Instability and Tipover of Appliances, Furniture and Televisions: Estimated Injuries and Reported Fatalities, 2008 Report

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This analysis was prepared by CPSC staff, has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

Executive Summary

This report contains information on instability or tipover of appliances, furniture, and televisions. An estimate of emergency department-treated instability or tipover injuries is presented, along with per capita injury rates. The death incidents are from 2000 – 2006 and the injury estimates are for 2006. The statistics presented in this report are not comparable to previously released statistics due to the addition of the instability definition which is broader in scope than the tipover definition (see Appendix). Also, appliance-related incidents are included in this report. They were not included in previously released statistics concerning tipovers.

Highlighted findings include:

- There were an estimated 42,700 appliance, furniture and television related emergency department (ED)-treated instability and tipover injuries for 2006 and a total of 180 reported fatalities for 2000 – 2006 associated with appliance, furniture and television instability and tipover.

- For ED-treated instability and tipover injuries for 2006, there were an estimated 26,300 (25,166+1,156) injuries involving furniture only (25,166) or furniture and a television (1,156). There were an estimated 15,900 (14,747+1,156) injuries involving a television only (14,747) or a television and furniture (1,156). The appliance category had an estimated 1,600 (1,631) injuries. Together these categories comprise the estimated 42,700 (25,166+14,747+1,156+1,631) appliance, furniture and television injuries.

- For the reported fatalities for 2000 – 2006 associated with instability or tipover, the furniture category accounted for 96 fatalities and the television category accounted for 87 fatalities. Twenty-five of these fatalities involved furniture and a television and so these cases are counted in each category. The appliance category had 22 reported fatalities.

- Approximately 45 percent of estimated injuries for 2006 and 80 percent of reported fatalities for 2000 – 2006 involved children younger than 10 years of age. Children ages one to three years have the largest age category numbers for both injuries and fatalities.

- 97 percent of the victims of ED-treated instability and tipover injuries for 2006 were treated and released. The most frequently occurring diagnosis for these types of injuries was contusions and abrasions.

- 72 percent of the estimated injuries for 2006 and 63 percent of the fatalities for 2000 – 2006 occurred at a residence.

Emergency Department-Treated Injuries

For 2006, CPSC staff estimates that 42,700 people were treated in U. S. hospital emergency departments for injuries related to instability or tipover of appliances, furniture, and televisions. The furniture category had the largest number of injuries among the three products with a national estimate of 26,300 injuries associated with instability or tipover for 2006. This was followed by the 2006 national injury estimate of 15,900 involving instability or tipover associated with televisions. The appliance category had the lowest national estimate of the three categories for 2006 with 1,600 injuries associated with instability or tipover. Estimates are shown in Table 1.

Table 1
2006 Estimated Emergency Department-Treated Injuries
Associated with Product Instability or Tipover

Category	Estimated Emergency Department-Treated Injuries[1]	Emergency Department-Treated Injuries Per Million Population[2]
Appliances, Furniture, and Televisions	42,700	143
Furniture[3]	26,300	88
Televisions[3]	15,900	53
Appliances	1,600	5

Source: U. S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U. S. hospitals that have emergency departments. The estimates include cases for appliance, furniture and television product codes as described in the appendix.

Of the 26,300 estimated emergency department-treated injuries associated with furniture, 22,500 could be attributed to subcategories (Table 2). The remaining 3,800 estimated injuries were associated with a range of furniture subcategories, but they did not occur with high enough frequencies to support reliable statistical estimates[4].

[1] The estimates are rounded to the nearest hundred. Coefficient of variation (CV) was 0.08 for appliances, furniture, and televisions, as a group. The CV was 0.21 for appliances, 0.09 for furniture, and 0.09 for televisions, individually.
[2] U. S. 2006 population from http://www.census.gov/popest/national/asrh/NC-EST2006/NC-EST2006-01.xls.
[3] Incidents where the narrative indicated that a television and furniture both fell have been counted in both the furniture and television categories. There were an estimated 1,156 injuries involving both.
[4] The criteria for estimates are discussed in the appendix.

Table 2
2006 Estimated Emergency Department-Treated Injuries Associated with Product Instability or Tipover, Selected Furniture Subcategories

Furniture Subcategory	Estimated Emergency Department-Treated Injuries[5]	Emergency Department-Treated Injuries Per Million Population[6]
Tables (includes cafeteria, kitchen, coffee, end, etc.)	8,100	27
Bookcases, Shelving Units, etc	6,900	23
Chests, Bureaus, or Dressers	5,100	17
Cabinets	2,400	8

Source: U. S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U. S. hospitals that have emergency departments. The estimates include cases for appliance, furniture or television product codes as described in the appendix.

Table 3 shows the NEISS frequencies of these reported injuries for each product category and subcategory. The furniture category with 753 (714+39)[7] reported injury incidents is the product category associated with the largest number of instability or tipover-related injuries. Within the furniture category, tables have the most reports of injuries (220+1=221)[7] followed by shelving units and bookcases (181+1=182)[7] and then chests, bureaus or dressers (131+19=150)[7]. The television category had 542 (503+39)[7] injury incident reports. The appliance category has the least number of injury incident reports (34) of the three product categories. Within the appliance category, refrigerators are associated with the most reports (17) followed by the washers or dryers category (8) and then the microwave category (5).

[5] The estimates are rounded to the nearest hundred. The CV was 0.16 for cabinets, 0.15 for chests, bureaus, and dressers, 0.12 bookcases, shelving, etc., and 0.11 for tables.
[6] U. S. 2006 population from http://www.census.gov/popest/national/asrh/NC-EST2006/NC-EST2006-01.xls.
[7] Count includes both categories where furniture/television only and furniture and television both fell.

Table 3
2006 NEISS Frequency of Emergency Department-Treated Injuries
Associated with Instability or Tipover by Product Category

Category	Subcategory	Injuries Reported
Appliances		**34**
	Trash Compactors	1
	Dishwashers	1
	Microwaves	5
	Stoves, Ovens, Ranges	1
	Refrigerators	17
	Washer/Dryer	8
	Unknown Appliance	1
Furniture Only		**714**
	Cabinets	72
	Chests, Bureaus, or Dressers	131
	Desks	29
	Entertainment Centers	18
	Miscellaneous Furniture	38
	Bookcases, Shelving Units, etc.	181
	Carts or Stands (microwave & TV)	13
	Tables (includes cafeteria, kitchen, coffee, end, etc.)	220
	Unknown Furniture	12
Furniture & Televisions		**39**
	TV and Chest, Bureau or Dresser	19
	TV and Desk	1
	TV and Stand or Cart	9
	TV and Entertainment Center	7
	TV and Miscellaneous Furniture	1
	TV and Shelf	1
	TV and Tables	1
Televisions Only		**503**

Source: U. S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS). The counts include cases for appliance, furniture or television product codes as described in the appendix.

When considered as a group, the 2006 injury estimate resulted in dispositions where 97 percent of the individuals were treated and released[8]. The most frequently occurring diagnosis for these types of injuries was contusions and abrasions (46 percent). This was followed by fractures (15 percent), lacerations (14 percent), internal organ injury (10 percent), strain or sprain (6 percent), and other/not stated (5 percent). The remaining four percent are from other diagnoses that are too few to support individual estimates. The primary body parts injured were the head (20 percent), foot (18 percent), and the face (11 percent). The next highest frequency of

[8] Other categories had too few records to support national estimates.

body part injury was hand and toe (7 percent each). The subsequent body parts were finger, ankle, and lower leg (5 percent each). This was followed by upper trunk and lower trunk (4 percent each). The next body parts were shoulder and lower arm (3 percent each). Other body parts account for the remaining eight percent[9]. For the 2006 national injury estimate, 49 percent of the injuries were to males and 51 percent to females.

The majority of the incidents (72 percent) that led to these emergency department visits occurred at a residence. The location of the injury was not recorded for 19 percent of the injuries and six percent occurred at a public place. The remaining three percent occurred at various locations, each of which were too few to support individual estimates.

Table 4 records the estimated 2006 injury rates by age category. Notice that the younger than ten years of age category is the largest age category with 482 injuries per million population associated with instability or tipover of appliances, furniture, and televisions per million individuals. As age increases, the incidence rates decrease for each age category except one.

Table 4
2006 Estimated Emergency Department-Treated Injuries
Associated with Product Instability or Tipover by Age Category

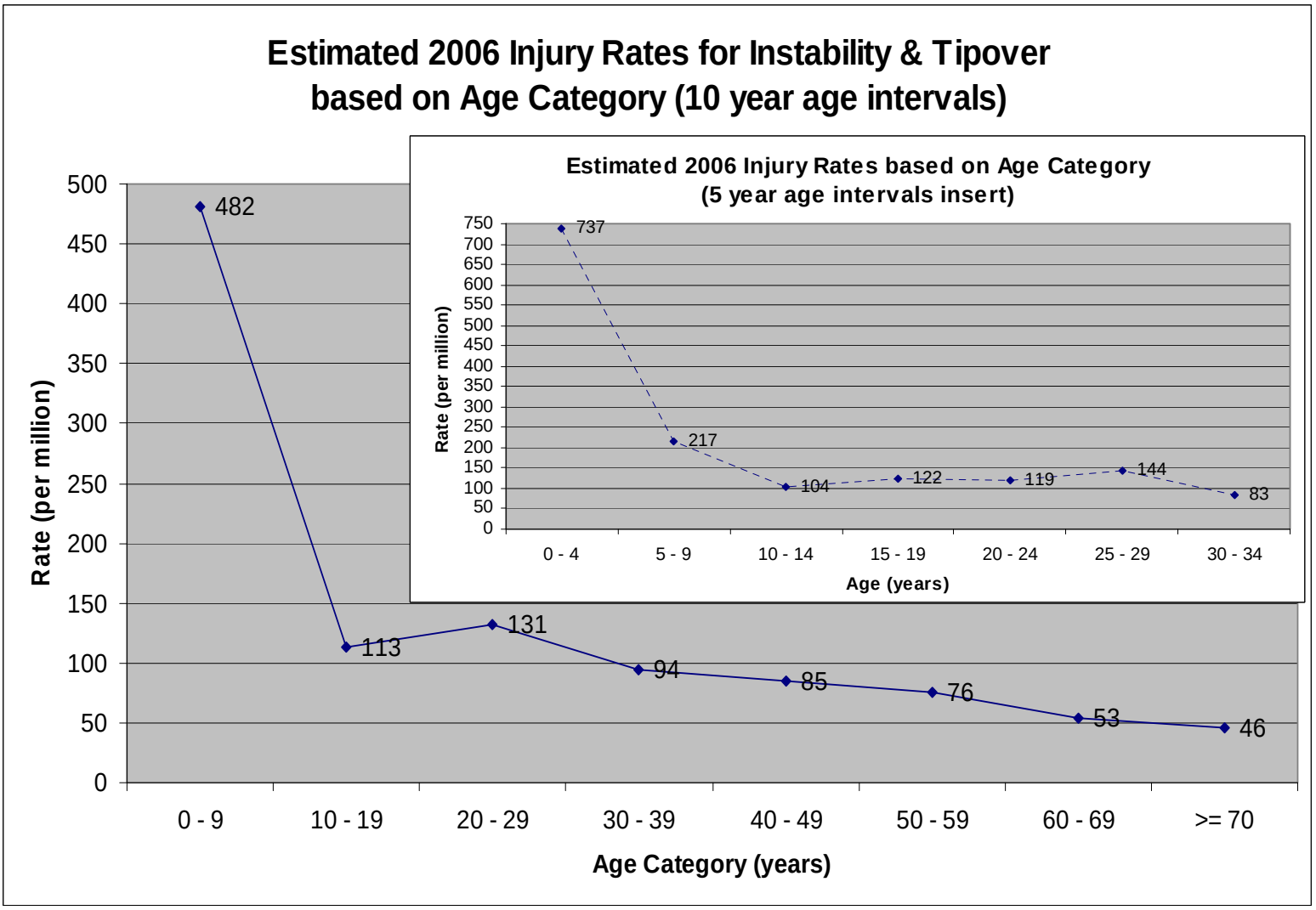
Age Category	Estimate[10]	Population[11]	Emergency Department-Treated Injuries Per Million Population
0 - 9	19,300	40,127,523	482
10 - 19	4,700	41,951,583	113
20 - 29	5,500	41,820,720	131
30 - 39	3,800	40,892,284	94
40 - 49	3,900	45,278,734	85
50 - 59	2,900	38,705,050	76
60 - 69	1,300	23,737,792	53
> = 70	1,200	26,884,798	46

Source: U. S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U. S. hospitals that have emergency departments. The estimates include cases for appliance, furniture or television product codes as described in the appendix.

Figure 1 gives a graphical representation of the 2006 estimated injury rates by age category. The insert to Figure 1 shows estimates by finer age categories. The insert shows that the less than five years of age group is where the majority of the incidents occurred.

[9] Other categories had too few records to support national estimates.
[10] The estimates are rounded to the nearest hundred. The CV was 0.09 for 0 – 9, 0.12 for 10 – 19, 0.16 for 20 – 29, 0.12 for 30 – 39, 0.13 for 40 – 49, 0.18 for 50 – 59, 0.20 for 60 – 69, and 0.23 for 70 plus age categories.
[11] U. S. 2006 population from http://www.census.gov/popest/national/asrh/NC-EST2006/NC-EST2006-01.xls.

Figure 1
Estimated 2006 Injury Rate[12] for Emergency Department-Treated
Product Associated Instability or Tipover Injuries by Age Category



Source: U. S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U. S. hospitals that have emergency departments. The estimates include cases for appliance, furniture or television product codes as described in the appendix.

[12] Incident rate is age interval injury estimate divided by the U.S. population in that age interval. U. S. 2006 five year age interval population from http://www.census.gov/popest/national/asrh/NC-EST2006/NC-EST2006-01.xls.

Reported Fatalities

CPSC staff has 180 fatality reports during 2000 – 2006 related to appliance, furniture or television instability or tipover. Included in this count are eight NEISS fatalities where the victim was DOA or expired in the emergency room. There is usually a lag in receiving fatality reports, and reporting for the last several years is considered incomplete. Table 5 has the associated product category frequencies for 2000 – 2006 reported fatalities. The furniture category has a total of 96 (71+25)[13] fatalities which is followed closely by 87 (62+25)[13] fatalities for televisions. The appliance category had the least of the three with 22 deaths for 2000 – 2006.

Table 5
Fatalities Reported to CPSC Staff for Appliances, Furniture, and Televisions Related to Instability or Tipover by Year and Product Category, 2000 – 2006

Year	Appliances	Furniture only	Furniture & Televisions	Televisions only	Total
2006	*3*	*7*	*6*	*17*	*33*
2005	*2*	*11*	*6*	*11*	*30*
2004	*1*	*13*	*1*	*9*	*24*
2003	4	6	1	9	20
2002	3	11	4	5	23
2001	6	19	3	8	36
2000	3	4	4	3	14
Total	*22*	*71*	*25*	*62*	*180*

Source: CPSC databases including NEISS, IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). The fatalities include cases for appliance, furniture and television product codes as described in the appendix. Italics denote period for which reporting is incomplete.

The subcategory breakouts for the reported 180 fatalities for 2000 – 2006 involving instability or tipover are shown in Table 6. For appliance fatality reports, the stoves, ranges, and oven category had the largest count with 13 of the 22 reported fatalities for appliances. The furniture category had a total of 96 (71+25)[13] fatalities with the subcategory of chests, bureaus and dressers accounting for 57 (46+11) [13] of the reported fatalities.

[13] Count includes both categories where furniture/television only and furniture and television both fell.

Table 6
Fatalities Reported to CPSC Staff for Appliances, Furniture, and Televisions Related to Instability or Tipover by Product 2000 – 2006

Category	Subcategory	Fatality Count
Appliances		**22**
	Microwaves	1
	Stoves, Ovens, Ranges	13
	Refrigerators	6
	Washer/Dryer	1
	Unknown Appliance	1
Furniture Only		**71**
	Cabinets	4
	Chests, Bureaus, or Dressers	46
	Entertainment Center	1
	Miscellaneous Furniture	6
	Bookcases, Shelving Units, etc.	2
	Tables (includes cafeteria, kitchen, coffee, end, etc.)	7
	Unknown Furniture	3
	Wardrobe	2
Furniture and Televisions		**25**
	TV and Chest, Bureau or Dresser	11
	TV and Stand or Cart	8
	TV and Entertainment Center	3
	TV and Table	2
	TV and Shelf	1
Televisions Only		**62**

Source: CPSC databases including NEISS, IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). The fatalities include cases for appliance, furniture and television product codes as described in the appendix.

For 2000 – 2006, the 180 fatalities reported to CPSC staff associated with appliance, furniture, and television instability or tipover have the following characteristics. For gender, 56 percent of the decedents were male and 44 percent were female. The majority of the 180 reported fatalities (63 percent) occurred at a residence. The location of the incident was not recorded for 32 percent of the decedents, three percent occurred at a public place, and the remaining two percent occurred at a school.

Table 7 gives the frequencies of fatalities reported to CPSC staff for certain age and product categories. The age categories of one year old, two year old, and three year old have the largest number of fatalities.

Table 7
Fatalities Reported to CPSC Staff for Appliances, Furniture, and Televisions Related to Instability or Tipover by Age and Product 2000 – 2006

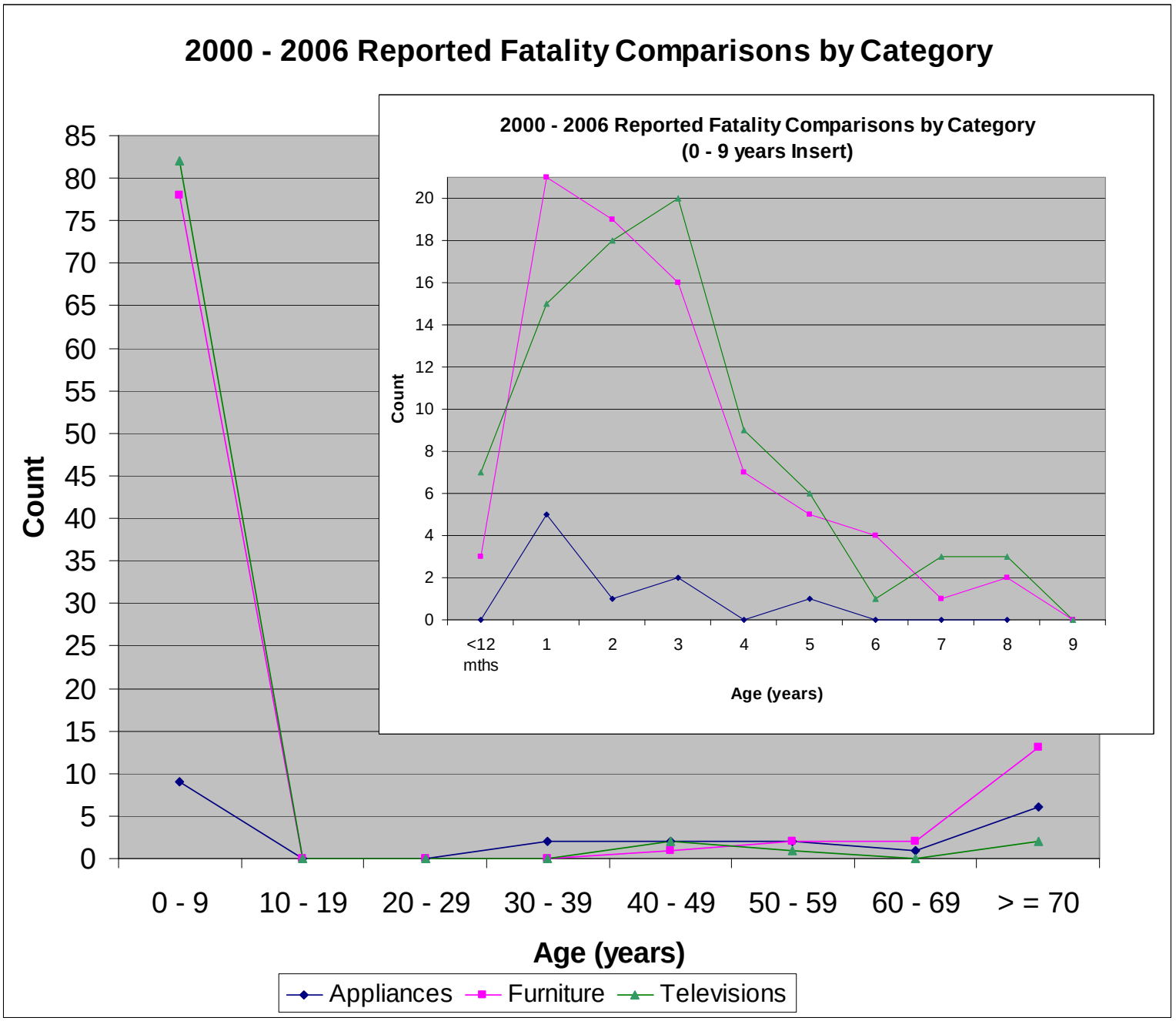
Age	Appliances	Furniture Only	Furniture & Televisions	Televisions Only	Total for the Age Category	Percent of Total Fatalities in Category (n=180)[14]
< 12 mths	0	3	0	7	10	6
1	5	14	7	8	34	19
2	1	16	3	15	35	19
3	2	10	6	14	32	18
4	0	4	3	6	13	7
5	1	3	2	4	10	6
6	0	3	1	0	4	2
7	0	0	1	2	3	2
8	0	0	2	1	3	2
9	0	0	0	0	0	0
≥ 10	13	18	0	5	36	20

Source: CPSC databases including NEISS, IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). The fatalities include cases for appliance, furniture and television product codes as described in the appendix.

Counts of reports by victim age and product category are shown in Figure 3. From this chart, the less than ten years of age category for appliances (43 percent), furniture (81 percent), and televisions (95 percent) is the largest. The appliance (29 percent) and furniture (14 percent) categories for 70 and older are the next largest age category. As the insert illustrates, the furniture category fatality graph peaks at age two before decreasing while the television fatality category graph peaks at age three before declining.

[14] Totals do not add up to 100 percent due to rounding.

Figure 2
2000 – 2006 Fatalities for Instability or Tipover by Product Category and Age



Source: CPSC databases including NEISS, IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). The fatalities include cases for appliance, furniture and television product codes as described in the appendix.

Scenario analysis for instability or tipover reported fatalities for appliances, furniture, and televisions yields the following characteristics. In 31 percent of the 180 reported incidents, an individual was trying to climb or retrieve an object from the top of the product. One common example of this is a child using the drawers on a dresser to climb up and turn on a television on

top of a dresser. As the child climbs the dresser, the dresser tips and the television falls off the top and strikes the child. There were scenarios (14 percent of the fatal incidents) where force was exerted by the individual which resulted in the product tipping. An example of this is an adult taking a heavy pan out of an oven and setting the pan on the oven door, which causes the oven to tip over on the person. For seven percent of the fatal incidents, the person was playing near the product or attempting to change media in the product or another product close by. An example of this is a child trying to change a DVD in a DVD player and the television tips over on the child. In three percent of the cases, the scenario was classified as miscellaneous because, even though the events are known, the incident does not fit into the established scenario categories. The remaining 45 percent of the fatalities were classified as unknown since little information is known about how the product fell.

Appendix

Methodology for Estimating Instability or Tipover of Appliances, Furniture, and Televisions Estimated Injuries and Reported Fatalities

A multidisciplinary team of CPSC staff met to discuss terminology, the types of products of interest, and what types of incidents should be counted for product-associated instability or tipover. For the purpose of this report, tipover concerns heavy objects that fall on an individual as a result of some type of interaction such as climbing or exerting a force on the object while it is in one of its positions of normal use. This interaction with the product results in the center of gravity of the product changing. When the product falls on an individual, the injuries are typically crushing or compressing in nature. Instability is defined differently from tipover for this report. For instability, the product falls as a result of some issue with the center of gravity. This is a less stringent definition compared to tipover since it does not require the additional criterion of interaction. The instability and tipover definitions helped to set the criteria for the types of scenarios and products that have been included in the data.

In examining the types of products, the staff considered whether the product was heavy and could potentially inflict crushing or compressing injuries. The additional criterion of the potential interaction with the individual and the product was also important. The categories of appliances, furniture, and televisions fit these criteria. The potential product codes were determined for these categories. Televisions have only one product code (572) which makes this category the easiest for finding potential incidents. The appliance category was more complicated. Table 8 below enumerates this category's potential product codes.

Table 8
Potential Appliance Product Codes Associated with Instability or Tipover

NEISS Product Code	Description
101	Washing machines without wringers or other dryers
102	Wringer washing machines
106	Electric clothes dryers without washers
107	Gas clothes dryers without washers
126	Washing machines, not specified
127	Clothes dryers, not specified
135	Washer-Dryer combinations (within one frame)
140	Washing machines, other or not specified
214	Dishwashers
252	Trash compactors
259	Electric ranges (with ovens)
260	Gas ranges (with ovens)
263	Freezer (separate from refrigerators)
264	Microwave ovens
266	Ovens, not specified
267	Other ranges (with ovens)
273	Ranges, not specified
276	Refrigerators
278	Electric ranges or ovens (excl. counter-top ovens)
279	Gas ranges or ovens
281	Ranges or ovens, not specified
482	Appliances, other and not specified

The furniture category is also more complex and the included product codes are shown in Table 9.

Table 9
Potential Furniture Product Codes Associated with Instability or Tipover

NEISS Product Code	Description
519	Television tables or stands
604	Desks, chests, bureaus or buffets
693	Footlockers
1107	Other containers
1112	Metal containers
1123	Plastic containers (rigid or semi-rigid)
1125	Wooden containers
1684	Carts, other or not specified
1726	Lockers
4013	Other furniture
4014	Furniture, not specified
4056	Cabinets, racks, room dividers and shelves
4057	Tables (excl. baby changing tables, billiard or pool tables)
4065	Clocks, electric or battery operated
4067	Clocks, not elec. or battery or not specified

The product codes were chosen based on the product's ability to potentially tipover. Children's furniture and other products such as chairs, couches, and beds were excluded. The emphasis was placed on products that are more upright and are generally considered not appropriate for climbing.

After the set of potential product codes was established, the next step was to determine what types of scenarios to look for in the narratives. Narrative key word searches were used with caution when extracting a potential set of data because the narrative field descriptions have so many possible word choices and sentence structures. Also, NEISS and DTHS narratives are often very terse and provide only basic information. For these reasons, the product codes and the time period were the criteria used to extract the data sets and then the narratives were examined to determine if the incident met the definition(s) for instability or tipover. The incident was not included if only a part of the product fell such as a door on an entertainment center. Cases involving adults moving products or people dropping products were removed since the product was not in its normal state of use. Products that were hanging on the wall and fell were also excluded.

Injury estimates came from NEISS data extracted on June 11, 2007 for the year 2006. More years were not considered due to the large volume of data (approximately 27,500 incidents based on product codes) that were examined for 2006. The NEISS product codes used for the data were the appliance, furniture or television codes mentioned above. Since reports in NEISS are unique, there were no duplicates. NEISS data is a weighted sample from which national estimates can be produced provided the sample count is greater than 20, the estimate is greater than 1,200 and the coefficient of variation (CV) is less than 33.

Data was extracted on June 2, 2008 from NEISS, IPII, DTHS and INDP for fatalities involving appliance, furniture and television codes (approximately 3,100 incidents based on product codes) mentioned above for the years 2000 to 2006. It should be noted that, for a given year, incidents are included on an ongoing basis for IPII and DTHS. In particular, additional reports are generally received for the most recent years. Information from these cases was extracted into an Excel spreadsheet and sorted by incident state and date. Source documents were checked to eliminate duplicate incident reports. As fatal incidents are notable events in the community where they occur, there were often multiple news reports (IPII), a medical examiner's report (IPII), a death certificate (DTHS), an in-depth investigation (INDP) and, less frequently, a hospital emergency department report (NEISS) for a single incident. IPII is a mixture of various types of information including newspaper clippings, consumer complaints and reports from other government agencies such as medical examiners/coroners. Information is voluntarily submitted to IPII, so that staff cannot be sure that information on all the deaths has been received. Once the incident set was established, the incidents were examined to code the additional characteristic of scenario.

All numbers in this report are rounded to the nearest integer except for injury estimates which are rounded to the nearest hundred. Population injury rates were calculated by taking the raw injury estimate (not rounded) for that year and dividing by the Census population for that age category for that year and multiplying by one million. Since NEISS is a weighted sample, injury estimate category percentages were based on the category weighted estimate divided by the total weighted estimate. Injury count category percentages were based on the category sample size observed divided by the total sample size. Death category percentages were based on the category count observed divided by the total count.