Injuries Resulting From Falls From Elevations

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U.S. Department of Labor
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Preface

This bulletin summarizes the results of a survey of workers who were injured as the result of falling from elevations. The findings of this survey, which was conducted during the period from December 1981 through June 1982, will assist the Occupational Safety and Health Administration (OSHA) in developing safety standards, compliance strategy, and training programs for reducing work-related injuries.

The survey was conducted by the Bureau's Office of Occupational Safety and Health Statistics, in cooperation with the following States: Arizona, Arkansas, California, Colorado, Delaware, Hawaii, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Missouri, Montana, Nebraska, North Carolina, Ohio, Tennessee, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming. BLS regional offices coordinated State operations. The Offices of Compliance; Standards Development; Statistical Studies and Analysis; Regulatory 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 survey. The Work Injury Report staff, Maryrose Cline-Buso, Larry Jones, and Lyn Pearson, were involved in the development and editing of the survey. Ms. Cline-Buso prepared the analysis of the survey findings. The survey was directed by Helen McDonald under the supervision of Herbert Schaffer.

The data collected in the survey are valid for understanding how and why injuries occurred among the workers studied. However, the user should exercise caution in extrapolating the data to estimate injuries for the entire population because of limitations of the survey. 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 period is not intended to represent the entire year.

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 during the survey period is not available. See appendix A for scope and methodology of the survey.

A list of other Work Injury Reports published since 1978 appears at the end of this bulletin.

Contents

Summary

The Bureau of Labor Statistics surveyed 774 workers who sustained work-related injuries as the result of falling from elevations.[1] The survey was conducted from December 1981 through June 1982. Workers were asked to describe the height at which they were working prior to their fall, the distance they fell, the object or surface from which they fell, the location of the worksite, and their activities at the time of the fall. As a measure of the severity of workers' injuries, information was obtained on the number of days workers lost from work and the amount of hospitalization required as a result of their injuries, as well as the nature of the injury and the part of the body affected. Injured workers were also asked to provide information on the availability and use of fall protection equipment (such as guardrails or safety belts) and any hazardous conditions or other factors which may have contributed to their fall.

Survey highlights

More than four-fifths of the workers surveyed indicated that there was no fall protection in the area where they were working at the time of their accident. In addition, most of the workers provided with fall protection equipment were unprotected at the time of the accident; they had either disconnected the personal fall protection devices to move around or they were not in the immediate area where guardrails were in place. Two-fifths of the workers fell 10 feet or more; one-tenth fell 20 feet or more. More than four-fifths lost time away from work; one-third were hospitalized as a result of their injuries.

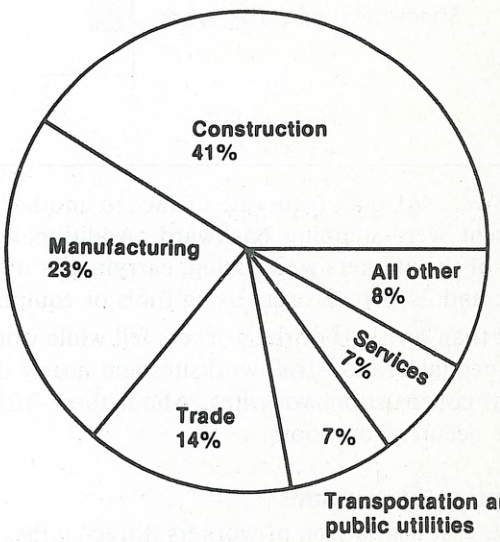
Industry, occupation, age, and sex

As shown in chart 1, about two-fifths of the falls occurred to workers employed by construction firms, mostly special trade and general building contractors (table 1). Nearly one-fourth worked for manufacturers. More than one-half of all workers were employed by companies with fewer than 50 employees, about equally divided between firms with 1 to 10 employees and firms with 11 to 49 (table 2). Craftworkers accounted for 44 percent of the injured workers; the predominant occupations were carpenters, 10 percent, and mechanics or repairers, 6 percent (table 3). Twenty-four percent of the workers surveyed were employed as laborers, most frequently construction laborers, and 12 percent as operatives (excluding transport). The remainder were employed in a wide variety of occupations such as transport equipment operatives, managers, and clerical workers. One-fourth of the workers were under 25 years of age, and almost three-fifths were under 35 (table 4). All but 5 percent of the injured workers were men (table 5).

Activity at time of accident

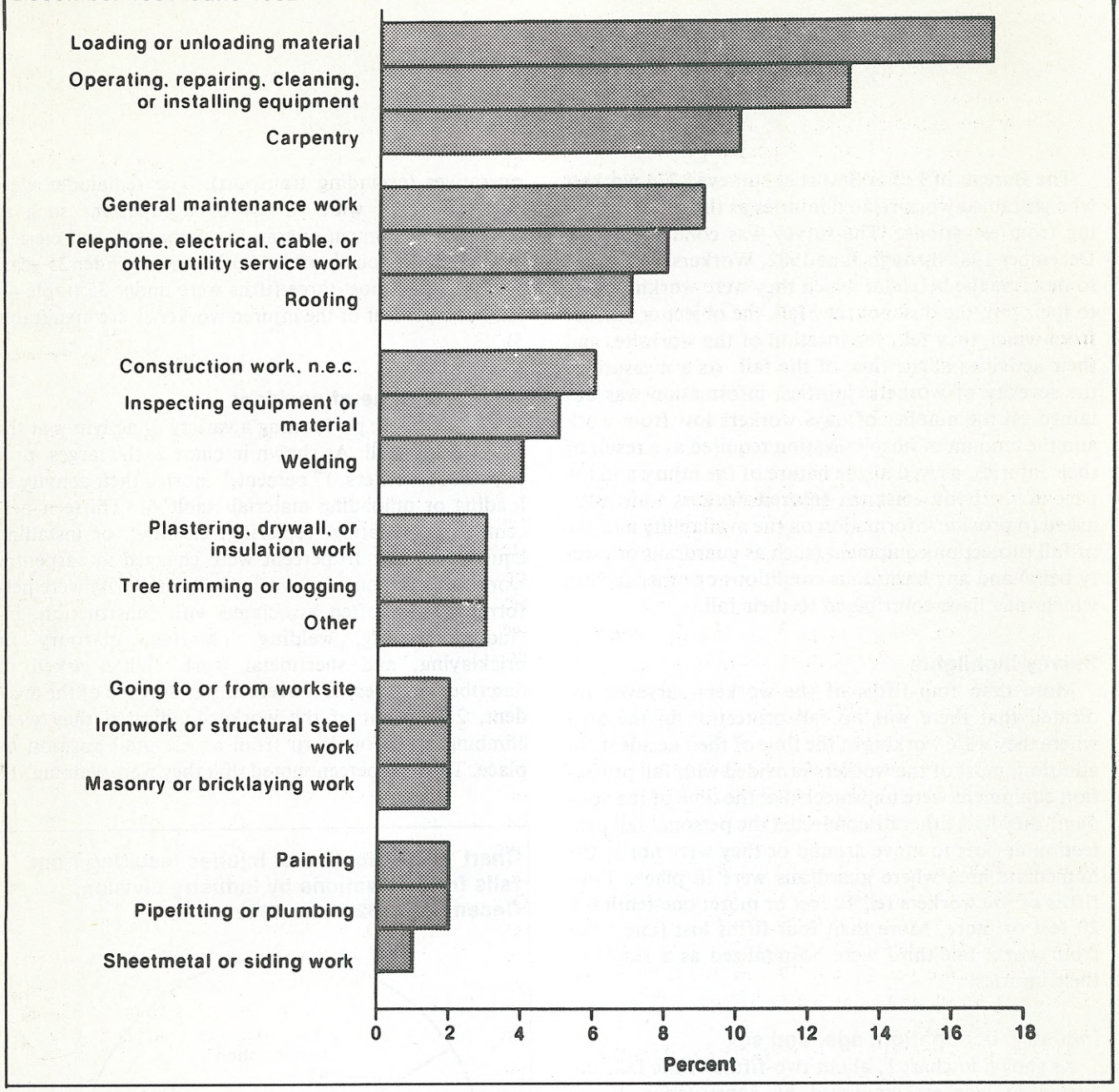
Workers were performing a variety of activities at the time of their fall. As shown in chart 2, the largest proportion of workers, 17 percent, reported their activity as loading or unloading material (table 6). Thirteen percent were operating, repairing, cleaning, or installing equipment, and 10 percent were engaged in carpentry work. Of the remaining workers, the majority were performing tasks often associated with construction, including roofing, welding, painting, masonry or bricklaying, and sheetmetal work. When asked to describe their specific movements at the time of the accident, 28 percent of the workers indicated they were climbing up to or down from an elevated position or place. Thirteen percent noted that they were walking, 11

Chart 1. Distribution of injuries resulting from falls from elevations by industry division, December 1982–June 1982



[1] See appendix A for the scope of the survey.

Chart 2. Distribution of injuries resulting from falls from elevations by activity at the time of the accident, December 1981–June 1982



percent were stepping from one surface to another, and 10 percent were stepping backward. Additionally, 28 percent of the workers were lifting, carrying, or moving objects; and 24 percent were using tools or equipment.

More than one-half of the workers fell while working at commercial or industrial worksites and nearly three-tenths at construction worksites. About three-fifths of the falls occurred outdoors.

Description of accident

The largest proportion of workers, three-tenths, were at heights of 5 to 10 feet when their accidents occurred (table 7). One-fourth were at elevations of 3 to 5 feet; and slightly more than one-fifth were 10 to 15 feet up. The remaining workers, about one-fourth, were at even higher elevations. Almost three-fifths worked daily or almost every day at the heights from which they fell.

Workers were asked to identify the object or structure from which they fell. Heading the list were scaffolds, 17 percent, and roofs, 14 percent. An additional 14 percent of the falls occurred to workers standing on miscellaneous single objects, such as pieces of equipment or work materials. Eight percent of the workers were on walkways or catwalks, and an equal percentage

were at ground or floor level, close to holes, openings, or trenches. Following these were loading docks, piled or stacked materials, attic beams or other building structures, and telephone or utility poles, each accounting for 5 or 6 percent of the cases.

The falls were usually preceded by one or more events which resulted in loss of balance. One-half of the injured workers reported that they slipped or lost their footing. Substantially fewer, 18 percent, indicated that they were holding onto an object and fell when it broke or they lost their grip. One-tenth of the workers said they fell because the surface on which they were standing broke, collapsed, or shifted. Examples of other events occurring less frequently were workers being struck, pushed, or knocked over; accidentally stepping in a hole or opening; tripping or catching their foot; and falling when tools or work materials slipped or broke, causing them to lose their balance. More than one-tenth attributed their falls simply to loss of balance with no other events involved.

The distance a worker fell was usually identical to the height where the work was being performed at the time of the accident. The few exceptions involved workers who fell to another elevated surface, were stopped by safety lines, or managed to stop their falls by grabbing onto beams, pipes, or pieces of equipment.

The source of injury, which identifies the object or substance which produced the injury, was most commonly the ground or floor surface (table 8). Workers who did not fall to a working surface landed on various types of objects, such as boxes, tools, or work materials. Almost one-half of the workers indicated they fell to concrete, rock, or asphalt surfaces. Nearly three-tenths landed on dirt or grass.

Injuries, hospitalization, and lost workdays

Fractures were the most common injuries, sustained by 46 percent of the workers (table 9). Next in frequency were muscle sprains or strains and bruises or contusions, accounting for 42 and 39 percent, respectively. Eighteen percent of the workers suffered cuts, lacerations, or punctures.

Almost three-tenths of the workers experienced injuries to more than one part of their body (table 10). An equal proportion of workers received injuries to the trunk, particularly the back. Lower extremity injuries, most commonly to the ankle, knee, and foot, were sustained by one-quarter of the workers and injuries to the upper extremities by more than one-tenth.

Eighty-five percent of the workers surveyed lost days away from work as a result of their injuries (table 11). The average lost-time case was an estimated 31 days, which was 14 days more than the 1982 national average for all lost-workday injury cases.[2] Thus, on the average, assuming a 5-day workweek, the falls resulted in a productivity loss of 6 workweeks. One-third of the workers were hospitalized due to their injuries (table 12). The average hospital stay was 10 nights.

It should be noted that one-quarter of the workers who lost time were unable to estimate the number of lost workdays. When compared to workers who were able to estimate lost time, these workers fell from higher elevations, sustained a larger proportion of fractures, and required hospitalization more often (see text table 1). Therefore, it is likely that the average number of lost workdays for these workers would be greater than for those who were able to provide estimates.

Availability and use of fall protection equipment

Fall protection equipment includes a variety of devices designed to either prevent falls or to save workers once they begin to fall. An example of the former would be guardrails. Devices such as safety nets or safety belts tied off to a lifeline would be in the latter category.

More than four-fifths of the workers surveyed reported there was no fall protection in their work area (table 13). Almost one-half of these workers were of the opinion, at least prior to their accidents, that fall protection was not practical to use for the type of work they were doing. Three-tenths felt they were not up high enough to need fall protection.

Fifty-seven workers, or 45 percent of those who indicated that fall protection equipment was available, reported that guardrails were used at the worksite. However, 30 of these workers fell from an area or side not protected by railings. For example, a scaffold may have had guardrails but the worker fell while climbing down from the platform. Eleven workers said the guardrails broke, and seven fell over or under the railings. One worker commented that the guardrail had been removed to speed up the work being done.

Seventy-four workers were provided with safety belts, but more than three-fourths were not attached to a lifeline or structure. Most said they were unwilling or unable to connect their safety belts because they were

Text table 1. Workers who estimated lost workdays and workers who did not, selected characteristics

(Percent of lost workday cases)

Characteristics	Lost time estimated	Lost time not estimated
Hospitalization		
Required hospitalization	32	71
Did not require hospitalization	68	29
Nature of injury		
Fracture	47	67
Distance worker fell		
Less than 10 feet	61	44
10 to 20 feet	33	33
20 feet or more	7	22

[2] News release, USDL-43-471, November 4, 1983, table 2.

moving around. This situation was particularly common among utility and telephone workers, who indicated that they were not using their pole straps while climbing up or down. Some workers indicated that there was no place to connect their equipment

Of the 16 workers who actually had personal fall protection in use at the time of their falls, 10 were wearing safety belts tied off with lanyards. Six were using safety belts with pole straps, which afford a measure of fall protection in addition to freeing the hands for work. Four of the workers using fall protection equipment indicated that it stopped their fall, although each sustained a back injury. One of the four commented that his protective equipment prevented a fall of approximately 50 feet.

Fall protection devices, however, failed to stop the fall of 12 of the 16 workers. Five workers fell while using pole straps: Three were climbing utility poles and 'gaffed out' when their climbing spikes failed to hold; one attached his pole strap to a hook which gave out; and a fifth said his safety belt broke. Of the remaining seven workers who were using fall protection, one fell 10 feet to the ground because his lanyard was too long. Another worker hooked his lanyard to a pole on a scaffold which broke when he fell against it, and one worker fell after he hooked his belt directly to a structure without fully closing the hook. Three workers using safety belts and lanyards did not indicate which part of the system failed. The final case was unique since the worker belonged to an industrial rescue team and was practicing rappelling down a mine shaft. While transferring to another descent rope, the equipment was bumped and she was released, falling 30 feet.

Practices and policies related to fall protection

Workers were asked if they or their co-workers ever worked at heights of 10 feet or more and, if so, to indicate their company's policy on the use of fall protection. While less than one-half of the workers surveyed were above 10 feet when they fell, four-fifths reported they (or their co-workers) worked at such heights (table 14). Furthermore, almost one-half noted that they worked at these heights daily or almost every day. Over one-half said their employers did not require fall protection of any kind at heights of 10 feet or more or that they did not know the company policy. In addition, three-fourths of the injured workers had not been provided training on the use of fall protection by their employers.

Conditions or factors contributing to accident

Three-fifths of the workers cited hazardous conditions which they felt contributed to their falls (table 15). Slippery working surfaces, usually reported in combination with weather conditions, were the most frequently noted hazardous conditions. Next in frequency were uneven or sloped walking surfaces and cluttered work areas. About two-fifths of the workers reporting hazardous conditions said they were aware of these conditions prior to their accident. Other factors which contributed to the accidents were more general. One out of five of the workers surveyed said they did not realize that they were near the edge of an opening. Carelessness and not paying attention to where they were going were each cited as contributing factors by almost 1 out of 10 workers. Other commonly indicated causal factors were the inability to see where they were stepping, being distracted by the activity of a co-worker, and being tired or fatigued.

Preventative measures

Finally, opinions were obtained from nearly seven-tenths of the workers surveyed on what might have prevented their fall. The largest proportion of the respondents, 43 percent, cited safer work procedures on their part; 22 percent indicated that the use of guardrails or other fall protection would have prevented their fall; and 21 percent said their employer should have enforced safer work procedures (table 16). Sixteen percent of the workers indicated that the hazardous conditions could have been removed before working in the area, and 10 percent recommended more or better safety training.

Table 1. Industry classification: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Standard Industrial Classification (SIC)	Number	Percent
Total	774	100
Agriculture, forestry, and fishing	31	4
Mining [1]	13	2
Construction	316	41
General building contractors	92	12
Heavy construction contractors	30	4
Special trade contractors	194	25
Manufacturing	180	23
Food and kindred products	35	5
Tobacco manufactures	1	([2])
Textile mill products	5	1
Apparel and other textile products	5	1
Lumber and wood products	29	4
Furniture and fixtures	5	1
Paper and allied products	9	1
Printing and publishing	8	1
Chemicals and allied products	4	1
Rubber and miscellaneous plastics products	5	1
Stone, clay, and glass products	6	1
Primary metal industries	21	3
Fabricated metal products	16	2
Machinery, except electrical	9	1
Electric and electronic equipment	4	1
Transportation equipment	15	2
Instruments and related products	3	([2])
Transportation and public utilities	57	7
Wholesale trade	55	7
Retail trade	55	7
Finance, insurance, and real estate	12	2
Services	52	7
Other industries, n.e.c.	3	([2])

[1] Limited to oil and gas extraction.
[2] Less than 0.5 percent.
n.e.c. = not elsewhere classified.
NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey.
SOURCE: State workers' compensation reports.

Table 2. Size of company: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Size of company	Number	Percent
Number of people employed in worker's company		
Total	719	100
1 to 10	195	27
11 to 49	201	28
50 to 99	102	14
100 to 499	130	18
500 or more	91	13

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

Table 3. Occupation: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Occupation	Number	Percent
Total	774	100
Professional, technical, and kindred workers	13	2
Managers and administrators, excluding farm	27	3
Salesworkers	10	1
Clerical and kindred workers	20	3
Craft and kindred workers	340	44
Boilermakers	8	1
Brickmasons and stonemasons	9	1
Brickmason and stonemason apprentices	1	(1)
Carpenters	74	10
Carpenter apprentices	4	1
Cement and concrete finishers	2	(1)
Crane, derrick, and hoist operators	4	1
Decorators and window dressers	1	(1)
Electricians	13	2
Electrician apprentices	2	(1)
Electric power line and cable installers and repairers	17	2
Excavating, grading, and road machine operators, excluding bulldozers	3	(1)
Blue-collar worker supervisors, n.e.c.	30	4
Inspectors, n.e.c.	1	(1)
Job-and-die setters, metal	1	(1)
Machinists	2	(1)
Mechanics and repairers	47	6
Air-conditioning, heating and refrigeration	5	1
Automobile mechanics	4	1
Heavy equipment mechanics	17	2
Household appliance and accessory installers and mechanics	1	(1)
Radio and television repairers	2	(1)
Miscellaneous mechanics and repairers	13	2
Mechanics and repairers, not specified	5	1
Millwrights	7	1
Molders, metal	2	(1)
Painters, construction and maintenance	19	2
Plasterers	1	(1)
Plumbers and pipefitters	15	2
Printing press operators	1	(1)
Roofers and slaters	20	3
Sheetmetal workers and tinsmiths	8	1
Sheetmetal apprentices	1	(1)
Shoe repairers	1	(1)
Structural metal workers	21	3
Telephone installers and repairers	6	1
Telephone line installers and repairers	16	2
Tile setters	1	(1)
Craft and kindred workers, n.e.c.	2	(1)
Operatives, excluding transport	90	12
Transport equipment operatives	34	4
Laborers, excluding farm	185	24
Animal caretakers, excluding farm	1	(1)
Carpenter helpers	4	1
Construction laborers, excluding carpenter helpers	62	8
Freight, material handlers	23	3
Garbage collectors	1	(1)
Gardeners and groundskeepers, excluding farm	8	1
Timber cutting and logging workers	11	1
Stock handlers	7	1
Vehicle and equipment cleaners	2	(1)
Warehouse laborers, n.e.c.	18	2
Miscellaneous laborers	38	5
Laborers, not specified	10	1

See footnotes at end of table.

Table 3. Occupation: Injuries resulting from falls from elevations, selected States, December 1981-June 1982—Continued

Occupation	Number	Percent
Farmers and farm managers	1	(1)
Farm laborers and farm laborer supervisors	25	3
Service workers, excluding private household	24	3
Private household workers	1	(1)
Nonclassifiable	4	1

[1] Less than 0.5 percent.

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey.

SOURCE: State workers' compensation reports.

Table 4. Age of worker: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Age	Number	Percent
Total	774	100
17-19 years	37	5
20-24 years	159	21
25-34 years	239	31
35-44 years	124	16
45-54 years	120	16
55-64 years	58	7
65 years or more	8	1
Not available	29	4

NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey.

SOURCE: State workers' compensation reports.

Table 5. Sex of worker: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Sex	Number	Percent
Total	774	100
Men	739	95
Women	35	5

NOTE: See appendix A for the scope of the survey.

SOURCE: State workers' compensation reports.

Table 6. Activity at time of accident: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Activity at time of accident	Number	Percent
Type of work		
Total	761	100
Painting	19	2
Welding	27	4
Roofing	50	7
Carpentry	77	10
Masonry or bricklaying	16	2
Ironwork or structural steel work	17	2
Sheetmetal or siding work	10	1
Plastering, drywall, or insulation work	22	3
Pipefitting or plumbing	17	2
Other construction work	42	6
Telephone, electrical, cable, or other utility service work	62	8
Loading or unloading material	130	17
Inspecting equipment or material	38	5
Operating, repairing, cleaning, or installing equipment	100	13
Tree trimming or logging	25	3
General maintenance work	69	9
Going to or from worksite	15	2
Other	25	3
Activity at time of accident		
Total [1]	733	([1])
Lifting, carrying, or moving objects	205	28
Using tools or equipment	174	24
Walking	98	13
Running	–	–
Stepping backward	71	10
Stepping from one surface to another	84	11
Climbing up or down	205	28
Other activity	6	1
Location of worksite		
Total	765	100
Privately owned home	40	5
Commercial or industrial building	409	53
Construction site	211	28
Logging site	10	1
Barn, orchard, or other agricultural site	19	2
Public street or roadside	27	4
Apartment house	8	1
Other	41	5
Location at the worksite		
Total	770	100
Indoors	299	39
Outdoors	471	61

[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 the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaires.

Table 7. Description of accident: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Description of accident	Number	Percent
Events involved in fall		
Total [1]	763	(1)
Surface you were on broke, collapsed, or gave way	14	2
Surface you were on moved, tilted, or shifted	60	8
Lost grip on object you were holding on to for balance	88	12
Object you were holding on to for balance gave way	46	6
Slipped or lost footing	381	50
Tripped or caught foot	29	4
Lost balance only	96	13
Was struck, pushed, or knocked over	53	7
Stepped in hole	44	6
Gaffed out	24	3
Tool or work material shifted, slipped, or broke	33	4
Piece of equipment or clothing got caught or hung up	7	1
Jumped to control fall	6	1
Other	16	2
Surface worker fell from		
Total	773	100
Suspended scaffold	26	3
Other type of scaffold	109	14
Walkway or catwalk	61	8
Loading dock	46	6
Roof	111	14
Attic beam or other building structure	36	5
Piled or stacked material	48	6
Single box, barrel, container, piece of furniture or equipment	105	14
Ground surface or floor (edge of a hole, trench, etc.)	58	8
Wall	30	4
Tree or log	23	3
Shelf, rack, or storage platform	21	3
Telephone or utility pole	37	5
Platform or ramp	17	2
Other structure	15	2
Other	30	4
Distance above the ground, floor level, or opening before fall		
Total	771	100
3 to 5 feet	196	25
5 to 10 feet	234	30
10 to 15 feet	160	21
15 to 20 feet	92	12
20 feet or more	89	12
How often worker normally worked at this height		
Total	753	100
First time worked at this height	28	4
Daily or almost every day	435	58
Several times a month	176	23
About once a month	43	6
Seldom—less than once a month	71	9

See footnotes at end of table.

Table 7. Description of accident: Injuries resulting from falls from elevations, selected States, December 1981-June 1982—Continued

Description of accident	Number	Percent
Distance worker fell		
Total	769	100
Less than 3 feet	17	2
3 to 5 feet	218	28
5 to 10 feet	227	30
10 to 15 feet	151	20
15 to 20 feet	82	11
20 feet or more	74	10
Surface(s) worker fell to		
Total [1]	766	(1)
Earth, dirt, or grass	209	27
Concrete, rock, or asphalt surface	356	46
Metal surface	97	13
Wood surface	67	9
Boxes, tools, work materials, or other objects	56	7
Carpet or tiled flooring	14	2
Other	42	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.

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

SOURCE: Survey questionnaires.

Table 8. Source of injury: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Source of injury	Number	Percent
Total	774	100
Bodily motion	1	(1)
Boilers, pressure vessels	1	(1)
Boxes, barrels, containers	17	2
Buildings and structures	14	2
Ceramic items	2	(1)
Conveyors	3	(1)
Electrical apparatus	1	(1)
Furniture, fixtures, etc.	1	(1)
Handtools, powered	1	(1)
Heating equipment (nonelectric), n.e.c.	2	(1)
Ladders	1	(1)
Machines	4	1
Metal items	13	2
Mineral items, nonmetallic, n.e.c.	2	(1)
Plants, trees, vegetation	3	(1)
Vehicles	7	1
Wood items	14	2
Working surfaces	675	87
Working surfaces, uns.	29	4
Floor	252	33
Ground	321	41
Ramps	1	(1)
Roofs	3	(1)
Runways, platforms	8	1
Sidewalks, paths, etc.	7	1
Stairs, steps	6	1
Street, road	14	2
Working surfaces, n.e.c.	34	4
Person	1	(1)
Miscellaneous, n.e.c.	6	1
Nonclassifiable	5	1

[1] Less than 0.5 percent.
n.e.c. = not elsewhere classified.
uns. = unspecified
NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey.
SOURCE: State workers' compensation reports.

Table 9. Nature of injury: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Nature of injury	Number	Percent
Total [1]	768	(1)
Fracture	355	46
Cut, laceration, or puncture	140	18
Bruise or contusion	299	39
Muscle sprain, strain, or torn ligaments	324	42
Concussion	46	6
Other	54	7

[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: See appendix A for the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.
SOURCE: Survey questionnaires.

Table 10. Part of body affected: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Part of body	Number	Percent
Total	774	100
Head	20	3
Brain	5	1
Eye(s)	1	(1)
Face	5	1
Scalp	2	(1)
Skull	2	(1)
Head, multiple	5	1
Neck	8	1
Upper extremities	110	14
Arm(s)	55	7
Arm, uns.	13	2
Upper arm	3	(1)
Elbow	29	4
Forearm	6	1
Arm, multiple	3	(1)
Arm, n.e.c.	1	(1)
Wrist	28	4
Hand	11	1
Finger(s)	10	1
Upper extremities, multiple	6	1
Trunk	219	28
Trunk, uns.	3	(1)
Abdomen	8	1
Back	100	13
Chest	43	6
Hips	21	3
Shoulder(s)	24	3
Trunk, multiple	15	2
Trunk, n.e.c.	5	1
Lower extremities	195	25
Leg(s)	79	10
Leg, uns.	11	1
Thigh	2	(1)
Knee	48	6
Lower leg	14	2
Leg, multiple	4	1
Ankle	54	7
Foot	42	5
Toe(s)	4	1
Lower extremities, multiple	16	2
Multiple parts	217	28
Nonclassifiable	5	1

[1] Less than 0.5 percent.
n.e.c. = not elsewhere classified.
uns. = unspecified
NOTE: Due to rounding, percentages may not add to 100. See appendix A for the scope of the survey.
SOURCE: State workers' compensation reports.

Table 11. Estimated days away from work: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Days away from work	Number	Percent
Total [1]	740	100
No days away from work	114	15
1 to 5 days	123	17
6 to 10 days	59	8
11 to 15 days	47	6
16 to 20 days	36	5
21 to 25 days	19	3
26 to 30 days	35	5
31 to 40 days	45	6
41 to 60 days	42	6
More than 60 days	71	10
Lost-time cases for which days away from work were not estimated	149	20
Mean days away from work per lost-workday case	31	
Median days away from work per lost-workday case	18	

[1] Excludes 3 workers for whom data were not available because they retired, were laid off, or put on permanent disability.

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

SOURCE: Survey questionnaires.

Table 12. Length of hospitalization required: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Length of hospitalization	Number	Percent
Total	763	100
No hospitalization required	500	66
1 night	14	2
2 nights	30	4
3 nights	26	3
4 nights	20	3
5 nights	28	4
6 nights	17	2
7 nights	21	3
8 nights	5	1
9 nights	12	2
10 nights	15	2
11 to 20 nights	35	5
21 to 30 nights	9	1
More than 30 nights	14	2
Hospitalized cases for which length of hospitalization was not estimated	17	2
Mean length (nights) of hospitalization per hospitalized case	10	
Median length (nights) of hospitalization per hospitalized case	6	

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

SOURCE: Survey questionnaires.

Table 13. Use of fall protection at time of accident: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Use of fall protection at time of accident	Number	Percent
Personal fall protection equipment worn or used at the time of accident		
Total	751	100
Safety belt (or harness) tied off with lanyard or rope grab	8	1
Safety belt (or harness) with pole strap in use	6	1
Window cleaner's belt connected to structure	–	–
Wearing safety belt or harness but not attached to lifeline or structure	53	7
Wearing other fall protection equipment	2	(1)
None	682	91
Fall protection in the work area at the time of accident		
Total [2]	717	(2)
None	589	82
Guardrails	57	8
Roofers' warning lines	3	(1)
Safety nets	–	–
Safety belts	74	10
Other fall protection	2	(1)
Reason(s) there was no fall protection in work area		
Total [2]	533	(2)
Not up high enough to need any	162	30
Not practical to use in that type of work	253	47
Did not think it was needed	106	20
Too much trouble to set up	26	5
Did not know if it was required	75	14
None provided by employer	26	5
Other reason(s)	12	2
Worker with fall protection: Reason(s) it failed to prevent fall [3]		
Total [2]	121	(2)
Fell from side or area not protected by guardrail	30	25
Fell over guardrail	4	3
Fell under guardrail	3	2
Guardrail broke	11	9
Safety net broke	–	–
Did not land on net	–	–
Warning line was too close to edge of roof	1	1
Was beyond warning line	2	2
Fall protection not connected because worker was moving around	42	35
Other reason(s)	33	27

[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.

[3] Includes 4 workers who did not fall the full distance because fall protection equipment stopped their fall.

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

SOURCE: Survey questionnaires.

Table 14. Fall protection practices and policies: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Fall protection practices and policies	Number	Percent
Frequency of work at heights of 10 feet or more		
Total	763	100
Never	150	20
Daily or almost every day	361	47
Several times a month	161	21
About once a month	33	4
Less than once a month	58	8
Workers who work at heights of 10 feet or more: Company requirements on the use of fall protection at these heights		
Total [1]	567	([1])
None required	256	45
Guardrails required	154	27
Roofers' warning lines required	16	3
Safety nets required	8	1
Personal fall protection (safety belt, lanyard, lifeline, etc.) required	141	25
Other fall protection required	2	([2])
Don't know whether company requires fall protection at these heights	50	9
Training on how and when to use fall protection		
Total	687	100
Not provided by company	514	75
Provided by company	173	25

[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 the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaires.

Table 15. Conditions or factors contributing to accident: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Conditions or factors contributing to accident	Number	Percent
Hazardous conditions at worksite		
Total [1]	725	([1])
Cluttered work area	61	8
Slippery walking surface	199	27
Uneven or sloped walking surface	85	12
Weather conditions	133	18
Inadequate lighting	27	4
Ladder or scaffold inadequate for job or not available	13	2
Structure in bad condition or unstable	29	4
Inadequate or faulty guardrails or safety equipment	32	4
Other	41	6
No hazardous conditions contributed to accident	286	39
Worker's awareness of hazardous conditions before accident		
Total	689	100
Not aware or hazardous conditions	151	22
Aware of hazardous conditions	252	37
No hazardous conditions involved	286	42
Other contributing factors		
Total [1]	685	([1])
Had physical condition which contributed to accident	10	1
Did not realize you were near edge of opening	126	18
Not paying attention to where you were going	55	8
Was careless in what you were doing	57	8
Could not see where you were going	40	6
Distracted by noise, co-worker's activity, etc	29	4
Tired or fatigued	24	4
Walking, climbing, or moving too fast	18	3
Other	24	4
Nothing else contributed to accident	381	56

[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 the scope of the survey. Because incomplete questionnaires were used, the total number of responses may vary by question.

SOURCE: Survey questionnaires.

Table 16. Accident prevention: Injuries resulting from falls from elevations, selected States, December 1981-June 1982

Accident prevention	Number	Percent
Actions, methods, or procedures that worker feels would have prevented accident		
Total [1]	534	([1])
Using guardrail or other type of fall protection	116	22
Removing hazards before working in area	86	16
More or better safety training	54	10
Using safer work procedures on your part	232	43
Having company enforce safe work procedure	111	21
Having proper equipment to do job	43	8
Other	27	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.

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

SOURCE: Survey questionnaires.

Appendix A. Survey Explanatory Note

The survey was designed to develop information on injuries resulting from falls from elevations. The scope of the survey extended to all industries except coal, metallic and nonmetallic mining, and government. All occupations were included in the scope of the survey.

In order to focus on situations in which fall protection may have been appropriate, cases were excluded from the survey if the worker fell less than 3 feet. In addition, falls on stairs, falls from ladders, vehicles, or animals, and falls resulting from explosions, cave-ins, or structural collapses (other than suspended scaffolds) were not included. Cases were also excluded from the survey 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 covered the 24 States listed in appendix B. To identify cases within the scope of the survey, staff of participating State agencies reviewed employers' reports of injuries required by State workers' compensation laws and mailed questionnaires to injured workers selected for study. Cooperation was requested on a voluntary basis. During the survey period, December 1981-June 1982, 774 survey questionnaires were returned and found to be within the scope of the survey, resulting in a 54-percent response rate.

Although the data were aggregated for all participating States, it should be noted that the workers' compensation cases selected for study reflect differences in reporting requirements. For example, some 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 falls from elevations. 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 the survey was terminated when responses exceeded 750 cases.

Questionnaires returned by the injured workers were reviewed for completeness and response errors. Where feasible, responses on the questionnaire falling into the 'other' category were classified by BLS to provide as much descriptive information as possible. Affected were the following questions: A (location at worksite), C (surface worker fell from), E (type of work), M (events involved in fall), N (hazardous conditions at worksite), U (reason there was no fall protection), V (reason fall protection failed to prevent fall), and X (actions, methods, etc., that might have prevented fall).

Estimates of mean and median lost workdays and nights of hospitalization do not include cases in which workers indicated lost time or hospitalization but failed to provide numerical estimates of the amount of time.

All usable responses in incomplete questionnaires were tabulated. Consequently, response rates vary among questions. No attempt was made to adjust the data for nonresponse.

Information on the employer's industry classification and the worker's age, sex, part of body injured, and source of injury was classified and tabulated for all respondents based on information furnished by the employer in the workers' compensation report.

Numerical values shown in tables were actual counts while percentages were rounded to the nearest whole number.

Appendix B. Participating State Agencies

Arizona Industrial Commission
Arkansas Department of Labor
California Department of Industrial Affairs
Colorado Department of Labor and Employment
Delaware Department of Labor
Hawaii Department of Labor and Industrial Relations
Indiana Division of Labor
Iowa Bureau of Labor
Kentucky Department of Labor
Maine Department of Labor
Maryland Department of Licensing and Regulation
Michigan Department of Labor
Missouri Department of Labor and Industrial Relations
Montana Department of Labor and Industry
Nebraska Workmen's Compensation Court
North Carolina Industrial Commission
Ohio Industrial Commission
Tennessee Department of Labor
Utah Industrial Commission
Vermont Department of Labor and Industry
Virginia Department of Labor and Industry
Washington Department of Labor and Industries
Wisconsin Department of Industry, Labor, and Human Relations
Wyoming Department of Labor and Statistics

Appendix C. Survey Questionnaire

Bureau of Labor Statistics
Work Injury Report—Falls From Elevations

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. 1220-0047
Approval Expires 6/30/82

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

A. Where were you working at the time of your accident? *(Check one.)*
1. ☐ Privately owned home
2. ☐ Commercial or industrial building (office, warehouse, store, factory, school, etc.)
3. ☐ Construction site
4. ☐ Other area (bridge, outside tank, tree, etc.): *(Describe)* _____

B. Were you indoors or outdoors?
1. ☐ Indoors
2. ☐ Outdoors

C. What did you fall from? *(Check one.)*
1. ☐ Suspended scaffold
2. ☐ Other type of scaffold
3. ☐ Walkway or catwalk
4. ☐ Loading dock
5. ☐ Roof
6. ☐ Attic beam or other building structure
7. ☐ Piled or stacked material (lumber, bricks, boxes, etc.)
8. ☐ Single box, barrel, container or piece of furniture
9. ☐ Ground surface or floor (edge of a hole, trench, etc.)
10. ☐ Wall
11. ☐ Tree
12. ☐ Other: *(Describe)* _____

D. What was your activity at the time of your accident? *(Check all that apply.)*
1. ☐ Lifting, carrying or moving objects
2. ☐ Using tools or equipment
3. ☐ Walking
4. ☐ Running
5. ☐ Stepping backward
6. ☐ Stepping from one surface to another
7. ☐ Climbing up or down
8. ☐ Other: *(Describe)* _____

E. What type of work were you doing? *(Check one.)*
1. ☐ Painting
2. ☐ Welding
3. ☐ Roofing
4. ☐ Carpentry
5. ☐ Other construction work: *(Describe)* _____
6. ☐ Telephone, electrical or other utility service work
7. ☐ Loading/unloading material
8. ☐ Inspecting equipment or material
9. ☐ Operating, repairing, cleaning or installing equipment
10. ☐ Tree trimming or logging
11. ☐ General maintenance work
12. ☐ Going to or from worksite
13. ☐ Other: *(Describe)* _____

F. How high above the ground, floor level or opening were you before you fell? *(Check one.)*
1. ☐ Less than 3 feet (for example: table height is less than 3 feet)
2. ☐ 3 to 5 feet
3. ☐ 5 to 10 feet
4. ☐ 10 to 15 feet
5. ☐ 15 to 20 feet
6. ☐ 20 feet or more

G. How often do you normally work at this height? *(Check one.)*
1. ☐ First time you worked at this height
2. ☐ Daily or almost every day
3. ☐ Several times a month
4. ☐ About once a month
5. ☐ Seldom—less than once a month

H. How far did you fall? *(Check one.)*
1. ☐ Less than 3 feet
2. ☐ 3 to 5 feet
3. ☐ 5 to 10 feet
4. ☐ 10 to 15 feet
5. ☐ 15 to 20 feet
6. ☐ 20 feet or more

I. What did you fall on to? *(Check all that apply.)*
1. ☐ Earth, dirt or grass
2. ☐ Concrete, rock or asphalt surface
3. ☐ Metal surface
4. ☐ Wood surface
5. ☐ Boxes, tools, work materials or other objects
6. ☐ Carpeted or tiled flooring
7. ☐ Other: *(Describe)* _____

J. What were your injuries? *(Check all that apply.)*
1. ☐ Fracture(s)—Indicate bone(s) broken (leg, rib, ankle, etc.)

_____
2. ☐ Cuts, lacerations or punctures
3. ☐ Bruises, contusions
4. ☐ Muscle sprain/strain, torn ligaments
5. ☐ Brain concussion
6. ☐ Other: *(Describe)* _____

K. 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 ☐☐☐☐☐

Check here ____ if you did not lose time beyond the day of injury.

L. Did your injury require you to be hospitalized overnight?
1. ☐ No
2. ☐ Yes

If yes, how long were you (or do you expect to be) in the hospital?

_____ Nights ☐☐☐☐

M. How did your accident occur? *(Check all that apply.)*
1. ☐ Floor, scaffold, etc., broke, collapsed or gave way
2. ☐ Walkway, tree, etc., moved, tilted or shifted
3. ☐ Lost grip on object you were holding on to for balance
4. ☐ Object you were holding on to gave way
5. ☐ Slipped or lost footing
6. ☐ Tripped or caught foot
7. ☐ Lost balance
8. ☐ Was struck, pushed or knocked over
9. ☐ Occurred in other way: *(Describe)* _____

N. Did any hazardous conditions contribute to your accident? *(Check all that apply.)*
1. ☐ Cluttered work area
2. ☐ Slippery walking surface: *(Describe)* _____
3. ☐ Uneven or sloped walking surface
4. ☐ Weather conditions: *(Describe)* _____
5. ☐ Inadequate lighting
6. ☐ Other: *(Describe)* _____
7. ☐ No hazardous conditions contributed to accident

O. Were you aware of these hazards *before* your accident?
1. ☐ No
2. ☐ Yes
3. ☐ No hazardous conditions involved

P. Did anything else contribute to your accident? *(Check all that apply.)*
1. ☐ Had physical condition which contributed to the accident:

(Describe) _____
2. ☐ Did not realize you were near edge or opening
3. ☐ Not paying close attention to where you were going
4. ☐ Was careless in what you were doing
5. ☐ Could not see where you were going
6. ☐ Was distracted by noise, co-worker's activity, etc.
7. ☐ Was tired or fatigued
8. ☐ Walking too fast or running
9. ☐ Other: *(Describe)* _____
10. ☐ Nothing else contributed to accident

CONTINUE ON REVERSE SIDE

BLS 98E (Feb. 1982)

Q. Do you or your co-workers ever work at heights of 10 feet or more? *(Check one.)*

1. ☐ No
2. ☐ Yes—daily or almost every day
3. ☐ Yes—several times a month
4. ☐ Yes—about once a month
5. ☐ Yes—less than once a month

R. If yes, does your company require the use of fall protection at heights of 10 feet or more? *(Check all that apply.)*

1. ☐ No
2. ☐ Yes—guardrails
3. ☐ Yes—roofers' warning lines
4. ☐ Yes—safety nets
5. ☐ Yes—personal fall protection (safety belt, lanyard, lifeline, etc.)
6. ☐ Yes—other fall protection: *(Describe)*

_____

7. ☐ Don't know

S. Does your company provide training on how and when to use fall protection?

1. ☐ No
2. ☐ Yes

T. Was there fall protection in the area where you were working at the time of your accident? *(Check all that apply.)*

1. ☐ No
2. ☐ Yes—guardrails
3. ☐ Yes—roofers' warning lines
4. ☐ Yes—safety nets
5. ☐ Yes—safety belts
6. ☐ Yes—other fall protection: *(Describe)* _____

U. If there was *no* fall protection, indicate reason(s) why. *(Check all that apply.)*

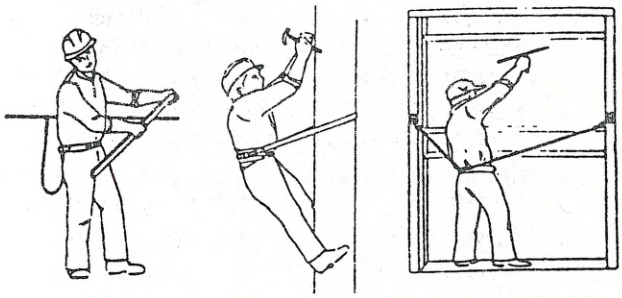
1. ☐ Not up high enough to need any
2. ☐ Not practical to use in that type of work: *(Explain)* _____
3. ☐ Did not think it was needed
4. ☐ Too much trouble to set up
5. ☐ Did not know if it was required
6. ☐ Other reason(s): *(Describe)* _____

V. If there *was* fall protection, why didn't it prevent your fall? *(Check all that apply.)*

1. ☐ Fell from side or area not protected by guardrail
2. ☐ Fell over guardrail
3. ☐ Fell under guardrail
4. ☐ Guardrail broke
5. ☐ Safety net broke
6. ☐ Did not land on net
7. ☐ Warning line was too close to edge of roof
8. ☐ Was beyond warning line
9. ☐ Other reason(s): *(Describe)* _____

W. Indicate whether you were wearing and using personal fall protection equipment *(see pictures below)* **at the time of your accident.** *(Check one.)*

1. ☐ Safety belt (or harness) tied off with lanyard or rope grab
2. ☐ Safety belt (or harness) with pole strap in use
3. ☐ Window cleaner's belt connected to structure
4. ☐ Wearing safety belt or harness but **not** attached to lifeline or structure
5. ☐ Wearing other fall protection equipment: *(Describe)* _____
6. ☐ None of the above



Safety Belt, Lifeline and Lanyard

Pole Strap

Window Cleaner's Belt

X. What do you feel could have prevented your accident? *(Check all that apply.)*

1. ☐ Using guardrails or other types of fall protection
2. ☐ Removing hazards before working in area
3. ☐ More or better safety training
4. ☐ Using safer work procedures on your part
5. ☐ Having company enforce safe work procedures
6. ☐ Other: *(Describe)* _____

Y. How many people are currently employed in your company? *(check one)*

1. ☐ 1 to 10
2. ☐ 11 to 49
3. ☐ 50 to 99
4. ☐ 100 to 499
5. ☐ 500 or more

Briefly describe how your accident occurred.

Work Injury Reports

Reports which may be purchased from the U.S. Department of Commerce, National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161:

- Survey of Ladder Accidents Resulting in Injuries
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- Survey of Welding and Cutting Accidents Resulting in Injuries
  NTIS Accession No. PB83 208017 (1978)
- Survey of Scaffold Accidents Resulting in Injuries
  NTIS Accession No. PB83 208009 (1978)
- Survey of Power Saw Accidents Resulting in Injuries
  NTIS Accession No. PB83 207993 (1978)

Reports available from the Office of Occupational Safety and Health Statistics, U.S. Department of Labor, Room 4014, 601 D Street, N.W., Washington, D.C., 20212 or regional offices:

- Accidents Involving Eye Injuries,
  Report 597 (1980)
- Accidents Involving Face Injuries,
  Report 604 (1980)
- Accidents Involving Head Injuries,
  Report 605 (1980)
- Accidents Involving Foot Injuries,
  Report 626 (1981)

Reports which may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

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  Bulletin 2115 (1981)
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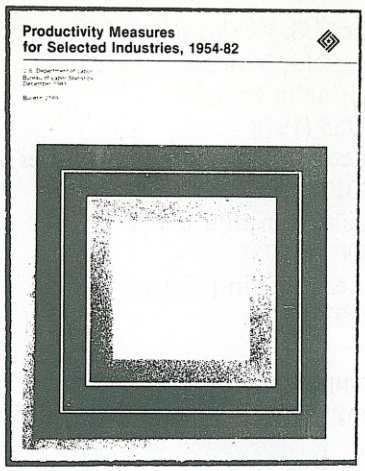

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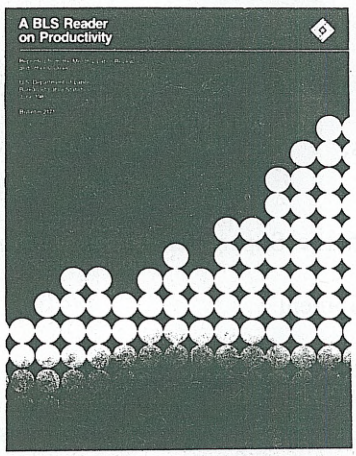

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