

Hazard Screening Report



Packaging and Containers for Household Products

(Product codes 1102, 1103, 1107, 1112, 1114, 1116, 1120, 1122-1125, 1127, 1128, 1130-1141, 1143, 1144)

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 for 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 Commission.

November 2005

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~~CONFIDENTIAL~~

NO. OF PRODUCTS IDENTIFIED

EXEMPTED BY: PETITION
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WITH PORTION REMOVED

The Hazard Screening Project

As an aid in setting priorities, CPSC staff is preparing this series of Hazard Screening Reports. Each report covers a group of related products, such as nursery equipment, housewares, 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 and deaths 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 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 remaining -- 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 18 reports by the end of 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 18 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
Housewares and Kitchen Appliances
Recreational Cooking and Camping Products
Home Communication, Entertainment and Hobby Products
General Household Appliances
Home Furnishings and Fixtures and 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 and Family Maintenance Products – Household Chemicals

These reports will be useful to individuals and organizations who are seeking reliable information about estimated numbers of 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!

This 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 that 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 are then generated by the Injury Cost Model¹ 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 this report states that the maximum addressable percentage of the costs is about 7%, it would be incorrect to say that 7% of the injuries or 7% of the costs are addressable.

For example: If a child under the age of five is found with an open pill bottle, and pills are missing, but no information about the container being child resistant is mentioned, we would consider this to be addressable.

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

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 definitive staff evaluations of whether a specific type of hazard might be prevented. The fact that a given hazard associated with a product was not considered potentially addressable in one of these reports should not 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 packaging and containers for household products. The report provides several pieces of information that will allow the reader to compare the products 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 packaging and containers for household products. 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.

Packaging and Containers for Household Products

Product Categories

Bags

(Includes product codes for: paper bags; plastic bags; and bags, not elsewhere classified)

Buckets or Pails

Glass Containers

(Includes product codes for: glass soft drink bottles; glass alcoholic beverage bottles; other glass bottles or jars; glass bottles or jars, not specified; canning jars or lids; and glass tubing or test tubes)

Metal Containers

(Includes product codes for: self-contained openers (zip-top or pull-top cans); metal containers (excluding aerosols, trash, and gasoline cans); and containers with key openers)

Miscellaneous Products

(Includes product codes for: plastic products, not specified; plastic wrapping products; paper products; aluminum foil wrapping products; and cardboard products)

Nonmetal/Nonglass Containers

(Includes product codes for: nonglass bottles or jars (excluding baby bottles); plastic containers (excluding bottles and jars); and wooden containers)

Other/Not Specified

(Includes product codes for: bottles or jars, not specified; containers, not specified; and other containers (excluding vacuum or pressurized))

Pressurized Containers

(Includes product codes for: vacuum containers; aerosol containers; and pressurized containers)

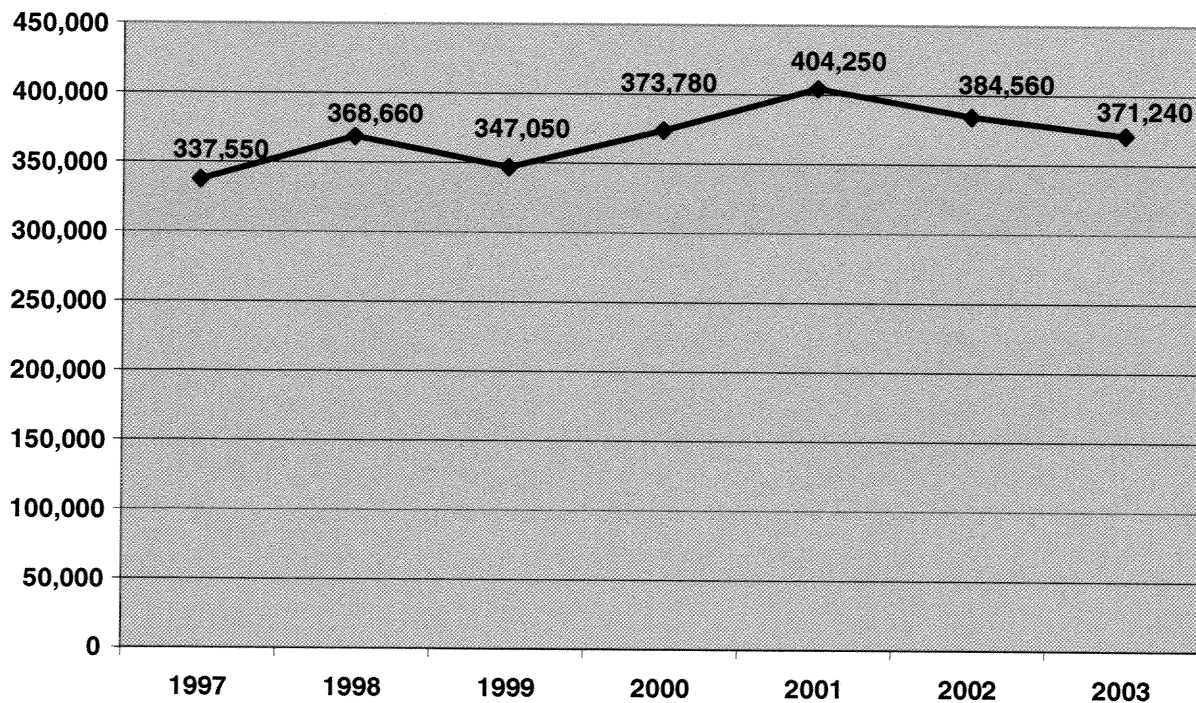
Packaging and Containers for Household Products

(Product codes 1102, 1103, 1107, 1112, 1114, 1116, 1120, 1122-1125, 1127, 1128, 1130-1141, 1143, 1144)

Bags, Buckets or Pails, Glass, Metal, Miscellaneous Products, Nonmetal/Nonglass, Other/Not Specified, Vacuum/Aerosol/Pressurized

ER Treated Injuries 2003	371,240	Percent of Households	Not Applicable
Medically Treated Injuries 2003	998,910	Number of Products in Use	Not Applicable
Percent of ER Treated Hospitalized	2.8%	Estimated Useful Life	Not Applicable
Deaths 2001	134	Estimated Retail Price Range	Not Applicable
Number of Incident Reports 2003	486	Death Costs (Millions)	\$670
Cost of Medically Treated Injuries (Millions)	\$15,539	Total Known Costs (Millions) ²	\$16,310

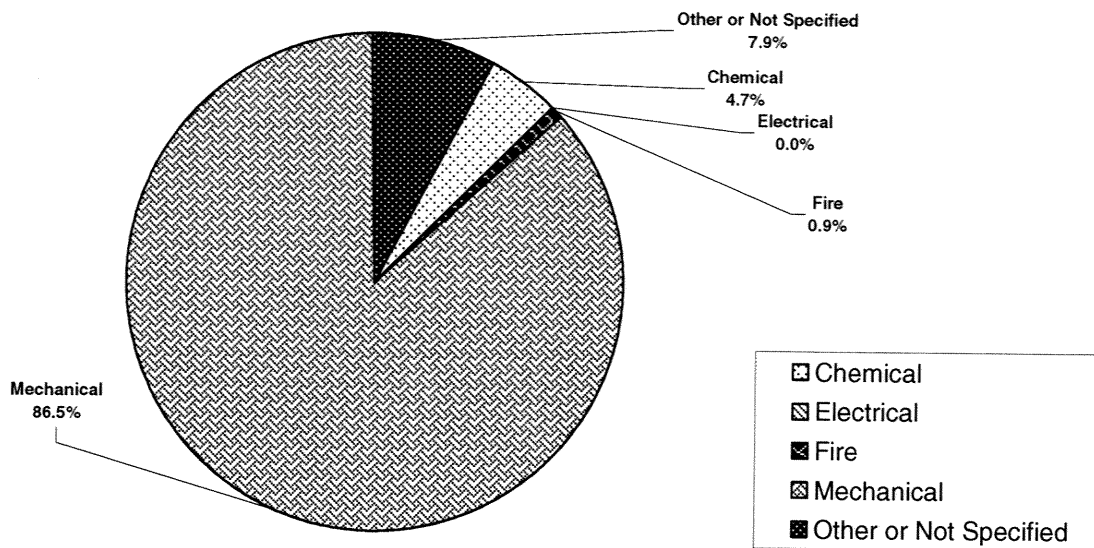
Figure 1. Estimated Number of Emergency Room-Treated Injuries Associated with Packaging and Containers, by Year, 1997 - 2003



The change from 1997 to 2003 was +33,690. This is not a statistically significant change. (p = 0.1750)

² This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2003 and death costs are based on 2000. At the time this report was prepared, these were the most recent years for which each of these cost items was available.

Figure 2. Distribution of Emergency Room-Treated Injuries by Energy Source of the Hazard for Packaging and Containers for Household Products, 2003



Deaths

In 2001, CPSC received 134 reports of deaths that were associated with packaging and containers for household products.

Of the 134 deaths, 46 were related to bags. Twenty-nine of those were due to suffocation, one was due to choking, and 16 were due to other causes. The suffocation deaths involved 18 children and 11 adults or teenagers. The 18 suffocation deaths of children all involved children under three having contact with plastic bags. The 11 adult or teenage deaths included two confirmed suicides. The 16 adult non-suffocation deaths were associated with: huffing or intentionally sniffing (12), auto erotic behavior (2), entanglement with a plastic bag (1), and tripping and falling on a plastic bag (1).

There were 28 deaths associated with buckets or pails; 20 of these deaths were of babies/toddlers between the ages of eight months and 18 months. Other/Not Specified containers were associated with 26 deaths, including deaths related to: a beer stein, a pill vial, a lip balm, a bottle cap, an alcohol bottle, a baby oil bottle, baskets, unspecified tanks, a banana box, barrels, and boxes. There were 16 deaths associated with miscellaneous products. Seven deaths were related to metal containers. Pressurized containers were associated with six deaths. There were three deaths involving nonmetal/nonglass containers, and two deaths involving glass container products.

A total of 21 deaths out of the 134 were determined to fit into the category of maximum addressable (mainly deaths associated with drowning in buckets and pails).

Overview Summary

The change in injury frequency over the seven-year period of 1997 – 2003 was 33,694. This is not a statistically significant change at the 95% confidence level ($p = 0.1750$).

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:

Over half of the emergency room-treated injuries associated with bags involved carrying or lifting heavy bags. None of these injuries was found to be potentially addressable.

A description of the criteria for maximum addressability for each of the products in this report is contained on pages 14 and 15.

The staff determined the percentage of injuries identified as maximum addressable by reviewing the entire set of product narratives reported through the National Electronic Injury Surveillance System (NEISS) for the full year 2003 for pressurized containers. For the remaining categories (bags, buckets or pails, glass, metal, miscellaneous products, nonmetal/nonglass, and other/not specified), 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 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 dollars is consistent with current economic literature. This cost is frequently expressed in the literature using a range of 3 million to 7 million dollars. For the purpose of consistency and ease of comparison, we have used the midpoint of this range. 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 packaging and container products, we find that the total maximum addressable injury and death cost is 1.2 billion dollars, out of a total cost associated with these products of 16 billion dollars, or about 7% maximum addressable.

Figure 3 shows the index³ of estimated injury and death costs for each of the product categories and the estimated maximum addressability of those costs.

³ This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2003 and the death costs are based on 2001. These are the most recent years for which each of these cost items was available at the time this report was prepared.

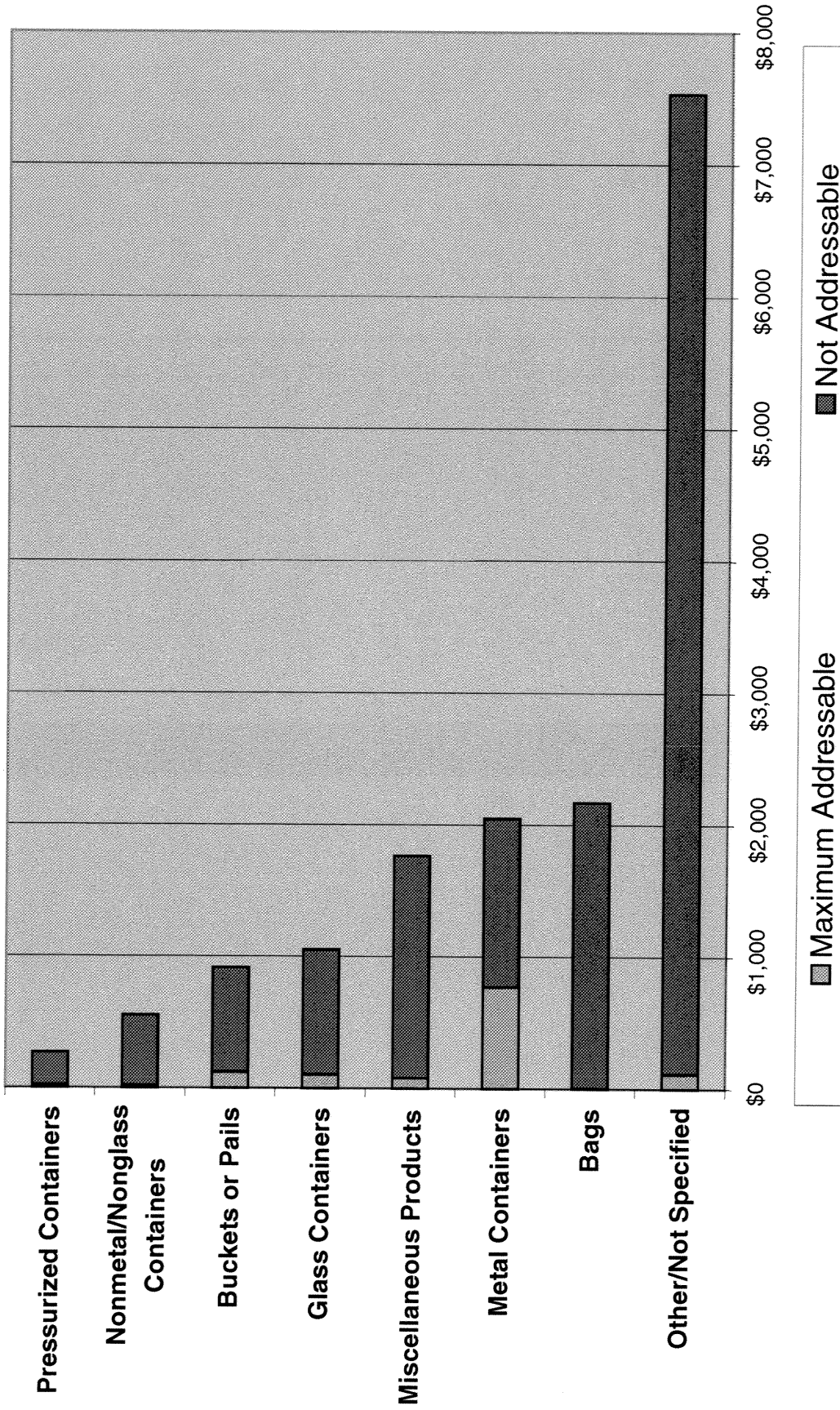
Table 1 – Product Summary Table – Injury, Death, and Cost Estimates

Product	Codes	ER Injuries 2003	All Medically Treated Injuries 2003	Hosp.% of ER Treated Injuries 2003	Incident reports 2003	Deaths 2001	Death Costs (millions) 2001	Medically Treated Injury Costs (millions) 2003	Total Known Costs (millions)
Bags	1128, 1130, 1144	35,400	108,400	3%	22	46	\$230	\$1,941	\$2,171
Buckets or Pails	1143	13,250	40,740	4%	17	28	\$140	\$775	\$915
Glass Containers	1120, 1122, 1124, 1134, 1136, 1140	39,510	85,210	2%	29	2	\$10	\$1,043	\$1,053
Metal Containers	1103, 1112, 1116	85,240	184,780	1%	26	7	\$35	\$2,013	\$2,048
Miscellaneous Products	1114, 1131, 1132, 1137, 1139	41,150	105,380	6%	149	16	\$80	\$1,684	\$1,764
Nonmetal/Nonglass Containers	1123, 1125, 1127	12,470	31,070	4%	49	3	\$15	\$539	\$554
Other Not Specified Containers	1107, 1135, 1141	140,800	428,930	3%	135	26	\$130	\$7,408	\$7,538
Pressurized Containers	1102, 1133, 1138	5,770	14,400	2%	59	6	\$30	\$238	\$268
Total ⁴		373,590	998,910	3%	486	134	\$670	\$15,641	\$16,311

Descriptions of how these estimates were derived can be found in the methodology section. Costs are in 2002 dollars.

⁴ Sums may not add to total because of rounding. Some cases appear in more than one category. Thus, numbers may not add to totals.

Figure 3. Estimated Cost Index in Millions of Dollars, Packaging and Containers, 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 2001
Bags	1128, 1130, 1144	0%	0/46
Buckets or Pails	1143	1%	20/28
Glass Containers	1120, 1122, 1124, 1134, 1136, 1140	10%	0/2
Metal Containers	1103, 1112, 1116	38%	0/7
Miscellaneous Products	1114, 1131, 1132, 1137, 1139	5%	0/16
Nonmetal/Nonglass Containers	1123, 1125, 1127	3%	0/3
Other/Not Specified	1107, 1135, 1141	1%	1/26
Pressurized Containers	1102, 1133, 1138	15%	0/6
Total		9%	21/134

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.

Bags	none identified in the data
Buckets or Pails	submersion, cut
Glass Containers	explosion, foreign body in eye, ingested glass, cut opening bottle, poisoning from contents, sharp edge
Metal Containers	cut, swallowed pull tabs
Miscellaneous Products	allergy to contents, cut on package, mouthing, small part (package or wrapper), poisoning from contents, sharp edge, tripped
Nonmetal/Nonglass Containers	chemical burn, entrapment, liquid in eye, poisoning from contents of container, sharp edge
Other/Not Specified	poisoning from contents of container
Pressurized Containers	can burst, child sprayed contents in eyes, poisoning (sprayed contents in mouth)

Maximum Addressability Definitions Used for Each Class of Products - Deaths.

Bags	none identified in the data
Buckets or Pails	drowning
Glass Containers	none identified in the data
Metal Containers	none identified in the data
Miscellaneous Products	none identified in the data
Nonmetal/Nonglass Containers	none identified in the data
Other/Not Specified	poisoning from contents, clothing ignition
Pressurized Containers	explosion

Table 3 - Calculation of Indices Using Cost Estimates from Injury Cost Model, and Death Certificates File.

Title	Medically Attended Injury Costs (millions)	Total Death Costs (millions)	Total Injury and Death Costs (millions)	Total Maximum Addressable Costs (millions)	Rank on Total Costs	Rank on Maximum Addressable Costs
Bags	\$1,941	\$230	\$2,171	\$0	2	8
Buckets or Pails	\$775	\$140	\$915	\$122	6	2
Glass Containers	\$1,043	\$10	\$1,053	\$102	5	4
Metal Containers	\$2,013	\$35	\$2,048	\$767	3	1
Miscellaneous Products	\$1,684	\$80	\$1,764	\$79	4	5
Nonmetal/Nonglass Containers	\$539	\$15	\$554	\$16	7	7
Other/Not Specified	\$7,408	\$130	\$7,538	\$111	1	3
Pressurized Containers	\$238	\$30	\$268	\$19	8	6
Total ⁵	\$15,641	\$670	\$16,311	\$1,216		

These “total injury and death cost” 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 2003 emergency room-treated injury reports, and death cost estimates are based on deaths reported which occurred in 2001. Estimates of numbers 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.

⁵ Sums may not add to totals because of rounding.

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.⁶

This analysis uses NEISS data for the period 1/1/1997 through 12/31/2003.

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 2002, 2003, and 2004 were not complete at the time this report was prepared.

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.

⁶ Kessler, Eileen and Schroeder, Tom. The NEISS Sample (Design and Implementation). U.S. Consumer Product Safety Commission. October 1999.

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.