Micromobility Products-Related Deaths, Injuries, and Hazard Patterns: 2017–2020

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October 2021

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Executive Summary

In this report, U.S. Consumer Product Safety Commission (CPSC) staff presents the latest available statistics on injury estimates, fatalities, and hazard patterns associated with three micromobility products: e-scooters (including dockless/rental e-scooters), hoverboards, and e-bikes. The timeframe covered is 2017 through 2020. This report includes all data presented in the previous annual report, Micromobility Products-Related Deaths Injuries and Hazard Patterns 2017-2019[1] and adds the 2020 data. For micromobility-related fatalities, staff notes that due to delays in death certificate reporting, the number of reported fatalities may change in the future. A new section has been added to the report this year. CPSC staff conducted a special follow-up study of e-scooter-related emergency department (ED)-treated injuries between January 1, 2020 and December 31, 2020. The special study allowed the collection and analysis of more detailed information on these injuries, such as the type of injury, the characteristics of the victim, and the incident scenario.

Emergency Department (ED) - Treated Injury Estimates:

- All Micromobility Products
  - Estimated total of 190,500 ED visits from 2017 through 2020;
  - The corresponding annual estimated ED visits for 2017, 2018, 2019, and 2020 were 34,000, 44,000, 54,800 and 57,700, respectively.

- E-Scooters
  - Estimated total of 75,400 ED visits from 2017 through 2020;
  - Annual estimated ED visits were 7,700, 14,500, 27,700, and 25,400 in 2017, 2018, 2019, and 2020 respectively;
  - Estimates for dockless/rental e-scooters did not meet the reporting criteria for NEISS.[2] These estimates accounted for 10 percent of ED visits for e-scooters. However, this may be an underestimate because not all dockless/rental e-scooters may have been identified as dockless/rental in the NEISS data by the hospital staff;

- Hoverboards
  - Estimated total of 98,200 ED visits from 2017 through 2020;
  - Annual estimated ED visits were 22,800, 26,300, 22,100, and 27,100 in 2017, 2018, 2019, and 2020, respectively;
  - Increase from 2019 to 2020 was statistically significant.

[1] The report, Micromobility Products-Related Deaths Injuries and Hazard Patterns 2017-2019 can be found at https://www.cpsc.gov/s3fs-public/Micromobility-Products-Related-Deaths-Injuries-and-Hazard-Patterns-2017%E2%80%932019_0.pdf?qLBFW4UCrbewQJl9BZyPkSExMnbaomP6

[2] The reporting criteria for NEISS require that the estimated number of injuries be 1,200 or higher, the sample size be 20 or larger, and the coefficient of variation be less than 33 percent.

- E-Bikes
    - Accounted for 9 percent of the overall micromobility injury estimate for 2017 through 2020;
    - Estimates did not meet the reporting criteria for NEISS.[3]

Special Study on E-Scooters:

- CPSC staff followed up 142 e-scooter cases through investigations for 2020;
- Rental e-scooters accounted for 28 percent of the e-scooter-related ED visits in the special study;
- Fifty-seven percent of the injuries occurred on paved roads;
- Twenty percent of the victims reported that it was dark or difficult to see;
- Sixteen percent of the injured were carrying or holding something while riding the e-scooter;
- Seventy-nine percent of the riders were wearing a helmet while riding the e-scooter.

Reported Fatalities:[4]

- All Micromobility Products
    - CPSC staff is aware of 71 fatalities from 2017 through 2020;
    - Number of fatalities were 5, 11, 31, and 24 in 2017, 2018, 2019 and 2020, respectively.

- E-Scooters (Dockless/rental in parentheses)
    - CPSC staff is aware of 42 (11) fatalities from 2017 through 2020;
    - Number of fatalities were 1 (none), 5 (2), 25 (7), and 11 (2) in 2017, 2018, 2019, and 2020, respectively.[5]

- Hoverboards
    - CPSC staff is aware of 6 fatalities from 2017 through 2020;
    - Four out of 6 reported fatalities occurred in 2017. The remaining 2 fatalities occurred in 2020.

- E-Bikes
    - CPSC staff is aware of 23 fatalities from 2017 through 2020;
    - No fatalities were reported in 2017. Number of fatalities were 6, 6, and 11 in 2018, 2019, and 2020, respectively.

[3] The reporting criteria for NEISS require that the estimated number of injuries be 1,200 or higher, the sample size be 20 or larger, and the coefficient of variation be less than 33 percent.

[4] Reporting for 2019-2020 is ongoing. Counts may change in future reports.

[5] Fatality reports associated with dockless e-scooters began to appear in the CPSC surveillance data in 2018.

Associated Hazard Patterns:

CPSC Field staff completed 167 follow-up in-depth investigations related to all micromobility products, based on reports of incidents in CPSC's Consumer Product Safety Risk Management System (CPSRMS) that occurred from 2017 through 2020. Of the 167 completed investigations, 41 involved an e-scooter, 121 involved a hoverboard, and 5 involved an e-bike.

- E-Scooters
  - Forty-one of the investigated incidents involved an e-scooter (32 of the 41 were dockless/rental e-scooters);
  - Brake problems were associated with more of the investigated incidents (18 out of 41) than any other problem.

- Hoverboards
  - Field staff investigated 121 incidents associated with hoverboards;
  - Fire hazards were the most common problem reported, accounting for 112 of the 121 investigated incidents.

- E-Bikes
  - CPSC staff reviewed 5 completed investigation reports on e-bikes;
  - Fire hazards were identified in 2 of the 5 investigated incidents.

Introduction

The use of micromobility products, including e-scooters, hoverboards, and e-bikes, has increased in recent years with advancements in battery technology and the growing popularity of commercial ride-sharing services. Consumers may rent commercial dockless e-scooters and e-bikes or purchase their own micromobility products. These products are popular with consumers because they are perceived as eco-friendly, given that they have no tailpipe emissions, and they are a convenient, cost-effective mode of transportation for short-distance travel.[6] No motor vehicle license is required to operate these products.

This report summarizes the injuries, deaths, and hazards associated with the use of micromobility products, based on data from the CPSC epidemiological databases from 2017 through 2020. Data from 2020 were added to the data from 2017 through 2019 previously presented in the 2020 annual report on micromobility products.[7] In addition, this report summarizes findings from a special follow-up study of emergency department-treated injuries involving e-scooters in 2020. 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
- electric bicycles (e-bikes: motorized bicycles powered by battery to assist riders' pedal-power, with a maximum speed of 15-20 mph).

Three-wheeled e-scooters, non-electric kick scooters, gas-powered scooters, or mobility scooters, mopeds, motorized carts, and other seated motorized scooters are not in scope for this report.

The first section of this report presents the national injury estimates for the micromobility products in the following order: overall micromobility, e-scooters, and hoverboards. The individual injury estimates for dockless/rental e-scooters and e-bikes were not presented in this report, due to small sample sizes and limitations in NEISS data possibly leading to undercounts because of the unavailability of sufficient information to identify the product as a dockless/rental. This is followed by a section on the special study of e-scooter-related injuries. The special study section is followed by a section on the fatalities reported to CPSC. Following the fatalities is a section on hazard patterns, as identified from completed in-depth investigation reports. For the sections on Fatality and Hazard Patterns, the analysis is presented for overall micromobility, then e-scooters (dockless/rental e-scooter statistics in parentheses), hoverboards, and finally for e-bikes. Lastly, Appendix A describes staff's methodology, including process for data extraction, scope determination, and discussion of the raking methodology. Appendix B presents additional details about the injury estimates. Appendix C lists the questions used in the follow-up study of NEISS on e-scooter-related injuries treated.

[6] See https://www.cpsc.gov/s3fs-public/safety-concerns-associated-with-micromobility-products.

[7] The report, Micromobility Products-Related Deaths Injuries and Hazard Patterns 2017-2019 can be found at https://www.cpsc.gov/s3fs-public/Micromobility-Products-Related-Deaths-Injuries-and-Hazard-Patterns-2017%E2%80%932019_0.pdf?qLBFW4UCrbewQJl9BZyPkSExMnbaomP6.

Staff's national estimates of injuries are based on injury data collected by CPSC's NEISS, which is a nationally representative stratified probability sample of hospitals in the United States and its territories.[8] Each injury report contains a product code that identifies the type of product involved; in addition, information on the injured victim's sex, age, diagnosis, disposition, body part injured, and a brief narrative description of the injury is available. Each injury in the sample represents an estimated number of injuries that staff projects nationally.

CPSC staff conducted a special follow-up study of NEISS on e-scooter-related injuries treated in hospital emergency departments between January 1, 2020 and December 31, 2020. These investigations were completed through telephone interviews and self-administered online surveys of injured victims to learn more about how the injury occurred, the type of injury, the scooter type involved, the characteristics of the rider/victim, and the incident scenario.

The fatality statistics, as well as the hazard pattern review staff presents in this report, are based on incidents reported to CPSC through the CPSRMS. See Appendix A for the codes and keywords used in the database searches. Reports in CPSRMS come from various sources, including consumer complaints, news clips, state/local authorities, medical examiners, national death certificates, manufacturers and retailers, among others. Staff considers the data in CPSRMS to be anecdotal and not nationally representative. Moreover, data collection is ongoing, and staff considers the later years' data to be incomplete. Specifically for death statistics, which rely on death certificates reported by the states, staff observes a lag of up to 2 years from the time of the death to the time of reporting to the CPSC. As such, the data included in this report (especially from 2019 through 2020) are likely incomplete. In annual reports for coming years, CPSC staff will update the statistics on an as-needed basis. Each incident report contains a product code that identifies the type of product involved, as well as information about the location of the incident (state and city) and the individual(s) involved or injured (age and sex), and a narrative description.

I. National Injury Estimates

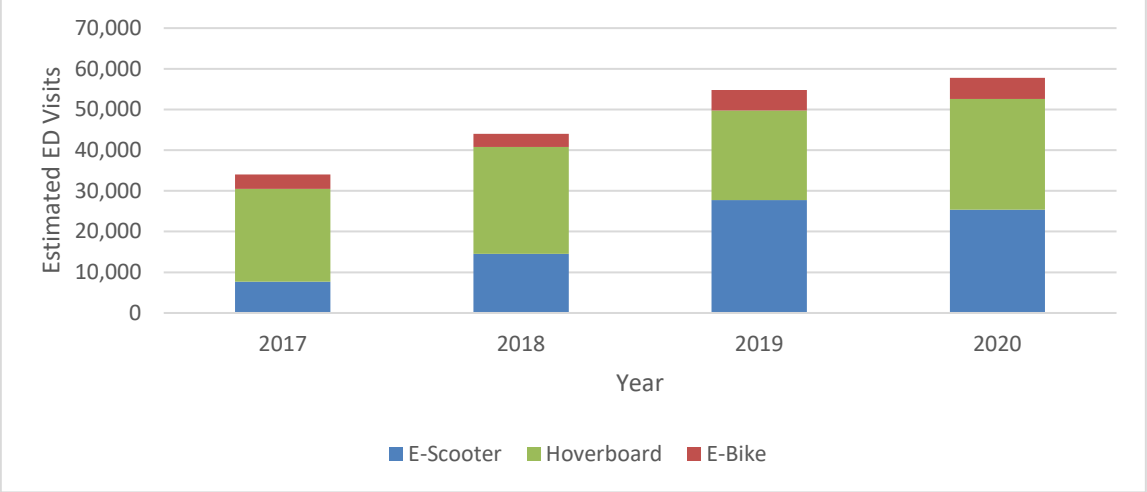
Staff estimates 190,500 injuries (sample size=5,335, coefficient of variation=0.12) related to all micromobility products were treated in U.S. EDs over the 4-year period 2017 through 2020. The annual estimated ED visits were 34,000, 44,000, 54,800, and 57,700 in 2017, 2018, 2019, and 2020, respectively. The annual estimates for 2021 are not available until NEISS data for 2021 are finalized in spring 2022.

Products

Figure 1.1 shows the national annual estimates of ED-treated micromobility injuries and product type from 2017 through 2020. The increase of ED-treated injury estimate for the overall micromobility products from 2019 to 2020 was not statistically significant (p-value: 0.71). In prior years, the ED-treated injury estimates reflected a statistically significant increase from 2017 to 2018 (p-value: 0.01), as well as from 2018 to 2019 (p-value: 0.05). See Appendix B for additional details.

[8] See https://www.cpsc.gov/Research--Statistics/NEISS-Injury-Data.

Figure 1.1: Estimated ED Visits Associated with Micromobility Products by Year



Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

During 2017 through 2020, annual estimated ED visits were 7,700, 14,500, 27,700, and 25,400 for e-scooters. There were statistically significant increases from 2017 to 2018 (p-value: 0.05) and 2018 to 2019 (p-value: <0.01). The 2020 ED-treated injury estimate decrease from 2019 for e-scooters was not statistically significant (p-value: 0.76). Staff did not identify any dockless/rental scooters in the 2017 NEISS data; for 2018 through 2020, the annual estimated ED visits, where the NEISS narrative provided enough information to determine that the product was a dockless/rental e-scooter, did not meet minimum requirement for reporting.[9] Moreover, it is likely that NEISS estimates on dockless/rental e-scooters is an underestimate, due to insufficient information present to identify the product as a dockless/rental.

During 2017 through 2020, annual estimated ED visits were 22,800, 26,300, 22,100, and 27,100 for hoverboards. The 2020 ED-treated injury estimate of 27,100 for hoverboards reflects an increase of 23 percent from the 2019 estimate, which is statistically significant (p-value: 0.02). Historically, from 2017 to 2018, there was a non-statistically significant increase (22,800 to 26,300, p-value: 0.06) and from 2018 to 2019, there was a statistically significant decrease (26,300 to 22,100, p-value: 0.03).

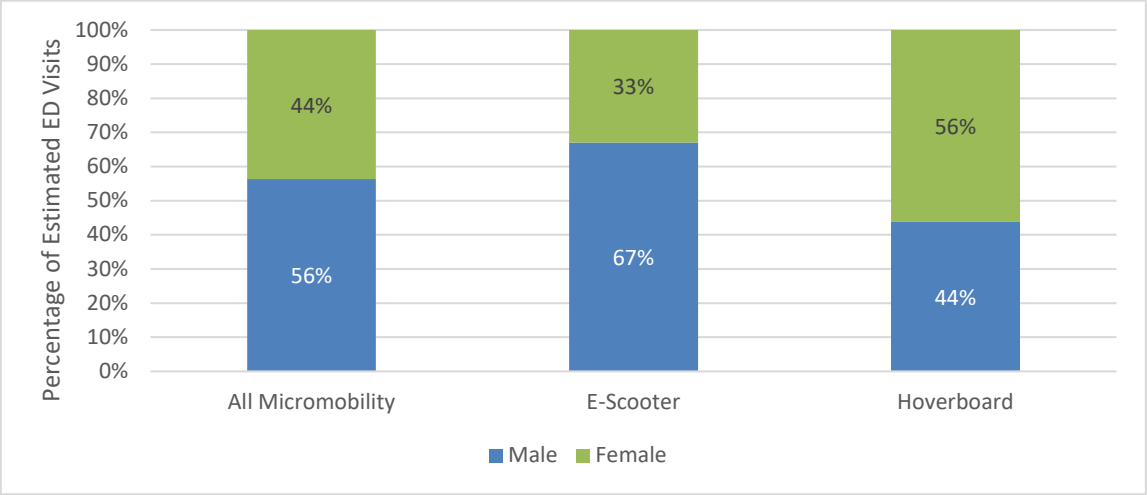
Staff determined that the annual estimated ED visits for e-bikes did not meet the reporting criteria for 2017 through 2020. Refer to Appendix B for details. E-bikes' share of annual estimates of ED-treated injuries for all micromobility products in 2017, 2018, 2019, and 2020 were 10, 7, 9, and 9 percent, respectively.

[9] The reporting criteria for NEISS requires that the estimated number of injuries be 1,200 or higher, the sample size be 20 or larger, and the coefficient of variation be less than 33 percent.

Gender

Figure 1.2 shows the distributions of estimated micromobility-related injuries by product type and sex. Males experienced a higher percentage of micromobility-related, ED-treated injuries in e-scooters (67 percent) during the 4-year period. In contrast, females had a higher percentage (56 percent) of hoverboard-related, ED-treated injuries.

Figure 1.2 Distribution of Estimated ED Visits Associated with Micromobility by Product Type and Sex (2017–2020 Total)



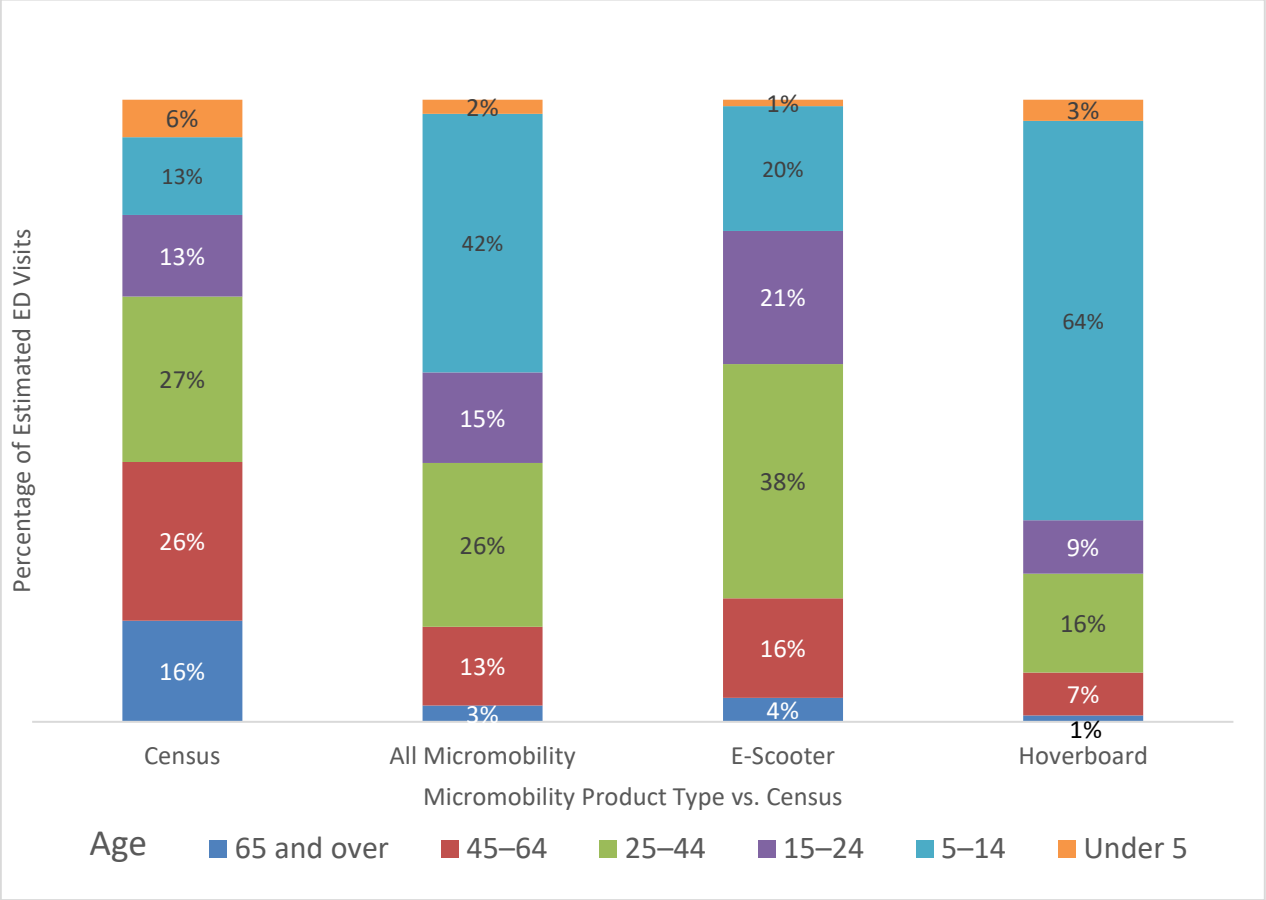
Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Age Groups

Figure 1.3 shows the distribution of estimated micromobility-related injuries by age from 2017 through 2020, versus the general U.S. population distribution. Staff obtained the population by age data from the U.S. Census Bureau,[10] corresponding to the average of 4 years, 2017–2020. The distributions of estimated injuries sustained by the 15-to-24 and 25-to-44 age groups were 21 percent and 38 percent, respectively, for e-scooters. These distributions were disproportionately high compared to their proportions in the general U.S. population (13 percent and 27 percent, respectively). Similarly, the percentage of estimated hoverboard-related injuries for the 5-to-14 age group (64 percent) was disproportionately high compared to its proportion in the general U.S. population (13 percent).

[10] See https://www.census.gov/data/datasets/time-series/demo/popest/2010s-national-detail.html.

Figure 1.3: Distribution of Estimated ED Visits Associated with Micromobility by Product Type and Age Group (2017–2020 Total) Compared to U.S. Population Age Distribution

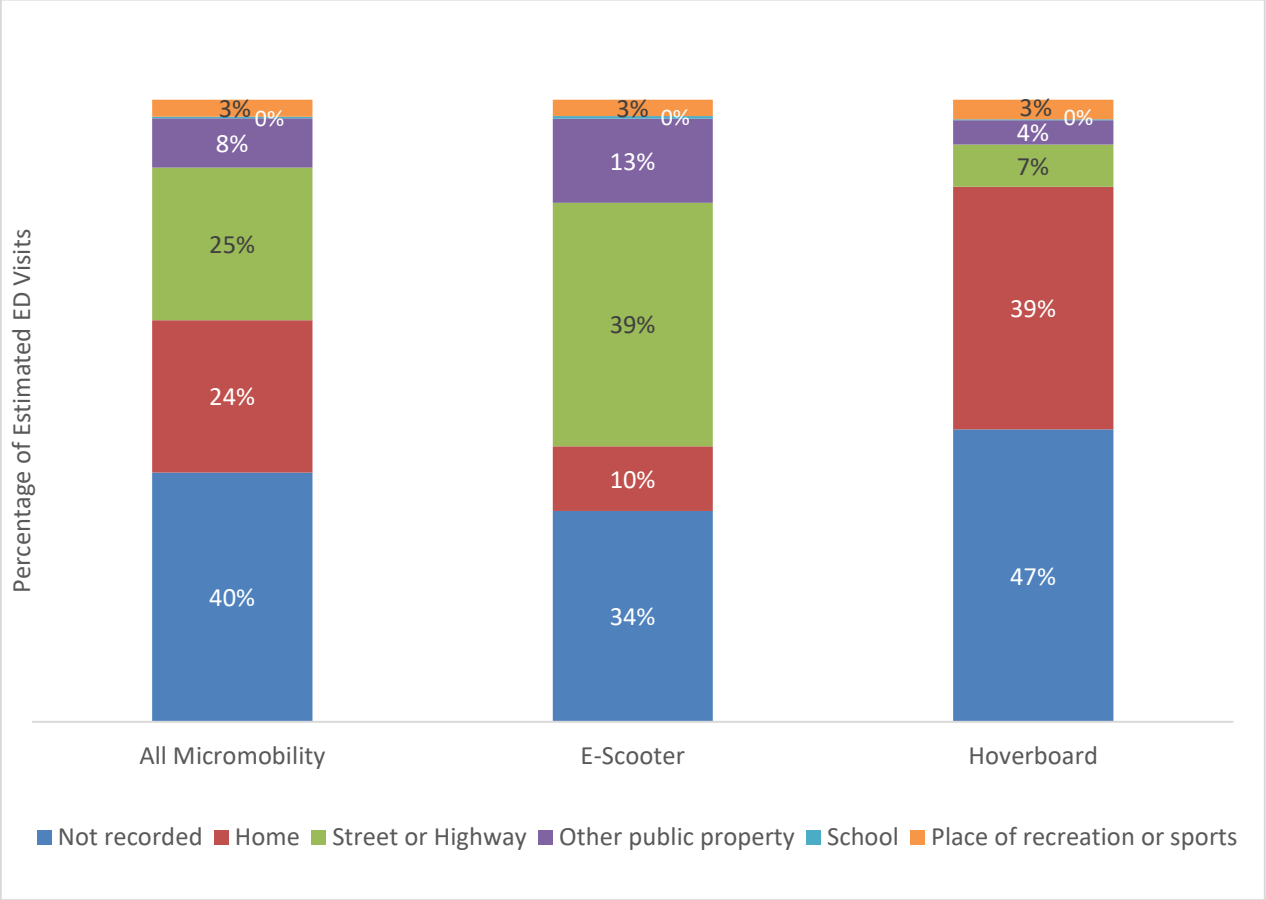


Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Location of Injury

Figure 1.4 presents the proportions of injuries associated with micromobility by product type and location of injury. A large proportion (34 percent for e-scooters, 47 percent for hoverboards, and 40 percent overall) of estimated injuries occurred at unknown locations. For the known locations, the injuries associated with e-scooters occurred most frequently on streets or highways (39 percent); whereas, the hoverboard-related injuries occurred most frequently at home (39 percent).

Figure 1.4: Distribution of Estimated ED Visits Associated with Micromobility Product Type and Location of Injury (2017–2020 Total)



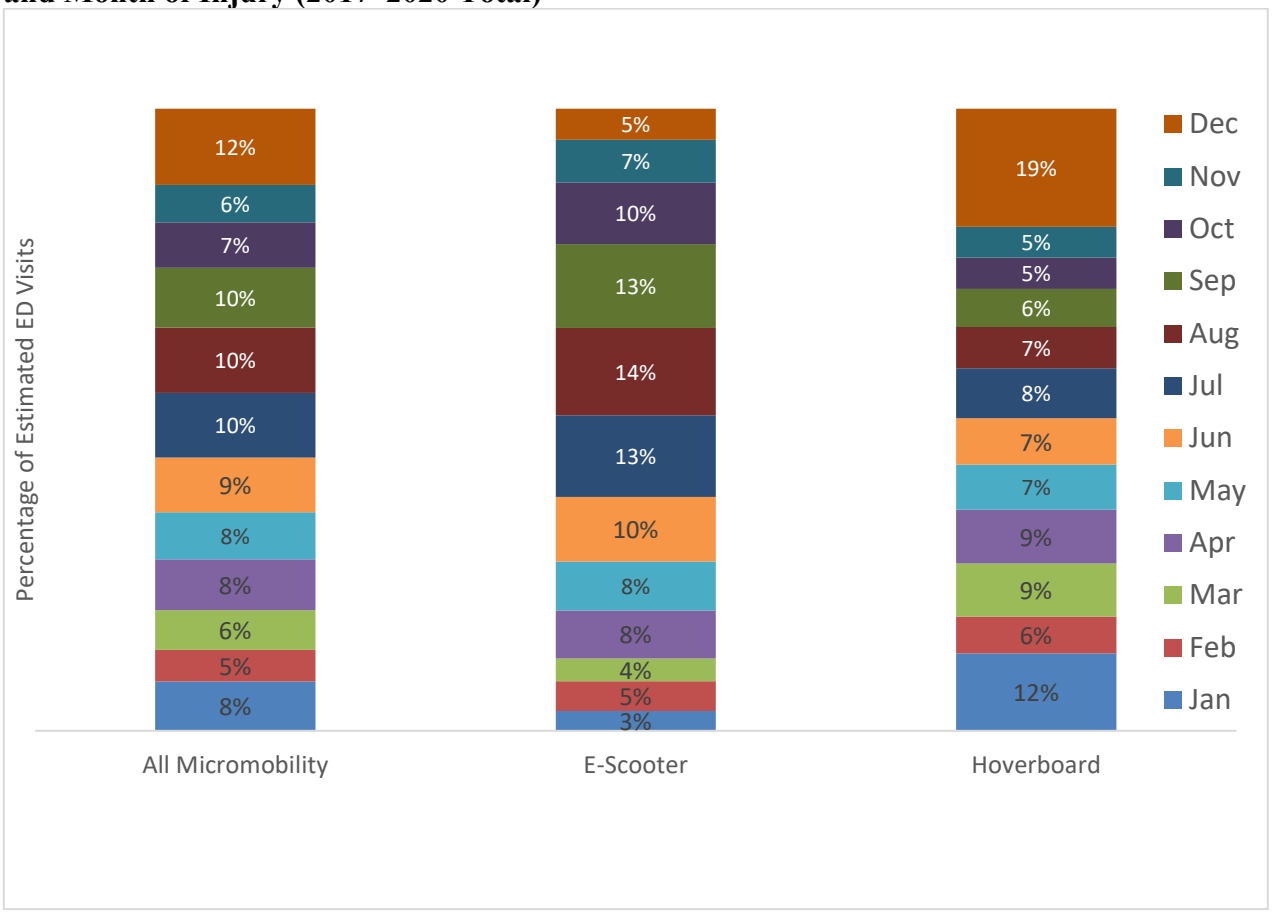
Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Time of the Year

Figure 1.5 illustrates the monthly percentage distribution of the estimated emergency visits by micromobility product type. If the distribution of ED visits were to follow the discrete uniform distribution,[11] the expected monthly ED visits would be around 8 percent. The months of April through October had the largest percentages for e-scooters ED visits; whereas, December and January had the largest percentages for hoverboard-related ED visits.

[11] The discrete uniform distribution is a symmetric probability distribution, where all 365 days are equally likely to be observed. Under that distribution, every month has a probability between 7.7 percent and 8.5 percent.

Figure 1.5: Distribution of Estimated ED Visits Associated with Micromobility Product Type and Month of Injury (2017–2020 Total)



Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Other Characteristics

The remaining characteristics, which do not vary much by product type, are as follows:

- Fractures, followed by contusions/abrasions, are the two most common diagnoses.
- The most frequently injured body parts[12] are the upper and lower limbs, as well as the head and neck.
- Most of the injuries are attributed to unspecified falls. Loss of user control, collisions with other motor vehicles, and pavement issues are other notable hazards leading to the injuries.
- More than 90 percent of the injured are treated and released from the EDs. About 7 percent are treated and admitted or transferred to another hospital. Disposition of the remaining 3

[12] Body parts were grouped. For example, all body parts that would generally be considered a part of the lower limb (*e.g.,* toe, foot, ankle, knee, and leg) were grouped as "lower limb."

percent of injuries included: "left without being seen," "held for observation," as well as fatalities.[13]

II. Special Study on E-Scooters

In response to the changing environment for micromobility devices, CPSC revised the set of product codes used to describe scooters and powered skateboards (*e.g.*, hoverboards) beginning in 2020. Previously two product codes 1329 (Scooters, unpowered) and 5042 (Scooters/skateboards, powered) were used to capture scooters and powered skateboards. However, this pair of codes created a conundrum for incidents and emergency department visits that only described a "scooter" without indicating whether the scooter was powered. The set was replaced with 5022 (Scooters, powered), 5023 (Scooters, unpowered), 5024 (Scooters, unspecified), and 5025 (Hoverboards, and powered skateboards). To obtain more detailed information about the scooters associated with emergency department visits, CPSC staff conducted a special study of scooter-related injuries from January 1, 2020 through December 31, 2020. Injuries coded as 5022 (Scooters, Powered) and 5024 (Scooters, Unspecified) were followed up through a survey questionnaire to obtain additional information on the scooter type involved, how the injury occurred, the type of injury, the characteristics of the rider/victim, and the incident scenario. The results showed some of product code 5024 (Scooters, unspecified) injuries (sample size=42) were powered scooters. Recalibrating the weights for these cases (by taking into account the survey response rate), the 42 injury cases were added to all completed survey responses for injuries under product code 5022. The e-scooter-related injuries (sample size=142) from the special study were included as part of the 2020 estimate of 25,400 e-scooter injuries seen in emergency departments. In the investigations, information was requested directly from the victim (or the victim's parent, if the victim was a minor) about the type of scooter involved, where the scooter was obtained, and how the injury occurred.

Scooter Types

Table 2.1 shows the number of respondents by verified scooter type and the corresponding NEISS product code in the special study. The respondents were asked a series of questions related to scooter type and different components. They were asked to provide information on the power source, whether it was an assisted mobility scooter, moped, motorcycle, or scooter that requires a registration or license. In addition, the respondents were asked if their scooter had steering handles and side-by-side wheels, as opposed to wheels that are one in front of the other. Of the 634 follow-up investigations on scooter-related incidents, 22 percent were e-scooters (142 out of 634), 58 percent were related to kick scooters, and the remainder 19 percent were other types of scooters.

[13] Less than 0.1 percent of the estimated injuries were fatal. All fatal injuries from NEISS have been included in the fatality discussion of this report.

Of the 142 follow-up e-scooter-related incidents, 70 percent were originally coded as powered scooters (100 out of 142), 30 percent were coded as unspecified scooters (42 out of 142).[14]

Table 2.1: Scooter Products: NEISS Product Code vs. Verified Scooter Product (2020)

Verified Product	Overall	Powered Scooter (5022)	Unspecified Scooter (5024)	Various Other Product Codes
Kick (unpowered) Scooter	370	18	349	3
Mobility Scooter	27	15	11	1
Moped	39	23	11	5
Hoverboard	15	4	7	4
E-Scooter	142	100	42	0
Gas powered scooter	17	14	3	0
Other/missing	24	11	13	0
Total	**634**	**185**	**436**	**13**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on responses from the special study survey questions V3 – V8. See Appendix C for details.

Table 2.2 shows the response rate for e-scooter investigations by Overall, Powered, and Unspecified scooter. Staff selected 2,477 cases for investigations, of which 142 were completed and determined to be in scope, and 2,335 were either incomplete or out of scope. For the findings to be generalizable to all those injured, raking ratio estimation was implemented to create adjusted weights to reduce non-response bias due to differences in sex, race, stratum, age category, and response rate. These benchmarked weights were used to produce the national estimates from the special study survey. See Appendix A for additional details.

Table 2.2: Completed E-Scooter Investigations by Powered vs. Unspecified Scooter (2020)

Investigation	Overall	Percent	Powered Scooter (5022)	Percent	Unspecified Scooter (5024)	Percent
Completed Investigation	142	6%	100	13%	42	2%
Incomplete/Out of Scope	2,335	94%	679	87%	1,656	98%
Total Assigned	**2,477**	**100%**	**779**	**100%**	**1,698**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.

Estimated Injuries - Scenario-Specific Characteristics

In the remainder of this section, staff summarizes the 142 e-scooter cases from the follow-up investigations. They are descriptive of the portion that participated in the special study. Additionally, respondents did not respond to every question posed to them; as such, in many of the tables below, the "Total" row does not add up to the total of 25,400 injuries.

Table 2.3 shows the distribution of the estimated ED injuries based on the rental status of e-scooter. Of the 25,400 injuries, rental e-scooters accounted for 28 percent, while nonrental e-scooters accounted for 72 percent.

[14] The 42 unspecified scooters have been included in the calculation of national injury estimates.

Table 2.3: Distribution of Estimated Injuries by Rental Status (2020)

Rental vs Non-rental	N	Estimated ED-treated Injuries+	Percent
Rental	48	7,200	28%
Non-rental	94	18,200	72%
Total	**142**	**25,400**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on the responses from special study survey question: S1 Which of the following best describes the scooter? Rental, Owned by victim, Borrowed, Other, Don't know.
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates.

Table 2.4 shows the distribution of the estimated ED injuries while the victim was either riding the e-scooter or was struck by the e-scooter. Of the 25,400 injuries, 97 percent of the injuries occurred to riders of the e-scooter, and 2 percent of the victims were struck by an e-scooter.

Table 2.4: Distribution of Estimated Injuries by How Victim Was Injured (2020)

Riding/Struck by Scooter	N	Estimated ED-treated Injuries+	Percent
Riding the scooter	134	24,700	97%
Struck by scooter	5	600	2%
Other	3	200	1%
Total	**142**	**25,400**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on the responses from special study survey question: V10 You/the victim were/was: Riding the scooter; Struck by scooter; Other.
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates.

Table 2.5 shows the distribution of the ED visits based on the type of surface. Of the 25,100 estimated injuries, paved road accounted for 57 percent, paved sidewalk for 40 percent, driveway for 6 percent, and 3 percent for other types of surface.

Table 2.5: Distribution of Estimated Injuries by Type of Riding Surface (2020)

Type of Surface	N	Estimated ED-treated Injuries+	Percent
Paved road	78	14,200	57%
Paved sidewalk	53	10,100	40%
Driveway	6	1,400	6%
Other	7	800	3%
Total	**138**	**25,200**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on the special study survey question: A3 What type of surface were you/the victim on?
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates; percentages may not sum to 100 percent due to rounding, and also because some riders may have ridden e-scooter on more than one surface type.

Table 2.6 shows the distribution of the injuries by responses on visibility (whether it was dark or difficult to see while riding the scooter). Of the 24,900 estimated injuries with a response to this question, 20 percent of the victims responded that it was dark or difficult to see.

Table 2.6: Distribution of Estimated Injuries by Visibility (2020)

Visibility Issues	N	Estimated ED-treated Injuries+	Percent
No	108	19,900	80%
Yes	31	5,000	20%
Total	**139**	**24,900**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on the special study survey question: A5 Was it dark or difficult to see?
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates.

Table 2.7 shows the percentage breakout of the ED-treated injuries based on source of distraction, such as music, cell phone, or loud music while riding the scooter. Of the 24,500 estimated injuries with a response to this question, a source of distraction accounted for only 2 percent.

Table 2.7: Distribution of Estimated Injuries by Distraction (2020)

Distraction	N	Estimated ED-treated Injuries+	Percent
No	130	24,000	98%
Yes	5	500	2%
Total	**135**	**24,500**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on responses to the special study survey question: A6 Was there anything else occurring at the time of the accident such as music, cell phone interference, or loud music?
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates.

Table 2.8 shows the percentage of ED-treated injuries based on whether rider was carrying/holding something (*e.g.*, bag, purse, or backpack) while riding the scooter. Of the 23,200 estimated injuries with a response to this question, 16 percent of the injured were carrying or holding something while riding the scooter.

Table 2.8: Distribution of Estimated Injuries by Rider Baggage (2020)

Carrying/holding something	N	Estimated ED-treated Injuries+	Percent
No	106	19,600	84%
Yes	21	3,600	16%
Total	**127**	**23,200**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.
Based on responses to the special study survey question: A8 Were/was you/the victim carrying or holding something such as a bag, purse, or backpack?
+Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding. Percentages are calculated from the unrounded estimates.

Table 2.9 shows the percent of ED-treated injuries by usage of safety equipment, such as a helmet, blinking lights, head lamp, knee pads, elbow pads, and/or reflective vest while riding the scooter. Because riders may use more than one type of safety equipment, such rows do not add up to the total. Of the 10,700 estimated injuries where this information was available, the rider was wearing a helmet while riding the e-scooter 79 percent of the time, had blinking lights or head lamp 38 percent of the time, was wearing a reflective vest 10 percent of the time, was wearing knee/elbow pads 9 percent of the time, and had other unspecified safety equipment 8 percent of the time.

Table 2.9: Distribution of Estimated Injuries by Safety Equipment (2020)

Safety equipment	N	Estimated ED-treated Injuries+	Percent
Helmet	39	8,400	79%
Blinking Lights/Head lamp	23	4,100	38%
Reflective vest	4	1,100	10%
Knee/elbow pads	5	1,000	9%
Other	6	900	8%
Total	**54**	**10,700**	**100%**

Source: NEISS, U.S. Consumer Product Safety Commission, 2020.

Based on responses from the special study survey question: S10 I'm going to read a list of safety equipment that riders might wear. Please tell me if the rider was wearing any of these at the time of the incident.

Riders may use more than one type of safety equipment as such rows do not add up to total.

+Injury estimates are rounded to the nearest 100. Percentages are calculated from the unrounded estimates.

III. Reported Fatalities Associated with Micromobility Products

CPSC staff is aware of 71 fatalities related to micromobility products that occurred in the United States during the 4-year timeframe, 2017 through 2020. Some of the characteristics of these reported fatalities are summarized in the tables below. Due to delays in death certificate reporting, staff expects the number of reported fatalities to change in future reports. Compared to the last annual report, Micromobility Products-Related Deaths Injuries and Hazard Patters 2017-2019, there are five additional fatalities. Out of the five fatalities, one e-bike and four e-scooter-related fatalities occurred in 2018 and 2019, respectively.

Table 3.1 shows the fatality data for micromobility products by year of death from 2017 to 2020. While data reporting is ongoing, staff observes 71 fatalities involving the micromobility products. E-scooter-related fatalities represent 42 (11 were dockless e-scooter-related) out of 71, or 59 percent, of total fatalities, mostly reported in the latter part of the 4-year time frame 2017-2020. E-bikes account for 23 fatalities, about 32 percent of the total fatalities, increasing substantially from 2017 to 2020. Four fatalities involving hoverboards occurred in 2017, and two occurred in 2020; as of the time of writing this report, staff is unaware of any hoverboard-related fatalities in 2018, or 2019.

Table 3.1: Number of Reported Fatalities Associated with Micromobility Product Type and Year

Year	All Micromobility	E-Scooter (Dockless/rental)	Hoverboard	E-Bike
2017	5	1 (0)	4	0
2018	11	5 (2)	0	6
2019	31	25 (7)	0	6
2020	24	11 (2)	2	11
Total	**71**	**42 (11)**	**6**	**23**

Note: Reporting for 2019-2020 is ongoing. Counts may change in future reports.
Source: CPSRMS, NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Of the 71 micromobility-related fatalities, 58 were male decedents, 10 were female decedents, and the gender was unknown for the remaining three. Decedents in the majority of the fatalities related to e-scooters (36, including all 11 dockless e-scooter fatalities, out of 42), and e-bikes (21 out of 23) were males; decedents in all but one hoverboard-related fatality were females. (Table 3.2)

Table 3.2: Number of Reported Fatalities Associated with Micromobility Product Type and Gender (2017–2020 Total)

Gender	All Micromobility	E-Scooter (Dockless/rental)	Hoverboard	E-Bike
Male	58	36 (11)	1	21
Female	10	3 (0)	5	2
Unknown	3	3 (0)	0	0
Total	**71**	**42 (11)**	**6**	**23**

Note: Reporting for 2019-2020 is ongoing. Counts may change in future reports.
Source: CPSRMS, NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Table 3.3 presents the fatality data for micromobility products by product type and age group of the deceased from 2017 to 2020. Sixty-two out of 71 total reported micromobility fatalities provided age information. The fatalities were divided into three age groups: children (younger than 18 years of age); adults (ages 18 to 59 years); and seniors (60 years of age or older). Of the 71 fatalities, 41 (58 percent) were adults, 15 (21 percent) seniors, 6 (8 percent) were children, and the remaining 9 (13 percent) were of unspecified ages. The majority of the 42 adult fatalities involved e-scooters (26, including 7 dockless/rental). Fourteen adult fatalities involved e-bikes, and one involved a hoverboard. Of the 6 child fatalities, four involved hoverboards, and two (1 dockless/rental) involved e-scooters. The majority the 14 senior fatalities involved e-bikes (9); five senior fatalities involved e-scooters; and one involved a hoverboard.

Table 3.3: Reported Fatalities Associated with Micromobility Product Type and Age Group (2017–2020 Total)

Age Group	All Micromobility	E-Scooter (Dockless/rental)	Hoverboard	E-Bike
Under 18	6	2 (1)	4	0
18–59	41	26 (7)	1	14
60 and over	15	5 (1)	1	9
Unknown	9	9 (2)	0	0
Total	**71**	**42 (11)**	**6**	**23**

Note: Reporting for 2019-2020 is ongoing. Counts may change in future reports.
Source: CPSRMS, NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Table 3.4 shows the data for micromobility-related fatalities by product and hazard types. Motor vehicle accidents were the leading cause of death associated with the 71 fatalities reported to CPSC staff. Out of the 71 fatalities, 40 deaths involved motor vehicle accidents (*e.g.*, collision with cars, SUVs, and trucks). E-scooters accounted for 30 (9 were dockless/rental e-scooters) of these 40 deaths, e-bikes accounted for eight of these deaths, while hoverboards accounted for the remaining two fatalities involving motor vehicle accidents.

Eight e-scooter fatalities (including 2 on dockless/rental e-scooters) and six e-bike deaths were due to user-control issues. User-control issues led to crashing into trees, colliding with other riders, striking road curbs, and/or getting thrown into oncoming traffic.

Three fatalities were associated with hoverboard-related fires. In one incident, two children died when a hoverboard that was charging caught fire. In another incident, a person died during a house fire that started in an area where two hoverboards were located, and at least one hoverboard was being charged at the time.

Three fatality incidents were related to pedestrian collisions. Out of the three fatalities, two were associated with e-bikes and the third with an e-scooter. In both of the e-bike incidents, the e-bike rider crashed into a pedestrian. The e-bike riders fell on the road, suffered head injuries, and died. In the e-scooter incident, the pedestrian was struck by an e-scooter while crossing a street.

Nine fatalities (1 involving a hoverboard, 2 involving e-scooters, and 6 involving e-bikes) were associated with falls resulting in deaths, but staff does not have sufficient scenario-specific information to determine the associated hazard.

Table 3.4: Reported Fatalities Associated with Micromobility Product Type and Associated Hazards (2017–2020 Total)

Hazard Pattern	All Micromobility	E-Scooter (Dockless/rental)	Hoverboard	E-bike
Motor vehicle accident	40	30 (9)	2	8
User control	14	8 (2)	0	6
Fire hazards	3	0	3	0
Pedestrian accident	3	1	0	2
Pavement	1	0	0	1
Intoxicated	1	1	0	0
Unspecified	9	2	1	6
Total	**71**	**42 (11)**	**6**	**23**

Note: Reporting for 2019-2020 is ongoing. Counts may change in future reports.
Source: CPSRMS, NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

IV. Hazard Patterns Based on In-Depth Investigation Review

Given that the narratives available in NEISS focus on the injury sustained rather than on the circumstances leading to the injury, and the death reports only cover the fatalities reported, CPSC staff evaluated the available in-depth investigations for a more comprehensive look at how incidents happened. Based on reports of incidents in CPSRMS that occurred between 2017 and 2020, CPSC Field staff completed 167 follow-up in-depth investigations related to all micromobility products. The 167 follow-up in depth investigations include four fatalities which have been discussed in the fatality section above. Of the 167 completed investigations, 41 involved an e-scooter (32 of the 41 were dockless/rental e-scooters); 121 involved a hoverboard; and five involved an e-bike. This does not necessarily reflect the current prevalence of incidents related to micromobility products in the CPSRMS database. Staff initiated many more in-depth investigations that could not be completed due to product unavailability or unwillingness of consumer(s) to cooperate and provide product and injury information. Data collection is ongoing, and staff expects the numbers to change in future reports. Staff discusses the types of products and the reported hazards associated with each from the 167 investigations below.

E-Scooters (Including Dockless/Rental E-Scooters)

Of the 41 e-scooter-related incidents that were investigated, 32 were dockless e-scooters. Staff's review of the 41 in-depth investigations shows the following hazards:

- **Brake problems** were associated with more of the reported incidents (18 out of 41) than any other category. The investigations show that brakes not engaging at all, sporadically engaging, or engaging excessively following a delay resulted in 15 of the 18 reported incidents. In one other case, the complainant reported that the brake cable was not properly

attached to the adjustment bracket on the handlebar grip. The remaining 2 incidents happened to the same consumer; other than an email message indicating mechanical brake failures, the consumer did not share any additional scenario-specific detail.

- **Unexpected power loss** caused the rider(s) to tip over or get thrown off in 5 of the 41 reported incidents. In one of the 5 incidents, the rider was going downhill and the e-scooter lost power when it went over a curb.
- **Fire hazards** were reported in 6 of the 41 incidents; all occurred while charging the e-scooter.
- **Multiple product-related issues,** such as brakes malfunctioning, throttles getting stuck, control panels catching fire, and wobbliness were reported in 4 of the 41 incidents. In one of these 4 incidents, the rider went over a bump, which seemed to mark the onset of throttle and brake problems.
- **Miscellaneous product-related problems**, such as footboard or handlebar breaking/detaching or e-scooter not powering up, were reported in 3 of the 41 incidents.
- **Control factors, environmental factors, and unknown factors** played a major role in the remaining 5 (out of 41) incidents. The users lost control of the e-scooters in 3 cases after hitting a pothole, coming off of a curb, or while being chased by an aggressive dog, respectively. Staff has insufficient information to determine why the users in the remaining 2 incidents went through an intersection against a red light, causing a collision with other motor vehicles that had the right-of-way.

Hoverboards

A review of the 121 in-depth investigations showed the following hazards:

- **Fire hazards** were the most common problem, accounting for 112 of the 121 reports. The reports describe fire (sometimes after an explosion), smoke, or sparks, emanating from the product; some reports describe the product overheating or melting. Seventy-four of the 112 incidents occurred when the board was being charged or had just completed charging; 21 of the 112 reported that the incidents occurred during use or immediately after use; 11 of the 112 boards caught fire spontaneously. Two additional incidents reported that the board would not shut-off and eventually started to smoke. In a different incident, the board caught fire after a consumer had reset the battery, which was not charging. Another hoverboard emitted sparks when the consumer attempted to remove the battery per the manufacturer's recommendation because the board was not charging. Staff had no scenario-specific information for the 2 remaining incidents.
- **Other electrical hazards** were identified in 6 of the 121 investigated incidents. These included unexpected loss of power, resulting in the rider losing balance (3 incidents); board operating (spinning) on one side only (2 incidents); and board failing to shut off and throwing off the rider (1 incident).
- **Other/unknown issues** resulted in 3 of the 121 investigated incidents. In each case, the board vibrated excessively, throwing off the rider. While uneven weight distribution may have contributed, at least for 2 of these incidents, some other unknown factor was at play.

E-Bikes

CPSC staff reviewed five completed investigation reports.

- **Fire hazards** were identified in 2 of the 5 investigated incidents. In each case, the fire was caused by the e-bike's lithium battery. In one case, the user removed the battery from the e-bike which then suddenly caught fire. In the other case, staff has insufficient information to determine whether the lithium battery was being charged or being removed from the e-bike.

- **Brake problem was reported** in one incident; the owner of the e-bike needed to "tighten" the brakes repeatedly until, on the day of the incident, the brakes failed completely.

- **Structural integrity problem** was reported in one incident. The consumer was riding an e-bike when the pedal and crank assembly were separated from the bike frame causing the person to fall.

- **Multiple product-related issue** was identified in one incident as the consumer stated that he was having issues with the bicycle chain and the throttle; the motor stalled while he was riding the bicycle causing him to fell.

Table 4.1 summarizes the hazards associated with the use of the various micromobility products.

Table 4.1: Distribution of Investigations by Product Type and Associated Hazard (2017–2020 Total)

	All Micromobility	E-Scooter (Dockless/rental)	Hoverboard	E-Bike
Fire	120	6 (1)	112	2
Brakes	19	18 (16)	0	1
Power Loss	5	5 (5)	0	0
Other Electrical	6	0	6	0
Misc. Product-Related	7	3 (3)	3	1
User/Environmental Factors	5	5 (4)	0	0
Multiple Product-Related	5	4 (3)	0	1
Total	**167**	**41 (32)**	**121**	**5**

Source: CPSC In-Depth Investigation File from CPSRMS, 2017-2020.

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Appendix A: Methodology

CPSC staff queried epidemiology data from the National Electronic Injury Surveillance System (NEISS) and Consumer Product Safety Commission Risk Management System (CPSRMS). Staff reviewed query results to include only the incidents related to micromobility products.

Date of Queries Extraction: 04/12/2021

Incident Dates or Treatment Dates: 1/1/17-12/31/20

Product codes and narrative descriptions

E-scooter:

- Product codes: 5042 (Scooters/skateboards, powered) in 2017-2019 5022 (Scooters, Powered) in 2020, and 5024 (Scooters, Unspecified) as part of the 2020 special study.
- 42 injury cases, originally coded as 5024, were identified to be e-scooters following the investigations through the special study. These 42 cases were added to the all injury cases coded under 5042 and 5022. To account for the response rate of the special study, the weights for these 42 cases were recalibrated before derivation of the injury estimates.
- Narrative/Text contains any of the following: "electric scooter," "e-scooter," "stand up scooter," "standup scooter," "motorized scooter," "power scooter," "*dockless scooter,*" "*rental scooter,*" "*scooter sharing,*" *any brand known to be dockless/rental e-scooters* and other variant spellings.
- For CPSRMS data, searched brand, manufacturer fields when their information were available to identify in-scope products.

Hoverboard:

- Product code: 5042 (Scooters/skateboards, powered) in 2017–2019 and 5025 (Hoverboards and powered skateboards) in 2020.
- Narrative/Text contains any of the following: "self-balancing scooter," "hoverboard," and other varied spellings.
- For CPSRMS data, searched brand, manufacturer fields when their information were available to identify in-scope products.

E-bike:

- Product code: 3215 (Mopeds or power-assisted cycles) in 2017-2020
- Narrative/Text contains any of the following: "electric bike," "e-bike," "electric bicycle," "e-bicycle," "power (assisted) bike," "power (assisted) bicycle," "motorized bike," "motorized bicycle," and other varied spellings.
- For CPSRMS data, searched brand, manufacturer fields when their information were available to identify in-scope products.

For this report, an incident was deemed out of scope if any of the following criteria was satisfied:

- not electric or battery-powered
- not two-wheeled

- seated scooters
- mopeds, motorcycle
- mobility scooter/wheelchair
- any brand names that are known to be not of interest.

For CPSRMS data, CPSC staff consolidated multiple reports that pertain to a single incident as one incident prior to analysis.

Raking Methodology and Raked Injury Estimate

This section summarizes the survey nonresponse and the estimation techniques implemented in this study in order to handle the nonresponse and to generate estimates of injuries. A unit nonresponse occurs when an assigned (sampled) subject cannot be reached or refuses to participate. In this case, no information is collected from the subject. In calculating the number of emergency department-treated, e-scooter-related injuries based on the results of this study, the biggest area of concern is unit nonresponse.

A popular method of dealing with unit nonresponse is raking, also known as "raking ratio estimation" or "sample balancing." This method uses an iterative proportional fitting algorithm to adjust weights to known population marginal totals to handle unit nonresponse within the survey. Further information can be found in (Tu and Garland 2012).

From January 1, 2020 to December 31, 2020, CPSC staff conducted a special study for injuries related to the NEISS product codes 5022 (Scooters, powered), and 5024 (Scooters, unspecified). The product code 5022 is used when an emergency department-treated injury is reported to have been associated with an e-scooter, whereas the specific type of scooter is unknown for the product code 5024. Any injury in the specified timeframe that had a corresponding product code of either 5022 or 5024 were assigned for a follow-up survey. Many surveys were not completed due to missing contact information for the victim, inability to make contact with a victim that had contact information available, or a victim's refusal to participate. Raking was implemented to handle this type of nonresponse. The weights recorded for nonresponding subjects are distributed among the subjects with completed surveys. That is, raking adjusts the weights of the completed surveys to compensate for the nonresponse.

In order to handle the nonresponse in this study via raking, the demographic variables such as gender, age, race, hospital size (stratum), and e-scooter response rate were used to rake the sample against the assigned marginal totals. The following variables had multiple-level responses and had to be collapsed into categories to limit the number of possible combinations to a manageable number: age, race, and stratum. Age variable was split into two age groups: “13 years old or younger” and “Over 13 years old”; Race into “White,” “Other race,” and “Not stated” Stratum was grouped into “Very large and Children’s hospitals” and “Other hospitals.” Estimates for e-scooter-related, emergency department-treated injuries can be determined based on the information collected for each completed survey. Raking uses the population marginal totals for all the aforementioned variables. For this study, the population marginal totals were generated through the NEISS database using the data known for all assigned cases for this special study survey. Using the corresponding weights, the population marginal totals can be obtained. The survey weights within

the study were raked (adjusted) to match the population marginal totals for each variable. The raking macro (lzreal, Hoaglin, & Battaglia) was used to generate the raked weights.

Appendix B: Summary of Annual Injury Estimates and Trend Analysis

Annual Injury Estimates, Corresponding Sample Sizes, and Coefficients of Variation by Product Type, 2017-2020

Year	All Micromobility			E-Scooter			Dockless/Rental E-Scooter			Hoverboard			E-Bike		
	N	Est. ED Visits	C.V.	N	Est. ED Visits	C.V.	N	Est. ED Visits	C.V.	N	Est. ED Visits	C.V.	N	Est. ED Visits	C.V.
2017	935	34,000	0.113	185	7,700	0.182				683	22,800	0.113	67	3,500	0.321
2018	1,149	44,000	0.118	369	14,500	0.252	47	1,800	0.797	714	26,300	0.126	66	3,200	0.480
2019	1,561	54,800	0.153	761	27,700	0.266	163	4,900	0.586	664	22,100	0.155	136	5,000	0.360
2020	1,690	57,700	0.168	652	25,400	0.280	36	900	0.451	922	27,100	0.137	116	5,200	0.414
Total	5,335	190,500	0.124	1,967	75,400	0.215	246	7,600	0.602	2,983	98,200	0.123	385	17,000	0.373

Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.
Grey shaded cells in the table do not meet the NEISS reportability criteria. Reporting criteria for NEISS require that the estimated number of injuries be 1,200 or higher, the sample size be 20 or larger, and the coefficient of variation be less than 33 percent.

Trend Analysis

Staff observed significant increases for all micromobility product related injuries from 2017 to 2018 as well as from 2018 to 2019. However, even after running trend analyses using different statistical models (results for one of the models shown below), no significant trend was observed at $\alpha = 0.05$ level. This is counter-intuitive; however, staff opines a lack of data points is the reason for absence of significance. It is likely that additional years of data would produce significant results.

Trend Analysis Results Based on Unstructured Variance/Covariance Matrix

Effect	Parameter Estimate	Standard Error	Degrees of Freedom	t-value	p-value
Intercept	-16,650,000	4,929,326	2	-3.38	0.08
Year	8,272	2,444	2	3.38	0.08

Source: NEISS, U.S. Consumer Product Safety Commission, 2017-2020.

Appendix C: Special Study Survey Questionnaire

Q1 The U.S. Consumer Product Safety Commission (CPSC) collects data through the National Electronic Injury Surveillance System (NEISS) on injuries treated in hospital emergency departments. CPSC conducts follow-up investigations with a small number of people to learn more about how the injury occurred. The results of these investigations will be used to determine if similar injuries can be prevented in the future.

Your participation in this survey is completely voluntary and your identity and answers will be strictly confidential. This survey will take between 10-15 minutes and data are used for statistical purposes only.

You should have received a letter with the following information needed to continue:
1. Investigation Task Number
2. Randomly generated password

To continue, you will have to enter the task number correctly below:

I1
CPSC would prefer that the person who answers this questionnaire is the actual person injured and treated in the hospital emergency department. If the injured person is under the age of 16, CPSC would prefer that a parent or guardian completes the questionnaire.

Was the injured person 16 years old or older?

Note: If you are the injured person and are under 16, please ask your parent or guardian to complete the survey. If no one is available, it is okay to respond yourself.
o Yes (1)
o No (2)

I2 According to our records from the National Electronic Injury Surveillance System the injured person was seen on {injury date} in the emergency department at {hospital name} for an injury that involved a scooter. Is that correct?
o Yes (1)
o No (2)
o Don't know (3)

I3 What information is incorrect from the statement above?
- ○ Different date (1)
- ○ Different hospital (2)
- ○ (I/the victim) did not receive treatment in a hospital emergency department for a scooter injury (3)

I4 What is the correct date?

I5 Where did you/the victim receive treatment for your/their injury?

V1 Are you the:
o Injured person (1)
o Parent or guardian of injured person (2)
o Other (specify in next window) (3)

V2 Specify relationship:

V3 Was the scooter unpowered (e.g., a kick scooter or push scooter)?
Note: Powered scooters have a power source like electric or gas.
o Yes (1)
o No (2)

o Don't know (4)

V4 Was the scooter an assisted mobility scooter to help people with physical limitations?
o Yes (1)
o No (2)

V5 Was the scooter a moped, motorcycle, or scooter that requires a registration or license?
o Yes (1)
o No (2)

V6 Did the scooter have handles for steering?
Note: Handles for steering are distinct from handles used for balancing purposes.
o Yes (8)
o No (9)

V7 If your scooter had only two wheels, were those wheels side-by-side?

Note: side-by-side wheels are distinct from wheels that are one in front of the other. Below is an example of side-by-side wheels.
o Yes (1)
o No (2)

V8 What kind of power did the scooter run on?
o Gas (1)
o Electric (2)
o Other (specify in next window) (3)

V9 Specify.

V10 You/the victim were/was:
Interviewer instruction: If two scooters collided select "Riding the scooter."
o Riding the scooter (1) o Struck by scooter (2) o Other (specify) (3)

V11 Specify.

A1 Please describe how the accident happened. That is, what were you/the victim doing just before, during, and just after the injury occurred? Please specify the location of the accident and any environmental factors; such as weather, temperature, and anything else that may have contributed to the accident.

A2 The following are specific questions about the incident that you may have already described. Please bear with us as you fill out the next set of questions.

A3 What type of surface were you/the victim on?
- ○ Paved Road (1)
- ○ Paved Sidewalk (2)
- ○ Gravel (3)
- ○ Grass (4)
- ○ Driveway (5)
- ○ Other (specify in next window) (6)
- ○ Don't know (7)

A4 Specify.

A5 Was it dark or difficult to see?
o Yes (1)

o No (2)
o Don't know (3)

A6 Was there anything else occurring at the time of the accident such as music, cell phone interference, or loud music?
o Yes (1)
o No (2)
o Don't know (3)

A7 Please specify the additional factors.

A8 Were/was you/the victim carrying or holding something such as a bag, purse, or backpack?
o Yes (1)
o No (2)
o Don't know (3)

A9 What were/was you/the victim carrying?

A10 Which of the following best describes how you were injured?
o Hit from the front (1)
o Hit from the side (2)
o Hit from behind (3)
o Other (specify in next window) (4)
o Don't know (5)

A11 Specify.

A12 Was there any warning before you/the victim were/was hit? (ex. bell, shouting, or other noise)
o Yes (1)
o No (2)
o Don't know (3)

S1 Which of the following best describes the scooter?
o Rental (1)
o Owned by victim (2)
o Borrowed (3)
o Other (specify in next window) (4)
o Don't know (5)

S2 Specify.

S3 Who was the scooter rented from?

S4 Do you know the brand and model names of the scooter or have a photo of the scooter involved in the injury?
o Yes (1)
o No (2)

S5 Specify brand

S6 Specify model
Note: if brand is known but model is not, enter unknown below

S7 If you are able, please upload a photo of the scooter.

S8 It is very important for us to know what brands are involved in these injuries. Would you be willing to go look at the scooter and record the brand name, model name, and take a photo of the scooter?

Note: You may also upload a pre-existing photo of the scooter if you have one. Select 'Yes' if you have a pre-existing photo.
o Yes (1)
o No (2)

S9 Specify brand

S10 Specify model

Note: if brand is known but model is not, enter unknown below

S11 If you are able, please upload a photo of the scooter.

S12 Were/was you/the victim wearing any of these at the time of the incident. (Select all that apply)
- ○ Helmet (1)
- ○ Knee pads (2)
- ○ Elbow pads (3)
- ○ Wrist pads (4)
- ○ Reflective vest (5)
- ○ Blinking lights/Head lamp (6)
- ○ Other (specify in next window) (7)
- ○ None of the above (8)

S13 Specify.

C1 Is there anything else about this accident or the scooter involved that you would like to share?
o Yes (1)
o No (2)

C2 Explain.

C3 The following race and ethnicity questions will help the U.S. Consumer Product Safety Commission better focus outreach and education efforts related to e-scooter safety.

C4 Are you/the victim Hispanic or Latino?
o Yes (1)
o No (2)
o Don't know (3)
o Prefer not to answer (4)

C5 What race(s) do you consider yourself to be? Please check all that apply.
- ○ White (1)
- ○ Black or African American (2)
- ○ American Indian or Alaska Native (3)
- ○ Asian (4)
- ○ Native Hawaiian or Pacific Islander (5)
- ○ Other (6)
- ○ Don't Know (7)
- ○ Prefer not to answer (8)

C6 Please specify "Other" race. Please be as specific as possible.

C7 We may be interested in sending a CPSC investigator to your home to gather more information about how the accident occurred and take more detailed pictures of the scooter. This investigation would be set up at your convenience. May we have an investigator contact you by phone to setup a visit?
o Yes (1)
o No (2)

C8 Please supply your phone number.

C9 When is a good time to call? (Check all that apply.)
- ○ Morning (1)
- ○ Afternoon (2)
- ○ Evening (3)