Hazard Screening Report

Yard and Garden Equipment

(Product codes 1400 – 1464)

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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.

CAUTION!

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. The remaining injuries are then run through the Injury Cost Model, to produce an estimate of *maximum* addressable costs.

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 28%, it would be incorrect to say that 28% of the injuries or 28% of the costs are addressable.

For example: If someone contacted the moving chain of a chain saw, but we have no information about how they made contact, or if there was a safety device present, we would count that injury as in the maximum addressable category. It may not be addressable; 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>

Introduction

The group of products included in this report consists of Yard and Garden Equipment, and includes both powered and unpowered products. The report provides several pieces of information that will allow the reader to compare products within this report as well as to compare with products in other categories in reports that will follow.

This report shows an index of the size of the overall injury and death problem associated with Yard and Garden Equipment. 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 included.

Finally, this report presents information on a hazard common to several of the products examined.

Yard and Garden Equipment

Individual Product Categories

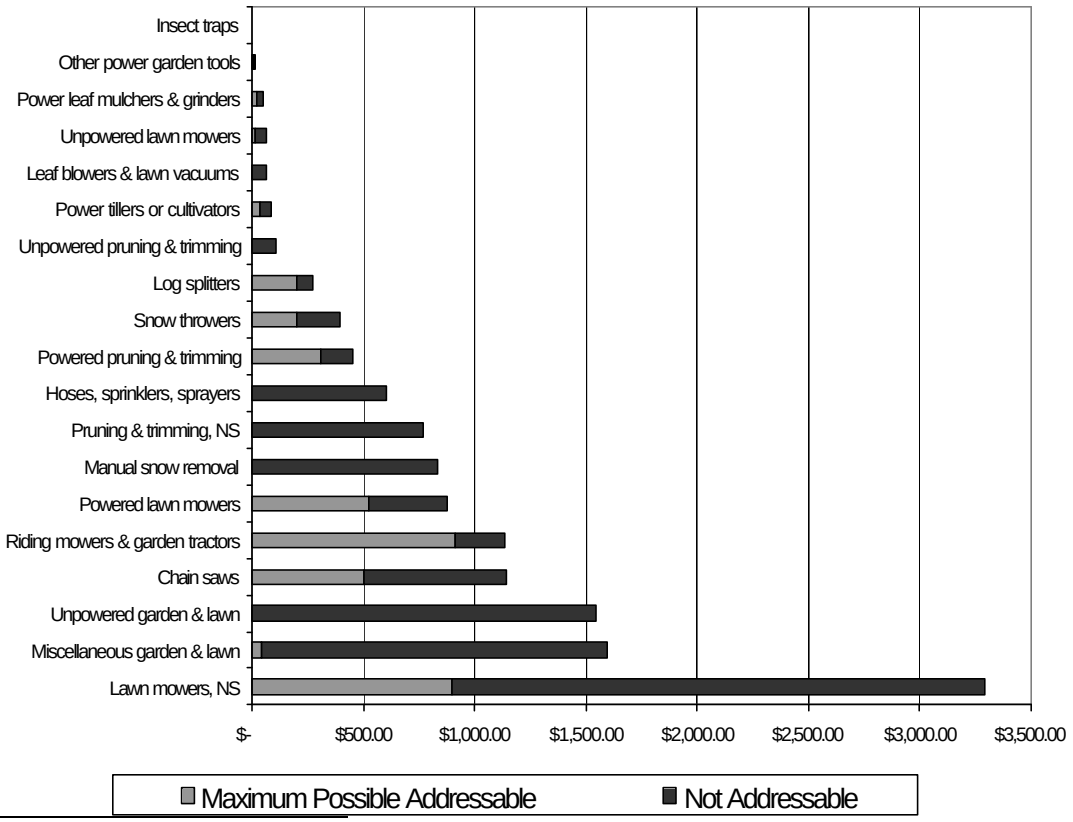
Powered pruning and trimming
Unpowered pruning and trimming
Pruning and trimming, not specified
Powered lawn mowers
Riding lawn mowers and garden tractors
Unpowered lawn mowers
Lawn mowers, not specified
Garden hoses, nozzles, sprinklers, sprayers
Snow throwers, blowers, or plows
Manual snow or ice removal and snow removal, not specified
Unpowered garden or lawn
Miscellaneous garden or lawn
Power tillers or cultivators
Other power garden tools
Chain saws
Power leaf mulchers and grinders
Log splitters
Leaf blowers and lawn vacuums
Electric insect traps

Yard and Garden Equipment
(1400 – 1464)

ER-Treated Injuries 2001[1]	273,550	Number of Households	n/a*
Medically-Treated Injuries 2001	443,970	Number of Products in Use	N/A*
Percent of ER-Treated Hospitalized	5%	Estimated Useful Life	N/A
Deaths 2000	118	Estimated Retail Price Range	N/A
Fires 1998	N/A	Fire Property Loss (Millions)	N/A
Number of Incident Reports 2002	573	Death Costs 2000 (Millions)	$590.0
Cost of Medically-Treated Injuries (Millions)	$12,699.8	Total Known Costs (Millions)[2]	$13,289.8

* NOTE: N/A indicates information not available. If information is not applicable table will say n/a.

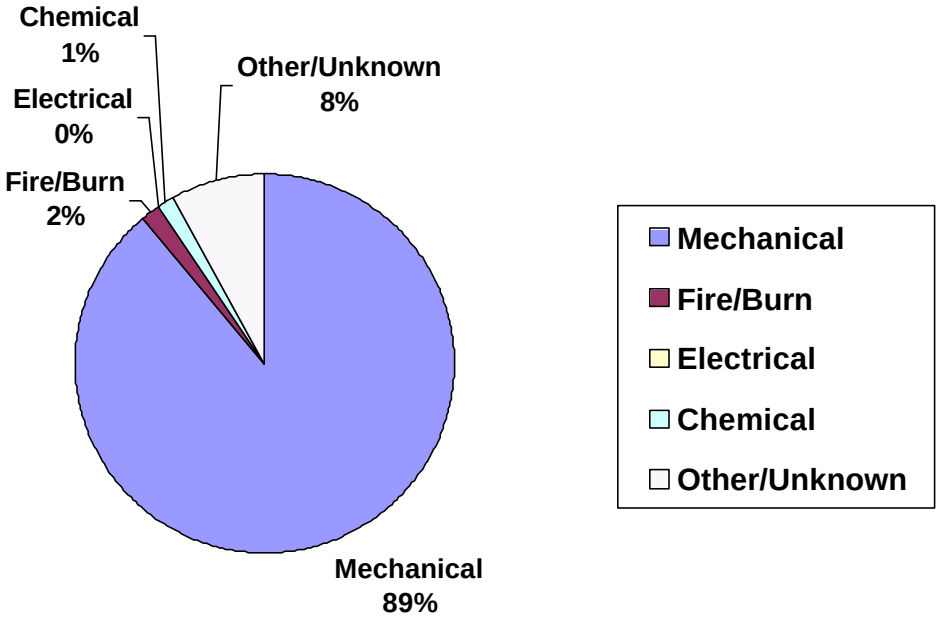
Figure 3. Estimated Cost Index in Millions of Dollars, Yard and Garden Products, by Total Cost and Maximum Possible Addressable Cost



[1] Emergency room-treated injury estimates (NEISS) for 2001 are presented, because the 2002 NEISS data were not officially complete at the time this report was prepared. As a result, 2001 was the most recent year for which the Injury Cost Model could produce estimates from NEISS of medically-treated injuries and of injury costs. The trend graph shown in Figure 1 includes the preliminary NEISS estimate from 2002 to provide the most complete, current picture of the trend in injuries.

[2] This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2001 and death costs are based on 2000. These are 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 Yard and Garden Equipment, Six Years, 1997 - 2002



Deaths

For 2000, CPSC has reports of 118 deaths associated with these products. The three leading product categories in frequency of deaths accounted for 88 of these deaths. Forty-four deaths were associated with Riding lawn mowers and garden tractors, 23 were associated with Chain saws, and 15 were associated with Miscellaneous garden or lawn products.

Overview Summary

The change in injury frequency over the 6-year period, 1997 – 2002, was a statistically significant ($p = .024$) increase of 35,700 emergency room-treated injuries. Almost two thirds of this increase, however, occurred in product categories for which the injuries treated mostly resulted from incidental contact with the product (e.g., bumped into, fell over, etc.) or from overexertion or muscle fatigue.

Table 1 provides a summary of all product groups examined for this report. The 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 number of products of each type in use, the estimated useful product life for each category, and 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 and 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 Yard and Garden Equipment may not be addressable. To know actual addressability of the hazards associated with a product usually requires detailed study of the problem and the product. This level of study is not feasible for this overview report. What we have done is identify that portion of the injury and death costs that is not addressable. These proportions were then applied to the cost estimates for each product group, to produce an estimate of *maximum* addressable costs.

> **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.

Example: The category, Unpowered garden and lawn, is the third ranked category with regard to total injury and death costs, with $1.5 billion in costs for a single year. Review of the hospital narratives for the injury reports revealed that virtually all of the emergency room-treated injuries upon which this estimate is based were incidental contact with the product or were exertion-related problems, e.g. "felt chest pain after pruning trees." None of these injuries were found to be addressable.

The staff reviewed the narratives included in National Electronic Injury Surveillance System (NEISS) injury reports for each product group, and reviewed the individual death reports.[3] Because the NEISS narratives are very short and often do not provide much detail, cases were

[3] See Methodology Section for a description of these databases.

categorized as "not addressable" only if it was clear that the injury was incidental or not related to anything about the product. If, for example, all we knew about a case involving a chain saw was that someone had contacted the moving chain, this was not enough information to conclude that the case was "not addressable." Such a case would be left in the "maximum addressable" category. The death reports often, but not always, had more information, allowing for better determination of addressability.

By applying this percentage to the total cost of medically-treated injuries, staff estimated the *maximum addressable* cost associated with injuries for each product or product group. Deaths were also reviewed and determined to be in either the not-addressable or maximum addressable category, and were valued at $5 million dollars each. 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.

The staff is currently considering whether there may be a difference between costs associated with addressable injuries and costs associated with non addressable injuries. It may be that incidental injuries with little product involvement tend to be less severe and therefore associated with lower average costs per injury. If incidental injuries do tend to be less costly, our methodology, which applies a percentage to the total injury costs, would tend to underestimate the maximum addressable costs associated with product groups. The staff is currently developing a methodology to address this issue.

Overall, after applying this process of review of the data to the entire category of Yard and Garden Equipment, we find that the total maximum addressable injury and death cost is $3.70 billion dollars, out of a total cost associated with these products of $13.28 billion dollars, about 28% maximum addressable.

Figure 3 shows the index[4] of estimated injury and death costs for each of the product categories and the estimated maximum addressability of those costs.

[4] This total represents an index rather than an actual single year estimate of costs, because injury costs are based on 2001 and the death costs are based on 2000. These are the most recent years for which each of these cost items was available.

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

Product	Codes	ER Injuries 2001	Medically -treated Injuries 2001	% Hospitalized 1997 - 2002	Incident Reports 2002	Deaths 2000	Fires 1998	# of Products in Use (millions)	Estimated Useful Product Life (Years)	Death Costs* (millions $)	Med. Trtd. Injury Costs* (millions $)	Total Known Costs
Powered pruning and trimming	1427, 1454, 1456, 1463, 1464	14,580	37,000	2%	40	2	N/A	38.5	9 years	$10.0	$440.15	$450.15
Unpowered pruning and trimming	1449, 1450, 1453, 1455	3,860	8,420	1%	0	1	N/A	No estimate	No estimate	$5.00	$102.77	$107.77
Pruning and trimming, N.S.	1447	26,270	60,170	2%	1	10	N/A	Not Applicable	Not Applicable	$50.0	$718.54	$768.54
Powered lawn mowers	1401, 1431, 1446, 1448	12,510	31,730	8%	116	6	N/A	50.4	6 years	$30.0	$844.85	$874.85
Riding lawn mowers and garden tractors	1405, 1422	13,280	37,870	10%	185	44	N/A	9.50	6 years	$220.0	$913.47	$1133.47
Unpowered lawn mowers	1402	870	2,230	6%	0	0	N/A	No estimate	No estimate	-	$61.77	$61.77
Lawn mowers, N.S.	1439	62,460	174,140	5%	0	3	N/A	Not applicable	Not applicable	$15.0	$3277.29	$3292.29
Garden hoses, nozzles, sprinklers, sprayers	1407, 1414	14,020	36,740	6%	39	3	N/A	No estimate	No estimate	$15.0	$588.74	$603.74
Snow throwers or blowers or plows	1434, 1435, 1458, 1459	4,680	11,550	12%	15	3	N/A	4.0 – 6.0	6 years	$15.0	$382.75	$397.75
Manual snow or ice removal and snow removal, N.S.	1415	13,020	42,960	7%	0	2	N/A	No estimate	No estimate	$10.0	$820.62	$830.62
Unpowered garden or lawn	1403, 1426	36,780	97,790	3%	13	1	N/A	No estimate	No estimate	$5.0	$1538.19	$1543.19
Miscellaneous garden or lawn	1413, 1417, 1425, 1430, 1432, 1445, 1452, 1462	33,530	90,390	5%	75	15	N/A	No estimate	No estimate	$75.0	$1518.19	$1593.19
Power tillers or cultivators	1408	2,250	5,930	3%	7	1	N/A	3.1	9 years	$5.0	$82.27	$87.27
Other power garden tools	1409	240	650	5%	0	1	N/A	No estimate	No estimate	$5.0	$9.02	$14.02
Chain saws	1411	30,150	66,970	5%	34	23	N/A	17.3 gas powered	9 years	$115.0	$1030.01	$1145.01
Power leaf mulchers and grinders	1433	740	1,800	8%	10	2	N/A	No estimate	No estimate	$10.0	$36.11	$46.11
Log splitters	1457	4,070	9,120	5%	2	0	N/A	0.1 (many rentals)	10 years	-	$274.37	$274.37
Leaf blowers & lawn vacuums	1441, 1461	1,350	4,130	5%	16	1	N/A	13.5	9 years	$5.0	$59.94	$64.94
Electric insect traps	1460	80	190	-	21	0	N/A	6.5	7 years	-	$.75	$.75

N/A – Not available N.S. – Not specified Not applicable – For codes that are "not specified" there is no actual product to estimate number in use or product life.

* Descriptions of how these estimates were derived can be found in the Methodology Section.

Table 3 lists all of the product groups ranked in descending order by the Total Injury and Death Costs Index. This table also shows the total maximum addressable cost for each product group and, for those product groups where there was an estimate of number of products in use, the maximum addressable cost per unit of the product in use. Rankings of the product groups on total costs, maximum addressable costs, and maximum addressable cost per unit are also provided.

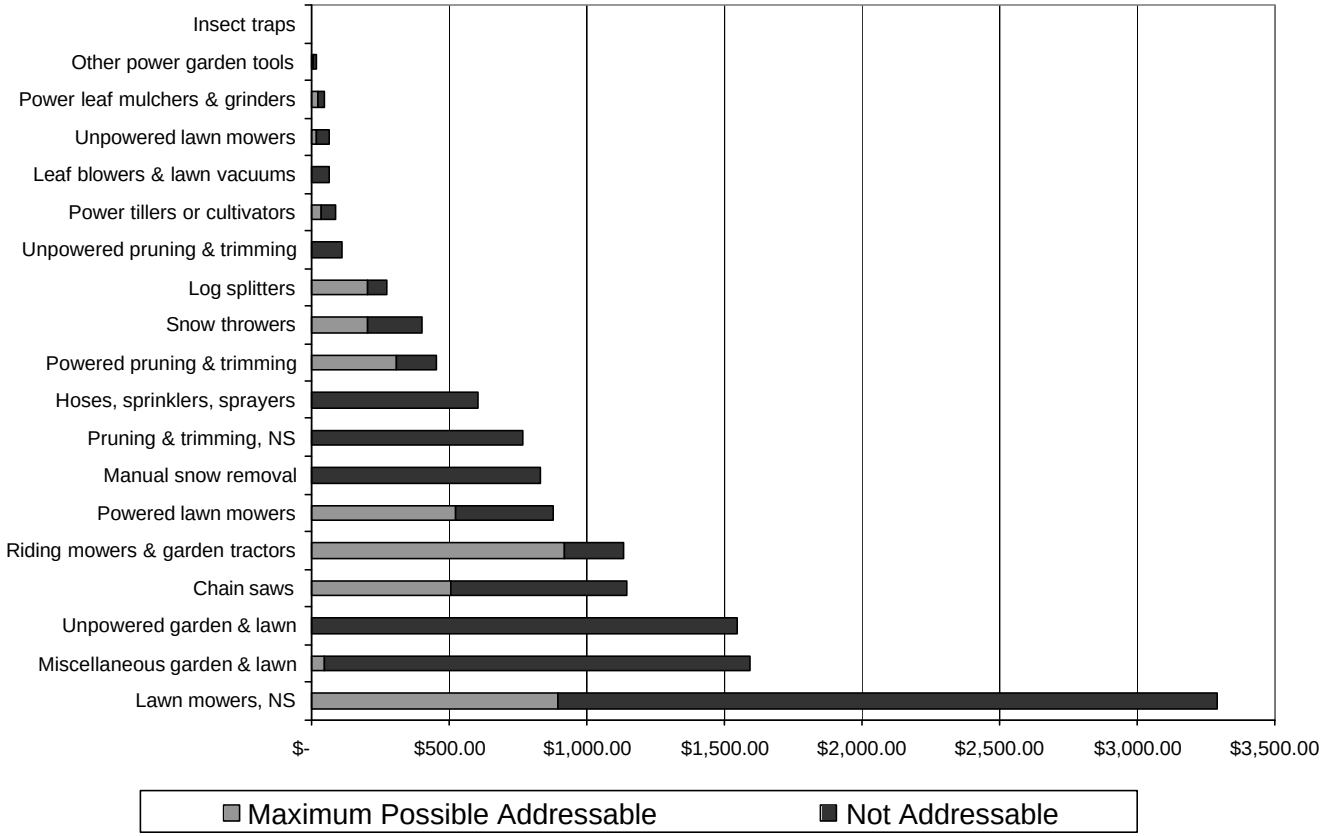
Several of the highest ranking product categories with regard to injury and death costs contained injuries that were almost all either incidental from contact with the product or from overexertion or overuse resulting from the nature of the work for which the products are used. Two of the top four product categories in terms of overall cost, Miscellaneous garden or lawn and Unpowered garden or lawn, accounted for over $3 billion in injury and death costs, but only $45 million in maximum addressable costs. These and several other products were identified as associated with mostly incidental or exertion injuries. A group of six product categories: Manual snow removal equipment; Pruning and trimming equipment, not specified; Hoses and sprayers; Unpowered pruning and trimming equipment; Unpowered lawn mowers; and Electric insect traps, accounted for over $2.3 billion in total costs, but no addressable costs were found for these products. While there may still be some hazards involving these products that are worth addressing, these hazards do not represent a large share of the injury and death costs associated with the products. The largest category in terms of total injury and death costs with almost $3.3 billion, was Lawn mowers, not specified. Injuries and deaths that were identified as addressable for this category were all cases involving powered lawn mowers that had been inappropriately coded as lawn mowers, not specified.

Products and hazards identified for which further study or hazard reduction activity may be appropriate are noted below:

- The whole category of Powered pruning and trimming equipment may need further evaluation. The estimated number of injuries annually increased significantly from 1997 to 2002. The product group was fifth on maximum addressable costs. The Pruning and trimming, not specified category was also large and contained many cases that probably involved powered trimmers. A study was recently completed on weed and grass trimmers as part of an ongoing hazard reduction activity, but other products in this category may also need to be examined.
- Walk-behind powered lawn mowers are covered by both mandatory and voluntary safety standards, but the mowers on the market have evolved, and some hazards may deserve a new evaluation.
- Riding lawn mowers and garden tractors were the subject of a great deal of CPSC study and effort in the 1980s and 1990s. Some hazards remain and result in far more deaths than any other product category in this report.
- Snow throwers were associated with high costs relative to the number of products in use. The industry has been approached about the primary hazard associated with these products (hand and finger injuries related to a clogged discharge chute) and is exploring ways to address the hazard without reducing the utility of the product.

- Power tillers and cultivators are another category with a small number of products in use, but which has one of the higher costs per unit of the product in use. This is often a rental product, which could result in a high proportion of inexperienced or first time users. The leading hazard is contact with the moving tines of the product while in use.
- Leaks from fuel tanks of liquid fueled yard and garden products is a problem that involved many types of product. While the Office of Compliance has addressed problems with specific brands through recalls, and there is a hazard reduction activity to develop a voluntary standard for gas tanks, this problem needs to be monitored and additional steps may be needed if the problem continues.
- Chain saws ranked first on maximum addressable costs and second on maximum addressable costs per unit. The large majority of these cases were ones that reported that the victim was cut on the saw. It is very possible that only a few, if any, of these could actually be addressed by product standards. CPSC has worked on chain saws since the 1970s, and has had some effort on the product every year up to the present. In 1985, the Commission voted to stop work on a mandatory standard, because the voluntary standard was believed to be adequate at the time. Emergency room treated injuries associated with chain saws in 2002 were about half of what they were in 1985. While there may still be some things about chain saws that could be corrected, the facts are that injuries are down dramatically since the voluntary standard went into effect, and while a large number of the injuries are included in "Maximum addressable," it may be that many of these injuries are just the result of an inherently dangerous product performing its function properly.

Figure 3. Estimated Cost Index in Millions of Dollars, Yard and Garden Products, by Total Cost and Maximum Possible Addressable Cost



- This 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	Codes	Percentage of injuries included in Maximum addressable	Number of deaths included in Maximum addressable
Powered pruning and trimming	1427, 1454, 1456, 1463, 1464	68%	2 of 2
Unpowered pruning and trimming	1449, 1450, 1453, 1455	0	0 of 1
Pruning and trimming, NS	1447	0	0 of 10
Powered lawn mowers	1401, 1431, 1446, 1448	61%	1 of 6
Riding lawn mowers and garden tractors	1405, 1422	36%	35 of 44
Unpowered lawn mowers	1402	0	0 of 0
Lawn mowers, N.S.	1439	27%	2 of 3
Garden hoses, nozzles, sprinklers, sprayers	1407, 1414	<1%	0 of 3
Snow throwers or blowers or plows	1434, 1435, 1458, 1459	53%	0 of 3
Manual snow or ice removal and snow removal, N.S.	1415	0	0 of 2
Unpowered garden or lawn	1403, 1426	<1%	0 of 1
Miscellaneous garden or lawn	1413, 1417, 1425, 1430, 1432, 1445, 1452, 1462	<1%	9 of 15
Power tillers or cultivators	1408	37%	1 of 1
Other power garden tools	1409	<1%	1 of 1
Chain saws	1411	85%	8 of 23
Power leaf mulchers and grinders	1433	54%	0 of 2
Log splitters	1457	74%	0 of 0
Leaf blowers	1461	24%	0 of 1
Electric insect traps	1460	0	0 of 0
Total		28%	59 of 118

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Table 3 - Calculation of Indices[5] using cost estimates from Injury Cost Model, Death Certificate File, and Estimates of Number of Products in Use.

Category	Medically-attended injury cost	Death cost	**Total injury and death costs**	**Total maximum addressable cost**	Rank on total costs	Rank on maximum addressable costs	Products in use (Millions)	Maximum addressable cost per unit	Rank on maximum addressable costs per unit
Lawn mowers N.S.	$ 3,277,290,000	$15,000,000	**$ 3,292,290,000**	**$ 894,868,300**	1	2			0
Miscellaneous garden	$ 1,518,190,000	$75,000,000	**$ 1,593,190,000**	**$ 45,000,000**	2	8			0
Unpowered garden	$ 1,538,190,000	$5,000,000	**$ 1,543,190,000**	**$ -**	3				0
Chain saws	$1,030,010,000	$115,000,000	**$ 1,145,010,000**	**$ 915,508,500**	4	1	17.3	$ 52.92	**2**
Riding mowers	$ 913,470,000	$220,000,000	**$ 1,133,470,000**	**$ 503,849,200**	5	4	9.5	$ 53.04	**1**
Power mowers (walk behind)	$844,850,000	$30,000,000	**$ 874,850,000**	**$ 520,358,500**	6	3	50.4	$ 10.32	5
Manual snow removal	$820,620,000	$10,000,000	**$ 830,620,000**	**$ -**	7				0
Pruning, Not Specified	$718,540,000	$50,000,000	**$ 768,540,000**	**$ -**	8				0
Hoses and sprayers	$588,740,000	$15,000,000	**$ 603,740,000**	**$ -**	9				0
Powered pruning	$440,150,000	$10,000,000	**$ 450,150,000**	**$ 309,302,000**	10	5	38.5	$ 8.03	6
Snow throwers	$382,750,000	$15,000,000	**$ 397,750,000**	**$ 202,857,000**	11	7	4	$ 50.71	**3**
Log splitters	$274,370,000	$0	**$ 274,370,000**	**$ 203,033,800**	12	6			0
Unpowered pruning	$102,770,000	$5,000,000	**$ 107,770,000**	**$ -**	13				0
Power tiller	$82,270,000	$5,000,000	**$ 87,270,000**	**$ 35,439,900**	14	9	3.1	$ 11.43	4
Leaf blowers	$59,940,000	$5,000,000	**$ 64,940,000**	**$ 14,385,600**	15	11	13.5	$ 1.07	7
Unpowered lawn mowers	$61,770,000	$0	**$ 61,770,000**	**$ -**	16				0
Power leaf mulchers	$36,110,000	$10,000,000	**$ 46,110,000**	**$ 19,499,400**	17	10			0
Other power garden	$9,020,000	$5,000,000	**$ 14,020,000**	**$ 5,000,000**	18	12			0
Electric insect traps	$750,000	$0	**$ 750,000**	**$ -**	19		6.5	$ -	0
Total	$12,699,800,000	$590,000,000	**$13,289,800,000**	**$2,779,233,900**					

[5] These estimates are indices, not actual estimates of expected injury cost reduction. This is because injury cost estimates are based on 2001 emergency room-treated injury estimates, death cost estimates are based on deaths reported which occurred in 2000, and addressability estimates of injuries are based on review of NEISS comments for 2002. Estimates of number of products in use are also very imprecise estimates. The cost figures in the table do not represent an actual estimate of the costs associated with any of the product groups for a specific year. They were developed, using the data available, to provide indices for the purpose of comparison.

Generic Hazard

There was one hazard associated with several different types of products. This hazard was related to leaking fuel systems, usually the gas tank, on gasoline or propane powered yard equipment. A summary of the data on this hazard follows.

This hazard was generic to all of the fuel-powered products in the yard and garden category. Eight different types of yard or garden product were identified with at least one incident of fuel leakage. A total of 20 different brand names were associated with these cases.

Table 4 shows the distribution of incident reports from 2002 for this hazard, by product type.

Table 4 - Incident reports received during 2002 concerning fuel leaks with Yard and Garden Equipment, by product type.

Product	Power lawn mower	Riding lawn mower	Power tiller	Chipper shredder	Powered trimmer	Snow blower	Insect trap	Leaf blower/ vacuum	Total
Number of Incidents Reported	45	56	2	1	9	3	1	2	119

Summary of Table

1 year – 119 reports of fuel leaks
20 brand names
8 types of products

Riding mowers and walk behind power mowers were the most frequently reported products.

The staff is currently working on a voluntary standard for fuel tanks to address this hazard. In addition there have been product recalls and corrective actions by the Office of Compliance to address this hazard.

Methodology

NEISS

The Commission operates the National Electronic Injury Surveillance System, a probability sample of 98 U.S. hospitals with 24-hour emergency rooms (ERs) and more than six beds. 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 12/31/2002. Data collection for 2002 had not been closed when this report was prepared.

CPSC's Death Certificate Database

CPSC purchases death certificates from all 50 states, 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 are not complete.

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 the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) (which includes 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.