Hazard Screening Report

Housewares and Kitchen Appliances

(Product codes 0202, 0204, 0212-0219, 0221-0224, 0227, 0231-0232, 0234-0242, 0247, 0250, 0252, 0255, 0257, 0259- 0271, 0273-0277, 0401, 0405, 0408, 0412-0413, 0416- 0417, 0419-0422, 0427-0429, 0431-0432, 0434-0436, 0438, 0443-0444, 0450, 0452-0453, 0460-0466, 0469, 0471, 0474, 0477-0478, 0480-0482)

This report and all others in this series are general overviews, which use data taken directly from the CPSC data files for the purpose of comparison among the products. No recoding or adjusting of the data is performed. For this reason, estimates of injuries provided in this report will differ from estimates presented in other documents produced by Epidemiology staff working in specific program areas. The figures presented here are not intended to compare to other reports outside this series of hazard screening reports.

The views expressed in this report are those of CPSC staff, have not been reviewed or approved by, and may not reflect the views of, the Commissioners.

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RULEMAKING ADMIN. PROG

The Hazard Screening Project

As an aid in setting priorities, Consumer Product Safety Commission (CPSC) staff is preparing this series of Hazard Screening Reports. Each report covers a group of related products, such as nursery equipment, house wares, etc.

These reports follow a common format that allows readers to compare the risk for different types of products within a given category. Significantly, CPSC staff has also developed a measurement tool that allows comparisons of risks from products in different categories. This feature, called "Maximum Addressable Cost Estimates," is explained more fully below. CPSC managers plan to use this information to set priorities for efficient use of resources.

Each Hazard Screening Report contains information on the estimated number of injuries and deaths associated with the type of products covered in that report. A graph shows the frequency of emergency-room treated injuries over time. This is followed by a pie chart showing the distribution of injuries by the source of the hazard, such as mechanical, fire, electrical, chemical and other. CPSC staff also estimates the total "cost" to society of each type of product. This includes the cost of injuries, deaths and property damage associated with the products.

To facilitate comparisons of risk between different types of products, CPSC staff has developed Maximum Addressable Cost Estimates. These build on the concept of "addressable" cost. Simply put, the "addressable" cost is the portion of the total cost that could possibly be reduced by some action that CPSC could take. Many of consumer injuries are not addressable. For example, if a boy trips over a rake in the driveway, any injury he suffers could be associated with the category of Yard and Garden Equipment. But it is very unlikely that such injuries could be prevented by changing the design of rakes. By eliminating these unaddressable costs from consideration, we are able to focus on what's left -- the costs that we might be able to do something about. The name "Maximum Addressable Cost Estimates" is intended to emphasize that these estimates are upper limits of the cost that might be successfully addressed. It should also be stressed that the term does not necessarily mean that there is any existing method or technology for reducing the costs. For a more detailed explanation of this subject, please refer to the individual Hazard Screening Reports.

CPSC staff plans to complete 20 reports in 2005. As each report is completed there will be an active link to it on the CPSC website. All reports are in Portable Document Format (PDF). The 20 reports that will comprise the complete set are:

Home Workshop Apparatus, Tools and Attachments
Yard and Garden Equipment
Toys
Nursery Products
Children's Outdoor Activities and Equipment
Major Team Sports
Injuries to Persons 65 and Older

House wares and Kitchen Appliances
Recreational Cooking and Camping Products
Home Communication, Entertainment and Hobby Products
General Household Appliances
Home Furnishings and Fixtures & Home Alarm,
Escape and Protection Devices
Sports (minus major team sports)
Personal Use Items
Heating, Cooling and Ventilating Equipment
Packaging and Containers for Household Products
Miscellaneous Products
Home Structures and Construction Materials
Home and Family Maintenance Products – Household Chemicals
Drugs

These reports will be useful to individuals and organizations who are seeking reliable information about estimated deaths, injuries, and costs associated with consumer products and to CPSC's staff and Commissioners, who need objective data to identify candidates for future activities to reduce deaths and injuries.

CAVEAT!

The report addresses the question of addressability of injuries by attempting to identify those injuries which are incidental and not addressable by mandatory or voluntary standards or by other action which the CPSC could take. Those injuries which remain are referred to as maximum addressable.

To know the actual addressability of the hazards associated with a product usually requires a detailed study of the problem, and the product. This level of study is not feasible for this type of overview report. What we do instead is try to eliminate those injuries and deaths which involve the product only marginally or incidentally. Maximum addressable costs were then generated by the Injury Cost Model[1] using the remaining injuries.

The maximum addressable cost estimate does not necessarily represent the injury and death costs that the CPSC might actually be able to prevent each year through some type of action. It represents only a target population from which any successful prevention will have to come.

Therefore, while the report states that the maximum addressable percentage of the costs is about 13%, it would be incorrect to say that 13% of the injuries or 13% of the costs are addressable.

For example: If a fire occurred during use of an appliance, but we have no information about the precise product failure mode that led to fire or specific events that precipitated the fire, we would count that incident in the maximum addressable category. It may not be addressable but we just don't have enough information to rule it out.

Maximum addressable injury estimates include every case that we could not clearly rule out as incidental. <u>They do not represent the number or percent of injuries that could actually be prevented.</u>

In addition, addressability definitions are based on review by Epidemiology staff using information available at the time each report is prepared. These determinations should be considered general estimates for agency planning purposes, not <u>definitive</u> staff evaluations of whether a specific type of hazard might be prevented. The fact that a given hazard is associated with a product was not considered addressable in one of these reports should <u>not</u> be construed as indicating that that hazard should never be reconsidered or addressed.

[1] The Injury Cost Model is described on page 18.

Introduction

The group of product codes included in this report consists of housewares and kitchen appliances. The report provides several pieces of information that will allow the reader to compare the activities within this report as well as to compare with products and activities in other categories in other reports in this series.

This report shows an index of the number of the overall injuries and deaths associated with housewares and kitchen appliances. The first information presented is a summary of the injury, death and cost data for the entire class of products. A trend graphic is presented which shows the frequency of emergency room-treated injuries since 1997. This is followed by a pie chart showing the distribution of the injuries by energy source of the hazard, i.e., mechanical, fire, electrical, chemical, other. There is also a summary table, which shows the injuries, deaths and costs associated with each product group.

The report also addresses the question of addressability of the injuries, by attempting to identify those injuries which are incidental and not addressable by mandatory or voluntary standards or by other action which the CPSC could take.

Housewares and Kitchen Appliances

Product Categories

Electric Cooking

Gas Cooking

Countertop Cooking

Countertop Processing

Large Kitchen Appliances

Irons

Ranges, Not Specified

Miscellaneous Appliances

Un-powered Gadgets

Cookware

Tableware

Candles

Other (Appliances Not Specified)

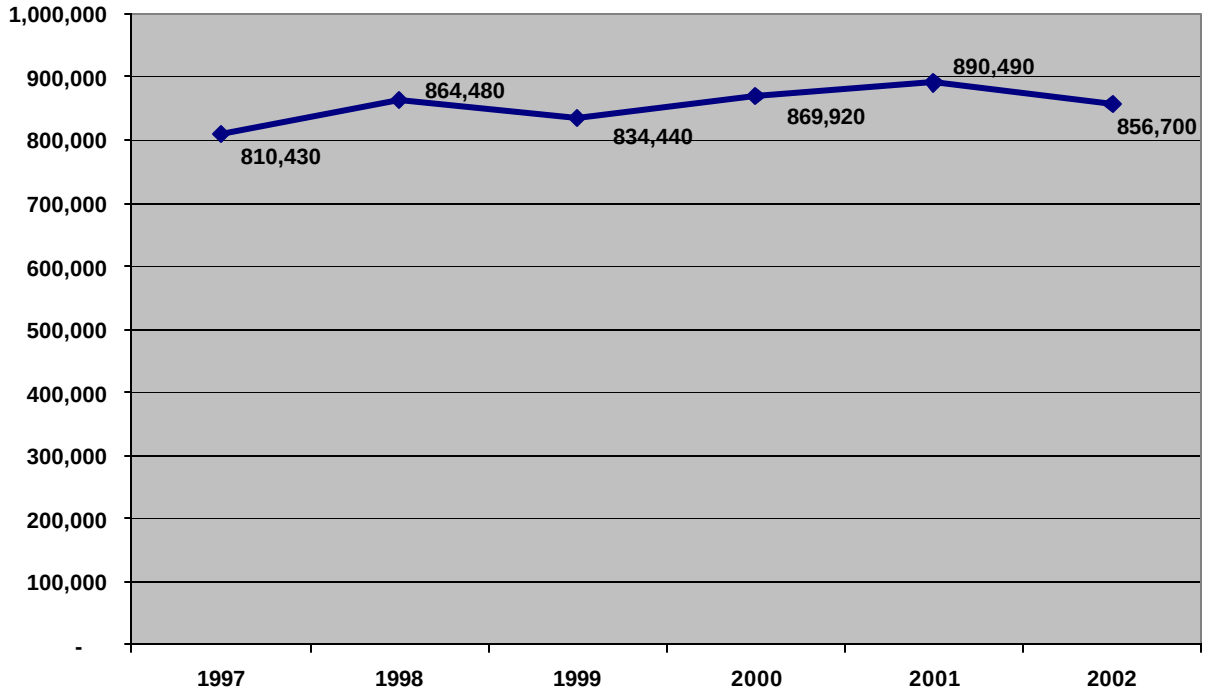
Housewares and Kitchen Appliances

(Product codes 0202, 0204, 0212-0224, 0227, 0231-0232, 0234-0242, 0247, 0250, 0252, 0255, 0257, 0259- 0271, 0273-0277, 0401, 0405, 0408, 0412-0413, 0416- 0417, 0419-0422, 0427-0429, 0431-0432, 0434-0436, 0438, 0443-0444, 0450, 0452-0453, 0460-0466, 0469, 0471, 0474, 0477-0478, 0480-0482

Electric Cooking, Gas Cooking, Countertop Cooking, Countertop Processing, Large Kitchen Appliances, Irons, Ranges, Not Specified, Miscellaneous, Un-powered Gadgets, Cookware, Tableware, Candles, Other Appliances-Not Specified

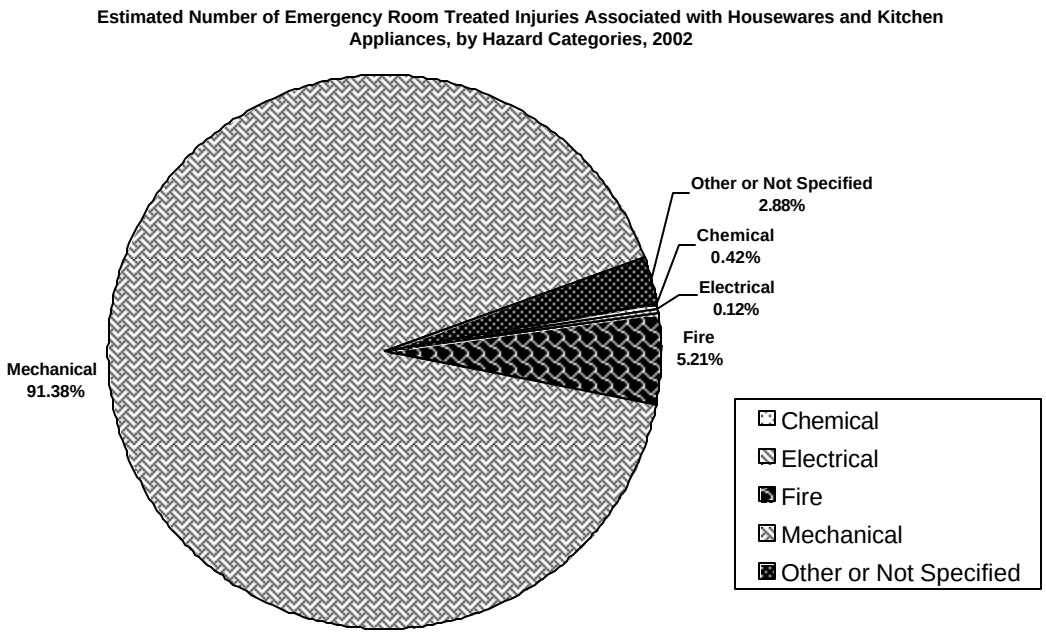
ER Treated Injuries 2002	856,700	Percent of Households	Not Applicable
Medically Treated Injuries 2002	1,870,410	Number of Products in Use	Not Applicable
Percent of ER Treated Hospitalized	1.9%	Estimated Useful Life	Not Applicable
Deaths 2000	369	Estimated Retail Price Range	Not Applicable
Number of Incident Reports 2002	4,382	Death Costs (Millions)	$1,845
Cost of Medically Treated Injuries (Millions)	$25,258	Total Known Costs (Millions)	$27,103

Estimated Number of Emergency Room-Treated Injuries Associated with Housewares and Kitchen Appliances, by Year 1997 - 2002



Change from 1997 to 2002 is +46,269. This is not a statistically significant change. (P = .3009)

Figure 2. Distribution of Emergency Room-Treated Injuries by Energy Source of the Hazard for Housewares and Kitchen Appliances, 2002



Deaths

In 2000, CPSC received 367 reports of deaths that were associated with housewares and kitchen appliances and nearly all of these deaths were fire related. Many of the victims perished in residential structure fires which resulted from candle usage, unattended cooking, electrical malfunctions and gas leaks associated with stoves, ranges, and ovens. Several victims also died from burn injuries sustained when their clothing ignited upon contact with open flame or burner surfaces during the use of ovens, ranges or stoves. Most of the burn victims were elderly people over the age of 75.

Candle-related fires were the most frequent cause of fire deaths at 108 deaths. There were 94 deaths associated with unspecified cooking ranges. There were 35 deaths associated with "other appliances"; 26 involved "gas cooking"; 21 involved "countertop cooking"; 16 involved "electric cooking"; and 11 deaths were associated with "cookware." Large kitchen appliances were associated with 20 deaths. There were 26 deaths associated with miscellaneous housewares and kitchen items; 4 deaths related to un-powered gadgets; 3 clothes iron related deaths; and 3 deaths associated with the tableware category. There were no deaths associated with any of the appliances within the "countertop processing" category.

A total of 299 deaths out of the 369 were determined to fit into the category of maximum addressable (mainly deaths associated with cooking fires, clothing ignition, gas leaks and candle fires).

Overview Summary

The change in injury frequency over the 6-year period, 1997 – 2002, was 46,270. This is not a statistically significant change at the 95% confidence level (p = .3009)

Table 1 provides a summary for product groups examined for this report. This table provides information on the number of emergency room-treated injuries, the number of medically-treated injuries, the percentage of the emergency room treatments that resulted in admission to the hospital, the number of incident reports received, the number of deaths reported, the costs associated with deaths and medically-treated injuries and the total of these two cost estimates.

Addressability

While it is useful to know the number of injuries, deaths, and related costs associated with a product, it is also important to have an estimate of how much of that social cost might actually be addressed through some action. Many of the injuries treated in emergency rooms that were related to this group of products may not be addressable. To know the actual addressability of the hazards associated with a product or an activity usually requires detailed study. This level of study is not feasible for this type of overview report. What we can do instead is try to identify that portion of the injury and death costs that is not addressable. Maximum addressable costs are then generated by the Injury Cost Model using the remaining injuries.

> **The maximum addressable cost estimate does not necessarily represent the injury and death costs that the CPSC might actually be able to prevent each year through some type of action. It represents only a target population from which any successful prevention will have to come.**

The reason for doing this kind of review is to identify situations such as the following example and allow us to focus on the areas where CPSC action could have some effect:

Virtually all of the emergency room-treated injuries associated with tableware involved incidental contact with knives, broken dishes or broken drinking glasses. None of these injuries were found to be addressable.

A description of the criteria for maximum addressability for each of the products in this report is contained on pages 12 and 13.

The staff determined the percentage of injuries identified as maximum addressable by reviewing the entire product narratives reported through the National Electronic Injury Surveillance System (NEISS) for the full year 2002 for six of the categories studied (electric cooking, gas cooking, countertop cooking, countertop processing, candles and other, not specified). For the remaining categories (large kitchen appliances, clothes irons, ranges-not specified, un-powered gadgets, cookware, tableware and miscellaneous), a random sample was selected of 300 of these cases for the year, and the narratives were reviewed to determine percentages of addressability.

The cases identified as potentially addressable and those identified as not addressable were then input to the Injury Cost Model, to determine the proportion of the costs which may be addressable. The percentages were then applied to the overall cost totals for the entire estimate for the product group to produce overall costs of injuries identified as maximum addressable.

Addressability for deaths was determined by reading the narrative of the death certificate or fatal incident report. Because the death reports often have more information than the NEISS reports, addressability for deaths was easier to determine. The cost of deaths was determined by applying the value of $5 million dollars for each death. The value of a statistical life of $5 million is consistent with current economic literature. This cost is frequently expressed in the literature using a range of $3 million to $7 million. For the purpose of consistency and ease of comparison, we have used the midpoint of this range in this report. The maximum addressable cost estimate for medically-attended injuries is added to the maximum addressable cost estimate for the deaths to obtain the total maximum addressable cost estimate. Table 2 shows the percentage of injuries included in the maximum addressable category for each product group. It also shows how many of the deaths reported were included in the maximum addressable category.

Overall, after applying this process of review of the data to the entire category of housewares and kitchen appliances, we find that the total maximum addressable injury and death cost is $3.5 billion dollars, out of a total cost associated with these products of $27 billion dollars, about 13% maximum addressable.

Figure 3 shows the index[2] of estimated injury and death costs for each of the product categories and the estimated maximum addressability of those costs.

[2] This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2002 and the death costs are based on 2000. These are the most recent years for which each of these cost items was available at the time this report was prepared.

Table 1 – Product Summary Table – Injury, Death, and Cost Estimates

Product	Codes	ER Injuries 2002	All Medically Treated Injuries 2002	Hosp. % of ER Treated 2002	Incident Reports 2002	DTHS 2000	# of Products in Use (millions) 2002	Percent of Households 2002	Death Costs *2000 ($ millions)	Med. Trtd. Injury Costs ($ millions)[3] 2002	Total Known Costs ($ millions)
Electric Cooking	0202, 0259, 0261	2,530	5,620	<1%	306	16	99	62%	$80	$139	$219
Gas Cooking	0204, 0260, 0262	900	1,940	5.2%	325	26	Not Available	38%	$130	$61	$191
Countertop Cooking	0212 , 0216, 0217, 0219, 0221, 0222, 0234, 0224, 0234, 0235, 0241, 0242, 0264, 0268, 0269, 0462, 0481	12,620	28,730	2.9%	1,132	21	620+	Not Available	$105	$615	$720
Countertop Processing	0213, 0215, 0218, 0227, 0231, 0232, 0240, 0270, 0271, 0274, 0275, 0471	8,980	19,090	1.0%	78	0	385[4]	Not Available	0	$314	$314
Large Kitchen Appliances	0214, 0237, 0252, 0263, 0276	46,480	133,020	3.6%	363	20	281	100%[5]	$100	$2,298	$2,398
Irons	0238, 0239, 0247, 0255, 0277, 0408	17,710	39,960	3.6%	74	3	95	90%	$15	$987	$1,002
Ranges Not Specified	0257, 0265, 0266, 0267, 0273	31,750	75,650	4.1%	540	94	Not Available	Not Available	$470	$1,816	$2,286
Miscellaneous	0236, 0250, 0413, 0419, 0432, 0434, 0436, 0438, 0477, 0480	79,650	212,590	4.8%	87	26	Not Available	Not Available	$130	$3,421	$3,551
Un-powered Gadgets	0401, 0416, 0421, 0422, 0427, 0428, 0429, 0431, 0443, 0444, 0453, 0469	34,380	74,780	1.0%	63	4	Not Available	Not Available	$20	$870	$890
Cookware	0405, 0412, 0435, 0452, 0460, 0461, 0465, 0466	36,480	83,120	2.8%	427	11	Not Available	Not Available	$55	$1,940	$1,995
Tableware	0417, 0420, 0450, 0464, 0474, 0478	582,180	1,164,930	1.1%	148	3	Not Available	Not Available	$15	$12,234	$12,249
Candles	0463	12,950	26,960	3.7%	695	108	2,000	70%	$540	$496	$1,036
Other (Appliances Not Specified)	0482	1,470	4,020	4.6%	144	35	Not Available	Not Available	$175	$67	$242
Total		868,080[6]	1,870,410	1.9%	4,338	367			$1,835	$25,258	$27,093

Not Available – Product information was not available

Descriptions of how these estimates were derived can be found in the methodology section.

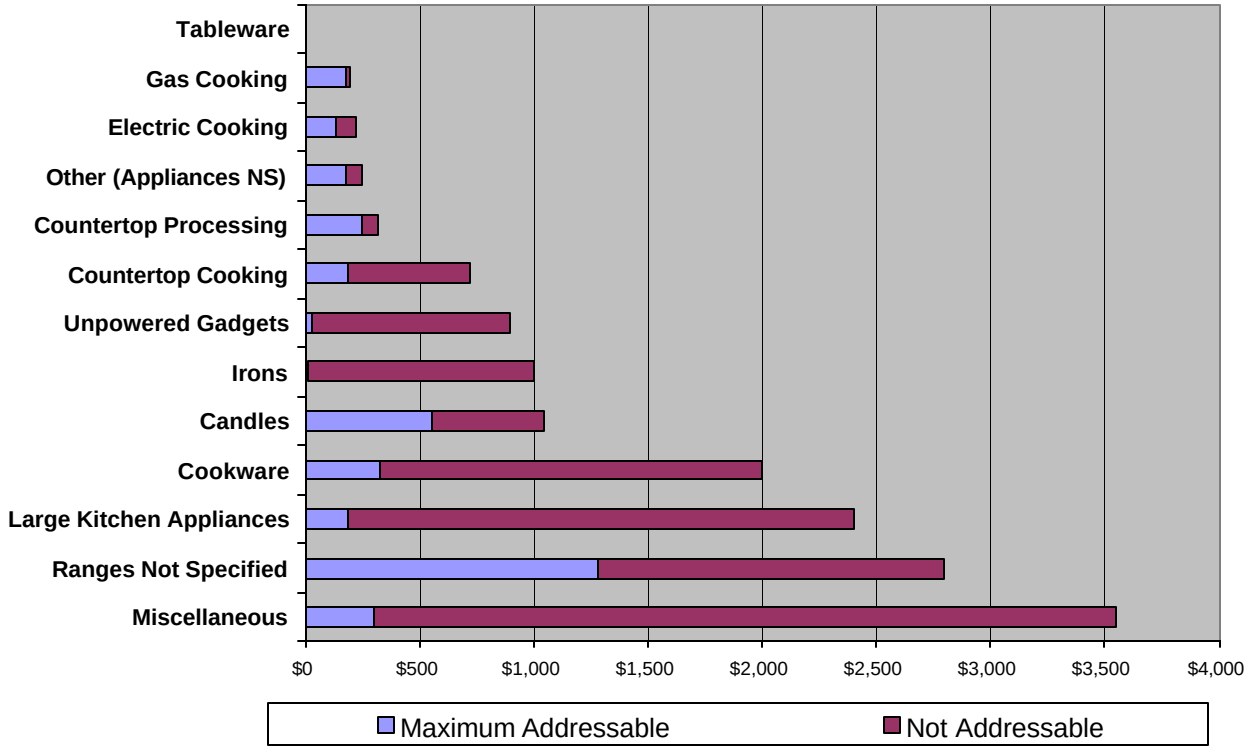
[3] Costs expressed in 2001 dollars.

[4] This total represents counted products; data is not available for knife sharpeners, electric scissors and ice makers/crushers.

[5] Many homes have more than one of these products.

[6] Some cases appear in more than one category, thus numbers may not add to totals.

Figure 3. Estimated Cost Index in Millions of Dollars, Housewares and Kitchen Appliances, by Total Costs.



- The estimate of maximum addressable cost does not necessarily represent the costs that the CPSC might actually be able to prevent each year through some type of action. It represents only a target population from which any successful prevention will have to come.

- The data presented in this graphic are also contained in Table 3, under the headings "Total injury and death costs" and "Total maximum addressable cost."

Table 2 – Product Hazard Addressability

Product Category	Codes	Percentage of injuries included in Maximum Addressable	Maximum Number of Addressable Deaths/ Total Deaths Reported 2000
Electric Cooking	0202, 0259, 0261	47%	13/16
Gas Cooking	0204, 0260, 0262	73%	23/26
Countertop Cooking	0212, 0216, 0217, 0219, 0221, 0224, 0223, 0224, 0234, 0235, 0241, 0242, 0264, 0268, 0269, 0462, 0481	16%	18/21
Countertop Processing	0213, 0215, 0218, 0227, 0231, 0232, 0240, 0270, 0271, 0274, 0275, 0471	77%	0/0
Large Kitchen Appliances	0214, 0237, 0252, 0263, 0276	6%	10/20
Irons	0238, 0239, 0247, 0255, 0277, 0408	-	2/3
Ranges, Not Specified	0257, 0265, 0266, 0267, 0273	46%	88/94
Miscellaneous	0236, 0250, 0413, 0419, 0432, 0434, 0436, 0438, 0477, 0480	8%	4/26
Un-powered Gadgets	0401, 0416, 0421, 0422, 0427, 0428, 0429, 0431, 0443, 0444, 0453, 0469	3%	1/4
Cookware	0405, 0412, 0435, 0452, 0460, 0461, 0465, 0466	15%	6/11
Tableware	0417, 0420, 0450, 0464, 0474, 0478	-	0/3
Candles	0463	7%	103/108
Other (Appliances Not Specified)	0482	22%	31/35
Total		**32%**	**299/367**

The percentages presented in this table are the percents of injuries, not costs, included in the maximum addressable category. These percentages cannot be directly compared to maximum addressable costs because the costs, while deriving from these same cases, take into account a number of variables, not just case weight. For more information on how these cost estimates are derived, refer to the methodology section at the end of this report.

Maximum Addressability Definitions used for each class of products - Injuries.

Electric Cooking-	cut on sharp edges, electric shock, hot surface burns
Gas Cooking-	flash/flame burn, gas leak, hot surface burn, explosion
Countertop Cooking-	cut on sharp edges
Countertop Processing-	cut on sharp edges (blenders, food processors), electric shock
Large Kitchen Appliances-	refrigerator tip-over, refrigerator door breakage
Irons-	none identified in the data
Ranges, Not Specified-	flash burn, gas leak/explosion, electric shock, hot surface burns
Miscellaneous-	cut on broomstick handles
Un-powered Gadgets-	cut on can openers
Cookware-	pressure cooker explosions, cut on pans/bowls
Tableware-	none identified in the data
Candles-	fire, burns
Other, Appliances N.S.-	cut on, electric shock

Maximum Addressability Definitions used for each class of products - Deaths.

Electric Cooking-	clothing ignition, unattended cooking, electrical malfunction
Gas Cooking-	gas leak, unattended cooking, clothing ignition,
Countertop Cooking-	fire (electrical malfunction), clothing ignition, electrocution
Countertop Processing-	none reported
Large Kitchen Appliances-	electrocution, fire (electrical malfunction), entrapment
Irons-	fire, electrical malfunction
Ranges, Not Specified-	clothing ignition, electrical malfunction, unattended cooking, electrocution, gas leak, range used as heater for home, hot surface burns
Miscellaneous-	crushed by heavy object, trash can drowning
Un-powered Gadgets-	choked on
Cookware-	clothing ignition, unattended cooking
Tableware-	none identified in the data
Candles-	fire, burn (clothing, bedding, furniture)
Other, Appliances N.S.-	unattended cooking, electrical malfunction, gas leak, electrocution

Table 3 - Calculation of Indices[7] using cost estimates from Injury Cost Model, Death Certificates File, and Estimates of Number of Products in use.

Title	Medically Attended Injury Costs (millions)[8]	Death Costs (millions)	**Total Injury and Death Costs (millions)**	**Total Maximum Addressable Costs (millions)**	Rank on Total Costs	Rank on Maximum Addressable Costs	Products in Use (millions)	Maximum Addressable Costs Per Unit	Rank on Maximum Addressable Costs per unit
Electric Cooking	$139	$80	**$219**	**$130**	12	10	99	$0.76	1
Gas Cooking	$61	$130	**$191**	**$160**	13	9	Not Available	Not Available	Not Available
Countertop Cooking	$615	$105	**$720**	**$188**	9	6	620+	$0.30	4
Countertop Processing	$314	$0	**$314**	**$242**	10	5	385	$0.63	3
Large Kitchen Appliances	$2,298	$100	**$2,398**	**$188**	3	6	281	$0.67	2
Irons	$987	$15	**$1002**	**$10**	7	12	95	$0.11	6
Ranges, Not Specified	$1,816	$470	**$2,286**	**$1,275**	4	1	Not Available	Not Available	Not Available
Miscellaneous	$3,421	$130	**$3,551**	**$294**	2	4	Not Available	Not Available	Not Available
Un-powered Gadgets	$870	$20	**$890**	**$31**	8	11	Not Available	Not Available	Not Available
Cookware	$1,940	$55	**$1,995**	**$321**	5	3	Not Available	Not Available	Not Available
Tableware	$12,234	$15	**$12,249**	**$0**	1	13	Not Available	Not Available	Not Available
Candles	$496	$540	**$1,036**	**$550**	6	2	2,000	.27	5
Other (Appliances Not Spec.)	$66	$175	**$242**	**$170**	11	8	Not Available	Not Available	Not Available
Total	$25,258	$1,835	**$27,093**	**$3,558**					

These "total injury and death costs" estimates and "total maximum addressable cost" estimates are indices, not actual estimates of cost and expected injury cost reduction. This is because injury cost estimates and addressability estimates are based on 2002 emergency room-treated injury reports, and death cost estimates are based on deaths reported which occurred in 2000. Estimates of number of products in use are also imprecise estimates. These cost figures were developed, using the data available, to provide indices for the purpose of comparison. They do not represent an actual estimate of the costs associated with any of the product groups for a specific year.

[8] Costs expressed in 2001 dollars.

Methodology

NEISS

The Commission operates the National Electronic Injury Surveillance System (NEISS), a probability sample of 98 U.S. hospitals with 24-hour emergency rooms (ERs) and more than six beds. Coders at these hospitals provide CPSC with data on all consumer product-related injury victims seeking treatment in the hospitals' ERs. Injury and victim characteristics, along with a short description of the incident, are coded at the hospital and sent electronically to CPSC.

Because NEISS is a probability sample, each case collected represents a number of cases (the case's *weight*) of the total estimate of injuries in the U.S. The weight that a case from a particular hospital carries is associated with the number of hospitals in the U.S. of a similar size. NEISS hospitals are stratified by size based on the number of annual emergency-room visits. NEISS comprises small, medium, large and very large hospitals, and includes a special stratum for children's hospitals.[9]

This analysis uses NEISS data for the period 1/1/1997 through 12/31/2002.

CPSC's Death Certificate Database

CPSC purchases death certificates from all 50 states, and New York City, the District of Columbia and some territories. Only those certificates in certain E-codes (based on the World Health Organization's International Classification of Diseases ICD-10 system) are purchased. These are then examined for product involvement before being entered into CPSC's death certificate database. The result is neither a statistical sample nor a complete count of product-related deaths, nor does it constitute a national estimate. The database provides only counts of product-related deaths from a subset of E-codes. For this reason, these counts tend to be underestimates of the actual numbers of product-related deaths.

Death certificate collection from the states takes time. Data for 2001 and 2002 were not complete at the time this report was prepared.

[9] Kessler, Eileen and Schroeder, Tom. The NEISS Sample (Design and Implementation). U.S. Consumer Product Safety Commission. October 1999.

CPSC's Injury or Potential Injury Incident File (IPII)

IPII is a CPSC database containing reports of injuries or potential injuries made to the Commission. These reports come from news clips, consumer complaints received by mail or through CPSC's telephone hotline or web site, Medical Examiners and Coroners Alert Program (MECAP) reports, letters from lawyers, and similar sources. While the IPII database does not constitute a statistical sample, it can provide CPSC staff with guidance or direction in investigating potential hazards.

CPSC's Injury Cost Model

The Injury Cost Model (ICM) is a computerized analytical tool designed to measure the direct and indirect costs associated with consumer product-related injuries. In addition to providing a descriptive measure of injury hazards in monetary terms, the ICM is also used to estimate the benefits of regulatory actions designed to reduce consumer product injuries and to assist the Commission in planning, budgeting, and evaluating projects.

The ICM is structured to measure the four basic categories of injury costs: medical costs, work losses, pain and suffering, and product liability and legal costs. Medical costs include doctor and hospital-related costs as well as diagnostic procedures, prescription drugs, equipment, supplies, emergency transportation, follow-up care, and administrative costs. Both the initial treatment costs and the costs of long term care are included.

Work-related losses represent the value of lost productivity, the time spent away from normal work activities as the result of an injury. Work-related losses include both the short-term losses resulting from being absent from work and the long-term losses resulting from permanent partial or total disability and its impact on lifetime earnings. They also include the value of work lost as a result of caring for injured children, the value of housework lost due to an injury, and the loss to the employer resulting from the disruption of the workplace.

Pain and suffering represents the intangible costs of injury, and is based on jury verdicts for consumer product-related injuries. Product liability and legal costs represent the resources expended in product liability litigation. These costs include the costs of administering the product liability insurance system (including the plaintiff's legal costs and the costs of defending the insured manufacturer or seller), the costs of claims investigation and payment, and general underwriting and administrative expenses; however, medical, work loss, and pain and suffering compensation paid to injury victims and their families is excluded, thus avoiding double counting.

The ICM estimates the costs of injuries reported through the National Electronic Injury Surveillance System (NEISS), a national probability sample of hospital emergency departments. The injury cost estimates depend on a number of factors, and vary by the age and sex of the injured person, the type of injury suffered, the body part affected, and whether or not the victim is hospitalized or treated and released. The ICM also uses empirically derived relationships between emergency department injuries and those treated in other settings (e.g., doctor's offices, clinics) to estimate the number of injuries treated outside hospital emergency departments and the costs of those injuries.

A number of databases are used to calculate the four cost categories. National discharge data and discharge data from six states are used to estimate the costs of hospitalized injuries. Data from Department of Defense medical records from almost two million retirees and civilian dependents of military personnel and several National Center for Health Statistics surveys dealing with costs of treatment in different medical settings are used to calculate medical costs for injuries where the victim is treated and released from the emergency department or treated in a clinic or doctor's office. Other major data sources include the Annual Survey of Occupational Illnesses and Injuries and the Detailed Claims Information (DCI) database for work loss estimates; and the Jury Verdicts Research data for pain and suffering estimates. Product liability and legal costs are derived analytically from insurance industry information and several studies of product liability.

To determine the maximum addressable cost estimate, the injury narratives were read to determine which would not be addressable. The remaining injuries were then input to the Injury Cost Model, producing the estimate of maximum addressable costs.

Variables Associated with Products in Use Estimates

Inputs needed for number of products in use estimates include: Annual Sales, Expected useful life, and Expected Number in use.

Annual Sales: The annual sales data are from trade sources, published information and association estimates. Economic Analysis staff used the average of unit sales as reported by appropriate industry sources.

Expected Number in Use: There is often not sufficient data available to conduct a Product Population Estimate for a class of products. As a surrogate in these cases, Economic Analysis staff used average sales multiplied by the useful life estimate. This will understate the number of products in use for products that have seen substantial growth in sales, and overstate the number in use for products that have seen substantial decreases in sales in recent years.

For the purposes of this study, the number of products in use is based on industry estimates of "saturation rates," when available. This is considered to be a more accurate estimate of consumer exposure, since it measures the number of households with at least one of the products.

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