Hazard Screening Report

Power Tools and Workshop Equipment

(Product codes 800-819, 821-893)

June 2003

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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 the consumer was cut using a powered saw, but we have no information about whether the consumer was cut on the blade, or the material being cut, 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 Power Tools and Workshop Equipment. This 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 Power Tools and Workshop Equipment. The first information presented is a summary of the injury, death and cost data for the entire class of products. A trend graphic (figure1) is presented which shows the frequency of emergency room-treated injuries since 1997. This is followed by a pie chart (figure 2) showing the distribution of the injuries for this class of products by energy source of the hazard, i.e., mechanical, fire, electrical, chemical, or other. There is also a summary table, which shows the injuries, deaths and costs associated with each product group.

Finally, this report presents information on two hazards common to several of the products examined.

Power Tools and Workshop Equipment

Individual Product Categories

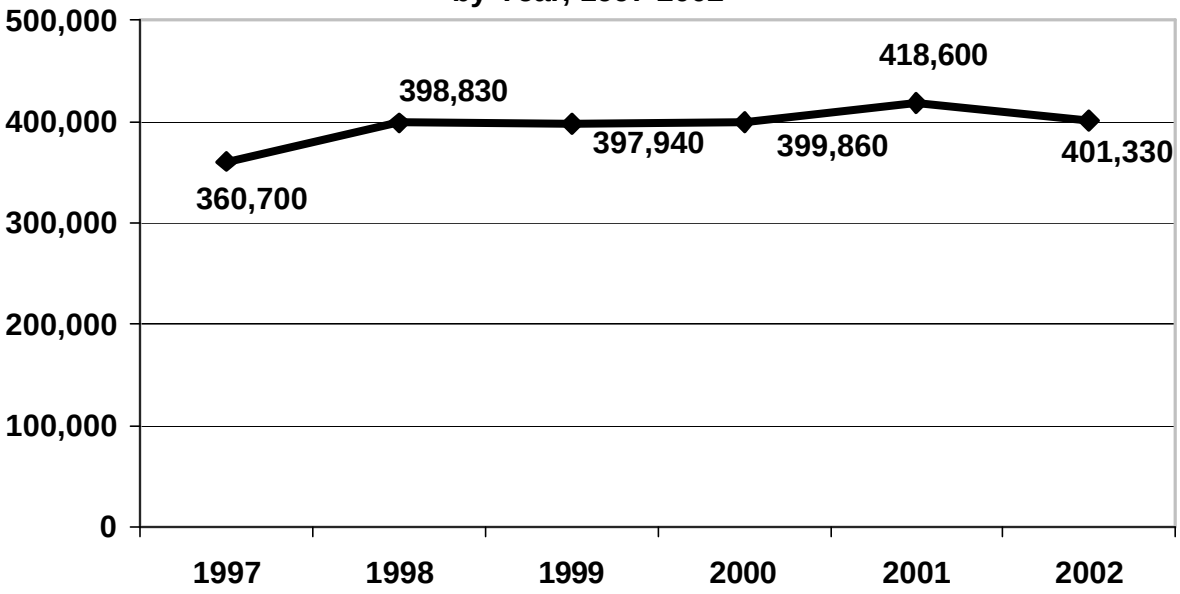
Powered drills
Welding, soldering, cutting torches
Manual workshop tools
Grinders, buffers, polishers
Batteries, battery chargers
Painting equipment, sprayers
Miscellaneous workshop tools
Power sanders
Other portable or stationary power tools
Hoists, lifts, jacks, or jack stands
Automotive tools or accessories
Air compressors (separate)
Drills, not specified
Nail guns or stud drivers
Stretch cords or straps
Miscellaneous power tools
Saws, not specified
Hand saws
Portable circular power saws
Bench or table saws
Band saws
Other power saws
Power saws, not specified
Jigsaws

Power Tools and Workshop Equipment
(800-819, 821-893)

ER-Treated Injuries 2001[1]	418,610	Percent of Households	n/a
Medically-Treated Injuries 2001	960,880	Number of Products in Use	N/A
Percent of ER-Treated Hospitalized	3.3%	Estimated Useful Life	N/A
Deaths 2000	183	Estimated Retail Price Range	N/A
Number of Incident Reports 2002	580	Death Costs (Millions)	$915
Cost of Medically-Treated Injuries (Millions)	$15,421.3	Total Known Costs (Millions)[2]	$16,336.3

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

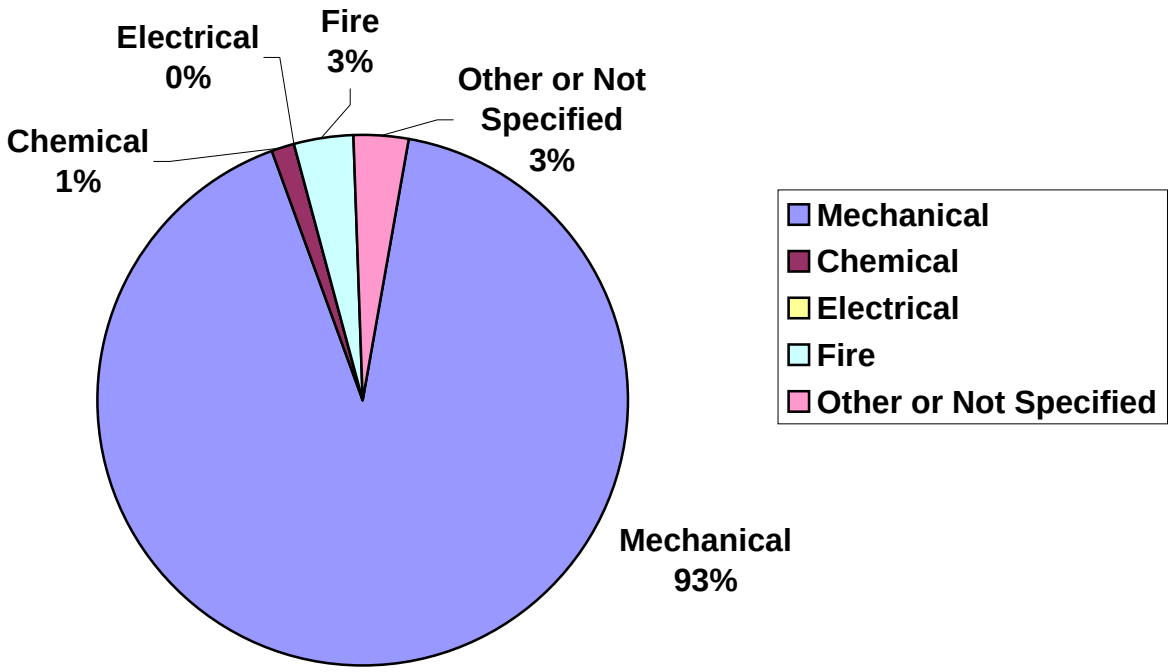
Figure 1. Estimated Number of Emergency Room-Treated Injuries Associated with Power Tools and Workshop Equipment, by Year, 1997-2002



[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, this 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 show 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 Power Tools and Workshop Equipment, 1997-2002



Deaths

For 2000, CPSC has reports of 183 deaths associated with these products. Eighty-one of these deaths were associated with Miscellaneous workshop tools, 39 were associated with Hoists, lifts, jacks, or jack stands, and 22 were associated with Welding, soldering or cutting torches. The remaining 41 deaths were associated with the remaining product categories.

Overview Summary

The change in injury frequency over the 6-year period, 1997 – 2002, was a marginally statistically significant ($.05 < p=.092 < .10$) increase of just over 40,000 emergency room-treated injuries.

Table 1 provides a summary of all the 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 number of products of each type in use, the estimated useful product life for each category, 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 Power Tools and Workshop Equipment may not be addressable. To know the 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 type of overview report. What we have done is to 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 Manual Workshop Tools is the top ranked category with regard to total injury costs. Almost 30% of the injuries involved a hammer. For the most part, consumers struck their hands or thumbs with the hammer during use. An additional 39% of the injuries involved knives with retractable blades and 94% of those injuries were lacerations. With both of these products, the most common injuries are inherent to the nature of the product. There is very little CPSC can do to reduce these injuries so they are considered to be incidental injuries.

The staff reviewed the narratives included in National Electronic Injury Surveillance System (NEISS) injury reports, and reviewed the individual death reports.[3] Because the

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

NEISS narratives are very short and often do not provide much detail, cases were 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 power saw was that it resulted from blade contact, this was not enough information to conclude that the case was "not addressable." Such cases 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 Power Tools and Workshop Equipment, we find that the total maximum addressable injury and death cost is $5.7 billion dollars, out of a total cost associated with these products of $16.3 billion dollars, about 35% 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	All Medically-Treated Injuries 2001	% Hospitalized 2001	Incident reports 2002	Deaths 2000	% of Households	# of Products in Use (millions)	Estimated Useful Product Life (Years)	Death Costs* 2000 (millions)	Med. Trtd. Injury Costs* 2001 (millions)	Total Known Costs (millions)
Power drills	855, 856, 871	5,789	12,981	4.0%	48	6	91%	95.1	11	$30	$188	$218
Welding, soldering, cutting torches	812, 831, 867, 859, 866, 868, 874	18,726	37,189	1.7%	68	22	N/A	N/A	N/A	$110	$781	$891
Manual workshop tools	827, 828, 829, 834, 836, 857, 862, 870, 878, 879, 881	147,729	333,884	1.4%	23	1	n/a	n/a	n/a	$5	$3,808	$3,813
Grinder, buffer, polisher	865, 873, 876	17,025	45,471	0.8%	13	5	18%	19	9	$25	$333	$358
Batteries, battery chargers	883, 884	9,908	23,852	4.7%	185	4	n/a	n/a	n/a	$20	$464	$484
Painting equipment, sprayers	887, 888	3,936	11,115	1.8%	26	2	0.5%	.5	10	$10	$157	$167
Miscellaneous workshop	815, 833, 835, 837, 852, 854, 869, 877, 880, 885, 893	60,739	149,999	3.5%	61	81	n/a	n/a	n/a	$405	$2,844	$3,249
Power sanders	803	1,032	2,393	1.6%	6	0	36%	37.4	9	$0	$34	$34
Other portable or stationary power tools	809	2,781	7,067	7.9%	19	2	n/a	n/a	n/a	$10	$160	$170
Hoists, lifts, jacks or jack stands	814	16,145	43,179	8.4%	35	39	N/A	N/A	N/A	$195	$988	$1,183
Automotive tools or accessories	821	661	1,744	-	13	1	N/A	N/A	N/A	$5	$47	$52
Air compressors (separate)	823	2,380	6,529	0.8%	12	2	N/A	N/A	10	$10	$104	$114
Drills, not specified	847	14,282	33,168	-	4	0	n/a	n/a	n/a	$0	$336	$336
Nail guns or stud drivers	882	14,626	32,055	5.9%	6	0	N/A	N/A	N/A	$0	$338	$338
Stretch cords or straps	886	4,851	11,415	0.4%	6	2	N/A	N/A	N/A	$10	$108	$118
Misc. power tools	804, 805, 807, 808	4,122	8,978	3.1%	5	2	15%	15.3	11	$10	$239	$249

N/A – Not available n/a - Not applicable, 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 1 – Product Summary Table – Injury, Death, and Cost Estimates (Continued)

Product	Codes	ER Injuries	All Medically-Treated Injuries	% hospitalized 2001	Incident reports 2002	Deaths 2000	% of Households	# of Products in Use (millons)	Estimated Useful Product Life (years)	Death Costs* 2000 (millions)	Med. Trtd. Injury Costs* 2001 (millions)	Total Known Costs (millions)
Saws, NS	845	24,555	55,652	2.5%	3	5	n/a	n/a	n/a	$25	$941	$966
Hand saws	830	5,215	10,923	-	1	1	N/A	N/A	N/A	$5	$109	$114
Portable circular power saws	832	10,584	22,430	10.5%	10	2	48%	50	12	$10	$618	$628
Bench or table saws	841	31,884	64,651	9.9%	7	0	N/A	N/A	15	$0	$1,967	$1,967
Band saws	842	3,601	7,368	0.9%	0	0	N/A	N/A	15	$0	$148	$148
Other power saws	843, 844, 863, 864	6,987	14,930	5.1%	25	3	n/a	n/a	n/a	$15	$361	$376
Power saws, NS	872	9,988	21,548	3.7%	4	3	n/a	n/a	n/a	$15	$329	$344
Jigsaws	875	1,060	2,400	-	0	0	55%	57.8	12	$0	$21	$21

N/A – Not available n/a - Not applicable, there is no actual product to estimate number in use or product life.
NS- not specified.

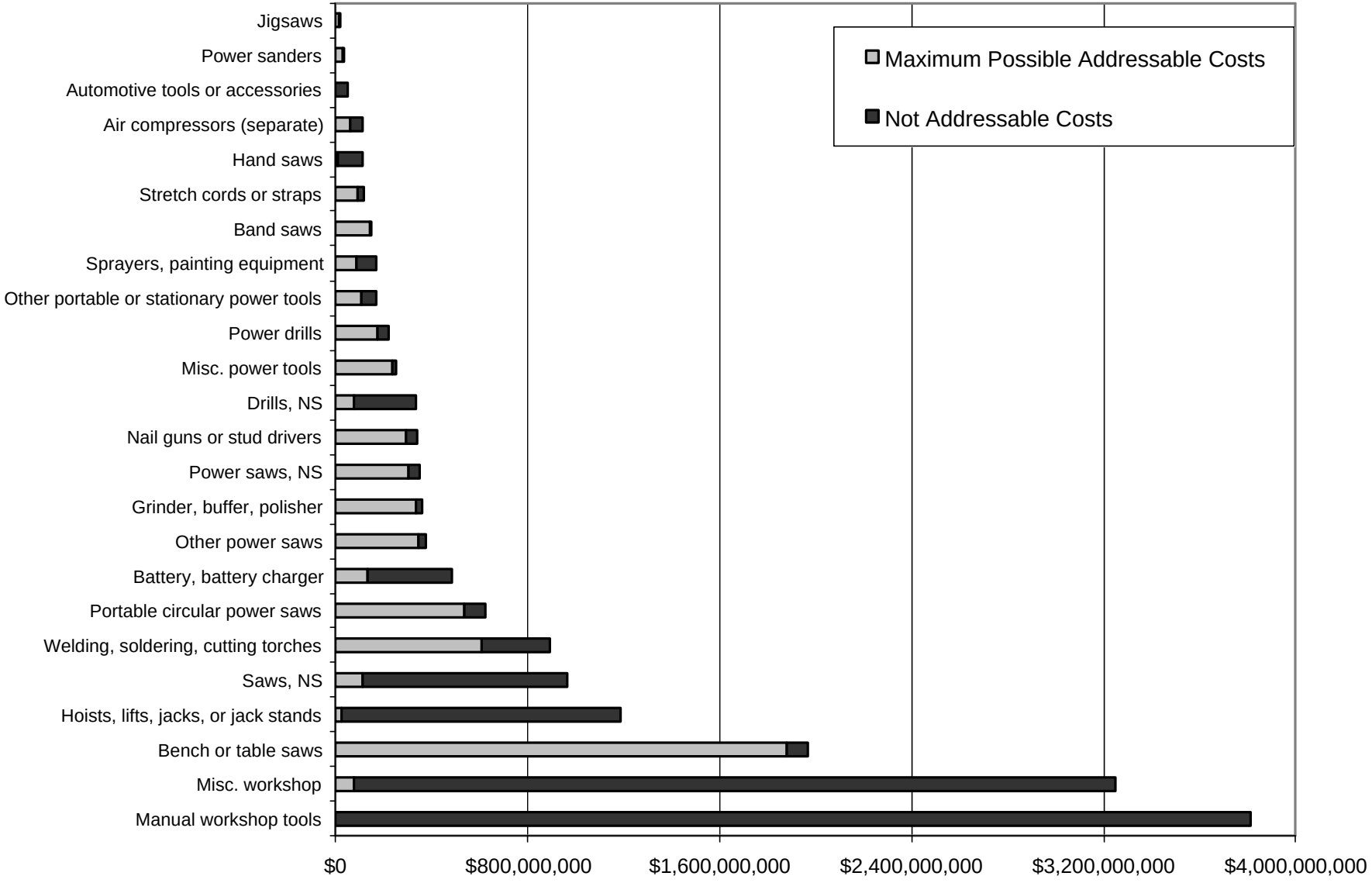
Table 3 lists all of the product groups ranked in descending order by the Total Injury and Death Costs Index. This table also shows the total maximum addressable cost for each product group and, for those product groups where there was an estimate of number of products in use, the maximum addressable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

Three of the top four product groups in terms of overall cost, Manual workshop tools, Miscellaneous workshop tools, and Hoists, lifts, jacks, and jack stands, accounted for half of the total costs ($8 billion) for the whole category Power Tools and Workshop Equipment, but only $101 million in maximum addressable costs. These and several other products or product groups were identified as associated with mostly incidental injuries. While there may still be some hazards involving these products that are worth addressing, these hazards do not represent a large share of the social costs associated with the products.

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

- Powered drills may need further evaluation. This product was associated with a high percentage of maximum addressable injuries (79% of injuries and 5 of 6 deaths). Also, there are several drill rechargeable battery-related reported incidents that are included under the Batteries, battery chargers discussion on page 13.
- Welding, soldering, and cutting torch-related injuries are most often to the eyes, most likely due to the users not wearing the appropriate eye protection. This hazard may be difficult to address. The 14 deaths that were included in maximum addressable involved electrocution, clothing ignition, other fires, and carbon monoxide poisoning.
- Grinder, buffer, or polisher-related injuries are most often due to foreign bodies in the eyes. In most cases, it is unknown if the consumer was wearing safety glasses. This may merit further study.
- Battery, battery charger hazards may merit further study because of improved rechargeable battery technology and the wider use of rechargeable batteries. There were many reported incidents that involved rechargeable battery hazards.
- Power washer-related injuries are on the rise possibly because of the increased popularity of the product. The product group, Painting equipment and sprayers, which includes power washers should be monitored to determine if additional study is needed.
- The Nail guns or stud drivers category includes pneumatic nail guns, which have been addressed by a new voluntary standard which became effective on May 1, 2003. This product group should be monitored for standard effectiveness.
- Stretch cords or straps have a low hospitalization percentage but are of concern since most of the injuries are to the head region. This category may need to be studied to determine what portion of the 86% of the injuries included in maximum addressable might, in fact, be preventable.
- Injuries involving blade contact (which were included among maximum addressable) account for approximately 83% of power saw-related injuries and a major part of the societal costs. Half of these injuries involved bench or table saws and a large portion involved portable circular power saws. More detailed study of this category of products is needed.

Figure 3. Estimated Cost Index in Millions of Dollars, Power Tools and Workshop Equipment, by Total Costs



* This estimate of maximum addressability 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 costs”.

Table 2 – Product Hazard Addressability

Product	**Codes**	**Percentage of injuries included in Maximum Addressable**	**Maximum Number of Addressable Deaths/ Total Deaths Reported**
Power drills	855, 856, 871	79%	5 of 6
Welding, soldering, cutting torches	812, 831, 859, 866, 867, 868, 874	68%	14 of 22
Manual workshop tools	827, 828, 829, 834, 836, 857, 862, 870, 878, 879, 881	0	0 of 1
Grinder, buffer, polisher	865, 873, 876	94%	4 of 5
Battery, battery chargers	883, 884	26%	2 of 4
Painting equipment, sprayers	887, 888	55%	0 of 2
Miscellaneous workshop	815, 833, 835, 837, 852, 854, 869, 877, 880, 885, 893	2%	4 of 81
Power sanders	803	91%	0
Other portable or stationary power tools	809	58%	0 of 2
Hoists, lifts, jacks or jack stands	814	2%	1 of 39
Automotive tools or accessories	821	0	0 of 1
Air compressors (separate)	823	46%	2 of 2
Drills, not specified	847	23%	0
Nail guns or stud drivers	882	87%	0
Stretch cords or straps	886	86%	0 of 2
Misc. power tools	804, 805, 807, 808	96%	1 of 2
Saws, NS	845	10%	3 of 5
Hand saws	830	3%	1 of 1
Portable circular power saws	832	85%	2 of 2
Bench or table saws	841	96%	0
Band saws	842	97%	0
Other power saws	843, 844, 863, 864	91%	3 of 3
Power saws, NS	872	87%	3 of 3
Jigsaws	875	76%	0
Total	-	30.8%	45 of 183

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

Title	Medically Attended Injury Costs	Total Death Costs	**Total Injury and Death Costs**	**Total Maximum Addressable Costs**	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
Manual workshop tools	$3,807,571,480	$5,000,000	**$3,812,571,480**	**$0**	1	23	n/a	n/a	n/a
Miscellaneous workshop	$2,844,243,991	$405,000,000	**$3,249,243,991**	**$76,884,880**	2	17	n/a	n/a	n/a
Bench or table saws	$1,966,863,116	$0	**$1,966,863,116**	**$1,880,321,139**	3	1			
Hoists, lifts, jacks or jack stands	$988,383,745	$195,000,000	**$1,183,383,745**	**$24,767,675**	4	20			
Saws, NS	$941,159,833	$25,000,000	**$966,159,833**	**$111,939,463**	5	12	n/a	n/a	n/a
Welding, soldering, cutting	$780,934,297	$110,000,000	**$890,934,297**	**$608,063,731**	6	2			
Portable circular power saws	$617,717,382	$10,000,000	**$627,717,382**	**$537,530,644**	7	3	50	$10.75	2
Battery, battery charger	$463,958,120	$20,000,000	**$483,958,120**	**$130,629,111**	8	11	n/a	n/a	n/a
Other power saws	$360,603,063	$15,000,000	**$375,603,063**	**$341,706,375**	9	4	n/a	n/a	n/a
Grinder, buffer, polisher	$332,709,271	$25,000,000	**$357,709,271**	**$332,746,715**	10	5	19	$17.51	1
Power saws, NS	$329,136,591	$15,000,000	**$344,136,591**	**$301,348,834**	11	6	n/a	n/a	n/a
Nail guns or stud drivers	$338,005,689	$0	**$338,005,689**	**$293,388,938**	12	7			
Drills, NS	$335,609,644	$0	**$335,609,644**	**$77,861,437**	13	16	n/a	n/a	n/a
Misc. power tools	$239,071,992	$10,000,000	**$249,071,992**	**$234,509,112**	14	8			
Power drills	$187,938,582	$30,000,000	**$217,938,582**	**$172,719,725**	15	9	95.1	$1.82	3
Other portable or stationary power tools	$159,889,995	$10,000,000	**$169,889,995**	**$92,736,197**	16	14	n/a	n/a	n/a
Painting equipment, sprayers	$156,544,452	$10,000,000	**$166,544,452**	**$86,099,449**	17	15			
Band saws	$148,275,070	$0	**$148,275,070**	**$143,381,993**	18	10			
Stretch cords or straps	$107,732,999	$10,000,000	**$117,732,999**	**$92,650,379**	19	13			
Hand saws	$109,109,914	$5,000,000	**$114,109,914**	**$8,273,297**	20	22			
Air compressors (separate)	$103,771,146	$10,000,000	**$113,771,146**	**$57,734,727**	21	18			
Automotive tools or accessories	$46,955,850	$5,000,000	**$51,955,850**	**$0**	22	24			
Power sanders	$34,410,506	$0	**$34,410,506**	**$31,313,560**	23	19	37.4	$0.84	4
Jigsaw	$20,696,721	$0	**$20,696,721**	**$15,729,508**	24	21	57.8	$0.27	5
Total	$15,421,293,449	$915,000,000	**$16,336,293,449**	**$5,652,336,890**					

[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 2001. 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 Product Hazards

Batteries/Battery Chargers

Forty-three reported incidents involved a power tool battery or battery charger. The most common hazard involved the charger overheating and resulting in the charger/battery melting or starting a fire. Battery or battery charger hazards are the most common powered drill hazards (32 out of 48). There was one reported death from a fire, which was started by a battery charger on a workbench.

Historically, battery power has been most popular and feasible with drills and screwdrivers because they require less power output and are not used for long, continuous periods of time. These two are expected to continue to be the two largest categories of battery-powered tools. Other battery-powered tools include reciprocating saws, sanding and grinding tools, rotary hammers, impact drivers, impact wrenches, staplers, and nailers. Battery technology is improving to provide better power output, expanding the possibilities for battery-powered tools. Cordless power saws are expected to become more prevalent and popular.

In one source of market information[6], the improving level of battery technology is said to be creating more powerful and longer running saws. Cordless power tools are becoming more popular because of their ease of use and mobility. Sales of cordless electric tools are forecast to increase at a higher rate annually compared with corded (plug-in) electric tools. The newer technology batteries, with the possibility of increased fire potential, are opening the door to a wider range of battery operated products and thus increasing the use of the newer type of batteries. Because of this, we might expect to see an increase in the number of fire-related battery or battery charger incidents.

Power saws

This is more a class of product hazards than a generic hazard. A large number of injuries are associated with power saws[7], 64,100 in 2001. Roughly 83% of the power saw-related injuries involved blade contact and are included in the maximum addressable injuries. Half of the power saw injuries involved bench or table saws. However, the generic concern is related to portable power saws. One source of market share information[7], stated that sales of cordless power tools are forecast to increase at a higher rate than plug-in power tools. The source also states that with improved battery technology, cordless power saws will become more prevalent and popular. If there is such a shift towards cordless power saws, this could have an effect on either the frequency or the pattern of injuries associated with these products. However, we do not currently have any indication of what this effect might be or when it might be seen.

[6] The Freedonia Group. "Power and Hand Tools to 2005: Market Size, Market Share, and Demand Forecast." Study #1478, October 2001. <http://www.freedoniagroup.com> pages 52, 57-58, 64.

[7] Includes the product codes for: portable circular power saws, bench or table saws, band saws, jigsaws, other power saws (this group includes product codes for other power saws, radial arm saws, power hack saws, and saber saws), and power saws, not specified.

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.[8]

This analysis uses NEISS data for the period 1/1/1997 through 12/31/2002. Data collection for 2002 was not 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.

[8] 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 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.