# Work-related Hand Injuries and Upper Extremity Amputations

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U.S. Department of Labor
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# Preface

This bulletin contains summaries of the results of two Bureau of Labor Statistics work injury surveys. The first survey covered selected hand injuries to blue-collar workers, January-April 1981; the second survey was limited to arm, hand, or finger amputations, December 1980-May 1981. The findings of these surveys will assist the Occupational Safety and Health Administration (OSHA) in developing safety standards, compliance strategy, and training programs for reducing work-related injuries.

The surveys were conducted by the Bureau's Office of Occupational Safety and Health Statistics, William Mead, Assistant Commissioner, in cooperation with 23 States: Arizona, Arkansas, California, Colorado, Delaware, Hawaii, Idaho, Indiana, Iowa, Kentucky, Maine, Massachusetts, Michigan, Missouri, Montana, Nebraska, New Jersey (amputation survey only), Ohio, Tennessee, Utah, Virginia, Washington, and Wisconsin. The BLS regional offices coordinated State operations. The Offices of Compliance, Standards Development, Statistical Studies and Analysis, and Training of OSHA and the Office of Safety Research of the National Institute for Occupational Safety and Health contributed to the planning and development of the surveys. Maryrose Cline-Buso prepared the summary on hand injuries, and Lyn Pearson summarized the amputation survey and developed the computer programs for both surveys. The surveys were directed by Helen McDonald under the supervision of Herbert Schaffer.

The user should exercise caution in extrapolating survey data to population estimates because of limitations of the surveys. The data were not intended to be statistically representative of the population studied. States participating in data collection may not represent the country as a whole; reporting requirements for workers' compensation reports, which are the source for selecting injuries for study, vary among States; and the data collection periods are not intended to represent the entire year. In addition, because of the exclusion of white-collar and service workers in the hand injuries survey, industries dominated by these occupations are underrepresented. Nevertheless, the data for each survey represent injured workers in the surveyed occupations in the participating States during the periods studied and are, therefore, valid for identifying injury patterns on a relative basis.

For analytical purposes, incidence rates of the injuries studied were not generated nor can they be inferred from the data because information on hours of work is not available. See appendix A for scope and methodology of the surveys.

# Contents

# Part I. Accidents Involving Hand Injuries


## Summary

The Bureau of Labor Statistics survey of workers in blue-collar occupations who suffered hand injuries focused on accidents involving cuts, fractures, scratches, or burns resulting in 1 or more days away from work.[1] Types of accidents were limited to: Struck by or against, caught in or between, rubbed or abraded, contact with temperature extremes, and contact with caustic substances. Based on the most recent data available from the OSHA Annual Survey and the Supplementary Data System, 7.6 percent of the disabling injuries, or an estimated 200,000[2] cases in 1980, met the survey definition.

The BLS survey of hand injuries showed that the largest percentage of the injuries occurred to workers who were operating, maintaining, or repairing fixed (stationary) machinery or equipment. The injuries, which were divided almost evenly between left and right hands, were generally cuts or lacerations. The majority of workers were not wearing gloves at the time of the accident. On the average, workers lost an estimated 17 days away from work as a result of their injuries.

Of the occupations studied, operatives, excluding transport, accounted for 45 percent of the workers injured; craft and kindred workers, 35 percent; and laborers, 14 percent. Among operatives, meatcutters and assemblers were predominant, while mechanics and repairers, machinists, and carpenters ranked highest among craft and kindred workers. Manufacturers employed 60 percent of the injured workers, primarily in fabricated metal products, food and kindred products, and machinery, except electrical. Construction and retail trade accounted for 13 and 8 percent, respectively. Men constituted 86 percent of the workers surveyed.

More than 2 out of every 5 workers were injured while operating, maintaining, or repairing fixed machinery or equipment. Table saws and presses, other than printing presses, were the two most common specific classifications of fixed machinery. As shown in the following table, injuries to those working with fixed machinery or equipment occurred most frequently when their hands either were caught in or between machinery or objects, hit against moving machine parts, or were struck by moving machine parts.

Workers who were lifting, carrying, or handling objects accounted for almost one-fourth of the hand injuries studied. Nearly one-fifth of the injuries occurred to workers using nonpowered handtools, primarily knives. In both situations, the injuries were most frequently the result of flying, falling, or swinging objects striking their hands. In fact, these objects produced the largest number of injuries overall. The two most prevalent types of flying, falling, or swinging objects were metal items and nonpowered handtools.

Of the workers using fixed machinery or power saws, more than two-thirds were operating the equipment when they injured their hands. Almost one-fifth were injured while engaged in cleaning, repairing, or servicing activities. The majority of workers using fixed machinery reported that there were no safeguards, such


[1] For a description of the survey scope and methods, see appendix A.

[2] See appendix A for estimating procedure.

**Text table 1. Type of accident by activity at time of accident**

(Number of workers)

| Type of accident | Activity | | | | | |
|---|---|---|---|---|---|---|
| | Total | Working with fixed (nonportable) machinery | Using powered handtools | Using nonpowered handtools | Lifting, carrying, or holding objects | Other |
| Total | 944 | 416 | 70 | 180 | 214 | 64 |
| Hit against moving machine part(s) | 134 | 115 | 11 | 2 | - | 6 |
| Struck by moving machine part(s) | 153 | 114 | 33 | 1 | 3 | 2 |
| Caught in or between machinery or object | 165 | 116 | 3 | 3 | 24 | 19 |
| Struck by falling, flying, or swinging object | 339 | 42 | 20 | 126 | 127 | 24 |
| Struck against nonmoving object | 121 | 20 | 3 | 41 | 55 | 2 |
| Other | 32 | 9 | - | 7 | 5 | 11 |

- Indicates that no data were reported.

as point-of-operation or barrier guards, in use at the time of their accidents. Of the workers who indicated that safeguards were in use, the three most common explanations for why the safeguards did not prevent their injuries were: Safeguards did not completely enclose all of the dangerous parts of the machines; hands passed through or under safeguards; or hands were in areas not protected by safeguards. Nearly 2 out of 5 also noted that there was a shutoff device within reach, and slightly more indicated that no other safety features were available.

Cuts were the most common injury studied, accounting for nearly 7 out of every 10 injuries. Slightly more than 1 out of 4 of the injuries were fractures. Heat and chemical burns, scratches, and multiple injuries together represented the remaining injuries.

The index finger was injured most frequently, followed by the middle finger, thumb, palm area or back of hand, ring finger, and little finger. Looking at left and right hands separately, the largest difference involved thumb injuries, with the right hand showing proportionately fewer injuries to the thumb than the left. Almost one-half of the external injuries, which exclude fractures, occurred to the back of the hand only, which was twice the proportion of injuries to the palm only. The remaining cases involved both sides of the hand.

The injuries were divided almost evenly between left and right hands, 51 and 48 percent, respectively. Only 1 percent of the cases studied involved both hands. Ninety percent of the injured workers were right handed. This percentage corresponds with the national estimate of adults who are right handed.[3]

The survey was limited to workers whose injuries resulted in 1 or more days away from work. More than one-quarter of the workers estimated that they lost 1 to 5 days, and three-tenths lost 6 to 15 days. The average case resulted in 17 days away from work, which was 1 day more than the national average for all lost workday cases.[4]

Workers were asked to indicate conditions or events which they felt led to their injuries. A wide variety of factors were listed; some were applicable to many work situations while others were more specific. Survey respondents most frequently attributed their injuries to the pace at which they were working, 29 percent, or the fact that they were unaware that their hands were in a hazardous area, 26 percent. Twenty percent felt they misjudged either the time or distance needed to avoid injury. The next three most common explanations, reported by 17 to 19 percent of the workers, were sudden or unintended movement of work materials, tools or equipment, or the hand itself.

Other frequently indicated factors were attention not fully on task, not looking at hands, tools or equipment in bad condition, and tools or machinery not equipped with safeguards. Altogether, about 1 in 12 injuries occurred when work materials, cleaning tools, clothing, or jewelry caught on or were pulled into equipment, dragging the workers' hands in with them.

Seven out of ten workers were not wearing hand protection at the time of injury. When asked to explain why, they generally indicated that gloves were not practical or were not required. Almost 1 out of 4 respondents felt that gloves were unsafe for the work being done, while nearly 1 out of 5 did not think hand protection was needed. One out of eight said gloves were not allowed to be worn on the job. When asked if gloves or other hand protection were available at the time of injury, more than one-half of the unprotected workers said that gloves were provided, usually light cotton or fabric, leather, or general purpose rubber-coated gloves.

Almost three-tenths of the injured workers were wearing gloves or other hand protection at the time of their injury, predominantly light cotton or fabric gloves. One-fourth wore leather gloves, and slightly more than one-tenth wore general purpose rubber-coated gloves. More than three-fifths of the protected workers indicated that they were wearing gloves to protect against cuts, splinters, blisters, scratches, friction, or rope burns.

When asked why the gloves did not prevent their injuries, nearly 2 out of 5 workers said their gloves were torn, punctured, or cut through by the object that injured them, and more than 1 out of 10 indicated that their gloves caught in a machine and pulled in their hands. Almost 3 out of 5 workers reported that the impact produced fractures, scratches, or abrasions without apparent damage to their gloves.

Of the workers wearing hand protection, 44 percent felt that it had no effect on their accidents. Thirty-four percent said it reduced the seriousness of their injuries, and 13 percent indicated that their gloves caused the accident. A majority of the protected workers felt that another type of hand protection would not have prevented their injuries.

A comparison of selected characteristics between workers wearing and not wearing hand protection is shown in the following table. Almost two-thirds of the workers wearing gloves, compared with less than three-fifths of the workers not wearing gloves, were employed in manufacturing. Craft and kindred workers accounted for a smaller percentage of workers using hand protection. The proportion of workers wearing gloves while working with fixed machinery was only 5 percentage points less than that of unprotected workers, 41 and 46 percent, respectively. One of the

[3] U.S. Department of Health and Human Services, National Center for Health Statistics, National Health Examination Survey, Cycle 1 (1960-62).

[4] Bureau of Labor Statistics, *Occupational Injuries and Illnesses in the United States by Industry, 1980,* Bulletin 2130 (1982).

largest differences was reflected in the types of injuries received. Proportionately, workers wearing gloves suffered fewer cuts and more fractures than workers not wearing gloves.

**Text table 2. Workers not wearing or wearing gloves by selected characteristics**

| Characteristics | Workers not wearing gloves | Workers wearing gloves |
|---|---|---|
| **Industry** | | |
| Manufacturing | 58 | 65 |
| Retail trade | 11 | 2 |
| Other | 31 | 33 |
| **Occupation** | | |
| Craft and kindred workers | 39 | 24 |
| Operatives, excluding transport | 44 | 48 |
| Laborers, excluding farm | 12 | 18 |
| Other | 5 | 10 |
| **Nature of injury** | | |
| Cuts, lacerations, or punctures | 76 | 53 |
| Fractures | 20 | 40 |
| Other | 4 | 7 |
| **Activity at time of accident** | | |
| Working with fixed (nonportable) machinery | 46 | 41 |
| Using nonpowered handtool | 21 | 14 |
| Lifting, carrying, or handling objects | 20 | 28 |
| Other | 13 | 17 |

Two-thirds of the workers did not receive any information on gloves. Of those who did, the largest proportion received instructions from their supervisors or employers, usually on when and where to use gloves.

Sixty-seven percent of the workers reported that their employers had no policy on wearing gloves or other hand protection for the work being done at the time of injury. Employers who had a policy were split between those who required gloves, 55 percent, and those who did not allow gloves to be worn, 45 percent. Fifty-six percent of the respondents indicated that gloves or other hand protection were available from their employers at partial or no cost to the employees. A majority of the employers who supplied gloves also had a program or policy for replacing lost, worn, or damaged gloves.

When asked what actions their employers took after the accident to prevent hand injuries from happening to others, three-tenths of the workers surveyed reported that their employers investigated the accident. A similar proportion of the workers said their employers warned other employees about the hazard. More than one-fifth of the respondents indicated no action was taken by their employers to prevent the accident from happening to others, while more than one-fourth did not know if any action was taken.

**Table 1. Industry: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Industry | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| Agriculture, forestry, and fishing | 19 | 2 | 5 | 2 |
| Mining [1] | 3 | ([2]) | 3 | 1 |
| Construction | 122 | 13 | 27 | 10 |
| General building contractors | 41 | 4 | 8 | 3 |
| Heavy construction contractors | 8 | 1 | 6 | 2 |
| Special trade contractors | 73 | 8 | 13 | 5 |
| Manufacturing | 566 | 60 | 172 | 65 |
| Food and kindred products | 76 | 8 | 28 | 11 |
| Textile mill products | 6 | 1 | 1 | ([2]) |
| Apparel and other textile products | 13 | 1 | – | – |
| Lumber and wood products | 65 | 7 | 26 | 10 |
| Furniture and fixtures | 27 | 3 | 4 | 2 |
| Paper and allied products | 23 | 2 | 2 | 1 |
| Printing and publishing | 23 | 2 | 1 | ([2]) |
| Chemicals and allied products | 9 | 1 | 5 | 2 |
| Petroleum and coal products | 2 | ([2]) | 2 | 1 |
| Rubber and miscellaneous plastics products | 35 | 4 | 9 | 3 |
| Leather and leather products | 4 | ([2]) | – | – |
| Stone, clay, and glass products | 11 | 1 | 3 | 1 |
| Primary metal industries | 20 | 2 | 14 | 5 |
| Fabricated metal products | 118 | 13 | 45 | 17 |
| Machinery, except electrical | 78 | 8 | 18 | 7 |
| Electric and electronic equipment | 24 | 3 | 8 | 3 |
| Transportation equipment | 22 | 2 | 4 | 2 |
| Instruments and related products | 3 | ([2]) | 1 | ([2]) |
| Miscellaneous manufacturing industries | 7 | 1 | 1 | ([2]) |
| Transportation and public utilities | 40 | 4 | 16 | 6 |
| Wholesale trade | 53 | 6 | 21 | 8 |
| Retail trade | 79 | 8 | 5 | 2 |
| Finance, insurance, and real estate | 5 | 1 | 2 | 1 |
| Services | 49 | 5 | 9 | 3 |
| Other industries, not elsewhere classified | 8 | 1 | 4 | 2 |

[1] Limited to oil and gas extraction.
[2] Less than 0.5 percent.
NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Dashes indicate that no data were reported.
SOURCE: State workers' compensation reports.

**Table 2. Selected nature of injury: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Nature of injury | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| Burn or scald (heat) | 20 | 2 | 6 | 2 |
| Burn (chemical) | 6 | 1 | 4 | 2 |
| Cut, laceration, puncture—open wound | 653 | 69 | 139 | 53 |
| Fracture | 245 | 26 | 106 | 40 |
| Scratches, abrasions (superficial wounds) | 5 | 1 | 3 | 1 |
| Multiple injuries | 15 | 2 | 6 | 2 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.
SOURCE: State workers' compensation reports.

**Table 3. Source of injury: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Source of injury | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| Animal products | 2 | (1) | – | – |
| Boilers, pressure vessels | 2 | (1) | 2 | 1 |
| Boxes, barrels, containers | 32 | 3 | 17 | 6 |
| Buildings and structures | 12 | 1 | 4 | 2 |
| Ceramic items | 2 | (1) | 1 | (1) |
| Chemicals, chemical compounds | 6 | 1 | 4 | 2 |
| Clothing | 1 | (1) | – | – |
| Coal and petroleum products | 3 | (1) | 1 | (1) |
| Conveyors | 12 | 1 | 3 | 1 |
| Electric apparatus | 10 | 1 | 3 | 1 |
| Flame, fire, smoke | 3 | (1) | 1 | (1) |
| Food products | 2 | (1) | 1 | (1) |
| Furniture, fixtures, etc. | 10 | 1 | 1 | (1) |
| Glass items, not elsewhere classified | 10 | 1 | 2 | 1 |
| Handtools, not powered | 147 | 16 | 38 | 14 |
| Handtools, not powered, unspecified | 1 | (1) | – | – |
| Axe | 2 | (1) | 2 | 1 |
| Blow torch | 1 | (1) | – | – |
| Chisel | 2 | (1) | – | – |
| File | 1 | (1) | – | – |
| Hammer | 20 | 2 | 9 | 3 |
| Knife | 91 | 10 | 19 | 7 |
| Pliers | 1 | (1) | 1 | (1) |
| Rope | 2 | (1) | 2 | 1 |
| Saw | 1 | (1) | – | – |
| Scissors | 4 | (1) | – | – |
| Screwdriver | 3 | (1) | – | – |
| Shovel | 1 | (1) | 1 | (1) |
| Wrench | 4 | (1) | 1 | (1) |
| Handtools, not powered, not elsewhere classified | 13 | 1 | 3 | 1 |
| Handtools, powered | 48 | 5 | 10 | 4 |
| Handtools, powered, unspecified | 1 | (1) | – | – |
| Grinder | 3 | (1) | – | – |
| Drill | 16 | 2 | 2 | 1 |
| Hammer | 2 | (1) | 1 | (1) |
| Knife | 1 | (1) | – | – |
| Saw | 20 | 2 | 7 | 3 |
| Welding tools | 1 | (1) | – | – |
| Handtools, powered, not elsewhere classified | 4 | (1) | – | – |
| Heating equipment (nonelectric), not elsewhere classified | 2 | (1) | 1 | (1) |
| Hoisting apparatus | 14 | 1 | 6 | 2 |
| Liquids, not elsewhere classified | 2 | (1) | 1 | (1) |
| Machines | 352 | 37 | 90 | 34 |
| Machines, unspecified | 7 | 1 | – | – |
| Agitators, mixers | 2 | (1) | – | – |
| Agricultural machines, not elsewhere classified | 3 | (1) | 1 | (1) |
| Buffers, polishers, etc. | 30 | 3 | 9 | 3 |
| Casting, forging, welding | 4 | (1) | 3 | 1 |
| Crushing, pulverizing | 2 | (1) | 1 | (1) |
| Drilling, boring | 26 | 3 | 4 | 2 |
| Highway construction | 3 | (1) | 2 | 1 |
| Mining | 1 | (1) | 1 | (1) |
| Packaging, wrapping | 10 | 1 | 2 | 1 |
| Picking, carding, etc. | 1 | (1) | – | – |
| Planers, shapers, molders | 23 | 2 | 3 | 1 |
| Presses (not printing) | 38 | 4 | 16 | 6 |
| Printing | 15 | 2 | 1 | (1) |
| Rolls | 10 | 1 | 4 | 2 |
| Saws | 85 | 9 | 19 | 7 |
| Shears, slitters, slicers | 28 | 3 | 7 | 3 |
| Stitching, sewing | 9 | 1 | – | – |

See footnotes at end of table.

**Table 3. Source of injury: Hand injuries resulting in days away from work, selected States, January-April 1981—Continued**

| Source of injury | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| **Machines—Continued** | | | | |
| Weaving, knitting, spinning | 4 | [1] | – | – |
| Machines, not elsewhere classified | 51 | 5 | 17 | 6 |
| Mechanical power transmission apparatus | 7 | 1 | 3 | 1 |
| Metal items | 183 | 19 | 48 | 18 |
| Metal items, unspecified | 13 | 1 | 5 | 2 |
| Automobile parts | 13 | 1 | 1 | [1] |
| Beams, bars | 15 | 2 | 5 | 2 |
| Molds | 8 | 1 | 4 | 2 |
| Molten metal | 1 | [1] | – | – |
| Nails, spikes, etc. | 12 | 1 | 2 | 1 |
| Pipe | 15 | 2 | 6 | 2 |
| Screws, nuts, bolts | 3 | [1] | 2 | 1 |
| Metal items, not elsewhere classified | 103 | 11 | 23 | 9 |
| Mineral items, nonmetallic, not elsewhere classified | 3 | [1] | 2 | 1 |
| Plastic items, not elsewhere classified | 1 | [1] | – | – |
| Pumps and prime movers | 6 | 1 | 2 | 1 |
| Radiating substances and equipment | 1 | [1] | – | – |
| Vehicles | 38 | 4 | 12 | 5 |
| Wood items | 24 | 3 | 8 | 3 |
| Miscellaneous, not elsewhere classified | 6 | 1 | 2 | 1 |
| Nonclassifiable | 3 | [1] | 1 | [1] |

[1] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Dashes indicate that no data were reported.

SOURCE: State workers' compensation reports.

**Table 4. Age of worker: Hand injuries resulting in days away from work, selected States, January-April 1981**

| Age | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| 16—19 years | 62 | 7 | 15 | 6 |
| 20—24 years | 243 | 26 | 56 | 21 |
| 25—34 years | 276 | 29 | 78 | 30 |
| 35—44 years | 137 | 15 | 48 | 18 |
| 45—54 years | 95 | 10 | 25 | 9 |
| 55—64 years | 90 | 10 | 28 | 11 |
| 65 years or more | 14 | 1 | 3 | 1 |
| Not available | 27 | 3 | 11 | 4 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 5. Sex of worker: Hand injuries resulting in days away from work, selected States, January-April 1981**

| Sex | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| Men | 811 | 86 | 231 | 88 |
| Women | 133 | 14 | 33 | 13 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 6. Selected occupations: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Occupation | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Total | 944 | 100 | 264 | 100 |
| **Craft and kindred workers** | 331 | 35 | 64 | 24 |
| Automobile accessories installers | 1 | (1) | – | – |
| Bakers | 7 | 1 | – | – |
| Boilermakers | 2 | (1) | 2 | 1 |
| Bulldozer operators | 2 | (1) | 1 | (1) |
| Cabinetmakers | 2 | (1) | 1 | (1) |
| Carpenters | 37 | 4 | 6 | 2 |
| Carpenter apprentices | 6 | 1 | – | – |
| Carpet installers | 4 | (1) | – | – |
| Cement and concrete finishers | 3 | (1) | 1 | (1) |
| Crane, derrick, and hoist operators | 1 | (1) | 1 | (1) |
| Decorators and window dressers | 1 | (1) | – | – |
| Electricians | 12 | 1 | 2 | 1 |
| Electric power line and cable installers and repairers | 1 | (1) | 1 | (1) |
| Excavating, grading, and road machine operators, excluding bulldozers | 4 | (1) | 2 | 1 |
| Floor layers, excluding tile setters | 1 | (1) | – | – |
| Blue-collar worker supervisors, not elsewhere classified | 11 | 1 | 4 | 2 |
| Glaziers | 5 | 1 | – | – |
| Inspectors, sealers, and graders, log and lumber | 3 | (1) | 3 | 1 |
| Inspectors, not elsewhere classified | 1 | (1) | – | – |
| Job-and-die setters, metal | 2 | (1) | 1 | (1) |
| Machinists | 40 | 4 | 5 | 2 |
| Mechanics and repairers | 82 | 9 | 11 | 4 |
| Air-conditioning, heating, and refrigeration | 2 | (1) | – | – |
| Aircraft mechanics | 1 | (1) | – | – |
| Automotive body repairers | 3 | (1) | – | – |
| Automobile mechanics | 17 | 2 | 1 | (1) |
| Farm implement mechanics | 5 | 1 | 2 | 1 |
| Heavy equipment mechanics | 24 | 3 | 2 | 1 |
| Household appliance and accessory installers and mechanics | 1 | (1) | – | – |
| Mechanic apprentices, excluding auto | 3 | (1) | – | – |
| Miscellaneous mechanics and repairers | 21 | 2 | 5 | 2 |
| Mechanics and repairers, not specified | 5 | 1 | 1 | (1) |
| Millers; grain, flour, feed | 1 | (1) | – | – |
| Millwrights | 8 | 1 | 2 | 1 |
| Molders, metal | 11 | 1 | 5 | 2 |
| Molder apprentices | 1 | (1) | 1 | (1) |
| Painters, construction and maintenance | 1 | (1) | – | – |
| Pattern and model makers, excluding paper | 1 | (1) | – | – |
| Plumbers and pipefitters | 13 | 1 | 5 | 2 |
| Plumber and pipefitter apprentices | 1 | (1) | – | – |
| Printing press operators | 16 | 2 | 2 | 1 |
| Roofers and slaters | 4 | (1) | 1 | (1) |
| Sheetmetal workers and tinsmiths | 9 | 1 | 4 | 2 |
| Sheetmetal apprentices | 2 | (1) | – | – |
| Sign painters and letterers | 1 | (1) | – | – |
| Stationary engineers | 1 | (1) | – | – |
| Structural metal workers | 4 | (1) | 1 | (1) |
| Telephone line installers and repairers | 1 | (1) | – | – |
| Tile setters | 1 | (1) | – | – |
| Tool-and-die makers | 7 | 1 | 1 | (1) |
| Tool-and-die maker apprentices | 4 | (1) | – | – |
| Specified craft apprentices, not elsewhere classified | 2 | (1) | – | – |
| Apprentices, not specified | 3 | (1) | – | – |
| Craft and kindred workers, not elsewhere classified | 11 | 1 | 1 | (1) |

See footnotes at end of table.

**Table 6. Selected occupations: Hand injuries resulting in days away from work, selected States, January–April 1981—Continued**

| Occupation | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| **Operatives, excluding transport** | 428 | 45 | 127 | 48 |
| Asbestos and insulation workers | 1 | (1) | 1 | (1) |
| Assemblers | 33 | 3 | 5 | 2 |
| Surveyor helpers | 1 | (1) | 1 | (1) |
| Checkers, examiners, inspectors; manufacturing | 3 | (1) | 1 | (1) |
| Clothing ironers and pressers | 1 | (1) | – | – |
| Cutting operatives, not elsewhere classified | 13 | 1 | 3 | 1 |
| Dressmakers, excluding factory | 2 | (1) | – | – |
| Drywall installers and lathers | 2 | (1) | – | – |
| Filers, polishers, sanders, buffers | 5 | 1 | – | – |
| Furnace tenders, smelters, and pourers; metal | 3 | (1) | 3 | 1 |
| Garage workers and gas station attendants | 1 | (1) | – | – |
| Produce graders and packers, excluding factory and farm | 1 | (1) | 1 | (1) |
| Laundry and drycleaning operatives, not elsewhere classified | 4 | (1) | 2 | 1 |
| Meatcutters and butchers, excluding manufacturing | 31 | 3 | 3 | 1 |
| Meatcutters and butchers, manufacturing | 35 | 4 | 17 | 6 |
| Mine operatives, not elsewhere classified | 4 | (1) | 3 | 1 |
| Mixing operatives | 2 | (1) | 1 | (1) |
| Oilers and greasers, excluding auto | 4 | (1) | 2 | 1 |
| Packers and wrappers, excluding retail | 13 | 1 | 3 | 1 |
| Painters, manufactured articles | 1 | (1) | – | – |
| Photographic process workers | 1 | (1) | – | – |
| Drill press operatives | 9 | 1 | 4 | 2 |
| Grinding machine operatives | 19 | 2 | 10 | 4 |
| Lathe and milling machine operatives | 14 | 1 | 1 | (1) |
| Precision machine operatives, not elsewhere classified | 12 | 1 | 3 | 1 |
| Punch and stamping press operatives | 13 | 1 | 8 | 3 |
| Riveters and fasteners | 1 | (1) | – | – |
| Sawyers | 23 | 2 | 11 | 4 |
| Sewers and stitchers | 8 | 1 | – | – |
| Shoemaking machine operatives | 3 | (1) | – | – |
| Furnace tenders and stokers, excluding metal | 1 | (1) | – | – |
| Carding, lapping, combing operative | 1 | (1) | – | – |
| Knitters, loopers, toppers | 2 | (1) | – | – |
| Spinners, twisters, winders | 1 | (1) | – | – |
| Weavers | 1 | (1) | – | – |
| Textile operatives, not elsewhere classified | 2 | (1) | – | – |
| Welders and flame cutters | 13 | 1 | 6 | 2 |
| Winding operatives, not elsewhere classified | 1 | (1) | – | – |
| Machine operatives, miscellaneous specified | 70 | 7 | 18 | 7 |
| Machine operatives, not specified | 25 | 3 | 4 | 2 |
| Miscellaneous operatives | 33 | 3 | 12 | 5 |
| Operatives, not specified | 15 | 2 | 4 | 2 |
| **Transport equipment operatives** | 28 | 3 | 16 | 6 |
| Delivery and route workers | 3 | (1) | – | – |
| Forklift and tow motor operatives | 4 | (1) | 2 | 1 |
| Truckdrivers | 21 | 2 | 14 | 5 |
| **Laborers, excluding farm** | 131 | 14 | 47 | 18 |
| Construction laborers, excluding carpenter helpers | 11 | 1 | 4 | 2 |
| Freight, material handlers | 8 | 1 | 2 | 1 |
| Garbage collectors | 3 | (1) | 2 | 1 |
| Gardeners and groundskeepers, excluding farm | 3 | (1) | – | – |
| Longshore workers and stevedores | 1 | (1) | – | – |
| Timber cutting and logging workers | 8 | 1 | 7 | 3 |
| Stock handlers | 11 | 1 | 1 | (1) |
| Vehicle and equipment cleaners | 2 | (1) | 1 | (1) |
| Warehouse laborers, not elsewhere classified | 17 | 2 | 6 | 2 |

See footnotes at end of table.

**Table 6. Selected occupations: Hand injuries resulting in days away from work, selected States, January-April 1981—Continued**

| Occupation | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| **Laborers, excluding farm—Continued** | | | | |
| Miscellaneous laborers | 57 | 6 | 19 | 7 |
| Laborers, not specified | 10 | 1 | 5 | 2 |
| **Farm laborers and farm laborer supervisors** | 11 | 1 | 4 | 2 |
| **Nonclassifiable** | 15 | 2 | 6 | 2 |

[1] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Dashes indicate that no data were reported.

SOURCE: State workers' compensation reports.

**Table 7. Activity and type of accident: Hand injuries resulting in days away from work, selected States, January-April 1981**

| Activity and type | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **What were you doing at the time of your injury?** | | | | |
| Total | 944 | 100 | 264 | 100 |
| Working with or on fixed (nonportable) machinery or equipment | 416 | 44 | 108 | 41 |
| Operating or repairing industrial or farm vehicles | 35 | 4 | 17 | 6 |
| Using powered handtool (for example: Portable drill, portable saw) | 70 | 7 | 20 | 8 |
| Using nonpowered handtool (for example: Knife, hammer) | 180 | 19 | 36 | 14 |
| Lifting, carrying, or handling objects | 214 | 23 | 75 | 28 |
| Working with chemicals | 6 | 1 | 4 | 2 |
| Other | 23 | 2 | 4 | 2 |
| **How was your hand injured?** | | | | |
| Total | 944 | 100 | 264 | 100 |
| Hand hit against moving machine part(s) | 134 | 14 | 29 | 11 |
| Hand was struck by moving machine part(s) | 153 | 16 | 40 | 15 |
| Hand was caught in or between machinery or objects | 165 | 17 | 53 | 20 |
| Flying, falling, or swinging object struck hand | 339 | 36 | 105 | 40 |
| Struck hand against nonmoving object | 121 | 13 | 26 | 10 |
| Chemical, caustic, or acid burned hand | 6 | 1 | 4 | 2 |
| Occurred in other way | 26 | 3 | 7 | 3 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

**Table 8. Conditions or events contributing to injury: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Condition or event | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **Indicate any conditions or events which you feel led to your injury.** | | | | |
| Total [1] | 939 | ([1]) | 263 | ([1]) |
| In a hurry | 268 | 29 | 74 | 28 |
| Did not realize hand was in hazardous area | 247 | 26 | 70 | 27 |
| Misjudged time or distance needed to avoid injury | 184 | 20 | 55 | 21 |
| Work material shifted position or broke | 183 | 19 | 53 | 20 |
| Tool or machinery shifted position or slipped | 162 | 17 | 45 | 17 |
| Hand slipped | 159 | 17 | 26 | 10 |
| Attention not fully on task | 99 | 11 | 14 | 5 |
| Not looking at hand | 94 | 10 | 22 | 8 |
| Tool or equipment was in bad condition (for example: Dull blade) | 88 | 9 | 24 | 9 |
| Tool or machinery not equipped with safeguard (such as a barrier guard) | 84 | 9 | 29 | 11 |
| Co-worker did something that caused your injury | 70 | 7 | 26 | 10 |
| Recent change in work routine or procedures | 59 | 6 | 19 | 7 |
| Little or no instructions given on how to do task | 54 | 6 | 20 | 8 |
| Tool or machinery accidentally activated | 53 | 6 | 12 | 5 |
| Tool or machinery broke or malfunctioned | 53 | 6 | 16 | 6 |
| Using wrong type of tool or equipment for job | 49 | 5 | 10 | 4 |
| Unfamiliar with tool or equipment used | 49 | 5 | 14 | 5 |
| View of hand blocked by part of machine or other object | 47 | 5 | 11 | 4 |
| Upset or under stress | 44 | 5 | 6 | 2 |
| Hand/finger(s) pulled into machine by work material | 24 | 3 | 7 | 3 |
| Tool or machinery had been altered or modified at the job site (for example: Barrier guard removed) | 40 | 4 | 8 | 3 |
| Gloves, clothing, jewelry, or watch got caught in the equipment | 36 | 4 | 33 | 13 |
| Tired or bored | 28 | 3 | 7 | 3 |
| Tool or machinery continued to run after being shut off (coasting) | 25 | 3 | 6 | 2 |
| Visibility poor due to inadequate lighting, dust, or glare | 23 | 2 | 7 | 3 |
| Task not being done according to instructions | 20 | 2 | 7 | 3 |
| Machine power not turned off | 20 | 2 | 5 | 2 |
| Accidentally hit foot pedal on machine | 19 | 2 | 3 | 1 |
| Safeguard on tool or machine failed | 15 | 2 | 2 | 1 |
| Reacted to loud noise or other distraction | 14 | 1 | 1 | ([2]) |
| Cleaning tool, cloth, or rag got caught in the equipment | 13 | 1 | 2 | 1 |
| Other factors contributed to injury | 29 | 3 | 12 | 5 |
| No contributing factors indicated | 43 | 5 | 13 | 5 |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

[2] Less than 0.5 percent.

NOTE: See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

**Table 9. Part of hand injured: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Part injured | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **Indicate which hand was injured.** | | | | |
| Total | 943 | 100 | 263 | 100 |
| Left hand only | 481 | 51 | 131 | 50 |
| Right hand only | 450 | 48 | 128 | 49 |
| Both hands | 12 | 1 | 4 | 2 |
| **On which side of the hand did your injury occur?** | | | | |
| Total [1] | 699 | 100 | 158 | 100 |
| Back of hand/finger only | 338 | 48 | 66 | 42 |
| Palm side of hand/finger only | 168 | 24 | 38 | 24 |
| Both sides of hand/finger | 193 | 28 | 54 | 34 |
| **Indicate where your hand was injured.** | | | | |
| Total [2] | 943 | ([2]) | 263 | ([2]) |
| Left hand: | | | | |
| Thumb | 122 | 13 | 26 | 10 |
| Index finger | 140 | 15 | 30 | 11 |
| Middle finger | 109 | 12 | 38 | 14 |
| Ring finger | 92 | 10 | 30 | 11 |
| Little finger | 59 | 6 | 19 | 7 |
| Palm area (includes back of hand) | 93 | 10 | 28 | 11 |
| Right hand: | | | | |
| Thumb | 82 | 9 | 21 | 8 |
| Index finger | 146 | 15 | 34 | 13 |
| Middle finger | 124 | 13 | 32 | 12 |
| Ring finger | 91 | 10 | 36 | 14 |
| Little finger | 72 | 8 | 19 | 7 |
| Palm area (includes back of hand) | 93 | 10 | 24 | 9 |
| **Are you left or right handed?** | | | | |
| Total | 911 | 100 | 252 | 100 |
| Left handed | 95 | 10 | 33 | 13 |
| Right handed | 816 | 90 | 219 | 87 |

[1] Excludes fractures.

[2] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

**Table 10. Use of gloves: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Use of gloves | Workers | Percent |
|---|---|---|
| **Were you wearing gloves or other hand protection at the time of your injury?** | | |
| Total | 944 | 100 |
| No | 680 | 72 |
| Yes—on both hands | 241 | 26 |
| Yes—on one hand only | 23 | 2 |
| **If you were wearing gloves:** | | |
| **Indicate the type of gloves or other hand protection you were wearing when injured.** | | |
| Total | 260 | 100 |
| Leather gloves | 65 | 25 |
| Light cotton or fabric gloves | 121 | 47 |
| Heavy-duty canvas gloves | 21 | 8 |
| Gloves for use with chemicals | 1 | (1) |
| General purpose rubber-coated gloves | 33 | 13 |
| Thin rubber (surgical) gloves | 6 | 2 |
| Steel mesh gloves | 6 | 2 |
| Asbestos gloves | 2 | 1 |
| Other | 3 | 1 |
| Don't know | 2 | 1 |
| **Indicate why the gloves or other hand protection did not prevent your injury.** | | |
| Total [2] | 252 | (2) |
| Gloves were torn, punctured, or cut through by object | 97 | 38 |
| Object or chemical went under or around gloves | 4 | 2 |
| Chemical, hot object, or fire burned through glove | 3 | 1 |
| Chemical soaked through glove without damaging it | – | – |
| Hand was fractured, scratched, or abraded inside glove | 144 | 57 |
| Heat or cold penetrated gloves | 2 | 1 |
| Gloves caught in machine and pulled hand in | 32 | 13 |
| Injured area not covered by hand protection | 6 | 2 |
| Gloves were in bad condition before accident | 5 | 2 |
| Other | – | – |
| Don't know | 2 | 1 |
| **What were the gloves you were wearing intended to protect against?** | | |
| Total [2] | 258 | (2) |
| Cold temperatures | 72 | 28 |
| Burns from heat, hot objects, or fire | 48 | 19 |
| Chemical burns or dermatitis | 7 | 3 |
| Cuts, splinters, blisters, scratches, friction, or rope burns | 163 | 63 |
| Other | 22 | 9 |
| Don't know | 5 | 2 |
| **What effect do you feel the gloves or other hand protection had on the accident?** | | |
| Total | 252 | 100 |
| Reduced the seriousness of the injury | 85 | 34 |
| Caused the accident (for example: Glove pulled into machine) | 34 | 13 |
| Contributed to the injury (for example: Glove cut, burned, or scratched skin) | 7 | 3 |
| No effect on the injury | 112 | 44 |
| Don't know | 14 | 6 |

See footnotes at end of table.

**Table 10. Use of gloves: Hand injuries resulting in days away from work, selected States, January–April 1981—Continued**

| Use of gloves | Workers | Percent |
|---|---|---|
| **Do you feel another type of glove or other hand protection could have prevented your injury?** | | |
| Total | 253 | 100 |
| No | 205 | 81 |
| Yes | 31 | 12 |
| Don't know | 17 | 7 |
| **If you feel another type of glove or other hand protection could have prevented your injury, was it available at the job site when injured?** | | |
| Total | 26 | 100 |
| No | 16 | 62 |
| Yes | 8 | 31 |
| Don't know | 2 | 8 |
| **If you were not wearing gloves or other hand protection:** | | |
| **Indicate why you were not wearing gloves or other hand protection at the time of your injury.** | | |
| Total [2] | 648 | (2) |
| Not allowed to wear them | 80 | 12 |
| Not practical or hard to work with them on | 371 | 57 |
| Did not think they were needed | 119 | 18 |
| Not required to wear | 253 | 39 |
| Took them off immediately before the accident | 18 | 3 |
| Unsafe to wear gloves for the work you were doing | 147 | 23 |
| Other | 9 | 1 |
| **What type of gloves or other hand protection, if any, were available at the worksite when your injury occurred?** | | |
| Total [2] | 558 | (2) |
| Leather gloves | 91 | 16 |
| Light cotton or fabric gloves | 142 | 25 |
| Heavy-duty canvas gloves | 51 | 9 |
| Gloves for use with chemicals | 29 | 5 |
| General purpose rubber-coated gloves | 74 | 13 |
| Thin rubber (surgical) gloves | 17 | 3 |
| Steel mesh gloves | 22 | 4 |
| Asbestos gloves | 28 | 5 |
| Other | 4 | 1 |
| Don't know | 52 | 9 |
| None available | 220 | 39 |

[1] Less than 0.5 percent.

[2] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question. Dashes indicate that no data were reported.

SOURCE: Survey questionnaire.

**Table 11. Practices and policies: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Practice and policy | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **What was your employer's policy on wearing gloves or hand protection for the type of work you were doing at the time of injury?** | | | | |
| Total | 894 | 100 | 247 | 100 |
| Required for work being done | 108 | 12 | 92 | 37 |
| Not allowed to wear any type of gloves or hand protection for work being done | 88 | 10 | 3 | 1 |
| No policy | 602 | 67 | 116 | 47 |
| Don't know | 96 | 11 | 36 | 15 |
| **What information were you given regarding gloves or other hand protection?** | | | | |
| Total [1] | 815 | ([1]) | 227 | ([1]) |
| When and where to use them | 130 | 16 | 52 | 23 |
| When and where not to use them | 95 | 12 | 18 | 8 |
| Specific type to wear for specific job | 82 | 10 | 29 | 13 |
| Limitations and advantages of gloves or other hand protection | 103 | 13 | 33 | 15 |
| Other | 1 | ([2]) | 1 | ([2]) |
| Not given any information | 538 | 66 | 129 | 57 |
| **If you were given information regarding gloves or other hand protection:** | | | | |
| **a. How did you receive this information?** | | | | |
| Total [1] | 250 | ([1]) | 94 | ([1]) |
| Supervisor or employer | 180 | 72 | 63 | 67 |
| Co-worker | 75 | 30 | 29 | 31 |
| Company safety official | 43 | 17 | 20 | 21 |
| Union representative | 13 | 5 | 7 | 7 |
| Other | 11 | 4 | 2 | 2 |
| **b. Would this information be enough to help you select the proper type of hand protection?** | | | | |
| Total | 239 | 100 | 88 | 100 |
| No | 29 | 12 | 12 | 14 |
| Yes | 179 | 75 | 65 | 74 |
| Don't know | 31 | 13 | 11 | 13 |
| **Are gloves or other hand protection available from your employer?** | | | | |
| Total | 796 | 100 | 236 | 100 |
| Yes—available at no cost from employer | 414 | 52 | 138 | 58 |
| Yes—employer pays part of cost | 29 | 4 | 15 | 6 |
| No—must be purchased at own expense | 246 | 31 | 77 | 33 |
| Other | 12 | 2 | 2 | 1 |
| Don't know | 95 | 12 | 4 | 2 |

See footnotes at end of table.

**Table 11. Practices and policies: Hand injuries resulting in days away from work, selected States, January–April 1981—Continued**

| Practice and policy | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **If your employer supplies gloves, does the company have a policy or program for replacing lost, worn, or damaged gloves?** | | | | |
| Total | 427 | 100 | 145 | 100 |
| No | 48 | 11 | 17 | 12 |
| Yes | 313 | 73 | 108 | 74 |
| Don't know | 66 | 15 | 20 | 14 |
| **What actions, if any, did your employer take after your accident to prevent such an injury from happening to others?** | | | | |
| Total [1] | 840 | ([1]) | 234 | ([1]) |
| Investigated accident | 254 | 30 | 62 | 26 |
| Conducted safety training or reviewed safety procedures | 70 | 8 | 13 | 6 |
| Installed safeguards (such as point of operation or barrier guards) | 40 | 5 | 14 | 6 |
| Repaired or replaced equipment | 71 | 8 | 19 | 8 |
| Warned other employees about hazard | 235 | 28 | 63 | 27 |
| Required use of appropriate type of hand protection | 13 | 2 | 1 | ([2]) |
| Warned employees not to use hand protection | 7 | 1 | 5 | 2 |
| Other action | 4 | ([2]) | – | – |
| Employer took no action | 177 | 21 | 48 | 21 |
| Don't know | 230 | 27 | 74 | 32 |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

[2] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question. Dashes indicate that no data were reported.

SOURCE: Survey questionnaire.

**Table 12. Activity and use of safeguards by workers using fixed machinery or power saws: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Activity and use of safeguard | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **What type of work were you doing at the time of your injury?** | | | | |
| Total | 409 | 100 | 109 | 100 |
| Operating machine or saw | 277 | 68 | 81 | 74 |
| Unjamming machine, saw, or material | 30 | 7 | 9 | 8 |
| Cleaning, repairing, servicing, etc., machine or saw | 68 | 17 | 15 | 14 |
| Setting up machine or saw | 33 | 8 | 4 | 4 |
| Other | 1 | (1) | – | – |
| **Was a safeguard in use at the time of your accident?** | | | | |
| Total | 347 | 100 | 87 | 100 |
| No | 226 | 65 | 63 | 72 |
| Yes | 100 | 29 | 20 | 23 |
| Don't know | 21 | 6 | 4 | 5 |
| **If a safeguard was in use, why didn't it prevent your injury?** | | | | |
| Total [2] | 88 | (2) | 17 | (2) |
| Hand passed through or under safeguard | 23 | 26 | 2 | 12 |
| Hand was in area of machine not protected by safeguard | 20 | 23 | 2 | 12 |
| Safeguard did not completely enclose dangerous parts of machine | 28 | 32 | 6 | 35 |
| Safeguard was not in proper position at time of accident | 11 | 13 | 3 | 18 |
| Safeguard malfunctioned or broke (for example: Device did not stop machine in time) | 9 | 10 | 2 | 12 |
| Safeguard was improperly adjusted | 8 | 9 | 2 | 12 |
| Object was thrown from machine | 4 | 5 | 1 | 6 |
| Other | 3 | 3 | 3 | 18 |
| Don't know | 2 | 2 | – | – |
| **Were there any other safety features available at the time of your injury?** | | | | |
| Total [2] | 311 | (2) | 80 | (2) |
| Push sticks, blocks, gripping pliers, or other holding devices | 39 | 13 | 6 | 7 |
| Hazard warning device (for example: An alarm) | 1 | (1) | – | – |
| Shut-off device within reach | 118 | 38 | 27 | 34 |
| Other | 5 | 2 | 1 | 1 |
| Don't know | 32 | 10 | 9 | 11 |
| No other safety features available | 132 | 42 | 39 | 49 |

[1] Less than 0.5 percent.

[2] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question. Dashes indicate that no data were reported.

SOURCE: Survey questionnaire.

**Table 13. Estimated days away from work: Hand injuries resulting in days away from work, selected States, January–April 1981**

| Days away from work | All workers | | Workers wearing gloves | |
|---|---|---|---|---|
| | Workers | Percent | Workers | Percent |
| **How many workdays did you (or do you expect to) lose due to your injury? (NOTE: Do not count the day of injury, days on light-duty work, normal days off, or holidays.)** | | | | |
| Total [1] | 939 | 100 | 263 | 100 |
| 1 to 5 days | 254 | 27 | 56 | 21 |
| 6 to 10 days | 170 | 18 | 33 | 13 |
| 11 to 15 days | 105 | 11 | 37 | 14 |
| 16 to 20 days | 82 | 9 | 16 | 6 |
| 21 to 25 days | 61 | 6 | 24 | 9 |
| 26 to 30 days | 63 | 7 | 26 | 10 |
| 31 to 40 days | 60 | 6 | 22 | 8 |
| 41 to 60 days | 55 | 6 | 23 | 9 |
| More than 60 days | 19 | 2 | 6 | 2 |
| Number of days away from work not estimated | 70 | 7 | 20 | 8 |
| Average days away from work per lost workday case | 17 | | 21 | |

[1] Excludes five workers who retired, were laid off, or put on permanent disability.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaire.

# Part II. Accidents Resulting In Arm, Hand, or Finger Amputations


## Summary

Work-related amputations involving the upper extremities (arms, hands, or fingers) result in loss of manual dexterity often affecting workers' job skills and future employment opportunities. In addition, the disfigurement and impairment of function can have social and psychological consequences which extend beyond the work environment. Based on the most recent data available from the OSHA Annual Survey and the Supplementary Data System, an estimated 16,000 workers[5] experienced finger, hand, or arm amputations in 1980. Their injuries accounted for 96 percent of all amputations. Indemnity compensation[6] for the loss of a finger averaged $3,144 per case while the loss of a hand averaged $13,500 and the loss of an arm, nearly $28,000.

The BLS survey of work-related arm, hand, or finger amputations[7] indicated that nearly one-fourth of the injured workers were under 25 years of age, and about one-half were under 35. The injuries were distributed equally between left and right hands, and none involved bilateral amputations. Most amputations were limited to fingers; four workers lost an entire hand; and three lost all or part of an arm.

More than 3 out of 4 amputations studied were restricted to a single finger, most often the index or middle finger. When more than one finger was involved, it was usually some combination of the index, middle, and ring fingers that was injured. Approximately three-fourths of the amputations occurred within the distal phalange,[8] which is farthest from the palm and generally considered the tip of the finger. Slightly more than one-tenth of the workers lost one or more complete fingers, that is, the amputations occurred within the proximal phalange.

Although workers in virtually all industries were surveyed, more than 3 out of 5 were employed in manufacturing. Within this industry group, fabricated metal products accounted for 11 percent of the injuries; lumber and wood products, 8 percent; food and kindred products, and machinery (except electrical), 7 percent each. More than 7 out of 10 workers were employed as either craft workers or operatives (excluding transport) at the time of injury. Among craft workers, two groups sustained the greatest number of injuries: Mechanics and repairers, 10 percent, and carpenters, 5 percent. Injuries among operatives were distributed about evenly over more than 30 job classifications.

Machines were the leading source of injury. In fact, two-thirds of the workers surveyed said they were working with or on fixed machinery when the injury occurred. Although numerous types of machines were implicated in these accidents, saws and presses (other than printing presses) accounted for the highest proportion of injuries, 16 and 10 percent, respectively.

Those who were injured while working with fixed machinery or power saws were asked to describe their activities at the time the accident occurred. About three-fifths of these workers were actually operating the equipment while slightly more than one-fifth were cleaning, repairing, or servicing it.

Workers also were asked to indicate whether their amputations were the result of cutting, crushing, or pulling forces, or some combination of these. While cutting and crushing actions were cited equally by all workers, those working with fixed machinery experienced more amputations from cutting than crushing, as shown in text table 3. This reflects, at least in part, the relatively high percentage of injured workers using machines such as saws, shears, slitters, and slicers.

As shown in text table 4, those working with fixed machinery were equally likely to be injured by striking against moving machine parts, such as saw blades; being struck by moving machine parts; or getting caught in or between machinery or work material.

Fifteen percent of the workers were injured while lifting, carrying, or handling objects. Text tables 3 and 4 show that these workers were more than twice as likely to suffer crushing rather than cutting injuries and


[5] See appendix A for estimating procedure.

[6] Derived from 1979 indemnity compensation data provided by 12 States participating in the BLS Supplementary Data System.

[7] See appendix A for the survey definition and scope of survey.

[8] See illustration in appendix D.

**Text table 3. Force of amputation by activity at time of accident**

(Number of workers)

| Force of amputation | Activity | | | | | |
|---|---|---|---|---|---|---|
| | Total | Working with fixed (nonportable) machinery | Working with industrial or farm vehicles | Using handtool (powered or nonpowered) | Lifting, carrying, or handling objects | Other |
| Total [1] | 861 | 572 | 54 | 54 | 126 | 55 |
| Cutting action | 444 | 321 | 19 | 37 | 43 | 24 |
| Pulling force | 96 | 64 | 7 | 3 | 8 | 14 |
| Crushing force | 442 | 268 | 37 | 17 | 92 | 28 |
| Other | 2 | - | 1 | 1 | - | - |

[1] Columns do not add to total because of multiple responses. - Indicates no data were reported.

**Text table 4. Type of accident by activity at time of accident**

(Number of workers)

| Type of accident | Activity | | | | | |
|---|---|---|---|---|---|---|
| | Total | Working with fixed (nonportable) machinery | Working with industrial or farm vehicles | Using handtool (powered or nonpowered) | Lifting, carrying, or handling objects | Other |
| Total | 861 | 573 | 54 | 54 | 126 | 55 |
| Hit against moving machine part(s) | 204 | 180 | 2 | 16 | - | 6 |
| Struck by moving machine part(s) | 215 | 186 | 8 | 15 | - | 6 |
| Caught in or between machinery or objects | 295 | 194 | 32 | 10 | 39 | 20 |
| Struck by falling, flying, or swinging object | 130 | 11 | 11 | 11 | 85 | 12 |
| Other | 18 | 2 | 1 | 2 | 2 | 11 |

- Indicates no data were reported.

that about two-thirds were hurt by falling, flying, or swinging objects. Sometimes the object being handled was responsible for the amputation, as when one worker's fingers were crushed by a 55-gallon drum he was securing in a truck. The drum shifted suddenly, pinning his fingers to the wall of the truck. In other instances, the object being handled was incidental to the accident, such as when a door suddenly swung shut and amputated the finger of a worker who was carrying a rack of test tubes.

Six percent of those injured were working with handtools. Text table 3 shows that nearly 7 out of 10 of these workers experienced cutting amputations. Text table 4 indicates their injuries most often occurred when they struck against or were struck by moving equipment or machinery, usually the tools with which they were working.

Two injuries occurred in ways that were unique and, therefore, could not be classified as cutting, crushing, or pulling types of amputations. In one case, a worker's finger was amputated by a stream of liquid under 2,250 pounds of pressure per square inch. The other worker's finger was twisted off by a powered handtool.

The most serious amputations were sustained by seven workers, four of whom lost a hand at the wrist, two who lost the lower portion of an arm, and one who lost the entire arm. All of these amputations were on the right side of the body. Six of the seven injuries were the result of contact with moving machinery. Three of the seven workers were either setting up or unjamming equipment when their co-workers mistakenly activated the equipment. The first was staging a piece of lumber to be cut when a co-worker activated the saw. The injured worker was in such a position that a hold-down bar trapped his hand, allowing the saw to amputate it. The second was unjamming a piece of cutting equipment and asked his co-worker to run the machine backward to help clear it. The co-worker activated the wrong switch and the machine ran forward, pulling the injured worker's hand into cutting range. The injured worker attributed the accident to poor machine design because the forward and reverse controls were not clearly marked. The third worker was unjamming a piece of farm equipment when a co-worker unexpectedly turned on the machine. Among those remaining, one lost a hand when feeding material into farm equipment, and another lost part of an arm when he slipped and fell into a molding press. The worker injured feeding materials into farm equipment blamed the accident on the fact that his mitten caught in running machinery, and the worker who fell into the press had slipped in oil on the floor. Another worker, who also lost part

of an arm, was caught in moving machinery while measuring it for replacement parts. He stated that he had complained to his supervisor that the equipment was still running but was ordered to perform this task since the equipment was "running slow enough to get the measurements." Finally, the only worker who lost an entire arm was a tree feller whose arm was crushed by a log rolling downhill.

Workers cited numerous events or conditions which they believed caused their accidents or contributed to their injuries. Some of these factors were general in nature, encompassing a broad spectrum of work practices, conditions, and human actions that could apply to many work situations. Other factors related specifically to machinery or tools.

Of the general factors, 29 percent of the workers felt that the accident occurred because they did not know their hands were in hazardous areas. This implied that some workers were unfamiliar with the equipment they were using when injured. For example, one worker put his hand into a clogged snowblower exhaust, unaware that he would contact moving blades. Other workers were quite familiar with the equipment but unaware that it was potentially hazardous. An example is the worker whose fingers were amputated when a centrifuge lid suddenly dropped shut on them. Twenty-five percent of the workers believed that being in a hurry to perform the job caused their accidents. They often commented that they were hurrying because of pressure from supervisors or because they were working under production quotas. One worker summarized conditions in his shop by stating, "You're always in such a hurry that safety is the last thing on your mind."

Other general factors which workers frequently cited as contributing to their accidents were: Work materials breaking or shifting position, 17 percent; misjudging the time or distance needed to avoid injury, 16 percent; inattention, 11 percent; and insufficient instruction in safely performing the task that led to injury, 11 percent. Thirteen percent indicated their accidents were precipitated by a co-worker's actions.

Lack of safeguards was the most common contributing factor related to machinery or tools and was cited by 17 percent of the workers. Thirteen percent attributed their amputations to accidental activation of equipment. Twelve percent identified defective tools or machines as causal factors.

Most of the workers whose accidents occurred while working with fixed machinery stated that safeguards were not in use at the time of injury. When safeguards were in use, they failed to prevent injury for several reasons. Close to 1 out of 5 workers using safeguarded equipment stated that the guard did not completely cover dangerous parts, and more than 2 out of 5 workers said their hands passed through or under the guards. The latter situation usually involved cutting implements such as saws, planers, or power mitres. Guards on this type of machinery are constructed to allow materials to be fed into the equipment. It follows that if material can be fed under the guard, so can a finger, hand, or arm. One solution to the problem of safe materials feeding, often recommended by safety manuals, is to use a holding apparatus such as gripping pliers or push sticks. These devices are intended to allow the worker to feed materials into machinery without getting dangerously near moving parts. Of the 50 workers who said these devices were available, fewer than one-third were using them when the amputation occurred.

One-third of all injured workers were wearing hand or arm protection, mostly gloves, at the time the amputation occurred. One-half of the workers believed the protection had no effect on the accident, often commenting that gloves were worn to protect against other hazards such as splinters, rope burns, or cold temperatures or used to improve grip. One-fourth felt gloves were actually responsible for the accident. In those cases, the worker invariably stated that the glove got caught in machinery and pulled in the hand, thus causing the amputation. Fewer than one-tenth of the workers felt gloves or arm protection helped reduce the seriousness of the injury. Their general feeling was that, while gloves could not have prevented the amputations, other fingers were protected from scratches, bruises, or cuts.

Injured workers were generally experienced in performing the jobs they were doing when injured. Three-fifths had 1 or more years of experience and nearly one-half performed the task daily or almost every day. One-tenth of the workers were injured when performing the task for the first time.

Nearly three-fifths of the injured workers had not received training in safely performing the tasks associated with their injuries and slightly less than one-fifth received training more than 2 years prior to the accident. Those workers less familiar with the task they were performing when injured were also less likely to have received safety training in performing that task. As text table 5 indicates, about 1 out of 4 less-experienced workers received training while 1 out of 2 workers with more than a year's experience received safety training.

Sixty percent of the injured workers knew of some action that their employers took after the accident to prevent a similar accident from happening to others. In order of prevalence, employers: Investigated the accident, 32 percent; warned other employees about the hazard, 32 percent; repaired or replaced equipment, 15 percent; and conducted safety training, 11 percent.

Finally, it should be noted that workers' comments often reflected a common theme—the surprising speed at which the amputation occurred. Many workers expressed shock that such a serious accident could occur

**Text table 5. Safety training by job experience**

| Safety training | Experience | | | | | |
|---|---|---|---|---|---|---|
| | Total | | Less than a year | | 1 year or more | |
| | Workers | Percent | Workers | Percent | Workers | Percent |
| Total | 785 | 100 | 320 | 100 | 465 | 100 |
| Received training | 324 | 41 | 88 | 27 | 236 | 51 |
| Did not receive training | 461 | 59 | 232 | 73 | 229 | 49 |

in an instant. There was no time to take preventative action, such as pulling their hands away or switching off machinery. In fact, some workers seemed to believe that reaching into moving machinery for "just a second" was not particularly dangerous because they were exposed to the hazard for such a short period of time. In other words, even when potential hazards were recognized by the worker, there was a tendency to minimize them. This idea is best illustrated by the following comment: "I just put (an object) in the machine, it made one slice and I saw it (the object) wasn't quite in so I just was going to push it down, just a little, it only took a second . . . I must have put my finger out and it got cut off."

**Table 14. Industry: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Industry | Workers | Percent |
|---|---|---|
| Total | 862 | 100 |
| Agriculture, forestry, and fishing | 29 | 3 |
| Mining [1] | 12 | 1 |
| Construction | 89 | 10 |
| Manufacturing | 538 | 62 |
| Food and kindred products | 60 | 7 |
| Tobacco manufactures | 3 | [2] |
| Textile mill products | 7 | 1 |
| Apparel and other textile products | 4 | [2] |
| Lumber and wood products | 68 | 8 |
| Furniture and fixtures | 31 | 4 |
| Paper and allied products | 34 | 4 |
| Printing and publishing | 18 | 2 |
| Chemicals and allied products | 10 | 1 |
| Petroleum and coal products | 2 | [2] |
| Rubber and miscellaneous plastics products | 24 | 3 |
| Leather and leather products | 2 | [2] |
| Stone, clay, and glass products | 16 | 2 |
| Primary metal industries | 32 | 4 |
| Fabricated metal products | 94 | 11 |
| Machinery, except electrical | 62 | 7 |
| Electric and electronic equipment | 24 | 3 |
| Transportation equipment | 29 | 3 |
| Instruments and related products | 4 | [2] |
| Miscellaneous manufacturing industries | 14 | 2 |
| Transportation and public utilities | 21 | 2 |
| Wholesale trade | 43 | 5 |
| Retail trade | 50 | 6 |
| Finance, insurance, and real estate | 7 | 1 |
| Services | 63 | 7 |
| Other industries, not elsewhere classified | 10 | 1 |

[1] Limited to oil and gas extraction.
[2] Less than 0.5 percent.
NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.
SOURCE: State workers' compensation reports.

**Table 15. Source of injury: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Source of injury | Workers | Percent |
|---|---|---|
| Total | 862 | 100 |
| Boilers, pressure vessels | 1 | [1] |
| Boxes, barrels, containers, | 19 | 2 |
| Buildings and structures | 19 | 2 |
| Ceramic items | 1 | [1] |
| Chemicals, chemical compounds | 1 | [1] |
| Clothing | 4 | [1] |
| Conveyors | 25 | 3 |
| Electric apparatus | 8 | 1 |
| Furniture, fixtures, etc. | 2 | [1] |
| Handtools, not powered | 14 | 2 |
| Handtools, powered | 30 | 3 |
| Heating equipment (nonelectric), not elsewhere classified | 2 | [1] |
| Hoisting apparatus | 13 | 2 |
| Ladders | 1 | [1] |
| Machines | 557 | 65 |
| Machines, unspecified | 13 | 2 |
| Agitators, mixers | 14 | 2 |
| Agricultural machines, not elsewhere classified | 15 | 2 |
| Buffers, polishers, etc. | 21 | 2 |
| Casting, forging, welding | 14 | 2 |
| Crushing, pulverizing | 10 | 1 |
| Drilling, boring | 23 | 3 |
| Highway construction | 8 | 1 |
| Packaging, wrapping | 18 | 2 |
| Picking, carding, etc. | 2 | [1] |
| Planers, shapers, molders | 17 | 2 |
| Presses (not printing) | 88 | 10 |
| Printing | 17 | 2 |
| Rolls | 4 | [1] |
| Saws | 142 | 16 |
| Screening, separating | 1 | [1] |
| Shears, slitters, slicers | 44 | 5 |
| Stitching, sewing | 4 | [1] |
| Weaving, knitting, spinning | 3 | [1] |
| Machines, not elsewhere classified | 99 | 11 |
| Mechanical power transmission apparatus | 19 | 2 |
| Metal items | 71 | 8 |
| Automobile parts | 6 | 1 |
| Beams, bars | 9 | 1 |
| Molds | 2 | [1] |
| Pipe | 9 | 1 |
| Screws, nuts, bolts | 1 | [1] |
| Metal items, not elsewhere classified | 44 | 5 |
| Pumps and prime movers | 9 | 1 |
| Textile items, not elsewhere classified | 2 | [1] |
| Vehicles | 46 | 5 |
| Highway vehicles, powered | 22 | 3 |
| Plant or industrial vehicles | 22 | 3 |
| Rail vehicles | 1 | [1] |
| Vehicles, not elsewhere classified | 1 | [1] |
| Wood items | 8 | 1 |
| Recreation and athletic equipment | 1 | [1] |
| Rubber products | 1 | [1] |
| Miscellaneous, not elsewhere classified | 7 | 1 |
| Nonclassifiable | 1 | [1] |

[1] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 16. Age of worker: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Age | Workers | Percent |
|---|---|---|
| Total | 862 | 100 |
| 16—19 | 50 | 6 |
| 20—24 | 145 | 17 |
| 25—34 | 224 | 26 |
| 35—44 | 149 | 17 |
| 45—54 | 115 | 13 |
| 55—64 | 119 | 14 |
| 65 years or more | 21 | 2 |
| Not available | 39 | 5 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 17. Sex of worker: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Sex | Workers | Percent |
|---|---|---|
| Total | 862 | 100 |
| Men | 754 | 87 |
| Women | 108 | 13 |

NOTE: See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 18. Occupations: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Occupation | Workers | Percent |
|---|---|---|
| Total | 862 | 100 |
| **Professional, technical, and kindred workers** | 14 | 2 |
| **Managers and administrators, excluding farm** | 24 | 3 |
| **Salesworkers** | 1 | (1) |
| **Clerical and kindred workers** | 6 | 1 |
| **Craft and kindred workers** | 269 | 31 |
| Bakers | 2 | (1) |
| Boilermakers | 1 | (1) |
| Brickmasons and stonemasons | 1 | (1) |
| Cabinetmakers | 6 | 1 |
| Carpenters | 40 | 5 |
| Carpenter apprentices | 1 | (1) |
| Cement and concrete finishers | 1 | (1) |
| Compositors and typesetters | 1 | (1) |
| Crane, derrick, and hoist operators | 3 | (1) |
| Decorators and window dressers | 1 | (1) |
| Electricians | 7 | 1 |
| Excavating, grading, and road machine operators, excluding bulldozers | 4 | (1) |
| Blue-collar worker supervisors, not elsewhere classified | 27 | 3 |
| Forge and hammer operators | 1 | (1) |
| Furniture and wood finishers | 2 | (1) |
| Glaziers | 1 | (1) |
| Inspectors, not elsewhere classified | 2 | (1) |
| Job-and-die setters, metal | 4 | (1) |
| Machinists | 18 | 2 |
| Mechanics and repairers | 82 | 10 |
| Air-conditioning, heating, and refrigeration | 1 | (1) |
| Aircraft mechanics | 1 | (1) |
| Automotive body repairers | 1 | (1) |
| Automobile mechanics | 10 | 1 |
| Farm implement mechanics | 3 | (1) |
| Heavy equipment mechanics | 32 | 4 |
| Loom fixers | 1 | (1) |
| Mechanic apprentices, excluding auto | 3 | (1) |
| Miscellaneous mechanics and repairers | 17 | 2 |
| Mechanics and repairers, not specified | 13 | 2 |
| Millers; grain, flour, feed | 2 | (1) |
| Millwrights | 13 | 2 |
| Molders, metal | 5 | 1 |
| Painters, construction and maintenance | 2 | (1) |
| Pattern and model makers, excluding paper | 1 | (1) |
| Plumbers and pipefitters | 3 | (1) |
| Printing press operators | 9 | 1 |
| Sheetmetal workers and tinsmiths | 7 | 1 |
| Stationary engineers | 1 | (1) |
| Structural metal workers | 3 | (1) |
| Telephone installers and repairers | 1 | (1) |
| Telephone line installers and repairers | 1 | (1) |
| Tile setters | 1 | (1) |
| Tool-and-die makers | 10 | 1 |
| Upholsterers | 1 | (1) |
| Specified craft apprentices, not elsewhere classified | 1 | (1) |
| Apprentices, not specified | 1 | (1) |
| Craft and kindred workers, not elsewhere classified | 2 | (1) |
| **Operatives, excluding transport** | 350 | 41 |
| Assemblers | 18 | 2 |
| Bottling and canning operatives | 3 | (1) |
| Checkers, examiners, inspectors; manufacturing | 2 | (1) |

See footnotes at end of table.

**Table 18. Occupations: Arm, hand, or finger amputations, selected States, December 1980–May 1981—Continued**

| Occupation | Workers | Percent |
|---|---|---|
| **Operatives excluding transport—Continued** | | |
| Clothing ironers and pressers | 1 | [1] |
| Cutting operatives, not elsewhere classified | 16 | 2 |
| Drillers, earth | 6 | 1 |
| Filers, polishers, sanders, buffers | 2 | [1] |
| Furnace tenders, smelters, and pourers; metal | 1 | [1] |
| Laundry and drycleaning operatives, not elsewhere classified | 2 | [1] |
| Meatcutters and butchers, excluding manufacturing | 10 | 1 |
| Meatcutters and butchers, manufacturing | 6 | 1 |
| Meat wrappers, retail trade | 1 | [1] |
| Mine operatives, not elsewhere classified | 2 | [1] |
| Mixing operatives | 5 | 1 |
| Oilers and greasers, excluding auto | 3 | [1] |
| Packers and wrappers, excluding retail | 9 | 1 |
| Painters, manufactured articles | 1 | [1] |
| Drill press operatives | 5 | 1 |
| Grinding machine operatives | 5 | 1 |
| Lathe and milling machine operatives | 6 | 1 |
| Precision machine operatives, not elsewhere classified | 5 | 1 |
| Punch and stamping press operatives | 33 | 4 |
| Riveters and fasteners | 1 | [1] |
| Sawyers | 21 | 2 |
| Sewers and stitchers | 2 | [1] |
| Shoemaking machine operatives | 1 | [1] |
| Furnace tenders and stokers, excluding metal | 1 | [1] |
| Carding, lapping, and combing operatives | 1 | [1] |
| Knitters, loopers, and toppers | 1 | [1] |
| Spinners, twisters, and winders | 1 | [1] |
| Welders and flame cutters | 16 | 2 |
| Winding operatives, not elsewhere classified | 2 | [1] |
| Machine operatives, miscellaneous specified | 83 | 10 |
| Machine operatives, not specified | 24 | 3 |
| Miscellaneous operatives | 44 | 5 |
| Operatives, not specified | 10 | 1 |
| **Transport equipment operatives** | 20 | 2 |
| Delivery and route workers | 2 | [1] |
| Forklift and tow motor operatives | 4 | [1] |
| Truckdrivers | 14 | 2 |
| **Laborers, excluding farm** | 128 | 15 |
| Animal caretakers, excluding farm | 1 | [1] |
| Carpenter helpers | 1 | [1] |
| Construction laborers, excluding carpenter helpers | 11 | 1 |
| Freight, material handlers | 12 | 1 |
| Garbage collectors | 4 | [1] |
| Gardeners and groundskeepers, excluding farm | 9 | 1 |
| Timber cutting and logging workers | 2 | [1] |
| Stock handlers | 5 | 1 |
| Vehicle and equipment cleaners | 4 | [1] |
| Warehouse laborers, not elsewhere classified | 4 | [1] |
| Miscellaneous laborers | 52 | 6 |
| Laborers, not specified | 23 | 3 |
| **Farmers and farm managers** | 1 | [1] |
| **Farm laborers and farm laborer supervisors** | 11 | 1 |
| **Service workers, excluding private household** | 29 | 3 |
| **Nonclassifiable** | 9 | 1 |

[1] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: State workers' compensation reports.

**Table 19. Activity and type of accident: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Activity and type | Workers | Percent |
|---|---|---|
| **What were you doing at the time of your injury?** | | |
| Total | 862 | 100 |
| Working with or on fixed (nonportable) machinery or equipment | 573 | 66 |
| Operating or repairing industrial or farm vehicles | 54 | 6 |
| Using powered handtool (for example: Portable drill, portable saw) | 41 | 5 |
| Using nonpowered hand tool (for example: Knife, hammer) | 13 | 2 |
| Lifting, carrying, or handling objects | 126 | 15 |
| Other | 55 | 6 |
| **How did your amputation occur?** | | |
| Total | 862 | 100 |
| Fingers, hand, or arm hit against moving machine part(s) | 204 | 24 |
| Fingers, hand, or arm were struck by moving machine part(s) | 215 | 25 |
| Fingers, hand, or arm were caught in or between machinery or objects | 295 | 34 |
| Flying, falling, or swinging object struck fingers, hand, or arm | 130 | 15 |
| Occurred in other way | 18 | 2 |
| **By what means did the object cause your amputation?** | | |
| Total [1] | 861 | ([1]) |
| Cutting action | 444 | 52 |
| Pulling force | 96 | 11 |
| Crushing force | 442 | 51 |
| Other | 2 | ([2]) |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

[2] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

**Table 20. Conditions or events contributing to injury: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Condition or event | Workers | Percent |
|---|---|---|
| **Indicate any conditions or events which you feel led to your injury.** | | |
| Total [1] | 861 | (1) |
| Did not realize hand was in hazardous area | 246 | 29 |
| In a hurry | 212 | 25 |
| Tool or machinery not equipped with safeguard (such as a barrier guard) | 147 | 17 |
| Work material shifted position or broke | 146 | 17 |
| Misjudged time or distance needed to avoid injury | 138 | 16 |
| Co-worker did something that caused your injury | 110 | 13 |
| Tool or machinery accidentally activated | 110 | 13 |
| Tool or equipment was in bad condition (for example: Dull blade) | 106 | 12 |
| Little or no instructions given on how to do task | 94 | 11 |
| Attention not fully on task | 93 | 11 |
| Tool, machinery, or work material shifted position or slipped | 85 | 10 |
| Not looking at hand | 74 | 9 |
| Hand slipped | 72 | 8 |
| Gloves, clothing, jewelry, or watch got caught in the equipment | 72 | 8 |
| Recent change in work routine or procedures | 70 | 8 |
| Tool or machinery had been altered or modified at the job site (for example: Barrier guard removed) | 70 | 8 |
| Unfamiliar with tool or equipment used | 67 | 8 |
| View of hand blocked by part of machine or other object | 60 | 7 |
| Tool or machinery broke or malfunctioned | 53 | 6 |
| Lost balance, slipped, or fell | 50 | 6 |
| Hand/finger(s) pulled into machine by work material | 44 | 5 |
| Upset or under stress | 44 | 5 |
| Tool or machinery continued to run after being shut off (coasting) | 43 | 5 |
| Other factors contributed to injury | 35 | 4 |
| Using wrong type of tool or equipment for job | 32 | 4 |
| Machine power not turned off | 30 | 3 |
| Reacted to loud noise or other distraction | 28 | 3 |
| Accidentally hit foot pedal | 28 | 3 |
| Tired or bored | 22 | 3 |
| Task not being done according to instructions | 21 | 2 |
| Cleaning tool, cloth, or rag got caught in the equipment | 21 | 2 |
| Safeguard failed | 20 | 2 |
| Visibility poor due to inadequate lighting, dust, or glare | 18 | 2 |
| No contributing factors indicated | 27 | 3 |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

**Table 21. Part of upper extremity amputated: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Part amputated | Total | | Left side | | Right side | |
|---|---|---|---|---|---|---|
| | Workers | Percent | Workers | Percent | Workers | Percent |
| Total | 862 | 100 | 426 | 100 | 436 | 100 |
| Finger(s) | 855 | 99 | 426 | 100 | 429 | 98 |
| One finger only | 685 | 79 | 339 | 80 | 346 | 79 |
| Thumb | 112 | 13 | 48 | 11 | 64 | 15 |
| Index | 210 | 24 | 96 | 23 | 114 | 26 |
| Middle | 176 | 20 | 84 | 20 | 92 | 21 |
| Ring | 109 | 13 | 71 | 17 | 38 | 9 |
| Little | 78 | 9 | 40 | 9 | 38 | 9 |
| Two fingers | 106 | 12 | 48 | 11 | 58 | 13 |
| Middle and ring | 39 | 5 | 18 | 4 | 21 | 5 |
| Index and middle | 36 | 4 | 17 | 4 | 19 | 4 |
| Ring and little [1] | 16 | 2 | 6 | 1 | 10 | 2 |
| Other two-finger combinations | 15 | 2 | 7 | 2 | 8 | 2 |
| Three fingers | 39 | 5 | 24 | 6 | 15 | 3 |
| Index, middle, and ring | 21 | 2 | 11 | 3 | 10 | 2 |
| Middle, ring, and little [1] | 14 | 2 | 9 | 2 | 5 | 1 |
| Other three-finger combinations | 4 | (2) | 4 | 1 | – | – |
| Four fingers | 22 | 3 | 13 | 3 | 9 | 2 |
| Thumb, index, middle, and ring | 3 | (2) | 2 | (2) | 1 | (2) |
| Thumb, middle, ring, and little | 1 | (2) | – | – | 1 | (2) |
| Index, middle, ring, and little [3] | 18 | 2 | 11 | 3 | 7 | 2 |
| Five fingers | 3 | (2) | 2 | (2) | 1 | (2) |
| Wrist | 4 | (2) | – | – | 4 | 1 |
| Lower arm (between wrist and elbow) | 2 | (2) | – | – | 2 | (2) |
| Upper arm (between elbow and shoulder) | 1 | (2) | – | – | 1 | (2) |

[1] Includes 1 case in which a portion of the metacarpal or palm area was also lost.

[2] Less than 0.5 percent.

[3] Includes 2 cases in which a portion of the metacarpal or palm area was also lost.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey. Dashes indicate that no data were reported.

SOURCE: Survey questionnaire.

**Table 22. Part of finger amputated:[1] Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Part of finger(s) amputated | Workers | Percent |
|---|---|---|
| Total | 855 | 100 |
| **Cases involving one finger** | | |
| Proximal phalange | 68 | 8 |
| Middle phalange | 90 | 11 |
| Distal phalange | 527 | 62 |
| **Cases involving multiple fingers** | | |
| Proximal phalanges only [2] | 18 | 2 |
| Middle phalanges only | 20 | 2 |
| Distal phalanges only | 74 | 9 |
| Proximal and middle phalanges | 12 | 1 |
| Proximal and distal phalanges | 12 | 1 |
| Middle and distal phalanges | 29 | 3 |
| Proximal, middle, and distal phalanges | 5 | 1 |

[1] See appendix D for a detailed illustration of the parts of the hand.

[2] Includes 4 cases in which a portion of the metacarpal or palm area was also lost.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

**Table 23. Use of hand or arm protection: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Use of protection | Workers | Percent |
|---|---|---|
| **Were you wearing any type of hand or arm protection at the time of your injury?** | | |
| Total | 855 | 100 |
| No | 582 | 68 |
| Yes | 273 | 32 |
| **If you were wearing hand or arm protection, what effect do you feel it had on the accident?** | | |
| Total | 251 | 100 |
| Reduced the seriousness of the injury | 19 | 8 |
| Caused the accident (for example: Glove pulled into machinery) | 62 | 25 |
| No effect on the injury | 129 | 51 |
| Don't know | 41 | 16 |

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

**Table 24. Work experience and safety practices: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Experience and safety practice | Workers | Percent |
|---|---|---|
| **How long had you been performing the type of work you were doing when injured?** | | |
| Total | 840 | 100 |
| First time you did this type of work | 81 | 10 |
| Less than 1 month | 65 | 8 |
| 1 to 6 months | 116 | 14 |
| 6 months to 1 year | 72 | 9 |
| 1 to 5 years | 203 | 24 |
| 5 years or more | 303 | 36 |
| **How frequently did you do this type of work?** | | |
| Total | 821 | 100 |
| First time you did this type of work | 81 | 10 |
| Seldom—less than once a month | 116 | 14 |
| About once a month | 60 | 7 |
| One or more times a week | 165 | 20 |
| Daily or almost every day | 399 | 49 |
| **Prior to your accident, did you receive safety training on how to perform this task?** | | |
| Total | 785 | 100 |
| No | 461 | 59 |
| Yes—less than 6 months ago | 112 | 14 |
| Yes—6 months to 1 year ago | 29 | 4 |
| Yes—1 to 2 years ago | 38 | 5 |
| Yes—more than 2 years ago | 145 | 18 |
| **What actions, if any, did your employer take after your accident to prevent such an injury from happening to others?** | | |
| Total [1] | 813 | ([1]) |
| Investigated accident | 263 | 32 |
| Conducted safety training or reviewed safety procedures | 93 | 11 |
| Installed safeguards (such as point of operation or barrier guards) | 94 | 12 |
| Repaired or replaced equipment | 123 | 15 |
| Told co-workers NOT to wear hand or arm protection (gloves, etc.) | 12 | 1 |
| Warned other employees about hazard | 261 | 32 |
| Other action | 10 | 1 |
| Employer took no action | 87 | 11 |
| Don't know | 232 | 29 |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

**Table 25. Activity and use of safeguards by workers using fixed machinery or power saws: Arm, hand, or finger amputations, selected States, December 1980–May 1981**

| Activity and use of safeguard | Workers | Percent |
|---|---|---|
| **What type of work were you doing at the time of your injury?** | | |
| Total | 599 | 100 |
| Operating machine or saw | 371 | 62 |
| Unjamming machine, saw, or material | 53 | 9 |
| Cleaning, repairing, servicing, etc., machine or saw | 131 | 22 |
| Setting up machine or saw | 39 | 7 |
| Other | 5 | 1 |
| **Was a safeguard in use at the time of your accident?** | | |
| Total | 475 | 100 |
| No | 331 | 70 |
| Yes | 116 | 24 |
| Don't know | 28 | 6 |
| **If a safeguard was in use, why didn't it prevent your injury?** | | |
| Total [1] | 105 | ([1]) |
| Hand passed through or under safeguard | 45 | 43 |
| Hand was in area of machine not protected by safeguard | 9 | 9 |
| Safeguard did not completely enclose dangerous parts of machine | 20 | 19 |
| Safeguard was not in proper position at time of accident | 15 | 14 |
| Safeguard malfunctioned or broke (for example: Device did not stop machine in time) | 13 | 12 |
| Safeguard was improperly adjusted | 3 | 3 |
| Other | 4 | 4 |
| Don't know | 6 | 6 |
| **Were there any other safety features available at the time of your injury?** | | |
| Total [1] | 395 | ([1]) |
| Push sticks, blocks, gripping pliers, or other holding devices | 50 | 13 |
| Hazard warning device (for example: An alarm) | 2 | 1 |
| Shut off device within reach | 109 | 28 |
| Other | 2 | 1 |
| Don't know | 49 | 12 |
| No other safety features available | 202 | 51 |
| **Were you using push sticks, etc. at the time of your injury?** | | |
| Total | 48 | 100 |
| No | 33 | 69 |
| Yes | 15 | 31 |

[1] Because more than one response is possible, the sum of the responses and percentages may not equal the total. Percentages are calculated by dividing each response by the total number of persons who answered the question.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for types of injuries included in the survey.

SOURCE: Survey questionnaire.

# Appendix A. Survey Explanatory Notes

The scope of the hand and amputation surveys extended to all industries except coal and metallic and nonmetallic mining. Cases were excluded from the surveys if the injury resulted in a fatality or if more than 120 days had elapsed between the time of injury and the beginning of the survey.

The survey of *hand injuries* was designed to develop information on specific injuries to the hand (including the fingers) resulting in 1 or more days away from work. The injuries were limited to cuts, lacerations, punctures, scratches, abrasions, fractures, and chemical or heat burns. In addition, the types of accidents were limited to: Struck by or against; caught in, under, or between; rubbed or abraded; contact with temperature extremes; and contact with toxic substances. The survey was confined to workers who were employed in craft occupations or as operatives, including transport equipment operatives; and laborers, including farm laborers. Major exclusions from the survey of hand injuries were: Cases involving only medical treatment or first aid; white-collar occupations; all illness cases such as dermatitis; certain kinds of injuries, notably bruises and sprains; and injuries resulting from motor vehicle accidents or falls. The BLS Supplementary Data System, which utilizes workers' compensation reports as a data base, indicated that about one-half of the disabling hand injuries fell within the scope of this survey.

The survey of work-related *arm, hand, or finger amputations* included all occupations. However, any amputation incurred as the result of a highway motor vehicle or public transportation accident was excluded. For purposes of this survey, amputations were defined as injuries resulting in loss of bone either at the worksite or as a result of surgical amputation. In addition, cases resulting in surgical reattachment were considered to be in the scope of the survey, assuming all other criteria were met.

To identify injury cases within the scope of the surveys, participating State agency staffs reviewed employers' reports of injuries required by State workers' compensation laws and mailed questionnaires to injured workers selected for study. Response to the survey was voluntary. During the hand injury survey period, January-April 1981, 22 State agencies identified 1,865 injury reports which were within the scope of the survey. Fifty-one percent of these workers responded to the mail questionnaire. The amputation survey was conducted by 23 States and extended from December 1980 to May 1981, with 1,528 in-scope cases selected for the survey. The response rate was 56 percent.

Although data were aggregated for all participating States, it should be noted that the workers' compensation cases selected for study reflect differences in State reporting requirements. For example, some participating States require reporting of workers' compensation cases involving medical treatment regardless of lost time, while others limit reporting to cases involving lost time ranging from 1 to 8 days.

No attempt was made to weight the data collected so that they would be representative of all hand or amputation injuries. Although participating States provided a broad geographical and industrial mix, they were not selected statistically to represent the country as a whole. Moreover, collection for each survey was terminated when responses exceeded 750 cases.

Based on other data sources, estimates were developed for hand injuries which met the survey definition, while estimates developed for upper extremity amputations relate to all such disabling amputations. These estimates were computed by using the number of disabling in-scope hand injuries or upper extremity amputations reported by 18 States participating in the Supplementary Data System for 1980 and the total number of lost workday cases as shown in *Occupational Injuries and Illnesses in the United States by Industry, 1980*, BLS Bulletin 2130 (1982):

(Number of disabling in-scope hand injuries)/(Total number of disabling cases) x (Total number of lost workday cases) = Total number of disabling in-scope hand injuries

(Number of disabling upper extremity amputations)/(Total number of disabling cases) x (Total number of lost workday cases) = Total number of disabling upper extremity amputations.

Characteristics of the injury and the person injured were classified and tabulated for all in-scope respondents based on information furnished by the employer in workers' compensation reports.

# Appendix B. Participating State Agencies

Arizona Industrial Commission
Arkansas Department of Labor
California Department of Industrial Relations
Colorado Department of Labor and Employment
Delaware Department of Labor
Hawaii Department of Labor and Industrial Relations
Idaho Industrial Commission
Indiana Division of Labor
Iowa Bureau of Labor
Kentucky Department of Labor
Maine Department of Manpower Affairs
Massachusetts Department of Labor and Industries
Michigan Department of Labor
Missouri Department of Labor and Industrial Relations
Montana Department of Labor and Industry
Nebraska Workmen's Compensation Court
New Jersey Department of Labor and Industry (amputation survey only)
Ohio Industrial Commission
Tennessee Department of Labor
Utah Industrial Commission
Virginia Department of Labor and Industry
Washington Department of Labor and Industries
Wisconsin Department of Industry, Labor and Human Relations

# Appendix C. Survey Questionnaires

Bureau of Labor Statistics
Work Injury Report
Accidents Involving Hand Injuries

**U.S. Department of Labor**

The information collected on this form by the Bureau of Labor Statistics and the State Agencies cooperating in its statistical program will be held in confidence and will be used for statistical purposes only.

*This report is authorized by law 29 U.S.C. 2. Your voluntary cooperation is needed to make the results of this survey comprehensive, accurate, and timely.*

Form Approved
O.M.B. No. 44R-1614

State ☐☐ Case Number ☐☐☐☐☐☐☐☐ Date of Accident ☐☐ – ☐☐ – ☐☐

## I. WORK ACTIVITY AT TIME OF INJURY

**NOTE:** THE TERM "HAND" REFERS TO INJURIES TO THE HAND, FINGER OR FINGERNAIL.

A. What were you doing at the time of your injury? *(Check one.)*
1. ☐ Working with or on fixed (nonportable) machinery or equipment *(Describe—for example: metal lathe, punch press, conveyor)* _____
2. ☐ Operating or repairing industrial or farm vehicles
3. ☐ Using powered hand tool (for example: portable drill, portable saw)
4. ☐ Using non-powered hand tool (for example: knife, hammer)
5. ☐ Lifting, carrying or handling objects
6. ☐ Working with chemicals
7. ☐ Other *(Describe)* _____

B. How was your hand injured? *(Check one.)*
1. ☐ Hand hit against moving machine part(s)
2. ☐ Hand was struck by moving machine part(s)
3. ☐ Hand was caught in or between machinery or objects
4. ☐ Flying, falling or swinging object struck hand
5. ☐ Struck hand against non-moving object
6. ☐ Chemical, caustic or acid burned hand
7. ☐ Occurred in other way *(Describe)* _____

C. Describe the object, machine part or chemical that injured you (for example: band saw blade, knife blade, conveyor belt, nitric acid).

D. Do any of the following explain why your hand came in contact with this object or chemical? *(Check all that apply.)*
1. ☐ Misjudged time or distance needed to avoid injury
2. ☐ Hand slipped
3. ☐ Not looking at hand
4. ☐ Lost balance, slipped or fell
5. ☐ Reacted to loud noise or other distraction
6. ☐ Gloves, clothing, jewelry or watch got caught in the equipment
7. ☐ Cleaning tool, cloth or rag got caught in the equipment
8. ☐ Did not realize hand was in hazardous area
9. ☐ None of the above

E. Were there any work conditions which you feel led to your injury? *(Check all that apply.)*
1. ☐ Using wrong type of tool or equipment for job
2. ☐ Tool or equipment was in bad condition (for example: dull blade)
3. ☐ Visibility poor due to inadequate lighting, dust or glare
4. ☐ View of hand blocked by part of machine or other object
5. ☐ Recent change in work routine or procedures
6. ☐ Unfamiliar with tool or equipment used
7. ☐ Co-worker did something that caused your injury *(Explain)* _____
8. ☐ None of the above

F. Indicate whether any of the following factors contributed to your injury. *(Check all that apply.)*
1. ☐ Attention not fully on task
2. ☐ Task not being done according to instructions
3. ☐ Little or no instructions given on how to do task
4. ☐ Tired or bored
5. ☐ In a hurry
6. ☐ Upset or under stress
7. ☐ None of the above

G. If you were using a tool or machinery, check whether any of the following contributed to your injury. *(Check all that apply and explain below, if possible.)*
1. ☐ Tool or machinery accidentally activated
2. ☐ Accidentally hit foot pedal
3. ☐ Tool or machinery continued to run after being shut off (coasting)
4. ☐ Tool or machinery broke or malfunctioned
5. ☐ Tool, machinery or work material shifted position or slipped
6. ☐ Tool or machinery had been altered or modified at the job site (for example: barrier guard removed)
7. ☐ Tool or machinery not equipped with safeguard (such as a barrier guard)
8. ☐ Safeguard failed
9. ☐ None of the above

*(Explain):* _____

H. Describe any other factors which contributed to your injury.

I. Mark where your hand(s) was injured.
1. Left hand 2. Right hand


J. Are you left or right handed? 1. ☐ Left handed 2. ☐ Right handed

K. What was your employer's policy on wearing gloves or other hand protection for the type of work you were doing at the time of the injury? *(Check one.)*
1. ☐ Required for work being done
2. ☐ Not allowed to wear any type of gloves or hand protection for work being done
3. ☐ No policy
4. ☐ Don't know

L. Were you wearing gloves or other hand protection at the time of your injury?
1. ☐ No 2. ☐ Yes—on both hands 3. ☐ Yes—on one hand only

**IF YOU WERE WEARING GLOVES OR OTHER HAND PROTECTION, COMPLETE SECTION II.**

**IF YOU WERE *NOT* WEARING GLOVES OR OTHER HAND PROTECTION, SKIP SECTION II. AND COMPLETE SECTION III. ON THE REVERSE SIDE.**

## II. IF YOU WERE WEARING GLOVES OR OTHER HAND PROTECTION, ANSWER THE FOLLOWING QUESTIONS

A. Indicate the type of gloves or other hand protection you were wearing when injured. *(Check one.)*
1. ☐ Leather gloves
2. ☐ Light cotton or fabric gloves
3. ☐ Heavy duty canvas gloves
4. ☐ Gloves for use with chemicals
5. ☐ General purpose rubber coated gloves
6. ☐ Thin rubber (surgical) gloves
7. ☐ Steel mesh gloves
8. ☐ Asbestos gloves
9. ☐ Other *(Describe)* _____
10. ☐ Don't know

B. Indicate why the gloves or other hand protection did not prevent your injury. *(Check all that apply.)*
1. ☐ Gloves were torn, punctured or cut through by object
2. ☐ Object or chemical went under or around gloves
3. ☐ Chemical, hot object or fire burned through gloves
4. ☐ Chemical soaked through glove without damaging it
5. ☐ Hand was crushed, scratched or abraded inside the glove
6. ☐ Heat or cold penetrated gloves
7. ☐ Gloves caught in machine and pulled hand in
8. ☐ Injured area not covered by hand protection
9. ☐ Gloves were in bad condition before accident
10. ☐ Other *(Describe)* _____
11. ☐ Don't know

C. What were the gloves you were wearing intended to protect against? *(Check all that apply.)*
1. ☐ Cold temperatures
2. ☐ Burns from heat, hot objects or fire
3. ☐ Chemical burns or dermatitis
4. ☐ Cuts, splinters, blisters, scratches, friction or rope burns
5. ☐ Other *(Describe)* _____
6. ☐ Don't know

D. What effect do you feel the gloves or other hand protection had on the accident? *(Check one and explain below, if possible.)*
1. ☐ Reduced the seriousness of the injury
2. ☐ Caused the accident (for example: glove pulled into machine)
3. ☐ Contributed to the injury (for example: glove cut, burned or scratched skin)
4. ☐ No effect on the injury
5. ☐ Don't know

*(Explain):* _____

E. Do you feel another type of glove or other hand protection could have prevented your injury?
1. ☐ No
2. ☐ Yes—if yes, were they available at the job site when injured?
   a. ☐ No b. ☐ Yes c. ☐ Don't know
3. ☐ Don't know

*(Explain):* _____

**CONTINUE WITH SECTION IV. ON THE REVERSE SIDE.**

BLS 101 (December 1980)

## III. IF YOU WERE NOT WEARING GLOVES OR OTHER HAND PROTECTION, ANSWER THE FOLLOWING QUESTIONS

A. Indicate why you were not wearing gloves or other hand protection at the time of your injury. *(Check all that apply.)*

1. ☐ Not allowed to wear them
2. ☐ Not practical or hard to work with them on
3. ☐ Did not think they were needed
4. ☐ Not required to wear
5. ☐ Took them off immediately before the accident
6. ☐ Unsafe to wear gloves for the work you were doing
7. ☐ Other *(Describe)* _____

B. What type of gloves or other hand protection, if any, were available at the worksite when your injury occurred? *(Check all that apply.)*

1. ☐ Leather gloves
2. ☐ Light cotton or fabric gloves
3. ☐ Heavy duty canvas gloves
4. ☐ Gloves for use with chemicals
5. ☐ General purpose rubber coated gloves
6. ☐ Thin rubber (surgical) gloves
7. ☐ Steel mesh gloves
8. ☐ Asbestos gloves
9. ☐ Other *(Describe)* _____
10. ☐ Don't know
11. ☐ None available

**CONTINUE WITH SECTION IV.**

## IV. INFORMATION AND TRAINING

A. What information were you given regarding gloves or other hand protection? *(Check all that apply.)*

1. ☐ When and where to use them
2. ☐ When and where not to use them
3. ☐ Specific type to wear for specific job
4. ☐ Limitations and advantages of gloves or other hand portection
5. ☐ Other *(Describe)* _____
6. ☐ Not given any information

B. If you were given information regarding gloves or other hand protection:

1. How did you receive this information? *(Check all that apply.)*
   a. ☐ Supervisor or employer
   b. ☐ Co-worker
   c. ☐ Company safety official
   d. ☐ Union representative
   e. ☐ Other *(Describe)* _____
2. Would this information be enough to help you select the proper type of hand protection?
   a. ☐ No
   b. ☐ Yes
   c. ☐ Don't know

C. Are gloves or other hand protection available from your employer? *(Check one.)*

1. ☐ Yes—available at no cost from employer
2. ☐ Yes—employer pays part of cost
3. ☐ No—must be purchased at own expense
4. ☐ Other *(Describe)* _____
5. ☐ Don't know

D. If your employer supplies gloves, does the company have a policy or program for replacing lost, worn or damaged gloves?

1. ☐ No 2. ☐ Yes 3. ☐ Don't know

E. What actions, if any, did your employer take after your accident to prevent such an injury from happening to others? *(Check all that apply.)*

1. ☐ Investigated accident
2. ☐ Conducted safety training or reviewed safety procedures
3. ☐ Installed safeguards (such as point of operation or barrier guards)
4. ☐ Repaired or replaced equipment
5. ☐ Warned other employees about hazard
6. ☐ Required use of appropriate type of hand protection
7. ☐ Warned employees not to use hand protection
8. ☐ Other action *(Describe)* _____
9. ☐ Employer took no action
10. ☐ Don't know

## V. ANSWER THE FOLLOWING QUESTIONS ONLY IF YOUR INJURY INVOLVED FIXED (NONPORTABLE) MACHINERY OR A POWER SAW

A. What type of work were you doing at the time of your injury? *(Check one.)*

1. ☐ Operating machine or saw
2. ☐ Unjamming machine, saw or material
3. ☐ Cleaning, repairing, servicing, etc., machine or saw
4. ☐ Setting up machine or saw
5. ☐ Other *(Describe)* _____
6. ☐ Don't know

**NOTE:** Questions B, C, and D ask about safeguards, which are guards or devices intended to prevent hands from entering the danger area with machine in operation.
*Examples of safeguards are:*

point of operation or barrier guards
retractable blade guards
light curtains
two hand controls
sweep arms
pullback harnesses

B. Was a safeguard in use at the time of your accident? *(Check one.)*

1. ☐ No—explain why not (for example: machine never had a safeguard, safeguard was not being used because it slowed production, guard had been removed because it was broken)

   _____
2. ☐ Yes
3. ☐ Don't know

C. Describe the type of safeguard and how it works.

D. Why didn't the safeguard prevent your injury? *(Check all that apply.)*

1. ☐ No safeguard in use at the time of injury
2. ☐ Hand passed through or under safeguard
3. ☐ Hand was in area of machine not protected by safeguard
4. ☐ Safeguard did not completely enclose dangerous parts of machine
5. ☐ Safeguard was not in proper position at time of accident
6. ☐ Safeguard malfunctioned or broke (for example: device did not stop machine in time)
7. ☐ Safeguard was improperly adjusted
8. ☐ Object was thrown from machine
9. ☐ Other *(Explain)* _____
10. ☐ Don't know

E. Were there any other safety features available at the time of your injury? *(Check all that apply.)*

1. ☐ Push sticks, blocks, gripping pliers or other holding devices
2. ☐ Hazard warning device (for example: an alarm)
3. ☐ Shut off device within reach
4. ☐ Other *(Explain)* _____
5. ☐ Don't know
6. ☐ No other safety features available

**VI. How many workdays did you (or do you expect to) lose due to your injury? (NOTE: Do not count the day of injury, days on light duty work, normal days off or holidays.)**

_____ Workdays

**VII. Describe in your own words how your injury occurred and how you feel it could have been prevented.**

Bureau of Labor Statistics
Work Injury Report
Accidents Involving Arm, Hand or Finger Amputations

**U.S. Department of Labor**

The information collected on this form by the Bureau of Labor Statistics and the State Agencies cooperating in its statistical program will be held in confidence and will be used for statistical purposes only.

***This report is authorized by law 29 U.S.C. 2. Your voluntary cooperation is needed to make the results of this survey comprehensive, accurate, and timely.***

Form Approved
O.M.B. No. 44R-1614

State ☐☐ Case Number ☐☐☐☐☐☐☐☐ Date of Accident ☐☐ – ☐☐ – ☐☐

I.

A. What were you doing at the time of your injury? ***(Check one.)***
1. ☐ **Working with or on fixed (nonportable) machinery or equipment** ***(Describe—for example: metal lathe, punch press, conveyor)***
   _____
2. ☐ **Operating or repairing industrial or farm vehicles**
3. ☐ **Using powered hand tool (for example: portable drill, portable saw)**
4. ☐ **Using non-powered hand tool (for example: knife, hammer)**
5. ☐ **Lifting, carrying or handling objects**
6. ☐ **Other** ***(Describe)*** _____

B. How did your amputation occur? ***(Check one.)***
1. ☐ **Fingers, hand or arm hit against moving machine part(s)**
2. ☐ **Fingers, hand or arm were struck by moving machine part(s)**
3. ☐ **Fingers, hand or arm were caught in or between machinery or objects**
4. ☐ **Flying, falling or swinging object struck fingers, hand or arm**
5. ☐ **Occurred in other way** ***(Describe)*** _____

C. Describe the object or machine part that injured you (for example: band saw blade, knife blade, conveyor belt).

D. By what means did the object cause your amputation? ***(Check all that apply.)***
1. ☐ **Cutting action**
2. ☐ **Pulling force**
3. ☐ **Crushing force**
4. ☐ **Other** ***(Explain)*** _____

E. Do any of the following explain why your fingers, hand or arm came in contact with this object? ***(Check all that apply.)***
1. ☐ **Misjudged time or distance needed to avoid injury**
2. ☐ **Hand slipped**
3. ☐ **Not looking at hand**
4. ☐ **Lost balance, slipped or fell**
5. ☐ **Reacted to loud noise or other distraction**
6. ☐ **Gloves, clothing, jewelry or watch got caught in the equipment**
7. ☐ **Cleaning tool, cloth or rag got caught in the equipment**
8. ☐ **Did not realize hand was in hazardous area**
9. ☐ **None of the above**

F. Were there any work conditions which you feel led to your injury? ***(Check all that apply.)***
1. ☐ **Using wrong type of tool or equipment for job**
2. ☐ **Tool or equipment was in bad condition (for example: dull blade)**
3. ☐ **Visibility poor due to inadequate lighting, dust or glare**
4. ☐ **View of hand blocked by part of machine or other object**
5. ☐ **Recent change in work routine or procedures**
6. ☐ **Unfamiliar with tool or equipment used**
7. ☐ **Co-worker did something that caused your injury** ***(Explain)***
   _____
8. ☐ **None of the above**

G. Indicate whether any of the following factors contributed to your injury. ***(Check all that apply.)***
1. ☐ **Attention not fully on task**
2. ☐ **Task not being done according to instructions**
3. ☐ **Little or no instructions given on how to do task**
4. ☐ **Tired or bored**
5. ☐ **In a hurry**
6. ☐ **Upset or under stress**
7. ☐ **None of the above**

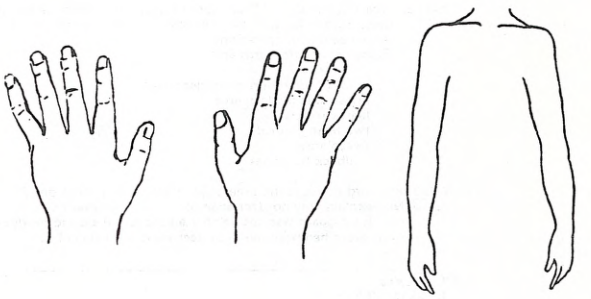
H. If you were using a tool or machinery, check whether any of the following contributed to your injury. ***(Check all that apply and expalin below, if possible.)***
1. ☐ **Tool or machinery accidentally activated**
2. ☐ **Accidentally hit foot pedal**
3. ☐ **Tool or machinery continued to run after being shut off (coasting)**
4. ☐ **Tool or machinery broke or malfunctioned**
5. ☐ **Tool, machinery or work material shifted position or slipped**
6. ☐ **Tool or machinery had been altered or modified at the job site (for example: barrier guard removed)**
7. ☐ **Tool or machinery not equipped with safeguard (such as a barrier guard)**
8. ☐ **Safeguard failed**
9. ☐ **None of the above**

***(Explain):*** _____

I. Describe any other factors which contributed to your injury.

J. Draw a line at the point of amputation and indicate below the part(s) amputated (for example: first digit of right index finger).

Left hand Right Hand Arms



**Parts amputated:** _____

K. If the amputation involved only the tip(s) of the finger(s) was there a loss of bone?
1. ☐ **No**
2. ☐ **Yes**

L. Were you wearing any type of hand or arm protection at the time of your injury?
1. ☐ **No**
2. ☐ **Yes** ***(Describe type, for example:*** **steel mesh gloves, protective sleeve, cotton gloves, palm pads)**
   _____

M. If you were wearing hand or arm protection what effect do you feel it had on the accident? ***(Check one and explain below, if possible.)***
1. ☐ **Reduced the seriousness of the injury**
2. ☐ **Caused the accident (for example: glove pulled into machinery)**
3. ☐ **No effect on the injury**
4. ☐ **Don't know**

***(Explain):*** _____

**CONTINUE WITH SECTION II. ON REVERSE SIDE.**

II.

A. How long had you been performing the type of work you were doing when injured? *(Check one.)*
1. ☐ First time you did this type of work
2. ☐ Less than 1 month
3. ☐ 1 to 6 months
4. ☐ 6 months to 1 year
5. ☐ 1 to 5 years
6. ☐ 5 years or more

B. How frequently did you do this type of work? *(Check one.)*
1. ☐ First time you did this type of work
2. ☐ Very seldom—less than once a month
3. ☐ About once a month
4. ☐ One or more times a week
5. ☐ Daily or almost every day

C. Prior to your accident, did you receive safety training on how to perform this task? *(Check one.)*
1. ☐ No
2. ☐ Yes—less than 6 months ago
3. ☐ Yes—6 months to 1 year ago
4. ☐ Yes—1 to 2 years ago
5. ☐ Yes—more than 2 years ago

D. What actions, if any, did your employer take after your accident to prevent such an injury from happening to others? *(Check all that apply.)*
1. ☐ Investigated accident
2. ☐ Conducted safety training or reviewed safety procedures
3. ☐ Installed safeguards (such as point of operation or barrier guards)
4. ☐ Repaired or replaced equipment
5. ☐ Told co-workers not to wear hand or arm protection (gloves, etc.)
6. ☐ Warned other employees about hazard
7. ☐ Other action *(Describe)* _____
8. ☐ Employer took no action
9. ☐ Don't know

**IF YOUR INJURY DID NOT INVOLVE FIXED (NONPORTABLE) MACHINERY OR ANY TYPE OF A POWER SAW, SKIP SECTION III. AND COMPLETE SECTION IV.**

**III. ANSWER THE FOLLOWING QUESTIONS ONLY IF YOUR INJURY INVOLVED FIXED (NONPORTABLE) MACHINERY OR A POWER SAW.**

A. What type of work were you doing at the time of your injury? *(Check one.)*
1. ☐ Operating machine or saw
2. ☐ Unjamming machine, saw or material
3. ☐ Cleaning, repairing, servicing, etc., machine or saw
4. ☐ Setting up machine or saw
5. ☐ Other *(Describe)* _____
6. ☐ Don't know

B. Indicate the type of machine you were working with or on at the time of your injury. Include the brand name and model number if known.

**NOTE:** Questions C, D, and E ask about safeguards, which are guards or devices intended to prevent hands from entering the danger area with machine in operation.
*Examples of safeguards are:*

point of operation or barrier guards
retractable blade guards
light curtains
two hand controls
sweep arms
pullback harnesses

C. Was a safeguard in use at the time of your accident? *(Check one.)*
1. ☐ No—explain why not (for example: machine never had a safeguard, safeguard was not being used because it slowed production, guard had been removed because it was broken)
2. ☐ Yes
3. ☐ Don't know

D. Describe the type of safeguard and how it works.

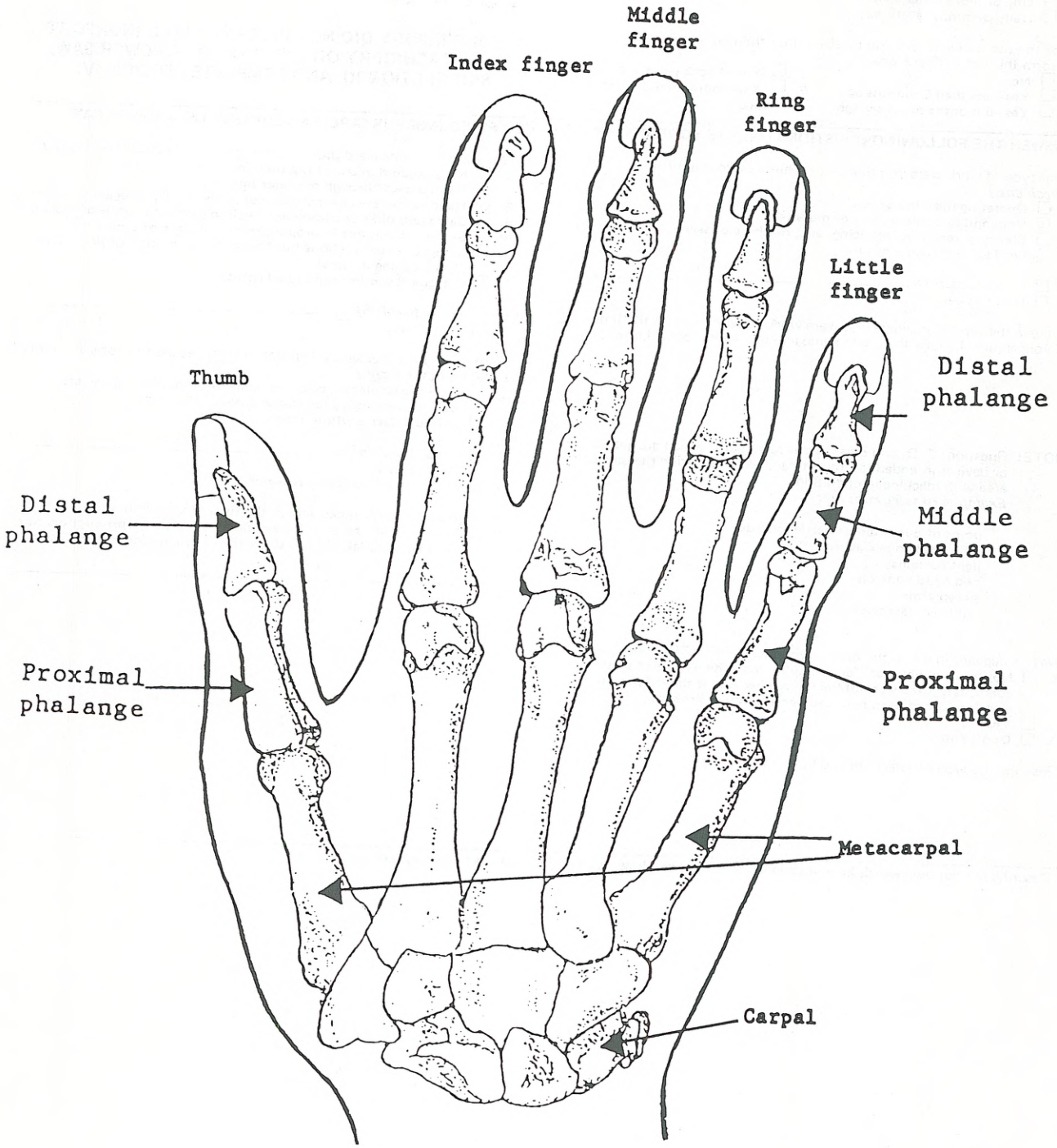
E. Why didn't the safeguard prevent your injury? *(Check all that apply.)*
1. ☐ No safeguard in use at the time of injury
2. ☐ Hand passed through or under safeguard
3. ☐ Hand was in area of machine not protected by safeguard
4. ☐ Safeguard did not completely enclose dangerous parts of machine
5. ☐ Safeguard was not in proper position at time of accident
6. ☐ Safeguard malfunctioned or broke (for example: device did not stop machine in time)
7. ☐ Safeguard was improperly adjusted
8. ☐ Other *(Explain)* _____
9. ☐ Don't know

F. Were there any other safety features available at the time of your injury? *(Check all that apply.)*
1. ☐ Push sticks, blocks, gripping pliers or other holding devices
2. ☐ Hazard warning device (for example: an alarm)
3. ☐ Shut off device within reach
4. ☐ Other *(Explain)* _____
5. ☐ Don't know
6. ☐ No other safety features available

G. Were you using push sticks, etc. at the time of your injury?
1. ☐ No—explain why not (for example: would slow production, not feeding material, did not think they were needed, not available)
_____
2. ☐ Yes

**IV. Describe in your own words how your injury occurred and how you feel it could have been prevented.**

# Appendix D. Illustration of Phalanges of the Right Hand



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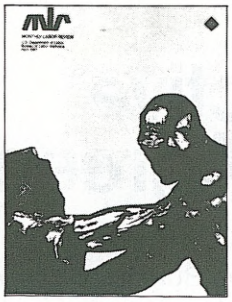

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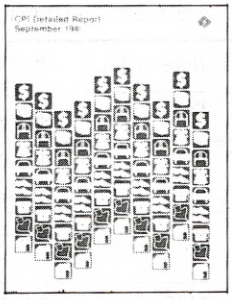


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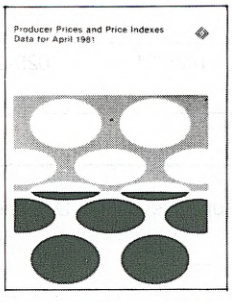


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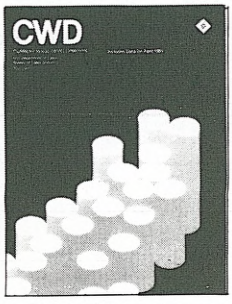


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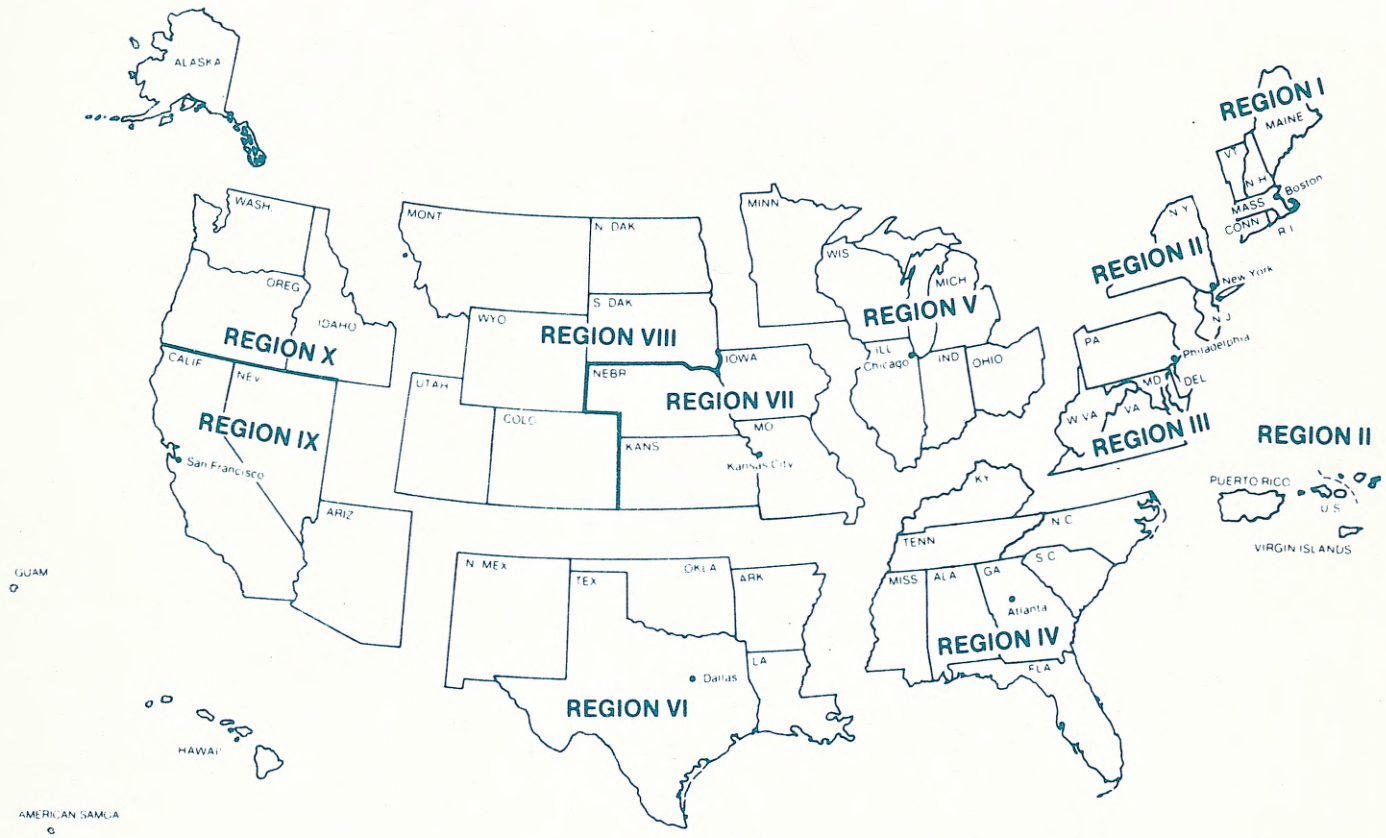


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