opportunities to enhance the collection and analysis of demographic data in the pursuit of improved consumer product safety outcomes for all U.S. consumers. Staff plans to continue developing data analysis strategies that will enhance the agency's understanding of the sociodemographic and socioeconomic factors associated with consumer products to allow for more targeted interventions.

In-depth Death Investigation Victim Zip Code Data Collection

In FY 2024, CPSC staff began collecting victim residence ZIP Code data during investigations. The residence ZIP Code data were not always captured for incidents (which may occur away from the residence). The victim ZIP Code is a mandatory field for all CPSC investigations, thereby allowing CPSC staff to capture the U.S. Census median household income for the ZIP Code of the residence of the victim. The data will enable CPSC staff to use both In-Depth Investigation (IDI) data and death certificates for socioeconomic analysis and future epidemiological reports.

Nationwide Emergency Department Sample (NEDS) Data

CPSC staff will use the United States Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) national resource of encounter-level healthcare data for socioeconomic analysis. This data source includes the Nationwide Emergency Department Sample (NEDS) data with the HCUP, a database of the largest all-payer insurance, nationally representative sample of 20 percent of the nation's population on all-cause Emergency Department charges and visits. A key data element included in the NEDs data is the U.S. Census median household income for patient's residence ZIP Code . It provides a quartile classification of the estimated U.S. Census median household income of residents in the patient's ZIP Code, allowing CPSC to review injury data with respect to patient income for socioeconomic analyses. This information is not provided with data from NEISS hospitals, given restrictions on personally identifiable information.

Revision of Statistical Policy Directive No. 15 (SPD-15) (2024)

CPSC staff continues to use a standardized approach to collecting and reporting race and ethnicity. OMB recently published a set of updates to their Statistical Policy Directive 15: Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity (SPD 15). These updates will expand the detail of the race and ethnicity data that agencies across Federal government collect, publish, and use to evaluate equitable program delivery and outcomes, monitor and enforce civil rights laws, and describe the demographic makeup of our nation. SPD 15 was established in 1977, last revised in 1997, to provide a common statistical framework to promote uniformity, comparability, and consistency across Federal information collections that include race and ethnicity.

The updates intend to collect race and ethnicity information using one combined question. The 1997 standards required two questions: a Hispanic or Latino ethnicity question and a separate

race question. The 2024 update combines race and ethnicity into one question and is required for both self-response and proxy reporting. Respondents can select multiple categories, but a single response is also considered a complete response. Another update is the addition of Middle Eastern or North African (MENA) as a new category, distinct from all other reporting categories. The 1997 standards defined people of Middle Eastern or North African (MENA) origin as a group within the White racial category. The definition for the White category is revised to remove references to MENA. Overall, SPD 15 calls for demographic information across seven primary groups, with six of them further subdivided into six secondary groups, for a total of 43 demographic groups.

Agencies must submit an Action Plan on Race and Ethnicity Data to OMB by or before September 28, 2025, describing how they intend to bring their collections and publications into compliance, and they must make these plans available through their websites at the time of their submission to OMB. The revised SPD 15 is effective as of March 28, 2029.

Socioeconomic Dashboards

CPSC developed in FY24 an interactive business intelligence platform dashboard that integrates data from the U.S. National Fire Incident Reporting System and U.S. Census data to provide staff with detailed visualizations of fire incidents. Staff can filter information on recorded fire incidents by geographic location, socioeconomic level of parties, consumer products, and race and ethnicity data, enabling an analysis of fire-related risks. In FY25, subject to the availability of funds, CPSC staff plans to expand the fire dashboard and begin the process of developing a similar dashboard for children's products.

CPSC staff plans to add data on fire incidents in 2021 and 2022 to the fire dashboard, which currently only has data from 2017 – 2020. Additionally, CPSC staff plans to add the dimensions of sex and age to the race/ethnicity, income, geography, and product dimensions already in the dashboard. This would significantly increase the ability of the fire dashboard to inform CPSC on hidden hazards to vulnerable communities (for example, older adults).

CPSC staff also plans to create a similar dashboard for children's products if funds are available. The level of effort and resources needed to create a dashboard for children's products – and other product categories – will be more intensive because the environment is not as data rich as for products associated with fire risk. Assuming resources are available, CPSC staff will construct a dashboard for children's products that will include, but are not limited to, categories such as highchairs, cribs, bassinets, and play yards. Like the fire dashboard, this dashboard would filter information on hazardous incidents within the products with the dimensions of race and ethnicity, income, geography, sex, and age.

Conclusion

In closing, understanding racial and socioeconomic differences in consumer product safety is critical for protecting people from unsafe products that can lead to injuries and death, placing significant burden on individuals, families, and communities. CPSC staff remain committed to finding ways to mitigate risks in an equitable way. CPSC staff will continue to work to identify ways of better addressing hazards in a diverse population.

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Appendix

The following are details regarding methodological decisions used in the SUIDs analyses above.

Sampling

A purposive sampling was used to select the five states with the highest rates of SUIDs per 100,000 live births as reported by the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS). As this type of selective sampling is a non-probabilistic technique, unlike a probabilistic one like random sampling, it is not a representative sample of all U.S. states is therefore not generalizable. As such, this is an exploratory data analysis and results should be interpreted with caution.

Inclusion Criteria

CPSC staff obtained mortality data from the Center for Disease Control (CDC) National Center for Health Statistics (NCHS) and subset these data to only include incident dates associated with the death occurring between January 1, 2013 and December 31, 2022. Following that, the data were further subset to only include incident locations within the five U.S. states of interest (Alabama, Arkansas, Louisiana, Mississippi, and West Virginia), followed by including only those cases associated with International Classification of Diseases (ICD)-10 coded associated with child sleep-related deaths:

- (W75) Accidental suffocation and strangulation in bed (ASSB);
- (W76) Other unintentional strangulation;
- (W80) Inhalation and ingestion of other objects causing obstruction of respiratory tract;
- (W83) Other specified threats to breathing; and
- (Y20) Undetermined – suffocation.

Following that, remaining cases not associated with any of the following product codes identified by CPSC safe sleep subject matter experts were excluded:

<u>Product Code</u>	<u>Product Name</u>
661	Bunk Beds
667	Bedspreads, Throws or Comforters
679	Sofas, Couches, Davenports, Divans or Studio Couches
680	Convertible Beds, Hideaway Beds or Sofa Beds
689	Blankets, Not Specified
1513	Playpens
1519	Car Seats (For Infants or Children)
1522	Baby Strollers
1529	Portable Cribs
1537	Bassinets or Cradles
1542	Baby Mattresses or Pads
1543	Nonportable Cribs
1545	Cribs, Not Specified

1552	Cribs, Nonportable or Not Specified
1553	Portable Baby Swings (For Home Use)
1597	Non-poisoning Death of Victim Under Age 5
1598	Overlay Deaths
1644	Nightwear
4002	Bedding, Not Specified
4008	Nonelectric Blankets
4009	Nonbaby Mattresses
4010	Mattresses, Not Specified
4050	Pillows
4051	Sheets or Pillowcases
4054	Other Bedding
4075	Bed Rails
4076	Beds or Bedframes, Other or Not Specified
4082	Toddler Beds
5037	Hammocks

Unit of Analysis

Counties were chosen as the unit of analysis due to availability of fatality, population, and economic data at that level. Individual cases were aggregated to the county level using the city, state, and ZIP Code available on death certificates. To identify counties from ZIP Codes, data were obtained from the U.S. Department of Housing and Urban Development (HUD), Office of Policy Development and Research (PD&R) *HUD-USPS ZIP Code Crosswalk* files (https://www.huduser.gov/portal/datasets/usps_crosswalk.html) and then matched with the NCHS mortality data subset described above. As HUD'S Crosswalk files caution, ZIP Codes do not always perfectly align with political boundaries, often crossing city, county, and even state borders. Consequently, HUD's Crosswalk files contain a residential ratio (*RES_RATIO*) variable that captures the ratio of residential addresses in a ZIP Code-to-County pair to the total number of residential addresses in that ZIP Code. As a sensitivity analysis, CPSC staff examined this *RES_Ratio* variable among the 884 deaths nested in the 199 counties of interest, finding a median value of 97.8 percent. That type of coverage, coupled with established research in the fields of geography and sociology on demographic and socioeconomic spatial autocorrelation among neighboring geographical areas mitigates concerns of mismatches between ZIP Codes and counties. Finally, county names were obtained by merging these NCHS and HUD data with data from the CDC's Social Vulnerability Index (SVI) data (https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2020.html).

Population Data

To calculate incidence rates, county-level population data by age, sex, and race were obtained from the U.S. Census Bureau's County Population by Characteristics' file (<https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-detail.html>) for 2020, for the 199 counties that had SUIDs cases from 2013 through 2022. As age data are grouped, it was not possible to obtain exact estimates for the specific group of infants ages 12 months or younger. As such, data for the populations under the age of 5 years were used to

impute annual estimates for each demographic group and then summed for the ten-year period. These estimates could be further refined in the future if paired with population growth data.

Economic Data

To divide the 199 counties into economically distinct thirds, economic data on median household income were obtained from the Economic Policy Institute along with cost-of-living data in the form of annual expenses for each of the 199 counties of interest (https://files.epi.org/uploads/fbc_data_2022.xlsx), standardized for the year 2020. As the EPI's documentation details (<https://files-staging.epi.org/uploads/142508.pdf>), their data capture the annual income of each county families of various sizes (in this case, a family of three comprising two working adults and one 4-year-old child) need "to attain a modest yet adequate standard of living", given expected expenses in that county for housing, food, child care, transportation, health care, other necessities, and taxes.

Statistical Significance

P-values for the confidence intervals used to test statistical significance of the incidence rate ratios in Table 3 utilized median-unbiased estimation (i.e. mid-p) given their preferred use with small samples; however, comparisons with an alternative estimation—unconditional maximum likelihood estimation (a.k.a. Wald)—resulted in no notable changes in statistical significance across any of the group comparisons.