



Survey of Injuries Involving Stationary Saws

Table and Bench Saws

2007–2008

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EXECUTIVE SUMMARY

In 2009, U.S. Consumer Product Safety Commission (CPSC) staff conducted a survey of stationary saw-related injuries that occurred between January 1, 2007, and December 31, 2008, and which were treated in one of the hospital emergency departments in the CPSC's National Electronic Injury Surveillance System (NEISS). This was a follow-up survey to a 2003 CPSC staff survey of saw-related injuries occurring in calendar year 2001, and reported through the NEISS. The purpose of the survey was to collect more specific and accurate information about the type of saw (i.e., product code) involved and also to collect more in-depth information about the hazard pattern and contributing factors to the injuries. This report presents the results from that survey for injuries related to table/bench saws.¹

- Based on the survey and the imputation of missing product data, the estimated total number of hospital emergency department-treated injuries related to table/bench saws in the United States during the calendar years 2007–2008 was 79,500.²
- The injuries related to table/bench saws account for 78.0 percent of the survey-based estimated total number of 101,900 injuries associated with all stationary saws (i.e., table/bench saws, band saws, radial arm saws, and miter saws).
- Of all injuries related to table/bench saws, the operator of the saw was the victim in 95.7 percent (76,100) of the cases. The estimated average age of the injured operators was 55.4 years, with the youngest at 11 years and the oldest at 95 years, and 97.2 percent of the operators were male.
- Injuries to operators were due to contacting the blade in 88.0 percent of the cases, and when blade contact caused the injury, the blade was contacted above the top of the cutting surface in 56.9 percent of the cases.
- Lacerations (64.8 percent) followed by fractures (12.2 percent) and amputations (10.5 percent) were the most common forms of injuries to operators. Fingers (89.1 percent) followed by hands (6.8 percent) were the body parts most frequently involved in the injuries.
- In 93.0 percent of the cases, the victim was examined/treated and released from the hospital, and in 6.6 percent of the cases, the victim was treated and either admitted to the same hospital or transferred to another hospital.
- A fixed cabinet saw was in use in the majority of the cases (68.7 percent), followed by a semiportable contractor saw (18.3 percent), and a portable bench saw (10.5 percent). The saw was owned by the operator's household in 86.7 percent of the cases. When the saw was owned, it was acquired new in 82.5 percent of the cases. In 76.7 percent of the cases, the

¹ Since the injuries to operators are of main interest, this report mostly deals with injuries to operators during operation of the saw.

² Not all of these incidents are addressable by an action the CPSC could take. It was not the purpose of this report to evaluate the addressability of the incidents, but rather to update estimates of injuries reported to CPSC staff and to analyze associated factors.

operator used the saw more than 10 times during the previous year. The operator had an owner's manual in 64.1 percent of the cases.

- At the time of the injury, the saw did not have a safety switch in 78.7 percent of the cases, and the saw blade was not protected by a blade guard in 65.7 percent of the cases. In most cases, the blade guard was removed (75.0 percent) for operational convenience. A riving knife was attached to the saw in 20.4 percent of the cases, and an anti-kickback pawl or spreader assembly was attached to the saw in 24.4 percent of the cases.
- At the time of the injury, the saw was used for cutting a wooden board in 91.2 percent of the cases. In most cases, the type of cutting operation performed was ripping along the length of the stock (85.7 percent) and primarily for vertically straight cuts (94.7 percent). A rip blade was in use in 70.0 percent of the cases of the injuries and, during the previous year, 67.4 percent of the operators used the saw mostly for ripping. A rip fence was in use at the time of the injury in 85.3 percent of the cases.
- The motor was running in 94.5 percent of the cases at the time of the injury. About 67.1 percent of the injuries happened when the operator was actually cutting or in the middle of a cut; and in 28.9 percent of the cases, injuries happened when the operator was at the end of a cutting operation. The operator was pushing the stock in 76.7 percent of the cases at the time of the injury, and a push stick was used in 35.6 percent of these cases.
- Overall, the stock kicked back or jumped in 40.5 percent of the cases. In 93.7 percent of the cases in which the stock kicked back or jumped, the operator thought that the blade contact was due to the stock kickback. When the stock kickback caused the injury, the operator's hand was pulled into the saw in 65.2 percent of the cases.

1. INTRODUCTION

In 2009, U.S. Consumer Product Safety Commission (CPSC) staff conducted a survey of stationary saw-related injuries that occurred between January 1, 2007, and December 31, 2008, and which were treated in one of the hospital emergency departments in the CPSC's National Electronic Injury Surveillance System (NEISS). This was a follow-up survey to a 2003 CPSC staff survey of saw-related injuries occurring in calendar year 2001, and reported through the NEISS. The purpose of the survey was to obtain more in-depth information about the nature and probable causes of the injuries, and also to verify the types of saws involved, particularly for the injuries in which the types of saws involved were not specified in the NEISS. Collecting more reliable and detailed information on the types of saws involved supports production of more accurate estimates of the number injuries related to the different types of saws.

This report presents the results of that survey. Because CPSC staff is currently evaluating the existing voluntary standard for table/bench saws to determine if performance requirements can be improved to reduce injuries, the report presents the results specifically for table/bench saws.

The remaining sections of the report are organized as follows:

- Section 2 provides some relevant background information about the extent of and trend in saw-related injuries, descriptions of table/bench saws, and types of cutting operations performed by using these saws.
- Section 3 presents the methodology used in designing and conducting the survey, response rates achieved, procedures used in data processing and analysis, and weighting procedures used to produce injury estimates.
- Section 4 is the main section of the report that presents the results obtained from the survey for table/bench saws.
 - Section 4.1 presents the distribution of unspecified saws to specific types of saws as obtained from the survey.
 - Section 4.2 presents estimates that characterize the injuries associated with table/bench saws and the age and disposition of the injured.
 - Section 4.3 presents the estimates of injuries to the operators of the saws. Since the injuries to operators are of main interest, the estimates are arranged in five groups: (1) characteristics of injuries and injured operators; (2) characteristics of saws and blades; (3) characteristics of cutting materials; (4) the operational factors at the time of the injury; and (5) selected characteristics of blade contact injuries.
- Section 5 presents a discussion of hazard patterns and associated risk factors as identified through the survey.
- Appendix A presents the details of estimation methodology used to produce the national estimates from the sample.
- Appendix B includes a sample of respondents' descriptive narratives of how the injuries happened.

2. BACKGROUND

2.1 Saw-Related Injuries and the Survey Objective

The estimates from the CPSC’s National Electronic Injury Surveillance System (NEISS) show that the number of emergency department-treated injuries associated with saws is high and not decreasing over the years. An annual average of 94,200 saw-related injuries was treated in U.S. hospital emergency departments during 2001–2008 (Table 1). Of these annual average injuries, 36,400 (38.6 percent) were associated with table/bench saws; 3,900 (4.1 percent) were associated with band and radial arm saws; 20,200 (21.4 percent) were associated with portable or handheld saws; and the type of saw was unspecified for the remaining 33,700 (35.8 percent) injuries.

A trend analysis of annual estimates for 2001–2008 indicates that the number of saw-related injuries was steady over the years. Although the estimated injuries for all saws decreased, and the estimates for table/bench saws increased, neither trend is significant³ (Figure 1). This confirms at least that the number of injuries associated with saws is not decreasing during this period, especially for injuries associated with table/bench saws.

Moreover, because the types of saws were unspecified for a large proportion of saw-related injuries reported in the NEISS, any estimate or analysis by type of saw from the NEISS is not very reliable. For example, the estimate of the number of injuries associated with stationary saws could have been larger than the current NEISS estimate if some of those unspecified saws were identified as stationary saws.

Table 1. NEISS Estimates of Emergency Department-Treated Injuries Associated with Saws, January 1, 2001 to December 31, 2008

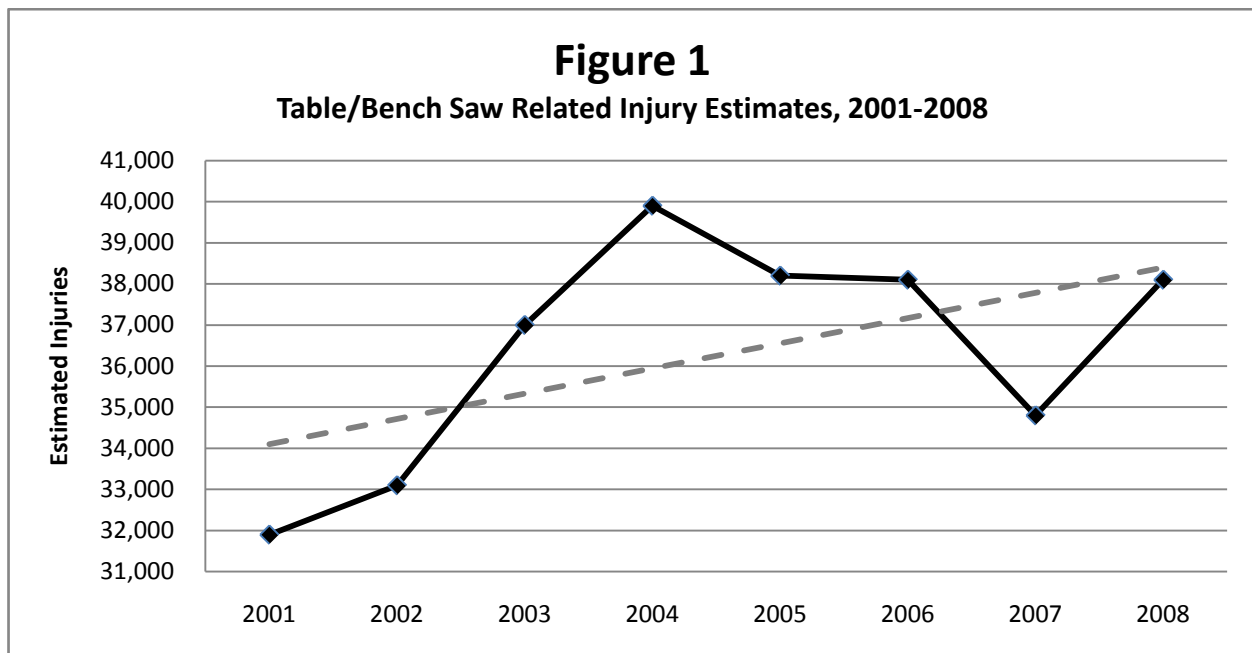
Year	Stationary Saws*		Handheld Saws**	Saws Not Specified***	Total for All Saw Types	
	Table/Bench Saws	Band Saw and Radial Arm Saw			Estimate	Coefficient of Variation (CV)
2001	31,900	4,100	17,600	40,300	93,900	0.05
2002	33,100	4,000	17,600	37,700	92,400	0.07
2003	37,000	4,300	18,900	35,100	95,200	0.08
2004	39,900	4,000	22,000	35,600	101,400	0.07
2005	38,200	3,300	20,200	33,800	95,400	0.07
2006	38,100	2,900	22,100	32,200	95,300	0.07
2007	34,800	4,300	20,300	28,300	87,700	0.07
2008	38,100	4,400	22,500	26,700	91,700	0.07
Total	291,000	31,300	161,200	269,500	753,100	0.06
Annual Average	36,400	3,900	20,100	33,700	94,100	-
Distribution by Type of Saw	38.7%	4.1%	21.4%	35.8%	100.0%	-

*Includes table/bench saw (0841), band saw (0842), and radial arm saw (0843). Since miter saw does not have a separate product code, it is categorized as ‘saws not specified’ in the NEISS. **Handheld saws include hand saw (0830), portable circular saw (0832), saber saw (0864), jigsaw (0875), hacksaw (0894), and power hack saws (0844). Product codes 0844 and 0894 were combined into 0894

³ p = 0.8480 for all saws and p = 0.1133 for stationary saws, where the requirement for significance is p < 0.05.

in 2003. ***Includes 'saws, not specified' (0845), 'power saws, other or not specified' (0895), other power saws (0863), and 'power saws, not specified' (0872). Product codes 0863 and 0872 were combined into 0863 in 2003.

This survey was conducted with two main objectives. The first objective was to identify the types of saws involved in incidents that were unspecified in the NEISS and also to verify the types of saws that were incorrectly specified in NEISS. That would allow distributing the incidents associated with unspecified saws to various types of saws to produce more accurate estimates of the number of injuries by types of saws. The second objective was to collect more detailed information about the nature and probable causes of the injuries related to stationary saws to have a better understanding of hazard patterns to support development of mitigation strategies. A similar survey was conducted in 2001 (Adler, 2003).



2.2 Product Description

A table saw is a popular power tool used primarily to cut wood. It consists of a circular saw blade mounted on an arbor, which is driven by an electric motor. The blade protrudes through the surface of a table, and the table provides support for the material being cut. The amount of the blade that protrudes above the table surface is adjustable and determines the depth of cut that will be made. The operator pushes the material to be cut into the saw blade.

There are three basic table saw categories that comprise the population of table saws used for both consumer and professional use: bench saws, contractor saws, and cabinet saws.⁴

Generally, the range of quality and accuracy of a table saw is commensurate with its size, motor horsepower, weight, and indirectly, price.

⁴ <http://www.woodcraft.com/articleprint.aspx?ArticleID=241>.

Bench saws are lightweight, inexpensive saws designed to be moved around easily and placed temporarily on a work bench or stand (see Figure 2). Prices for bench saws range from \$100 to \$500.⁵



Figure 2. Typical Bench Saw



Figure 3. Typical Contractor Saw

Contractor saws are characterized by a set of light duty legs and a bigger table and motor than a bench saw (Figure 3). Prices for a contractor saw can range from about \$150 to \$1,000, or more. These saws are generally quieter and more accurate than bench saws, and able to cut materials up to two inches thick. Contractor saws are commonly used by the home woodworker because the saws are capable of high quality work and are commonly found at mass merchandisers.

Cabinet saws are heavier than contractor saws because the higher powered motor is enclosed in a solid base (see Figure 4). Prices for cabinet saws range from \$1,200 to \$3,000. These saws are designed for heavy use, and the greater weight minimizes vibration so that cuts are smooth and more accurate. These saws are typically the highest grade saw found in the home woodworking shop.

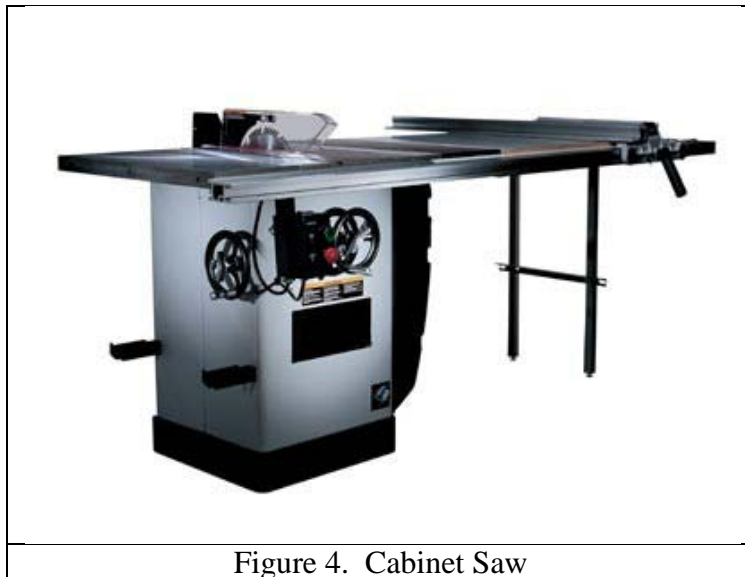


Figure 4. Cabinet Saw

⁵ <http://www.nextag.com/10-inch-bench-top-table-saw/products-html>.

2.3 Types of Cutting Operations

Descriptions of the cutting operations that are usually performed using a table/bench saw are discussed below and shown in Figure 5.

Ripping: A rip cut is performed by passing the stock between the blade and the rip fence. Often, the procedure is described as a cut made parallel to or with the grain of the stock. The basic rip cut is performed by placing the stock on the table in front of the blade snugly against the fence, and moving the stock past the saw blade.

Crosscutting: A simple crosscut, or cutting against the grain of the stock, is made by placing the edge of the stock against a miter gauge and moving both the gauge and stock past the saw blade. The operator should be almost directly behind the miter gauge so he/she will be out of line with the saw blade (as a safety precaution).

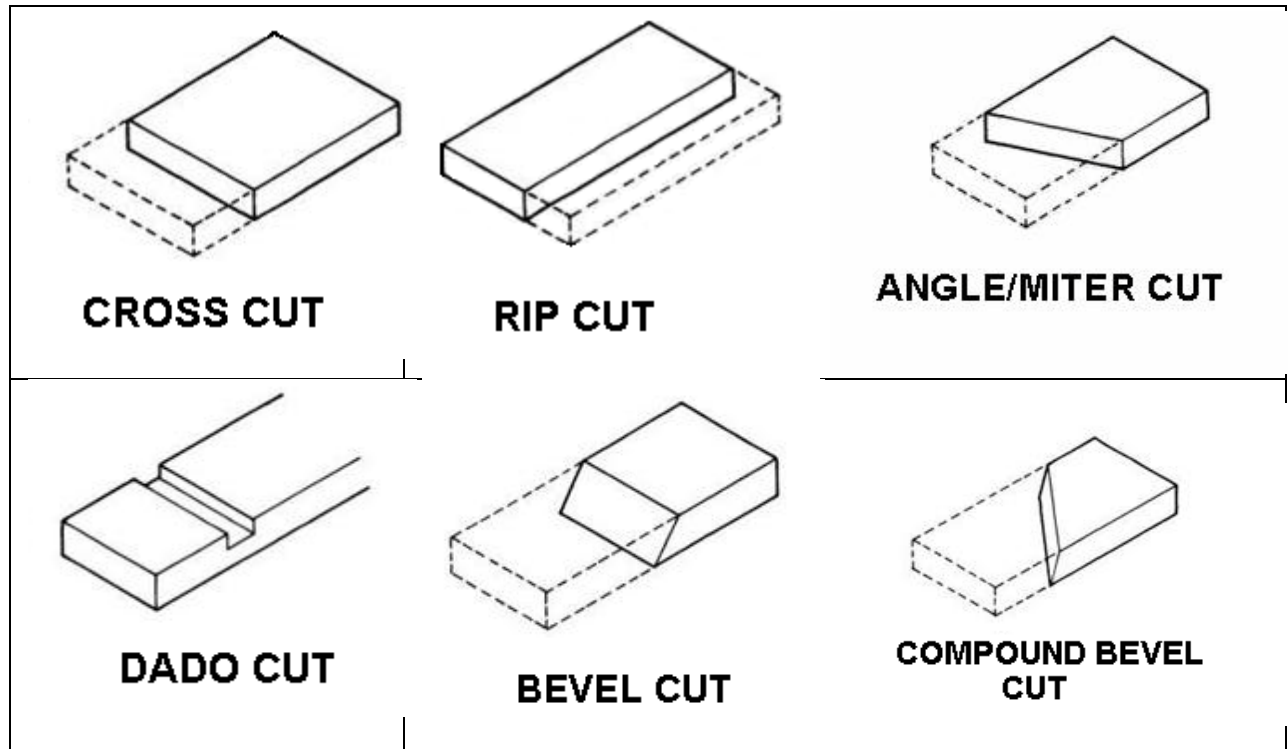
Mitering: An angled crosscut that needs a miter gauge to facilitate the accuracy of the cut (e.g., cutting the stock for a picture frame). For this type of cut, the miter gauge is usually set at a 45-degree angle for cutting two matching segments of stock. When two such cuts are matched, the joint is called a miter. The actual cutting may be simple, but a high degree of accuracy is required for a good match.

Beveling: Most bevels are rip cuts using the rip fence as a guide, while the blade (or table) is tilted to the angle required. Sometimes, the miter gauge is used when a cut is performed on a narrow stock because there is a tendency for the stock to move away from the fence.

Dadoing: A dado cut is done by setting a regular saw blade to a cutting depth less than the stock thickness and making repeated cuts, or using a special blade to widen the normal kerf⁶ to get a U-shaped cut that creates a dado when done across the grain, or a groove when done with the grain.

⁶ The space or channel created in the stock by the blade during cutting.

Figure 5: Types of Cutting Operations



3. METHODOLOGY

3.1 Sample Frame: National Electronic Injury Surveillance System (NEISS)

The saw-related injuries reported to U.S. hospitals with emergency departments served as the frame from which the sample was selected for the survey. The NEISS is an electronic system that collects consumer product-related injury data from a nationally representative sample of hospital emergency departments in the United States. The NEISS sample is comprised of a probability sample of 96 hospitals stratified into five strata—small, medium, large, very large, and children’s hospitals (where the first four strata were stratified by hospital size). All consumer product-related injuries treated in the sample hospitals are reported to the NEISS. See EPDS (2000) and Marker and Lo (1996) for details about the NEISS and its design.

3.2 Sample Selection

All injuries related to stationary and other unspecified saws that occurred between January 1, 2007 and December 31, 2008, reported to the NEISS were selected for the survey. The product codes used for stationary and unspecified saws in the NEISS are: 0841 (table or bench saws), 0842 (band saws), 0843 (radial arm saws), 0845 (saws, not specified), and 0895 (power saws, other, or not specified). The injuries associated with these product codes were assigned for the investigation.

3.3 Survey Questionnaire

The survey questionnaire was developed by covering a range of questions to characterize injuries, hazard patterns, and human factors associated with saw-related injuries. The questionnaire included questions on the following broad areas:

- verification or specification of saw type;
- nature of injuries;
- demography and disposition of victims;
- saw ownership, assembly, owner’s manual, and safety precautions;
- characteristics of saws involved in accidents;
- characteristics of saw blades;
- operational factors related to stage and nature of cutting at the time of injury;
- operational factors related to feeding /supporting the stock; and
- operational factors related to stock kickback and blade contact.

The survey questionnaire was formatted using the Computer Assisted Telephone Interviewing (CATI) software that was used for data collection. The software, which has a built-in facility for managing sequence or skip patterns of the survey questions, was used to format the questions with structured precoded responses. This means that the software controls which subsequent questions are asked a particular respondent depending on their responses to previous questions. For example, if in an earlier question the respondent indicated that the incident happened while using a band saw, then the software only allows asking that respondent questions related to band saws. The CATI system also has some built-in edit features. Thus, the software checks for any inconsistency in responses between related questions, and signals the interviewer to verify the entry at the time of the interview.

3.4 Data Collection

The contact details of the injured persons were obtained from the NEISS hospital that reported the injury. The cases with available telephone numbers were assigned for CATI; the cases that could not be contacted by telephone, or did not have a telephone number, were assigned for a mail survey; and the cases for which no contact details could be obtained from the hospitals remained out of coverage of the survey. However, the contact telephone numbers were available for the majority of the cases, and most of the interviews were conducted by telephone using the CATI system. In more than 95 percent of the cases, the interview was conducted directly with the victim; and in the remaining 5 percent of the cases, the interview was conducted with either the victim's father/mother, or someone who witnessed the incident.

3.5 Response Rate

Of the total 2,991 assigned cases of injuries associated with stationary and unspecified saws, 1,397 cases (46.7 percent) were successfully interviewed. The remaining 1,594 (53.3 percent) cases could not be interviewed (i.e., nonresponse) for various reasons, such as failure to reach (12.5 percent); refusal (11.7 percent); nonresponse to mailed questionnaires (9.7 percent); no identification available/released from the hospital (18.5 percent); or purged⁷ (0.9 percent), as shown in Table 3.1. The number of cases assigned, number responded, and the response rates by type of stationary and unspecified saws are presented in Table 3.2.

Table 3.1 Distribution by Response Status of the Cases Assigned for the Survey of Injuries Associated with Stationary Saws

Response Status	Specific Status	Number Assigned	Percent
Respondent	Total	1,397	46.7
Nonrespondent	Total	1,594	53.3
	Failure to reach	374	12.5
	Refusal	350	11.7
	Mailed	289	9.7
	No ID	553	18.5
	Purged	28	0.9
Total	Total	2,991	100.0

⁷ Purge—the assignment was made in error due to either a duplicate assignment or the analyst's decision to cancel the assignment.

Table 3.2 Response Rate by NEISS Product Code (Type of Stationary Saw)

NEISS Product Code	Type of Saw (Based on NEISS)	Number Assigned	Number Responded	Response Rate (%)
841	Table/Bench Saws	1,602	815	50.9
842	Band Saws	141	71	50.4
843	Radial Arm Saws	28	20	71.4
845	Saw, not specified	646	229	35.4
895	Power Saw, other or not specified	574	262	45.6
Total	Total	2,991	1,397	46.7

3.6 Data Cleaning and Editing

Since the CATI system has the capability for built-in skip patterns and some built-in data edit facility, the survey data was fairly clean at the onset. Moreover, an edit program was applied on the data file produced by the CATI system to check the consistency of data items that are logically interrelated. For example, because a table saw cannot be handheld, the values for these two data items must be consistent, and the edit program ensured that. The edit program also checked the proper implementation of the skip pattern. A few cases failed and were corrected using the responses to related questions by the edit program or by manually checking the completed interview questionnaire.

3.7 Computing National Estimates

To produce national estimates from the sample, the NEISS weights of the responding sampled cases were first adjusted to account for the nonresponding cases. This was done by distributing the weights of the nonresponding cases to those of the responding cases. Then the adjusted weights were benchmarked to the NEISS estimates at some broader levels to ensure that the national estimates produced from the saw survey were consistent with the NEISS estimates. These benchmarked weights were used to produce the national estimates from the saw survey.

One or more variables were missing for a small number of cases, which were otherwise considered complete responses. The missing values of these variables were imputed by using a hot deck imputation scheme.

Specific details of estimation, variance estimation, and imputation procedures used for the survey are presented in Appendix A.

4. RESULTS - ESTIMATES

4.1 Distribution of Unspecified Saws

An important objective of this survey was to verify the type of saw reported in a NEISS incident and to identify the saw type if it was unspecified. Table 4.1 presents the distribution of unspecified saws and table/bench saws as coded in the NEISS to various saw types as identified in the follow-up survey. Among the unspecified saws, 23.6 percent were identified as miter saws; 16.4 percent as table/bench saws; 19.5 percent as various handheld saws; 19.0 percent as other, nonstandard types of saws or remained not specified; 19.4 percent were identified as not a saw or not a powered saw; and 2.1 percent were either band or radial arm saws. Among the table/bench saws, 95.9 percent were verified as table/bench saws, and the remaining 4.1 percent were recategorized as other types of saws or not a saw.

Table 4.1 Distribution of Injuries Associated with Saws Coded as ‘Not specified’ or ‘Table/Bench Saw’ in NEISS Based on the Follow-up Survey

Reported in NEISS	Identified in Saw Injury Survey	Sample Count	Weighted Population Count	Percentage Distribution (%)
Power Saw, other or not specified (0895), Saw, not specified (0845)	Table or Bench Saw	73	9,030	16.4
	Band Saw	10	**	1.8
	Radial Arm Saw	3	**	0.3
	Miter Saw	122	12,980	23.6
	Handheld Saw*	95	10,700	19.5
	Saw, other or not specified	92	10,440	19.0
	Not a saw or not a powered saw	96	10,680	19.4
	Total	491	54,980	100.0
Table or Bench Saw (0841)	Table or Bench Saw	782	69,950	95.9
	Band Saw	1	**	0.2
	Radial Arm Saw	1	**	0.1
	Miter Saw	5	**	0.8
	Handheld Saw*	19	1,740	2.4
	Saw, other or not specified	3	**	0.3
	Not a saw or not a powered saw	4	**	0.3
	Total	815	72,960	100.0

*Handheld saw includes hand saw (0830), portable circular saw (0832), saber saw (0864), jigsaw (0875), hacksaw (0894), and chain saw (1411).

**Estimate does not meet reporting requirements.

Table 4.2 presents the estimated number of injuries in 2007–2008 associated with different types of stationary saws after recategorizing the injuries based on the updated information from the survey. The total number of injuries associated with table/bench saws as estimated from the follow-up survey is 79,500, which is 9.1 percent higher than the 72,900 estimated injuries associated with the NEISS product code (0841) for table or bench saws. Table 4.2 also shows that 78.0 percent of all injuries associated with stationary saws are related to table/bench saws.

4.3 Injuries to Operators

As mentioned before, of the total table/bench saw-related injuries, about 95.7 percent were to the operators, and the remaining 4.3 percent were to helpers, to bystanders, or while the saw was being transported, maintained, or repaired. Because the injuries in which the operator was the victim are of greater interest, the rest of this report analyzes only the injuries to operators at the time of operation, and it excludes the 4.3 percent of injuries to others, or the incidents when the saw was not in use. The estimates presented are intended to trace the nature of injuries, operating practices, hazard patterns, and contributing factors. The estimates are presented in five main sections as follows:

- Characteristics of injured operators and injuries;
- Characteristics of saws and blades;
- Characteristics of cutting materials;
- Operational factors at the time of the injury; and
- Characteristics of blade contact injuries.

4.3.1 Characteristics of Injured Operators and Injuries

Table 4.4 and Table 4.5 present various characteristics of injured operators and the nature of their injuries.

The total numbers of injuries to operators in calendar years 2007 and 2008 were 37,100 and 39,000, respectively. The majority of the injuries to operators were due to blade contacts (88.0 percent). Most of the injuries were to fingers and hands, which account for 95.9 percent of the injuries. Fingers were the most frequently injured body parts (89.1 percent), followed by hands (6.8 percent). The remaining 4.1 percent of injuries were to eyeballs, lower arms, lower trunks, wrists, heads, faces, and other body parts. Laceration was the most frequent form of injury (64.8 percent), followed by fracture (12.2 percent), and amputation (10.5 percent). The injuries to fingers were lacerations, amputations, fractures, avulsions, crushing, or contusions/abrasions. However, the injuries to lower arms, wrists, or hands were lacerations only. The injuries to lower trunks, upper legs, or lower legs were lacerations or contusions/abrasions. Finally, the injuries to heads or faces were internal injuries or contusions/abrasions; and injuries to eyeballs were due to foreign objects. About 6.6 percent of operators were treated and kept overnight for observation, treated and transferred to another hospital, or hospitalized. (Table 4.4)

The average age of the operators was 55.4 years, with the youngest at 11 years, and the oldest at 95 years of age. About 52,600 operators (69.1 percent) were between 15 and 64 years old, and 23,100 operators (30.4 percent) were 65 years old or older. Most of the operators were males (97.2 percent). About 2.6 percent of operators were ill or were on or under the influence of medication, drugs, or alcohol at the time of the incident. About 38.0 percent of operators were wearing eyeglasses only; 41.5 percent were wearing safety goggles only; 13.1 percent had no protective gear; and the rest had gloves only, gloves with eyeglasses or goggles, or both eyeglasses and goggles. (Table 4.5)

Table 4.4 Nature of Injuries and Disposition, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Year of injury				
2007	399	37,100	0.10	48.8
2008	422	39,000	0.11	51.2
Did blade contact cause injury?				
Yes	724	66,900	0.09	88.0
No or don't know	97	9,200	0.16	12.1
Body part injured				
Finger	733	67,800	0.10	89.1
Hand	51	5,200	0.21	6.8
Eyeball, Face, Head, Wrist, Lower Arm	25	2,200	0.23	2.9
Other	12	**	**	1.2
Diagnosis				
Laceration	525	49,300	0.10	64.8
Fracture	105	9,300	0.22	12.2
Amputation	96	8,000	0.14	10.5
Avulsion	58	6,100	0.17	8.0
Contusion, Abrasion	17	1,600	0.26	2.1
Other	20	1,800	0.31	2.4
Disposition				
Treated/examined and released	753	70,800	0.10	93.0
Treated and transferred to another hospital	16	2,100	0.28	2.8
Treated and admitted to hospital	47	2,900	0.25	3.8
Held for observation, left without being seen/left against medical advice	5	**	**	0.4

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

**Table 4.5 Characteristics of Operators, Survey of Saw Injuries - Table/Bench Saws, 2007–2008
(Injuries to Operators)**

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Age group of victim				
0–14	4	**	**	0.5
15–64	548	52,600	0.10	69.1
65 or older	269	23,100	0.11	30.4
Sex of victim				
Male	800	74,000	0.09	97.2
Female	21	2,100	0.27	2.8
Race of victim				
White	544	49,800	0.12	65.4
Black	22	1,500	0.35	2.0
Other	32	2,300	0.37	3.0
Not specified	223	22,500	0.23	29.6
Was the operator ill or under any medication, drugs, or alcohol?				
Yes	25	2,000	0.23	2.6
No	796	74,100	0.10	97.4
Was the operator left- or right-handed?				
Left-handed	61	5,400	0.17	7.1
Right-handed	709	66,500	0.10	87.4
Both hands interchangeably (ambidextrous) or don't know	51	4,200	0.17	5.5
Operator's protective gear				
Eyeglasses	313	28,900	0.09	38.0
Safety goggles	344	31,600	0.10	41.5
Eyeglasses and safety goggles, Eyeglasses and gloves, Eyeglasses and some other special clothing	31	3,200	0.19	4.2
Gloves, Safety goggles and gloves, Safety goggles and some other special clothing, Other	29	2,400	0.23	3.2
Nothing	104	10,000	0.18	13.1

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

4.3.2 Characteristics of Saws and Blades

Tables 4.6 to 4.8 present estimates for various characteristics of saws and blades used at the time of the incident.

The saw was owned by the operator's household in 86.7 percent of the cases; and the saw was already assembled at the time of purchase in 80.8 percent of the cases. Among the saws that were not borrowed or rented, the operator's household got the saw new in 82.5 percent of the cases. The operator had an owner's manual for the saw in 64.1 percent of the cases; and 22.3 percent of those who had an owner's manual remembered a warning or safety precaution printed in the manual about the operation of the saw. About 9.7 percent of all operators reported seeing a label on the saw with a warning or safety precaution. About 76.7 percent of the operators used the saw more than 10 times during the prior year; and 8.0 percent used the saw 1–5 times. The majority of the operators (53.0 percent) used a saw less than one hour per use; and 44.5 percent used a saw one hour or more per use. About 24.6 percent of the operators used different blades for different types of cutting operations. The most frequent types of cutting operations performed using the saw during the previous year were ripping (67.4 percent), followed by a combination of uses (24.1 percent). (Table 4.6)

Of the total number of injuries to operators, the operator was using a fixed cabinet saw in 68.7 percent of the cases, followed by a semiportable contractor saw in 18.3 percent of the cases, and a portable bench saw in 10.5 percent of the cases. In 20.4 percent of the cases, a riving knife⁸ was attached to the saw; and in 24.6 percent of the cases, an anti-kickback pawl⁹ or spreader¹⁰ assembly was attached to the saw at the time of the injury. Among the cases with an anti-kickback or spreader assembly attached, in 86.6 percent cases the assembly was resting on the stock. The saw was modified only in a very small number of cases (1.7 percent), and the modification was done by the operator in most of the cases. (Table 4.7)

At the time of the injury, the most frequent type of blade used was a rip blade (70.0 percent), followed by a combination blade (16.8 percent). The saw blade was directly mounted on the motor in 59.2 percent of the cases and was indirectly powered by the motor in 33.0 percent of the cases. The blade was sharp in 95.3 percent of the cases, and dull in 2.5 percent of the cases. There was no safety switch for the saw in 78.7 percent of the cases; and of those that had a safety switch, the switch was removable in 46.3 percent of the cases, while the switch was stationary in 50.0 percent of the cases. A blade guard was attached to the saw prior to or at the time of the injury in 31.5 percent of the cases. When a blade guard was attached, 99.6 percent were in good condition, and the guard functioned properly in 93.0 percent of the cases. The most frequent reason for not having a blade guard at the time of the incident was "the guard was removed" (75.0 percent), followed by "the saw never had a blade guard" (19.2 percent). Among all operators, 13.5 percent thought the blade guard could have prevented the injury, while 52.6 percent did not have any opinion about whether the blade guard could have prevented the injury. (Table 4.8)

⁸ A safety device aligned directly behind the saw blade that ensures split of the stock along the kerf (the space or channel created in the stock by the blade during cutting) to prevent stock kickback.

⁹ A safety device designed to prevent stock kickback.

¹⁰ A safety device that ensures split of the stock to keep the stock from pinching or contacting the rear teeth of the blade.

Table 4.6 Saw Ownership, Assembly and Use, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Saw ownership				
Operator's household	717	66,000	0.10	86.7
Borrowed	68	6,400	0.17	8.4
Other	36	3,700	0.22	4.9
Rented	0	**	**	0.0
If not borrowed or rented, did the owner get the saw new or used?				
New	623	57,500	0.10	82.5
Used	110	9,700	0.13	13.9
Don't know	20	2,500	0.27	3.6
Subtotal (not borrowed or rented)	753	69,700	0.10	100.0
Saw assembly				
Before purchase	667	61,500	0.10	80.8
After purchase	81	7,300	0.15	9.6
Don't know	73	7,300	0.17	9.6
Have owner's manual?				
Yes	531	48,800	0.10	64.1
No	210	19,200	0.12	25.2
Don't know	80	8,100	0.16	10.7
If you have a manual, do you remember any warning or safety precaution in the manual?				
Yes	113	10,900	0.14	22.3
No or don't know	418	37,900	0.11	77.7
Subtotal (with owner's manual)	531	48,800	0.10	100.0
Any warning or safety precaution on a label on the saw?				
Yes	87	7,400	0.15	9.7
No	689	65,100	0.10	85.5
Don't know	45	3,600	0.24	4.7
How many times the operator used the saw last year?				
First time or don't know	38	3,500	0.20	4.7
1-5 times	61	6,100	0.21	8.0
6-10 times	81	8,100	0.17	10.6
More than 10 times	641	58,400	0.10	76.7
How many hours/minutes per use?				
Less than 1 hour	433	40,300	0.10	53.0
1 hour or more	362	33,900	0.10	44.5
Don't know	26	1,900	0.25	2.5
Operator uses different blades for different types of cutting operations				
Yes	208	18,700	0.12	24.6
No	578	54,200	0.12	71.2
Don't know or not applicable	35	3,200	0.19	4.2

Table 4.6 Saw Ownership, Assembly and Use, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators) (Continued)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Most frequent type of cutting operations performed using the saw during last year				
Crosscutting	32	3,300	0.20	4.3
Ripping	539	51,300	0.13	67.4
Combination of uses	212	18,300	0.13	24.1
Other or don't know	38	3,200	0.18	4.2

*Percentages may not add up exactly to 100 percent due to rounding.

Table 4.7 Characteristics of Saws, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Type of table saw				
Fixed cabinet saw	559	52,300	0.13	68.7
Semi-portable contractor saw	163	13,900	0.14	18.3
Portable bench saw	79	8,000	0.18	10.5
Don't know	20	1,900	0.28	2.5
Was a riving knife attached to the saw?				
Yes	161	15,500	0.14	20.4
No	531	49,500	0.11	65.0
Don't know	129	11,100	0.16	14.6
Was an anti-kickback pawl or spreader assembly attached to the saw?				
Yes	195	18,700	0.13	24.6
No	544	50,500	0.10	66.4
Don't know	82	6,900	0.15	9.1
If an anti-kickback or spreader assembly was attached, was it resting on the stock or not?				
Resting on the stock	169	16,200	0.13	86.6
Not touching the stock or don't know	26	2,500	0.22	13.4
Subtotal (pawl or spreader attached)	195	18,700	0.13	100.0
Any modifications to saw?				
Yes	17	1,300	0.27	1.7
No	758	70,000	0.09	92.0
Don't know	46	4,800	0.21	6.3

*Percentages may not add up exactly to 100 percent due to rounding.

**Table 4.8 Characteristics of Saw Blades, Survey of Saw Injuries - Table/Bench Saws, 2007–2008
(Injuries to Operators)**

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Blade type used at the time of the injury				
Crosscut blade	39	3,600	0.19	4.7
Rip blade	563	53,300	0.13	70.0
Combination blade	145	12,800	0.14	16.8
Dado blade or other	30	2,700	0.21	3.6
Don't know	44	3,700	0.20	4.9
Blade directly or indirectly mounted on the motor				
Direct drive (blade mounted directly onto the motor output shaft)	478	45,100	0.10	59.2
Indirect drive (belt or gear driven)	278	25,100	0.13	33.0
Don't know	65	5,900	0.16	7.8
Blade condition				
Sharp	780	72,500	0.10	95.3
Dull	20	1,900	0.27	2.5
Other or don't know	21	1,700	0.25	2.2
Any safety switch on the blade?				
Yes	139	13,400	0.13	17.6
No	652	59,900	0.11	78.7
Don't know	30	2,800	0.21	3.7
If there was a safety switch, was it removable/stationary?				
Removable	58	6,200	0.15	46.3
Stationary	73	6,700	0.12	50.0
Don't know	8	**	**	3.7
Subtotal (safety switch on blade)	139	13,400	0.13	100.0
Was a blade guard attached?				
Yes	260	24,000	0.12	31.5
No	535	50,000	0.10	65.7
Don't know	26	2,100	0.23	2.8
Reasons for not having a blade guard				
Guard removed	395	37,500	0.11	75.0
Saw never had a guard	106	9,600	0.13	19.2
Guard broken off or other	34	2,900	0.20	5.8
Subtotal (no blade guard attached)	535	50,000	0.10	100.0
If a blade guard was attached, what was the condition?				
In good condition	257	23,900	0.10	99.6
Don't know	3	**	**	0.4
Subtotal (blade guard attached)	260	24,000	0.12	100.0
If a blade guard was attached, did the blade guard function properly?				
Yes	241	22,300	0.11	93.0
No or don't know	19	1,700	0.33	7.0
Subtotal (blade guard attached)	260	24,000	0.12	100.0
Could blade guard have prevented injury?				
Yes	115	10,300	0.14	13.5
No	286	25,800	0.10	33.9
Don't know	420	40,000	0.13	52.6

*Percentages may not add up exactly to 100 percent due to rounding. **Estimate does not meet reporting requirements.

4.3.3 Characteristics of Cutting Materials

Table 4.9 presents estimates by various characteristics of materials (stocks) being cut at the time of the injury. In most cases, the operator was cutting a wooden board (91.2 percent), and the shape of the stock was mostly rectangular (95.0 percent). The cutting operation was done through the length of the stock in 85.7 percent of the cases, followed by the width of the stock in 6.6 percent of the cases, and at an angle in 2.5 percent of the cases. The condition of the stock was mostly hard and smooth (57.8 percent), followed by “nothing unusual” (13.3 percent), hard (9.1 percent), and/or dry (4.3 percent). In 61.2 percent of the cases, the whole surface of the stock fit on the table, and in 36.4 percent of the cases, the stock extended beyond the table.

Table 4.9 Characteristics of Cutting Materials, Survey of Saw Injuries - Table/Bench Saws, 2007--2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
What were you cutting?				
Wooden board	746	69,400	0.10	91.2
Other or don't know	75	6,700	0.13	8.8
Shape of stock				
Rectangular	773	72,300	0.10	95.0
Other shape or don't know	48	3,800	0.17	5.0
Type of cutting				
The length of the stock (with the grain, ripping)	698	65,200	0.11	85.7
The width of the stock (against the grain, cross cutting)	57	5,000	0.19	6.6
The stock at an angle	21	1,900	0.30	2.5
Other, don't know, or not applicable	45	4,000	0.17	5.3
Condition of stock¹¹				
Hard	82	6,900	0.15	9.1
Smooth	26	2,300	0.21	3.0
Dry	34	3,300	0.22	4.3
Hard and Smooth	461	44,000	0.15	57.8
Smooth and Dry	26	1,800	0.25	2.4
Hard, Smooth, and Dry	25	2,100	0.25	2.8
Nothing unusual	108	10,100	0.15	13.3
Other or don't know	59	5,600	0.15	7.4
Did the whole surface of stock fit on the table or did it extend beyond?				
Fit on the table	512	46,600	0.10	61.2
Extend beyond	292	27,700	0.11	36.4
Don't know	17	1,800	0.25	2.4

*Percentages may not add up exactly to 100 percent due to rounding.

¹¹ This question allowed the choice of one or more of the following: hard, smooth, dry, green, knotty, nothing unusual, other, or don't know.

4.3.4 Operational Factors at the Time of Injury

Tables 4.10 to 4.12 present estimates by various operational factors at the time of injury. The motor was running at the time of injury in 94.5 percent of the cases; and the motor was just turned on or off, or the status of the motor was not known at the time of injury, for the remaining 5.5 percent of the cases. The operator was actually in the process of cutting in 67.1 percent of the cases, at the end of a cutting operation in 28.9 percent of the cases, and about to start cutting or pausing during a cutting operation, or the stage of cutting was not known in 3.9 percent of the cases. The position of the blade was “inside a cut” in 74.8 percent of the cases involving injuries, and “jumping out of the cut” in 11.6 percent of the cases. If the cutting was already started, the cutting of the stock was “part way through” in 67.3 percent of the cases, “coming out at the other end of the stock” in 28.0 percent of the cases; and in 4.7 percent of the cases “just starting to cut at one end,” or the status was reported as unknown. At the time of injury, the blade was vertically straight in 94.7 percent of the cases, and was tilted to the side for a bevel cut in 1.9 percent of the cases. (Table 4.10)

The stock was resting on a table in 97.0 percent of the cases; and in the remaining cases, the stock was on a sawhorse, or supported in some other way, or the stock position was unknown. The stock was firmly anchored in 82.8 percent of the cases. A rip fence was used in 85.3 percent of the cases; of these, the stock was held securely against the fence in 96.3 percent of the cases, and the stock was wobbling, shifting, or other/unknown in 3.7 percent of the cases. If the stock was held securely against the fence, it was held in one hand in 48.8 percent of the cases, and was held in both hands in 47.7 percent of the cases. At the time of injury, the operator was pushing the stock in 76.7 percent of the cases, holding the stock still in 5.8 percent of the cases, pulling the stock or “unknown” in 2.9 percent of the cases, and “none of these” in the remaining cases (14.5 percent). Among the cases where the operator was pushing the stock, a push stick was used in 35.6 percent of the cases; and in 62.0 percent of the cases, neither a push stick nor a miter gauge was used. (Table 4.11)

The stock kicked back¹² or jumped in 40.5 percent of all cases. As mentioned before, the majority of the injuries to the operators were due to blade contacts (88.0 percent). Of the injuries due to blade contacts, in 56.9 percent of the cases, the blade contact was above the cutting surface. For the injuries where the stock kicked back and blade contact occurred, 93.7 percent of the respondents thought that the blade contact was due to the stock kickback. Of the injuries from blade contacts due to stock kickbacks, in 65.2 percent of the cases, the stock pulled the operator’s hand into the blade; in 17.0 percent of the cases, the stock moved out from underneath causing the hand to fall into the blade; and in the remaining cases, something else happened, or the cause was unknown. Of the cases where blade contact caused injuries to hands or fingers, in 66.6 percent of the cases, the operator’s hand was behind the blade when contact was made; and in 25.3 percent of the cases, the hand was in front of the blade. (Table 4.12)

¹² Kickback occurs when the cutting material wedges against the saw blade and is thrown back in the direction of rotation of the blade, which, in most cases is toward the operator; it causes unexpected movement of the cutting material.

Table 4.10 Operational Factors: Stage and Nature of Cutting at the Time of Injury, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Was the motor running?				
Motor was running	775	71,900	0.09	94.5
Motor was not running, just turned on/off, or don't know	46	4,200	0.17	5.5
Stage of cutting				
At the end of a cutting operation	237	22,000	0.10	28.9
Actually cutting/in the middle of cut	549	51,100	0.11	67.1
About to start cutting, pausing during a cutting operation, or don't know	35	3,000	0.19	3.9
Blade position with respect to stock or motion at the time of injury				
Inside a cut	613	56,900	0.11	74.8
Jumping out of the cut	96	8,800	0.16	11.6
Above the stock	28	2,500	0.23	3.3
Resting on stock but not yet in a cut	9	**	**	1.2
Other or don't know	75	6,900	0.15	9.1
If the blade was in a cut, how much of the stock was cut?				
Part way through	538	50,600	0.12	67.3
Coming out at the other end of the stock	236	21,000	0.10	28.0
Just starting to cut at one end or don't know	38	3,500	0.19	4.7
Subtotal (blade was in a cut)	812	75,100	0.09	100.0
Was the blade straight or tilted for bevel cut?				
Vertically straight	772	72,100	0.10	94.7
Tilted for bevel cut	18	1,462	0.26	1.9
Don't know/Not applicable	31	2,576	0.21	3.4

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

**Table 4.11 Operational Factors: Feeding/Supporting the Stock, Survey of Saw Injuries -
Table/Bench Saws, 2007–2008 (Injuries to Operators)**

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
How was the stock supported?				
On a table	792	73,800	0.10	97.0
On a sawhorse, in some other way, or don't know	29	2,300	0.21	3.0
Was the operator pulling, pushing, or holding the stock at the time of the injury?				
Pushing	627	58,400	0.10	76.7
Holding	50	4,400	0.20	5.8
Pulling or don't know	22	2,200	0.25	2.9
None of these	122	11,000	0.12	14.5
If the operator was pushing the stock, was a push stick or miter gauge used to push?				
Push stick used	225	20,800	0.12	35.6
Neither push stick nor miter gauge was used	383	36,200	0.11	62.0
Miter gauge or push stick used, or both used, or don't know	19	**	**	2.4
Subtotal (operator was pushing)	627	58,400	0.10	100.0
Was the stock or the support firmly anchored?				
Yes	670	63,000	0.12	82.8
No	112	10,100	0.16	13.3
Don't know	39	3,000	0.18	3.9
Was a rip fence used?				
Yes	694	64,900	0.10	85.3
No	82	7,700	0.16	10.1
Don't know	45	3,500	0.18	4.6
If a rip fence was used, was the stock held securely against the fence?				
Held securely	669	62,500	0.11	96.3
Wobbling or shifting, other, or don't know	25	2,400	0.23	3.7
Subtotal (rip fence used)	694	64,900	0.10	100.0
If the stock was held securely against the fence, how was it secured?				
Held with one hand	330	30,500	0.12	48.8
Held with both hands	312	29,800	0.12	47.7
Clamped to the table, other way, or don't know	27	2,200	0.25	3.5
Subtotal (stock was held securely)	669	62,500	0.11	100.0

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

Table 4.12 Operational Factors: Stock Kickback and Blade Contact, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	821	76,100	0.09	100.0
Did the stock kick back or jump?				
Yes	330	30,800	0.12	40.5
No	450	41,700	0.09	54.8
Other or don't know	41	3,600	0.18	4.7
Was injury due to contact with the blade?				
Yes	724	66,900	0.09	88.0
No or don't know	97	9,200	0.16	12.1
If blade contact caused the injury, did the blade contact above or below the cutting surface?				
Above	414	38,100	0.09	56.9
Below	268	24,800	0.16	37.0
Don't know	42	4,100	0.19	6.1
Subtotal (blade contact injuries)	724	67,000	0.09	100.0
If the stock kicked back or jumped and injury was due to blade contact, was contact caused by the stock kickback?				
Yes	241	22,400	0.12	93.7
No, other, or don't know	15	1,500	0.32	6.3
Subtotal (stock kicked back or jumped and blade contact injury)	256	23,900	0.12	100.0
If stock kickback caused blade contact, did the stock move out from under the hand causing blade contact?				
Stock moved out from underneath, causing hand to fall into blade	41	3,800	0.20	17.0
Stock pulled hand into the blade	158	14,600	0.15	65.2
Something else or don't know	43	4,000	0.17	17.9
Subtotal (kickback caused contact)	242	22,400	0.12	100.0
If injury was to hands or fingers and due to blade contact, was the hand in front of or behind the blade when contact was made?				
In front of blade	188	16,900	0.11	25.3
Behind blade	479	44,400	0.12	66.6
Don't know	55	5,400	0.19	8.1
Subtotal (hand/finger injury due to blade contact)	722	66,700	0.09	100.0

*Percentages may not add up exactly to 100 percent due to rounding.

4.3.5 Selected Characteristics of Blade Contact Injuries

Table 4.13 presents some selected characteristics of injuries to operators due to blade contact. The estimated number of injuries to operators due to blade contact during 2007–2008 was 66,900, which is 84.2 percent of all emergency department-treated injuries associated with table/bench saws. Among the blade contact injuries, the most frequent form of injury was laceration (65.9 percent), followed by fracture (12.4 percent), amputation (12.0 percent), and avulsion (8.5 percent). About 7.1 percent of operators were treated and admitted to a hospital, or treated and transferred to another hospital. A blade guard was attached to the saw prior to or at the time of injury in 30.9 percent of the cases; and the stock kicked back or jumped in 35.6 percent of the cases. A riving knife was attached to the saw in 19.6 percent of the cases, and an anti-kickback pawl or a spreader assembly was attached to the saw in 23.9 percent of the cases at the time of the injury.

Table 4.13 Selected Characteristics of Blade Contact Injuries, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	724	66,900	0.09	100.0
Type of table saw				
Fixed cabinet saw	486	45,500	0.13	68.0
Semiportable contractor saw	150	12,600	0.14	18.8
Portable bench saw	72	7,500	0.18	11.2
Don't know	16	1,300	0.28	1.9
Age group of victim				
0–14	3	**	**	0.5
15–64	479	45,900	0.10	68.5
65 or older	242	20,700	0.10	31.0
Diagnosis				
Laceration	470	44,100	0.10	65.9
Fracture	94	8,300	0.23	12.4
Amputation	94	8,000	0.14	12.0
Avulsion	55	5,700	0.18	8.5
Other	11	**	**	1.2
Disposition				
Treated/examined and released	659	61,800	0.09	92.4
Treated and transferred to another hospital	15	1,900	0.28	2.8
Treated and admitted to hospital	45	2,900	0.25	4.3
Held for observation	2	**	**	0.1
Left without being seen/left against medical advice	3	**	**	0.3
Was a blade guard attached?				
Yes	221	20,700	0.11	30.9
No	481	44,500	0.10	66.5
Don't know	22	1,700	0.25	2.5

**Table 4.13 Selected Characteristics of Blade Contact Injuries, Survey of Saw Injuries -
Table/Bench Saws, 2007–2008 (Injuries to Operators) (Continued)**

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	724	66,900	0.09	100.0
Did the stock kickback or jump?				
Yes	256	23,800	0.12	35.6
No	429	39,600	0.09	59.2
Other or don't know	39	3,500	0.19	5.2
Was a riving knife attached to the saw?				
Yes	135	13,100	0.13	19.6
No	474	44,300	0.11	66.2
Don't know	115	9,500	0.16	14.2
Was an antikickback pawl or spreader assembly attached to the saw?				
Yes	165	16,000	0.13	23.9
No	487	44,700	0.10	66.8
Don't know	72	6,200	0.16	9.3
If an antikickback or spreader assembly was attached, was it resting on the stock or not?				
Resting on the stock	142	13,700	0.14	85.6
Not touching the stock or don't know	23	2,300	0.244	14.4
Subtotal (assembly attached)	165	16,000	0.125	100.0
Was a rip fence used?				
Yes	606	56,600	0.10	84.6
No	77	7,200	0.17	10.8
Don't know	41	3,100	0.19	4.6
Any modifications to saw?				
Yes	13	**	**	1.6
No	673	62,100	0.09	92.8
Don't know	38	3,700	0.22	5.5

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

4.3.6 Medical Disposition as Related to Kickback

Table 4.14 presents some medical dispositions of injuries based on whether the stock kicked back or jumped. This is a more detailed breakdown of the blade contact injuries shown in Table 4.13, so most of the estimates do not meet reporting criteria. The highest percentage of treated and released was stock did not kick back or jump up (94.9 percent), followed by injuries from stock that did kick back or jump up (90.2 percent), stock did something other than kick back or jump (83.2 percent), and unknown (76.0 percent). Overall, 92.4 percent of the cases were treated and released.

Table 4.14 Medical Disposition as Related to Kickback, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	724	66,900	0.09	100.0
Stock kicked back or jumped				
Treated/examined and released	226	21,000	0.12	90.2
Treated and transferred	7	**	**	3.3
Treated and admitted to hospital	21	**	**	5.7
Held for observation	1	**	**	0.1
Left without being seen/left against medical advice	1	**	**	0.7
Total	256	24,000	0.12	100.0
Stock did not kick back or jump				
Treated/examined and released	404	38,000	0.10	94.9
Treated and transferred	6	**	**	2.1
Treated and admitted to hospital	18	**	**	2.9
Held for observation	1	**	**	0.1
Total	429	40,000	0.09	100.0
Stock did something other than kick back or jump				
Treated/examined and released	11	**	**	83.2
Treated and admitted to hospital	3	**	**	16.8
Total	14	**	**	100.0
Unknown if stock kicked back or jumped				
Treated/examined and released	18	1,800	0.26	76.0
Treated and transferred	2	**	**	12.7
Treated and admitted to hospital	3	**	**	8.1
Left without being seen/left against medical advice	2	**	**	3.2
Total	25	2,300	0.24	100.0
Total				
Treated/examined and released	659	61,800	0.09	92.4
Treated and transferred	15	1,900	0.28	2.9
Treated and admitted to hospital	45	2,900	0.25	4.3
Held for observation	2	**	**	0.1
Left without being seen/left against medical advice	3	**	**	0.3
Total	724	66,900	0.09	100.0

*Percentages may not add up exactly to 100 percent due to rounding. **Estimate does not meet reporting requirements.

4.3.7 Medical Diagnosis as Related to Kickback

Table 4.15 presents some medical diagnoses of injuries based on whether the stock kicked back or jumped. This is a more detailed breakdown of the blade contact injuries shown in Table 4.13, so most of the estimates do not meet reporting criteria. The most common diagnosis overall was laceration (65.9 percent). The highest percentage of lacerations was stock did not kick back or jump (69.4 percent), followed by injuries from unknown if stock kicked back or jumped (64.6 percent), stock kicked back or jumped (61.1 percent), and stock did something other than kick back or jump (46.4).

Table 4.15 Medical Diagnoses as Related to Kickback, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries, 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Overall Total	724	66,900	0.09	100.0
Stock kicked back or jumped				
Laceration	151	14,541	0.14	61.1
Amputation	41	3,720	0.21	15.6
Fracture	41	3,377	0.32	14.2
Avulsion	16	**	**	6.5
Other	6	**	**	2.0
Contusions, Abrasions	1	**	**	0.6
Total	256	23,813	0.12	100.0
Stock did not kick back or jump				
Laceration	296	27,513	0.10	69.4
Fracture	48	4,368	0.23	11.0
Amputation	46	3,792	0.16	9.6
Avulsion	35	3,756	0.22	9.5
Contusions, Abrasions	3	**	**	0.5
Other	1	**	**	0.1
Total	429	39,644	0.09	100.0
Stock did something other than kick back or jump				
Laceration	7	**	**	46.4
Avulsion	3	**	**	24.8
Amputation	3	**	**	18.3
Fracture	1	**	**	10.6
Total	14	**	**	100.0
Unknown if stock kicked back or jumped				
Laceration	16	**	**	64.6
Fracture	4	**	**	18.4
Amputation	4	**	**	10.6
Avulsion	1	**	**	6.3
Total	25	2,314	0.24	100.0

Table 4.15 Medical Diagnoses as Related to Kickback, Survey of Saw Injuries - Table/Bench Saws, 2007–2008 (Injuries to Operators)

Description	Sample Count of Injuries	Estimated Number of Injuries, 2007-2008	CV of Estimated Number	Percentage Distribution* (%)
Total				
Laceration	470	44,096	0.10	65.9
Fracture	94	8,294	0.23	12.4
Amputation	94	7,974	0.14	11.9
Avulsion	55	5,738	0.18	8.6
Other	7	**	**	0.8
Contusions, Abrasions	4	**	**	0.5
Total	724	66,949	0.09	100.0

*Percentages may not add up exactly to 100 percent due to rounding.

**Estimate does not meet reporting requirements.

6. DISCUSSION

An important objective of this survey of injuries associated with stationary saws was to identify the specific types of saws involved in the incidents when the saw type was unspecified in the NEISS or to verify the types of saws reported in the NEISS so that more accurate estimates of the number of injuries associated with a particular type of saw could be obtained. The results show that the estimated total number of injuries associated with table/bench saws in 2007–2008 was 79,500 (Table 4.2), which is 9.1 percent higher than the NEISS estimate of 72,900 (Table 1). Almost all of the victims were the operators of the saws. In most cases, the victim was examined or treated and released from the hospital on the same day; and in some cases (less than 7 percent), the victim was treated and admitted to the same or another hospital.

An analysis of the estimates by various factors and a review of respondents' narratives of incidents helped characterize the general hazard patterns of the injuries. The hazard patterns appear very similar to those identified in the survey conducted in 2001. Blade contact to fingers appears to be a major hazard related to the use of table or bench saws. In 88.0 percent of the cases, the injuries to operators associated with table or bench saws were due to blade contact; and in the majority of these cases, the blade was contacted above the cutting surface. Laceration, followed by fracture and amputation, were the most common forms of injuries to operators. Fingers followed by hands were the most frequent body parts involved in the injuries. Injuries to fingers were mainly due to contacting the blade. Most often, lacerations and, in some cases, amputations of fingers occurred when the operator did not move his hand when it came close to the blade. Common reasons for blade contact included: trying to reach the stock, operating on a small piece of stock without using a push stick, lack of attention when the hand was close to the saw blade, stock kickback, and the catching of gloves by the blade. Often a lapse in an operator's attention resulted in the operator's hand or fingers contacting the blade. In some situations, the operator was pushing the stock and got too close to the blade, resulting in the catching of gloves by the blade. In some situations, the operator's hand, holding the stock and/or guiding the stock, slipped into the blade when the blade jammed in the stock. In some cases, stock kickback was reported as the cause of blade contact when the blade was contacted above the cutting surface. In these incidents, the blade slowed or stopped momentarily as it bound or caught in the stock, such as when it hit a knot or when it was pinched or jammed, because the cut began too close behind the blade. This caused the stock to bounce out and hit an operator's hand and caused his hand to contact the blade. In some other cases, the stock pulled the operator's hand to the blade. In the majority of the cases, the saw did not have an anti-kickback pawl or spreader assembly attached. In many of the blade contact cases, there was no blade guard in use at the time of the incident. Often the blade guard was removed to get a clear view of the blade; while in some cases, the saw never had a blade guard. The majority of all operators were not sure if a blade guard could have prevented the injury.

In most cases, the operator was cutting a rectangular wooden board through the length of the stock (i.e., ripping). In a majority of the cases, the condition of the stock was hard and smooth, a rip blade was in use, and the blade was direct drive (i.e., mounted directly on the motor output shaft). The saw did not have a safety switch in the vast majority of the cases, and when the saw had a safety switch, the switch was removable in almost half of the cases.

To give an idea of the nature of the incidents based on verbal descriptions, a sample of respondents' narratives about how the incident happened is included in Appendix B.

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APPENDIX A DETAILS OF ESTIMATION METHODOLOGY

Weighting and Estimation

Since all of the NEISS cases with relevant product codes that occurred within the survey time period were selected for follow up, the base weights of the cases selected for the survey were equal to their NEISS weights.¹³ Then the base weights of the cases that were successfully interviewed during the follow-up survey were adjusted to account for the nonresponding cases. The weighting adjustment is done in two steps. Initially, a nonresponse adjustment is applied to distribute the weights of the nonresponding cases to the responding cases by defining adjustment cells that are likely to be homogeneous in terms of injury characteristics of respondents and nonrespondents; and then a raking adjustment is applied to ensure that the marginal totals of the adjusted weights of the responding cases are the same as the corresponding marginal totals estimated from the NEISS. The process of nonresponse and raking adjustments to compute the final weights for the responding sample can be expressed as follows:

If W_i^b is the base weight (equal to the NEISS weight) for the i -th case selected for follow-up investigation, then the initial nonresponse adjusted weight, W_i^n , can be defined as

$$W_i^n = \begin{cases} W_i^b * \frac{\sum_{i \in c} W_i^b}{\sum_{i \in c \cap r} W_i^b} & \text{if } i \in r \\ 0 & \text{otherwise,} \end{cases}$$

Where, c indicates a nonresponse adjustment cell and r indicates the set of responding cases.

Based on an analysis of the responses, the adjustment cells were defined by the NEISS product codes, the NEISS sampling strata, and the age groups (0–16¹⁴, 17–64, 65+ years) of the victims.

At the next step, the final weight, W_i^f , is derived by applying a raking ratio adjustment (Brackstone and Rao, 1979; Deville and Särndal, 1992) to the nonresponse adjusted weights, W_i^n , using the following raking margins:

- a. year of treatment and NEISS stratum,
- b. year of treatment and product code, and
- c. year of treatment and age group.

The categories of the variables used for defining the raking margins are as follows: year of treatment (2007 and 2008), product code (841, 842, 843, 845, and 895), and age group (0–14, 15–64, and 65+ years).

The final weight, W_i^f , for the i -th case can be defined as:

¹³ Because there was no subsampling between the injuries reported to the NEISS and the injuries selected for the survey. In other words, the selection probability is 1, and hence the weight remains the same.

¹⁴ The age group 0–16 years instead of 0–14 years was used here, because the sample size within 0–14 years was not sufficient for a stable nonresponse adjustment.

$$W_i^f = \begin{cases} W_i^n * \phi_i & \text{if } i \in r \\ 0 & \text{otherwise,} \end{cases}$$

where, ϕ_i is the raking ratio (adjustment factor) for the i -th case as derived through the process of iteration using a raking algorithm.

The estimates of injuries and relevant characteristics are produced based on these final raking adjusted weights, W_i^f , and include the eligible cases only. The general form of the national estimator of a proportion (or percentage) of injuries presented in the report can be expressed as follows:

$$\hat{P}_c = \frac{\hat{Y}_c}{\hat{T}} \text{ with } \hat{Y}_c = \sum_{i \in E} W_i^f y_i \text{ and } \hat{T} = \sum_{i \in E} W_i^f$$

where,

\hat{P}_c is the estimate of a proportion in category, c ,

\hat{Y}_c is the estimate of total incidents in category, c ,

y_i is a dichotomous variable with $y_i = 1$ if the case belong to category, c , and 0 otherwise,

\hat{T} is the estimate of total number of eligible incidents in the population, and

E represents the set of responding eligible cases.

Although this report is for table/bench saws only, the weighting adjustments included all stationary and unspecified saws because the follow-up survey reclassified some saws to other categories. The tabulation included all table/bench saws as reported in the follow-up survey, irrespective of their NEISS product codes, and hence all cases had to be included during weighting adjustments.

Item Nonresponse and Imputation

Generally, the survey had a very low rate of partial nonresponse. One or more variables were missing for a small number of cases, which were otherwise considered complete responses. The missing values of these variables were imputed by using a hot deck imputation scheme (Ford, 1983; Kalton and Kasprzyk, 1986). Under this scheme, within an imputation class, a donor with a nonmissing value is selected randomly for a case with a missing value and then the missing value is imputed using the corresponding value of the donor. For all imputed variables used in this report, the base imputation class was formed by using the reported product code (i.e., saw type as obtained from the survey). Then, within the base imputation class, some other variables were used to create a finer imputation class as necessary. Often this refinement of imputation class was required to maintain the skip pattern (see p.10) of the variable. As mentioned previously, the extent of such imputation was very low. In most cases, the number of imputed values for a variable was less than 10, and the maximum number of values imputed for a variable was 14.

Variance Estimation

The variances of the estimates were computed (estimated) by using the SAS[®] Proc SurveyFreq procedure (SAS, [®] 2004). The variances of estimated counts are presented in the form of coefficient

of variations (CV) in the report. A CV is defined as the ratio of the standard error (i.e., the square root of the variance) and the estimate. A 95 percent confidence interval for an estimate can be defined in terms of CV as (Estimate \pm 1.96*CV*Estimate) under a normal approximation.¹⁵

SAS[®] survey procedures compute variances directly for the estimates of totals, but use the Taylor Series linearization method for proportions (SAS[®], 2004; Woodruff, 1971; Fuller, 1975). Because the NEISS design is a cluster sample of injuries within a hospital, hospitals are used as primary sampling units (PSUs), and each NEISS sampling stratum of hospitals is used as a variance stratum. The finite population correction (*fpc*) factors¹⁶ are ignored (i.e., sampling with replacement of hospitals is assumed), given the number of hospitals in the sample compared to the total number of hospitals in a stratum is small, except in the stratum of children's hospitals, which is a negligible contributor to the total estimate.

¹⁵ A normal approximation can be used in most cases if the sample size is 50 or more. See Cochran (1977), pp. 27–42, for further discussion on confidence limits and normal approximation.

¹⁶ $fpc = (1 - n/N)$, where n/N is the PSU sampling fraction in a stratum. For this survey, n is the number of sampled hospital in a stratum, and N is the total number of hospitals in the stratum.

APPENDIX B
A SAMPLE OF RESPONDENTS' NARRATIVES OF INCIDENTS

Q21. PLEASE DESCRIBE HOW THE ACCIDENT HAPPENED AND WHAT THE INJURIES WERE. THAT IS, WHAT WERE YOU DOING JUST BEFORE, DURING, AND AFTER THE INJURY OCCURRED? PLEASE START WITH WHAT WAS GOING ON JUST BEFORE THE INJURY OCCURRED.

HE WAS USING HIS TABLE SAW TO CUT SMALL PIECES OF WOOD. IT WAS LATE IN THE DAY AND I THINK HE WAS GETTING TIRED. HE WAS USING A PUSH STICK TO PUSH THE WOOD THROUGH AND HE REACHED AROUND TO GET THE WOOD BUT HIS FINGER TIP CAUGHT THE BLADE AND HE WAS CUT. I TOOK HIM TO THE HOSPITAL AND THEY STITCHED HIS FINGER.

THE 59 YO MALE VICTIM WAS WORKING WITH HIS TABLE SAW AT HOME CUTTING BOARDS. SOMEHOW, HIS LEFT HAND CAME INTO CONTACT WITH THE BLADE, LACERATING HIS MIDDLE FINGER AND PARTIALLY AMPUTATING HIS INDEX FINGER. VICTIM TRANSPORTED TO ER BY HIS WIFE. RECEIVED IV ANTIBIOTICS AND 4 STITCHES IN MIDDLE FINGER, TREATED AND RELEASED THE SAME DAY.

VICTIM IS A 66 YEAR OLD MALE WHO WAS USING A FRIEND'S SAW AT A CHURCH TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 15 MINUTES & SUPPORTING THE WOOD WITH BOTH HANDS. VICTIM GOT HIS RIGHT HAND TOO CLOSE TO THE BLADE & CUT HIS INDEX FINGER. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

THE VICTIM WAS CUTTING A 2 X 4 ON HIS TABLE SAW AT HOME. THE STOCK KICKED (HE DOESN'T KNOW WHY) AND HIS FINGER ROLLED OVER THE BLADE. HE CUT RING THE (4TH) FINGER ON HIS RIGHT HAND. HE WAS TRANSPORTED TO ER BY A FRIEND. HE RECEIVED 38 STITCHES AND WAS DISCHARGED THE SAME DAY.

I HAD COMPLETED SEVERAL CUTS AND I HAD LEFT ONE PIECE TO THE RIGHT OF THE SAW. WHEN I REACHED ACROSS TO GET THE LAST PIECE OF WOOD I HIT THE BLADE AND I CUT MY RIGHT THUMB. THERE MAY HAVE BEEN A KICK BACK, BUT I'M NOT SURE. MY WIFE INSISTED ON TAKING ME TO THE ER.

VICTIM IS A 70 YEAR OLD MALE WHO WAS USING A TABLE SAW TO CUT A SMALL PIECE OF WOOD. VICTIM HAD BEEN CUTTING FOR ABOUT 15 MINUTES WITH A PUSH STICK IN HIS RIGHT HAND & HOLDING THE WOOD WITH HIS LEFT HAND. VICTIM SAID HE JUST GOT HIS LEFT HAND TOO CLOSE TO THE BLADE & CUT HIS LEFT FINGER. VICTIM WAS TAKEN TO THE ER, TREATED, & RELEASED.

I WAS RIPPING 6 FOOT PIECE OF TRIM. I WAS AT THE END OF THE CUT AND PUSHED A LITTLE TOO HARD. I WOUND UP PUSHING MY LEFT HAND INTO THE SAW AND I FRACTURED MY FINGER. I ALSO CUT MY LEFT INDEX AND MIDDLE FINGERS. MY WIFE DROVE ME TO THE HOSPITAL.

VICTIM IS A 57 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM WAS ON HIS 1ST CUT & JUST GOT HIS LEFT FINGERS TOO CLOSE TO THE BLADE & CUT 4 OF THEM. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 48 YEAR OLD MALE WHO WAS MOVING A TABLE SAW THAT HAD BEEN BROKEN DOWN. VICTIM CUT HIS RIGHT FINGER ON THE TOP OF THE TABLE, NOT THE BLADE. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 49 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 15 MINUTES & WAS IN THE MIDDLE OF A CUT WHEN THE CAT JUMPED FROM A SHELF TOWARDS THE SAW. THE VICTIM'S REACTION WAS TO PUSH THE CAT AWAY & IN DOING SO, WHEN HE TURNED HE PUT HIS LEFT THUMB INTO THE BLADE. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 40 YEAR OLD FEMALE WHO WAS USING A FRIEND'S TABLE SAW TO CUT A DOOR. VICTIM HAD BEEN CUTTING ABOUT 5 MINUTES WHEN THE DOOR SLIPPED & SHE WENT TO GRAB IT & PUT HER LEFT MIDDLE FINGER INTO THE BLADE. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 66 YEAR OLD MALE WHO WAS USING A TABLE SAW TO CUT A SMALL PIECE OF WOOD. VICTIM HAD BEEN CUTTING FOR 3 HOURS ON & OFF. VICTIM WAS IN THE MIDDLE OF A CUT & GOT DISTRACTED & JUST GOT HIS LEFT INDEX FINGER TOO CLOSE TO THE BLADE & CUT IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

APPENDIX B (Continued)
A SAMPLE OF RESPONDENTS' NARRATIVES OF INCIDENTS

<p>Q21. PLEASE DESCRIBE HOW THE ACCIDENT HAPPENED AND WHAT THE INJURIES WERE. THAT IS, WHAT WERE YOU DOING JUST BEFORE, DURING, AND AFTER THE INJURY OCCURRED? PLEASE START WITH WHAT WAS GOING ON JUST BEFORE THE INJURY OCCURRED.</p>
<p>VICTIM IS A 42 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING FOR ABOUT 15 MINUTES & WHEN HE REACHED FOR THE COMPLETED CUT, HE PUT HIS RIGHT THUMB INTO THE BLADE. VICTIM WENT TO THE ER, WAS TREATED,& RELEASED.</p>
<p>VICTIM IS A 74 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ON & OFF FOR ABOUT 5 HOURS. VICTIM HAD COMPLETED A CUT & REACHED FOR THE WOOD & PUT HIS RIGHT THUMB INTO THE BLADE & LACERATED IT. VICTIM STATED HE WAS TIRED. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>VICTIM IS A 25 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 30 MINUTES & COMPLETED A CUT. WHEN THE VICTIM REACHED FOR THE WOOD, HE ACCIDENTALLY CUT HIS LEFT THUMB. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>I WAS CUTTING TOO SHORT OF A PIECE OF WOOD FOR THE TABLE SAW. I WAS RABITTING AN EDGE AND IT KICKED BACK UP AND AS IT SLIPPED THE WOOD WENT INTO THE BOTTOM OF MY FOREARM. IT WAS A GLANCING BLOW ABOUT 1/4' DEEP THAT TOOK OUT A CHUNK OF SKIN ABOUT AN INCH BY A HALF INCH. IT PEELED BACK MAKING A FLAP.</p>
<p>'MY HAND SLIPPED ON A PIECE OF WOOD AND MY THUMB HIT THE BLADE. I WAS AT THE END OF A CUT AND I WAS REACHING DOWN WITH MY LEFT HAND TO TURN THE POWER OFF AND THAT IS WHEN MY RIGHT THUMB HIT THE SAW BLADE.'</p>
<p>VICTIM IS A 20 YEAR OLD MALE WHO WAS AT A FRIEND'S HOUSE & USING HIS TABLE SAW TO RIP PLYWOOD. VICTIM HAD BEEN CUTTING ABOUT 20 MINUTES WHEN THE STOCK KICKED BACK & PULLED HIS LEFT MIDDLE FINGER INTO THE BLADE & CUT IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>I WAS CUTTING A PIECE OF WOOD AND WAS IN A CONFINED AREA WHERE THE TABLE SAW WAS AND I HAD FINISHED CUTTING THE PIECE OF WOOD AND IT WAS LONG. I WENT TO REACH FOR IT TO PICK IT UP AND I TOUCHED THE TIP OF THE BLADE WITH MY THUMB ON MY LEFT HAND AND IT JUST TORE IT TO PIECES. THIS WAS A VERY OLD SAW AND WAS AT MY NEIGHBORS HOUSE. THIS WOULD NOT HAVE HAPPENED WITH A NEWER SAW BECAUSE THEY HAVE A GUARD FOR THE BLADE. THE BLADE WAS SPINNING SO FAST THAT YOU CAN'T SEE THE TIPS OF THE BLADE AND I JUST REACHED OVER TO REMOVE THE WOOD AND NICKED MY THUMB ON THE BLADE. I SHOULD HAVE TURNED THE SAW OFF BEFORE TRYING TO REMOVE THE BOARD SINCE I WAS INDEED DONE WITH THE CUT. WHAT DID I DO? I GRABBED IT AND SAID PRAISE THE LORD THAT I DIDN'T CUT THE WHOLE THING OR THE WHOLE HAND OFF! MY WIFE DROVE ME TO THE HOSPITAL AND THEY FIXED IT UP.</p>
<p>VICTIM IS A 62 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 15 MINUTES WHEN THE STOCK KICKED BACK. THE STOCK HIT HIS LEFT KNUCKLE & FINGER & LACERATED IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>WELL I WAS CUTTING DOWN A PCITURE FRAME. THE FRAME WAS TOO BIG FOR THE NEW PICTURE THAT I WANTED TO PUT IN IT SO I WAS MAKING IT SMALLER. I WAS CUTTING A 45 AND I HAD IT ON THE GUIDE. I THOUGHT I WAS AT LEAST 8 INCHES FROM THE BLADE. IT HAPPENED REALLY FAST AND I REALLY DON'T KNOW WHAT HAPPENED. I THINK THE BOARD JUMPED OR SOMETHING. I HAVE BEEN DOING THIS TYPE OF WORK FOR YEARS AND IT HAS NEVER HAPPENED TO ME BEFORE. I CUT THE FIRST JOINT OF THE LITTLE FINGER OF THE RIGHT HAND. IT CUT THE JOINT OFF COMPLETELY AND WAS HELD ON BY JUST A SMALL PIECE OF SKIN. RIGHT AWAY I WRAPPED IT IN A PAPER TOWEL AND MY WIFE TOOK ME TO THE EMERGENCY ROOM. THE BONE DOCTOR OR WHAT EVER YOU CALL HIM PUT A PIN IN IT AND I GO NEXT WEEK TO GET THE PIN OUT.</p>
<p>'I WAS SAWING A BOARD, A 2X6. I WAS RIPPING THE LENGTH OF THE BOARD. IT CAME OFF THE OTHER END AND IT STARTED TO FALL. I REACHED TO GRAB IT AND SLICED MY LEFT THUMB. I WAS TAKEN TO THE ED, TREATED AND RELEASED.'</p>
<p>VICTIM IS A 51 YEAR OLD FEMALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING 3-4 HOURS WHEN HE HIT A KNOT IN THE WOOD CAUSING HIS LEFT THUMB TO BE PULLED INTO THE BLADE & HE LACERATED IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>

APPENDIX B (Continued)
A SAMPLE OF RESPONDENTS' NARRATIVES OF INCIDENTS

<p>Q21. PLEASE DESCRIBE HOW THE ACCIDENT HAPPENED AND WHAT THE INJURIES WERE. THAT IS, WHAT WERE YOU DOING JUST BEFORE, DURING, AND AFTER THE INJURY OCCURRED? PLEASE START WITH WHAT WAS GOING ON JUST BEFORE THE INJURY OCCURRED.</p>
<p>VICTIM IS A 79 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 3 HOURS & WAS USING HIS LEFT HAND TO SUPPORT THE WOOD. VICTIM GOT HIS LEFT THUMB TOO CLOSE TO THE BLADE & FRACTURED THE TIP OF IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>VICTIM IS A 46 YEAR OLD MALE WHO WAS USING A TABLE SAW TO CUT A CHANNEL IN THE WOOD WITH A DADO BLADE. VICTIM HAD BEEN CUTTING ABOUT 30 MINUTES WHEN HE GOT HIS LEFT HAND TOO NEAR TO THE BLADE. VICTIM AMPUTATED ONE FINGER & CUT SEVERAL OTHERS. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>VICTIM IS A 58 YEAR OLD MALE WHO WAS USING A TABLE SAW TO CUT WOOD. VICTIM HAD BEEN CUTTING 2-3 HOURS & USING A PUSH STICK IN HIS RIGHT HAND & GUIDING THE WOOD WITH HIS LEFT HAND. VICTIM GOT HIS LEFT MIDDLE FINGER TOO CLOSE TO THE BLADE & CUT IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>VICTIM IS A 49 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP 2 X 4'S. VICTIM HAD BEEN CUTTING ABOUT 4 HOURS WHEN HE REACHED WITH HIS LEFT HAND FOR THE PIECE OF WOOD & CUT HIS INDEX FINGER. VICTIM WENT TO THE ER, WAS TREATED,& RELEASED.</p>
<p>VICTIM IS A 70 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP TREATED WOOD. VICTIM HAD BEEN CUTTING ABOUT 45 MINUTES & HAD COMPLETED A CUT, THEN REACHED FOR THE WOOD & PUT HIS LEFT FINGER TIP INTO THE BLADE. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>I WAS CUTTING TRIM FOR A WINDOW AND WHILE I WAS PUSHING THE WOOD THROUGH, ONE PIECE OF WOOD LIFTED AND I PUSHED IT DOWN. I THOUGHT MY FINGERS WERE FAR ENOUGH BACK BUT IT CUT A PIECE OFF MY LEFT THUMB ABOUT ONE INCH LONG AND REQUIRED 11 STITCHES. I WAS DRIVEN TO THE ED, TREATED AND RELEASED.</p>
<p>I WAS RIPPING A 10 FOOT BOARD THAT I HAD JUST RUN THRU THE PLANER. I WAS RIGHT AT END OF THE BOARD AND I HAD A SET OF ROLLER HOLDDOWNS WHICH HOLD THE BOARD DOWN ON THE SAW TABLE AND AGAINST THE RIP FENCE, AND I WAS USING A PUSH STICK. THE WAY I HAD THE HOLDDOWNS ON THE TABLE WAS BACK TOO FAR AND I COULDN'T PUSH THE STICK FOR THE REMAINING 3 INCHES OF THE BOARD. I REACHED OVER THE TOP AND I HEARD A PING AND IT WAS MY THUMB. IT WAS A DUMB THING TO DO. I GUESS IT WAS JUST A MENTAL LAPSE. I CUT THE TIP OF MY RIGHT INDEX FINGER. I HAD TO GET 2 STITCHES. IT IS ALL TAKEN CARE OF NOW AND I WILL BE BACK TO NEW SOON. I TURNED THE SAW OFF, TURNED THE DUST COLLECTOR OFF. I HAVE A BOX OF RAGS, WHICH ARE LIKE A THICK ROLL OF PAPER TOWELS AND I WRAPPED THEM AROUND MY HAND, TOOK MY SHOP APRON OFF TURNED THE LIGHT OFF AND WENT UP AND SAID TO MY WIFE 'HONEY, I THINK WE NEED TO TAKE A TRIP TO THE HOSPITAL.'</p>
<p>'MY HUSBAND HAD JUST GOTTEN THE SAW BACK. IT WAS BEING REPAIRED. HE DECIDED TO TRY THE SAW OUT, SINCE HE HAD JUST GOTTEN IT BACK. WHILE HE WAS CUTTING A PIECE OF WOOD IT WOUND UP BREAKING THE PIECE OFF INSTEAD OF CUTTING THE PIECE OFF. WHEN MY HUSBAND SAW WHAT IT DID HE TURNED THE SAW OFF. BEING 85 YEARS OLD HE DID NOT HAVE THE REACTION TIME A YOUNGER MAN WOULD HAVE AND WHEN HE REACHED OVER TO PICK UP THE BROKEN OFF PIECE OF WOOD THE SAW HAD NOT COMPLETELY STOPPED. HE BRUSHED THE BLADE AND CUT AND FRACTURED HIS THUMB, MIDDLE AND INDEX FINGERS. I TOOK HIM TO THE ER.'</p>
<p>I WAS CUTTING TRIM WITH MY NEIGHBOR FOR A NEW STORM DOOR ON THE BACK PORCH. I WAS CUTTING THE LAST PIECE. THE SAW JUST DRUG THE PIECE OF WOOD THRU THE SAW AND MY HAND GOT CAUGHT ON IT SOMEHOW. IT WAS SO FAST, I FELT A LITTLE BURN AND I THOUGHT I JUST NICKED MYSELF. I HELD MY HAND UP AND I NOTICED THAT MY THUMB AND LITTLE FINGER OF MY LEFT HAND WERE GONE. I TURNED THE SAW OFF AND TOLD MY FRIEND THAT I NEEDED TO GO TO THE HOSPITAL. I WRAPPED IT UP WITH AN OLD SHIRT AND THEN I SENT HIM IN FOR A COUPLE OF TOWELS. HE DROVE ME TO THE HOSPITAL.</p>
<p>VICTIM IS A 44 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 3 HOURS & COMPLETED A CUT. VICTIM REACHED FOR THE WOOD & PUT HIS LEFT 2 FINGERS INTO THE BLADE & CUT THEM. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>

APPENDIX B (Continued)
A SAMPLE OF RESPONDENTS' NARRATIVES OF INCIDENTS

<p>Q21. PLEASE DESCRIBE HOW THE ACCIDENT HAPPENED AND WHAT THE INJURIES WERE. THAT IS, WHAT WERE YOU DOING JUST BEFORE, DURING, AND AFTER THE INJURY OCCURRED? PLEASE START WITH WHAT WAS GOING ON JUST BEFORE THE INJURY OCCURRED.</p>
<p>I WAS CUTTING A PIECE OF TRIM MOULDING. IT GOT WEDGED IN THE BLADE AS I WAS PUSHING IT THROUGH. I HAD MADE IT ABOUT 90 PERCENT THROUGH WHEN IT BECAME WEDGED. THEN AS I PUSHED I TRIED PULLING THE WOOD FROM THE BACKSIDE WITH MY OTHER HAND AND THE WOOD KICKED BACK AND PULLED MY FINGER IN WITH THE WOOD. IT CUT MY INDEX FINGER AND I WENT TO THE ER.</p>
<p>I HAD AN ATTACHMENT CALLED A SHAPER HEAD ON THE SAW. IT IS USED TO PUT DECORATIVE EDGES ON WOOD. THE WOOD SLIPPED AND GOT MY FINGERS. IT IS OLDER MACHINERY AND DOESN'T HAVE A LOT OF SAFETY PRECAUTIONS. IT PROBABLY WOULDN'T HAVE HAPPENED WITH NEWER EQUIPMENT. ALSO I INJURED MY HAND 12 YEARS AGO AND DON'T HAVE COMPLETE NORMAL FEELINGS IN IT.</p>
<p>VICTIM IS A 69 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING FOR ABOUT 15 MINUTES & WAS IN THE MIDDLE OF A CUT WHEN THE STOCK KICKED BACK. VICTIM CUT 3 FINGERS ON HIS LEFT HAND. VICTIM WAS TAKEN TO THE ER, TREATED, & RELEASED.</p>
<p>VICTIM IS A 59 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM WAS ON HIS 1ST CUT WHEN THE WOOD KICKED BACK & THE WOOD HIT HIS RIGHT THIRD FINGER & BADLY LACERATED IT. VICTIM WAS TAKEN TO THE ER, TREATED, & RELEASED.</p>
<p>VICTIM IS A 53 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING FOR 2 OR 3 HOURS WHEN THE SAW CAUGHT A KNOT & THE STOCK KICKED BACK CAUSING THE VICTIM'S LEFT THUMB TO BE PULLED TO THE BLADE. VICTIM LACERATED HIS THUMB & WAS ADMITTED FOR SURGERY.</p>
<p>VICTIM IS A 64 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 1 HOUR. VICTIM WAS NEAR THE END OF A CUT WHEN THE STOCK KICKED BACK, & THE STOCK HIT HIM IN HIS LEFT WRIST, FRACTURING IT. VICTIM WENT TO THE ER, WAS TREATED & RELEASED.</p>
<p>I WAS CUTTING A SCRAP BOARD TO BE USED AS FIREWOOD. THE BOARD KICKED-BACK AND PULLED MY LEFT HAND INTO THE BLADE CUTTING MY LEFT MIDDLE FINGER AND MY INDEX FINGER. NEVER COULD FIGURE OUT WHY IT KICKED-BACK.</p>
<p>VICTIM IS A 54 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING ABOUT 30 MINUTES & COMPLETED A CUT. VICTIM REACHED FOR THE WOOD & ACCIDENTALLY PUT HIS RIGHT THUMB INTO THE BLADE & LACERATED IT. VICTIM SAID HE WAS PRE-OCCUPIED & NOT FOCUSED ON WHAT HE WAS DOING. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>HE WAS ATTEMPTING TO MAKE A BOARD THINNER, SO IT WAS RIDING ON THE 3/4 INCH SIDE. HE WAS MAKING A TAPERED CUT AND I GUESS HIS FINGERS JUST GOT IN THE WAY AND HE KNICKED HIS INDEX AND MIDDLE FINGERS OF HIS RIGHT HAND. HE FINISHED ALL OF HIS CUTTING AND AFTERWARD WRAPPED HIS FINGERS IN PAPER TOWELS. WHEN HE WAS ALL FINISHED HE WENT HOME AND CLEANED UP. HE THEN LET ME DRIVE HIM TO THE EMERGENCY ROOM. THEY CHECKED TO SEE IF THERE WAS ANY WAY TO STITCH HIM UP, BUT THERE WASN'T. THEY PUT STERI STRIPS ON ONE FINGER AND SOME KIND OF COVERING ON THE OTHER AND SENT US HOME. HE ONLY CUT FLESH, THERE WAS NO BONE INVOLVED AND WE WERE LUCKY BECAUSE IT SEEMS TO BE HEALING UP PRETTY DECENTLY.</p>
<p>VICTIM IS A 57 YEAR OLD MALE WHO WAS HOLDING/GUIDING THE MOULDING AGAINST THE FENCE AS IT EXITED THE BLADE WHILE HIS FRIEND, WHO OWNED THE TABLE SAW, WAS DOING THE ACTUAL CUTTING. THEY HAD BEEN CUTTING ON & OFF ALL DAY (8 HOURS) WHEN THE WOOD JUMPED & PULLED THE VICTIM'S 3 FINGERS INTO THE BLADE, CUTTING THEM. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.</p>
<p>'I DID EVERY THING WRONG. FIRST I WAS TIRED, IT WAS AT THE END OF A SHIFT. I WAS CUTTING TRIM FOR VINYL SIDING AND IT NEEDED TO BE CUT AT AN ANGLE SO I REMOVED THE BLADE GUARD BECAUSE IT IS HARD TO CUT TRIM WITH IT ON, IT MAKES CUTTING AWKWARD. I WAS HOLDING THE VINYL WITH MY RIGHT HAND AND I WAS REACHING OVER THE SAW WITH MY LEFT HAND TO BEGIN PULLING THE VINYL BECAUSE IT HAD STRAYED FROM MY LINE. WHEN I REACHED I CUT MY FINGERS WITH MY BLADE. I HAVE WRAPPED MY HAND AND IMMEDIATELY WENT TO THE HOSPITAL. IT WAS STUPIDITY ON MY PART AND I FEEL AS THOUGH I SHOULD HAVE STUPID STAMPED TO MY FOREHEAD. I WAS STUPID AND I AM STILL PAYING FOR IT.'</p>

APPENDIX B (Continued)
A SAMPLE OF RESPONDENTS' NARRATIVES OF INCIDENTS

Q21. PLEASE DESCRIBE HOW THE ACCIDENT HAPPENED AND WHAT THE INJURIES WERE. THAT IS, WHAT WERE YOU DOING JUST BEFORE, DURING, AND AFTER THE INJURY OCCURRED? PLEASE START WITH WHAT WAS GOING ON JUST BEFORE THE INJURY OCCURRED.

I WAS MAKING SOME WOODEN ARM RESTS FOR MY PICK UP TRUCK AND I WAS SAWING A BOARD, RIPPING IT. I HAD A PUSH STICK PUSHING THE WOOD THRU WITH MY RIGHT HAND AND MY LEFT HAND WAS JUST AT MY SIDE, WHEN THE WOOD CAME OUT OF THE BACKSIDE OF THE SAW, TO KEEP IT FROM FALLING ON THE FLOOR I REACHED AROUND THE BLADE WITH MY LEFT HAND, STUPIDLY, AND I CUT MY INDEX AND MIDDLE FINGER. I ACTUALLY BROKE MY MIDDLE FINGER ALSO. WELL, THE FIRST THING I DID WAS REACH AROUND TO MY POTTERY WHEEL AND GOT A WHITE APRON AND WRAPPED MY HAND UP. I AM ON BLOOD THINNERS SO I WANTED TO TRY TO STOP THE BLEEDING AS SOON AS I COULD. I TURNED EVERYTHING OFF IN THE BASEMENT AND WENT OUT AND CALLED MY WIFE IN, SHE WAS PLANTING PETUNIAS. I TOLD HER I CUT MYSELF AND WE HAD BETTER HEAD ON IN TO THE HOSPITAL. MY WIFE DROVE ME THERE.

VICTIM IS A 58 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM WAS ON HIS 1ST CUT WHEN THE STOCK KICKED BACK & PULLED HIS LEFT HAND TO THE BLADE. VICTIM AMPUTATED ONE FINGER, CUT ANOTHER, & ALSO CUT HIS HAND. VICTIM WENT TO THE ER & WAS TRANSFERRED TO THE HOSPITAL FOR SURGERY.

VICTIM IS A 47 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING FOR A FEW MINUTES WHEN THE STOCK KICKED BACK & PULLED HIS RIGHT HAND TOWARDS THE BLADE & HE CUT 2 FINGERS. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 30 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM WAS ON HIS FIRST CUT & USING 2 PUSH STICKS TO HOLD/GUIDE THE WOOD. THE WOOD THAT HE WAS CUTTING GOT CAUGHT IN THE BLADE & THEN PULLED THE PUSH STICK & HIS LEFT INDEX FINGER TO THE BLADE. VICTIM CUT THE TIP OF HIS FINGER. VICTIM WAS TAKEN TO THE ER, TREATED, & RELEASED.

VICTIM IS AN 84 YEAR OLD MALE WHO WAS USING A TABLE SAW TO CUT SMALL PIECES OF WOOD. VICTIM HAD BEEN CUTTING FOR ABOUT 15 MINUTES & THEN TURNED THE SAW OFF. VICTIM REACHED FOR THE CUT WOOD & PUT HIS RIGHT RING FINGER INTO THE BLADE. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.

VICTIM IS A 67 YEAR OLD MALE WHO WAS USING A TABLE SAW TO RIP WOOD. VICTIM HAD BEEN CUTTING FOR ABOUT 3 HOURS WHEN THE STOCK KICKED BACK & PULLED HIS LEFT THUMB INTO THE BLADE & FRACTURED IT. VICTIM WENT TO THE ER, WAS TREATED, & RELEASED.