

Injuries Resulting From Falls on Stairs

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U.S. Department of Labor
Bureau of Labor Statistics
August 1984

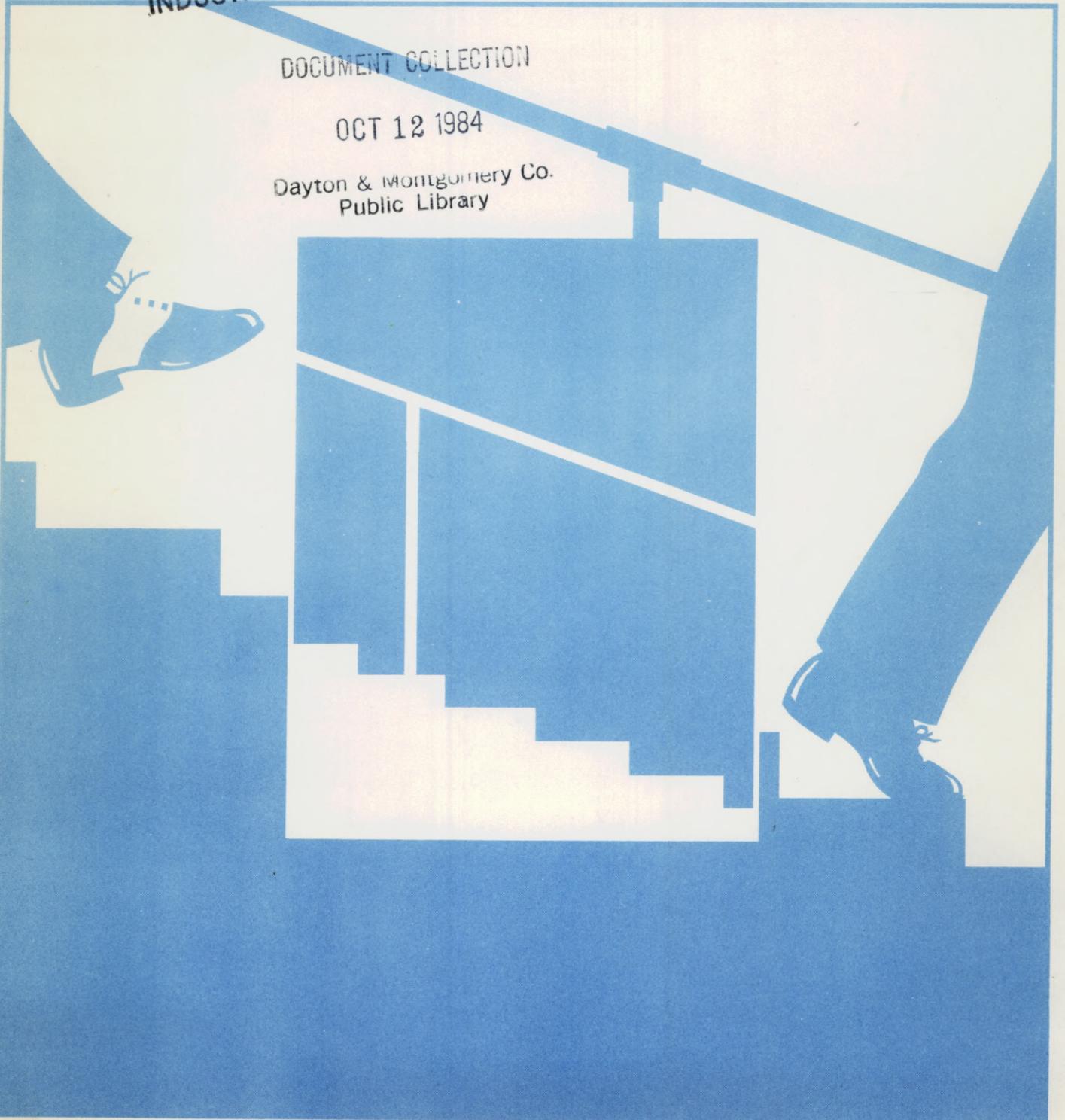
Bulletin 2214

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Injuries Resulting From Falls on Stairs



U.S. Department of Labor
Raymond J. Donovan, Secretary

Bureau of Labor Statistics
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August 1984

Bulletin 2214

Preface

This bulletin summarizes the results of a survey of workers who were injured by slips or falls on stairs. The findings of this survey, which was conducted during the period from December 1981 through April 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 OSHA Offices of Compliance, Standards Development, Statistical Studies and Analysis, Regulatory Analysis, and Training as well as the Office of Safety Research of the National Institute for Occupational Safety and Health contributed to the planning and development of the survey. The analysis of the survey findings was prepared by Larry Jones and Helen McDonald. Lyn Pearson developed computer tabula-

tions. The survey was directed by Helen McDonald under the supervision of Herbert Schaffer.

The data collected in the survey indicate how and why injuries occurred among the workers studied in the cooperating States. However, the user should exercise caution in extrapolating the data to population estimates because of limitations of the survey. States participating in data collection may not represent the country as a whole; government and mining industries are not included; reporting requirements for workers' compensation reports, the source documents for selecting injuries for study, vary among States; and the data collection period is not intended to represent the entire year.

Incidence rates of the injuries studied were not generated, nor can they be inferred from the data because information on hours of work for 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.

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Survey Results

Falls to lower levels on stairs result in nearly 33,000 disabling work injuries a year and account for 1.3 percent of all lost-time injuries and illnesses, according to a BLS estimate.¹ To obtain additional information on the causes and consequences of these accidents, the Bureau of Labor Statistics conducted a special study in which workers were asked to describe their activity at the time of the fall, how the accident occurred, the number of stairs they fell down, and the location of the stairs. As a measure of the severity of workers' injuries, information was obtained on the number of days lost from work, the amount of hospitalization required, the nature of the injury, and the part of the body affected. Injured workers also provided descriptions of the stairs, including slip-resistant features, and any hazardous conditions or other factors which may have contributed to their falls. In addition to stair accidents classified as falls to lower levels, the scope of the survey included slips and falls to the same level on stairs. The survey findings reflect the responses of 1,007 workers injured during a 5-month period from December 1981 through April 1982.²

Summary of survey findings

Unlike many types of work-related accidents, falls on stairs occurred with about the same frequency among different groups of workers. Comparisons of workers who slipped or fell on stairs with the general working population indicated that age was not a factor in these accidents. The industry distribution and male/female ratios of the injured workers showed that the service industries and women workers were somewhat over-represented. However, the major difference appeared in the occupational distributions. Service workers, waiters and waitresses included, have a higher risk of accidents on stairs, probably reflecting their frequent use of stairs in serving customers.

¹ Estimates of the total number of disabling injuries resulting from falls on stairs were derived from 1980 BLS Supplementary Data System disability files and the 1980 Annual Survey of Occupational Injuries and Illnesses, and limited to private sector data. The proportion of disabling cases involving falls on stairs (SDS data) was multiplied by the number of lost workday injuries and illnesses (annual survey data) to produce an estimate of the total number of disabling injuries for falls on stairs.

² See appendix A for scope of survey.

Most of the incidents occurred while going down the stairs. Loss of traction caused the largest number of the accidents and, except for exterior stairs, was usually due to water or other liquids on the steps. On outdoor stairways, ice and snow were the major hazards. Overall, about three-fifths of the accidents were attributed, totally or in part, to hazardous conditions on the stairs. The fact that nearly two-thirds of the workers were not using handrails implies that some, though not all, of the accidents could have been prevented by using this safety feature. Over one-fifth of the stairs on which accidents occurred were not equipped with railings.

Finally, four-fifths of the workers surveyed lost an average of 18 days away from work as a result of their accidents, indicating that falls on stairs are usually serious and require a long recuperative period.

Industry, age, sex, and occupation

The industry, age, and sex of workers who fell on stairs nearly matched that of all workers in the States which participated in this survey. Furthermore, this relationship prevailed in most of the occupational groupings.

The distribution of stair accidents by industry was similar to the States' overall employment distribution. As shown below, the two exceptions were the services industry, which had proportionately more injuries, and manufacturing firms, which showed proportionately fewer injuries:

Industry division	Percent	
	All workers ³	Workers who fell on stairs
Total	100	100
Construction	5	6
Manufacturing	27	21
Transportation and public utilities	6	8
Wholesale trade	7	7
Retail trade	21	19
Finance, insurance, and real estate	7	9
Services	24	29
Other	3	1

³ "All Workers" is an annual average and is derived either from the BLS-State Employment and Earnings Survey data or from State unemployment insurance program data.

Age distributions of the injured workers and of all workers were nearly identical in these States, as shown below using unpublished BLS data from the Current Population Survey, 1982:

Age	Percent	
	All workers	Workers who fell on stairs
19 or less	8	6
20-24	13	15
25-34	29	30
35-44	21	19
45-54	16	15
55-64	11	12
65 or more	3	2

Falls on stairs were almost evenly divided between men and women, 51 and 49 percent, respectively, although men represented a larger proportion of all workers employed in these States, 56 percent.⁴

The largest differences between the injured workers and all workers were reflected in two occupational groups. As indicated in chart 1, service workers, including waiters, waitresses, and other food service employees, accounted for the largest proportion of workers injured, 22 percent, while representing only 14 percent of all workers. Conversely, professional and technical workers constituted a higher proportion of all workers but experienced relatively fewer accidents.

Injuries, hospitalization, and lost workdays

Muscle sprains or strains, the most common injuries, were sustained by 64 percent of the workers who fell (table 1). Next in frequency were bruises or contusions, 38 percent, and fractures, 20 percent.

Thirty-three percent of the injuries were to the lower extremities, most commonly the ankle or knee (table 2). Thirty percent of the workers received injuries to the trunk, particularly the back, while 23 percent of the accidents resulted in injuries involving multiple body parts.

Eighty percent of the workers surveyed lost days away from work as a result of their injuries (table 3). The average lost-time case resulted in 18 days away from work. Twelve percent of the workers indicated that they were hospitalized overnight after the accident, with an average hospital stay of 7 nights (table 4).

Activity at the time of the accident

Over four-fifths of the workers were going down the stairs when the accident occurred (table 5). Relatively few workers, 5 percent, indicated they were running at the time of their fall. About three-fifths of the workers were carrying objects while using the stairs. Most workers were familiar with the stairs since 9 out of 10 had used the stairs before the accident.

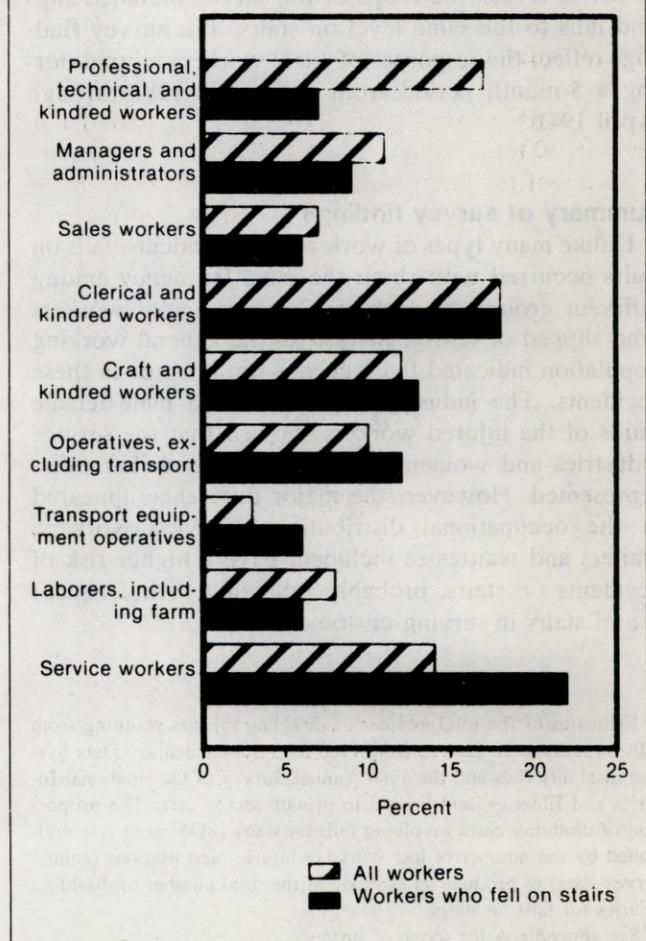
Nearly two-thirds of the workers were not using handrails when they fell. The most frequent explanations for this were lack of railings on the entire staircase or at the particular spot where the accident occurred. One-sixth of the workers indicated that, due to objects being carried, they were unable to hold the railing, and about one-tenth of the workers felt, at least prior to their accident, that using the handrail was unnecessary.

Description of the accident

Over three-fifths of the accidents occurred when the worker's foot slipped on the step or off the edge of the step (table 6). About 1 out of 10 workers caught their shoe heels, and a similar proportion either tripped on the step or slipped or tripped on objects (as opposed to the step surface). Other falls were initiated by actions solely related to bodily motion such as turning or twisting a foot or missing a step.

Three-fifths of the workers fell to the landing or bottom of the stairs. About 1 out of 4 workers stopped

Chart 1. Percent distribution of all workers and workers who fell on stairs by occupation



⁴Current Population Survey, 1982, unpublished BLS data.

falling prior to reaching the landing. Most of the remaining workers either fell upward or to the same level or managed to stop their fall but were still injured in the process. Falls over the side of the stairs accounted for 1 percent of the injuries.

Because of the varying lengths of staircases, workers were asked to indicate the number of steps they fell down, rather than whether they fell from the top or middle of the staircase. The largest proportion of falls, 38 percent, were two to four steps in distance, followed by falls involving five to eight steps, 22 percent. Thirteen percent of the workers fell down nine or more steps. The remaining workers fell down one step, fell upwards or, as noted above, did not actually fall.

Location and description of the stairs

More than one-fourth of the falls occurred on exterior stairs, reflecting, in part, the adverse weather conditions during the winter months of the survey period (table 7). Among the accidents which occurred on interior stairs, the most frequent locations were: Office or public buildings, 25 percent; industrial buildings such as factories or warehouses, 21 percent; and stores, restaurants, or hotels, 17 percent (table 7).

Slightly more than one-fifth of the staircases were not equipped with handrails, most frequently exterior stairs or those located in stores, restaurants, or hotels. About one-third of the stairs were enclosed by walls on both sides and a similar proportion were open on one side.

A typical step has a height (rise) of 7 to 8 inches and depth of 10 to 12 inches. Workers who provided measurements of the stairs indicated that 15 percent of the step risers were higher than normal and 22 percent were less than 10 inches deep. About one-fifth of the stairs had open backs.

The staircases on which the accidents occurred were divided into four size groups. Staircases with 2 to 4 steps accounted for 19 percent of the accident sites; 5 to 8 steps, 26 percent; 9 to 12 steps, 27 percent; and more than 12 steps, 22 percent.

Thirty-eight percent of the stairs had a surface composed of concrete, stone, brick, or marble, and 20 per-

cent were wood. Fifteen percent were covered with carpeting or runners.

Nearly one-third of the workers indicated that the stairs had slip-resistant features, such as a rough surface, nonskid strips, or slip-resistant paint. However, workers who fell on these stairs slipped almost as frequently as workers on stairs without these safety features. A cross-tabulation indicated that slips were the initial event in 66 percent of the falls on stairs without slip-resistant features. However, slips also caused 59 percent of the falls on stairs with slip-resistant devices. Some workers explained that the slip-resistant strips or paint had worn over time and offered little traction. In other instances, the steps, including the slip-resistant features, were covered with ice or snow.

Conditions or factors contributing to the accident

Over three-fifths of the workers noted hazardous conditions on the stairs and, with few exceptions, indicated that these conditions contributed to their accident (table 8). Slippery surfaces were by far the most common hazard, cited in 42 percent of the accidents. As shown below, two-fifths of the slippery surfaces were the result of winter weather. Less than one-fifth were attributed to the step surface itself:

<i>Condition</i>	<i>Percent</i>
Total with slippery surfaces	100
Ice or snow	40
Grease or oil	6
Water or other liquids	35
Step surface or covering	17
Other	2

Inadequate lighting, worn or uneven steps, and broken steps were each cited as causal factors by 5 to 7 percent of the workers. Other contributing factors cited frequently by workers were the shoes they were wearing, 14 percent; not paying attention to where they were going, 12 percent; not being able to see where they stepped, 10 percent; and moving too fast, 9 percent.

Table 1. Nature of injury: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Nature of injury	Number	Percent
Total ¹	1,007	(¹)
Fracture	206	20
Cut, laceration, or puncture	96	10
Bruise or contusion	378	38
Muscle sprain, strain, or torn ligaments	643	64
Concussion	25	2
Other	73	7

¹ Because more than 1 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 questionnaire.

Table 2. Part of body affected: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Part of body	Number	Percent
Total	1,007	100
Head	21	2
Head, uns.	4	(¹)
Brain	1	(¹)
Eye(s)	2	(¹)
Face	8	1
Face, uns.	1	(¹)
Jaw	1	(¹)
Mouth	2	(¹)
Nose	2	(¹)
Face, multiple parts	1	(¹)
Face, n.e.c.	1	(¹)
Head, multiple	3	(¹)
Head, n.e.c.	3	(¹)
Neck	4	(¹)
Upper extremities	99	10
Arm(s)	41	4
Arm, uns.	8	1
Upper arm	3	(¹)
Elbow	22	2
Forearm	7	1
Arm, multiple	1	(¹)
Wrist	21	2
Hand	12	1
Finger(s)	14	1
Upper extremities, multiple	11	1
Trunk	305	30
Abdomen	4	(¹)
Back	186	18
Chest	28	3
Hips	32	3
Shoulder(s)	26	3
Trunk, multiple	28	3
Trunk, n.e.c.	1	(¹)
Lower extremities	335	33
Leg(s)	121	12
Leg, uns.	13	1
Thigh	3	(¹)
Knee	93	9
Lower leg	8	1
Leg, multiple	4	(¹)
Ankle	136	14
Foot	52	5
Toe(s)	3	(¹)
Lower extremities, multiple	23	2
Multiple parts	231	23
Body parts, n.e.c.	3	(¹)
Nonclassifiable	9	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 3. Estimated days away from work: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Days away from work	Number	Percent
Total	977	100
No days away from work	195	20
1 to 5 days	285	29
6 to 10 days	134	14
11 to 15 days	61	6
16 to 20 days	42	4
21 to 25 days	32	3
26 to 30 days	35	4
31 to 40 days	35	4
41 to 60 days	60	6
More than 60 days	37	4
Lost time cases for which days away from work were not estimated	61	6
Mean days away from work per lost-workday case	18	
Median days away from work per lost-workday case	9	

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 questionnaire.

Table 4. Length of hospitalization required: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Length of hospitalization	Number	Percent
Total	1,000	100
No hospitalization required	877	88
1 night	12	1
2 nights	9	1
3 nights	14	1
4 nights	11	1
5 nights	11	1
6 nights	6	1
7 nights	7	1
8 nights	2	(¹)
9 nights	4	(¹)
10 nights	11	1
11 to 20 nights	24	2
21 to 30 nights	3	(¹)
Hospitalized cases for which length of hospitalization was not estimated	9	1
Mean length (nights) of hospitalization per hospitalized case	7	
Median length (nights) of hospitalization per hospitalized case	6	

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. Because incomplete questionnaires were used, the total number of responses may vary by question.
SOURCE: Survey questionnaire.

Table 5. Activity at time of accident: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Activity	Number	Percent
General activity at time of accident		
Total	1,006	100
Going down stairs	837	83
Walking	783	78
Running	34	3
Going up stairs	946	94
Walking	143	14
Running	20	2
Working on stairs (for example: cleaning stairs)	17	2
Other	9	1
Direction of worker movement on stairs		
Total	981	100
Moving forward	961	98
Moving backward	20	2
Holding object(s) at time of accident		
Total	1,004	100
Not holding object(s)	431	43
Holding object(s) with both hands	221	22
Holding object(s) with one hand	352	35
Use of handrails at time of fall		
Total	989	100
Holding handrail	306	31
Not holding handrail	620	63
No handrail on stairs	204	21
Hands were not free to hold on to handrail	155	16
Let go of rail for a moment	53	5
There was no rail at that spot	20	2
Rail was out of reach	45	5
Did not think it was necessary	110	11
Other reason	33	3
Don't remember	63	6
How often worker normally uses stairs involved in accident		
Total	987	100
First time worker used these stairs	92	9
Less than once a day	163	17
1 to 4 times a day	371	38
5 to 10 times a day	193	20
More than 10 time a day	168	17

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 questionnaire.

Table 6. Description of accident: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Description of accident	Number	Percent
How accident occurred		
Initial event		
Total	994	100
Tripped or slipped on object(s) lying on stairs	32	3
Tripped on step	72	7
Caught heel	88	9
Slipped on step or slipped off edge of step	621	62
Foot turned or twisted	43	4
Lost balance	50	5
Pushed or knocked down steps	4	(¹)
Missed a step	60	6
Other	24	2
Intermediate event(s)		
Total ²	306	(¹)
Tripped or slipped on object(s) lying on stairs	1	(¹)
Tripped on step	30	10
Caught heel	18	6
Slipped on step or slipped off edge of step	45	15
Foot turned or twisted	103	34
Lost balance	172	56
Pushed or knocked down steps	-	-
Missed a step	36	12
Other	3	1
Final event		
Total	1,007	100
Fell down to landing or bottom of stairs	603	60
Fell part way down stairs	238	24
Fell up the stairs or to the same level	78	8
Fell over side of stairs or railing to surface below	9	1
Did not fall to surface (caught railing and stopped fall, etc.)	77	8
Other	2	(¹)
Number of steps worker fell down		
Total	1,001	100
None (fell up stairs, over side, etc.)	165	16
One step	104	10
2 to 4 steps	379	38
5 to 8 steps	216	22
9 to 12 steps	86	9
More than 12 steps	39	4
Don't know	12	1

¹ Less than 0.5 percent.

² Because more than 1 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 questionnaire.

Table 7. Description of stairs: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Description of stairs	Number	Percent
Location of stairs		
Total	1,004	100
In an office or public building	247	25
In a store, restaurant, or hotel	173	17
In an industrial building (factory, warehouse, plant, etc.)	206	21
In a house or other residential building	61	6
Outside	275	27
In a building under construction	17	2
Other location	25	2
Wall enclosures		
Total	989	100
Enclosed by walls on both sides	339	34
Enclosed by wall on one side	357	36
Open on both sides	270	27
Other	23	2
Width of stairs		
Total	961	100
Less than 2 feet	62	6
2 to 4 feet	680	71
5 to 8 feet	197	20
More than 8 feet	22	2
Height of step (rise)		
Estimated or measured height		
Total	974	100
Less than 7 inches	131	13
7 to 8 inches	542	56
More than 8 inches	82	8
Don't know	219	22
Measured height only		
Total	102	100
Less than 7 inches	28	27
7 to 8 inches	59	58
More than 8 inches	15	15

See footnotes at end of table.

Table 7. Description of stairs: Injuries resulting from falls on stairs, selected States, December 1981-April 1982—Continued

Description of stairs	Number	Percent
Depth of tread		
Estimated or measured depth		
Total	967	100
Less than 10 inches	221	23
10 to 12 inches	471	49
More than 12 inches	50	5
Spiral stairs (depth varies)	8	1
Don't know	217	22
Measured depth only		
Total	102	100
Less than 10 inches	22	22
10 to 12 inches	67	66
More than 12 inches	13	13
Back of steps		
Total	989	100
Closed	768	78
Open	221	22
Nosing on stairs		
Total	976	100
Stairs with nosing	255	26
Stairs without nosing	471	48
Don't know	250	26
Depth of nosing		
Total	251	100
About 1 inch	167	67
More than 1 inch	36	14
Don't know	48	19
Surface of the steps		
Total	997	100
Carpet	128	13
Runner	20	2
Concrete, stone, brick, or marble	380	38
Metal or metal grate	132	13
Wood	198	20
Tile	73	7
Other	37	4
Don't know	29	3

See footnotes at end of table.

Table 7. Description of stairs: Injuries resulting from falls on stairs, selected States, December 1981-April 1982—Continued

Description of stairs	Number	Percent
Slip-resistant features		
Total ¹	978	(¹)
Nonslip-mats	32	3
Nonskid-strips	81	8
Slip-resistant paint	18	2
Roughened surface	154	16
Other	31	3
None	520	53
Don't know	144	15
Handrails on stairs		
Total	991	100
No handrails	204	21
Handrails on one side	432	44
Handrails on both sides	343	35
Handrails on both sides and down the center	12	1
Number of steps in the staircase		
Total	992	100
2 to 4 steps	188	19
5 to 8 steps	255	26
9 to 12 steps	265	27
More than 12 steps	216	22
Don't know	68	7

¹ Because more than 1 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 questionnaire.

Table 8. Hazardous conditions and other factors contributing to accident: injuries resulting from falls on stairs, selected States, December 1981-April 1982

Conditions or factors	Number	Percent
Hazardous conditions on stairs		
Total ¹	986	(')
No hazardous conditions	378	38
Steps broken or in bad condition	46	5
Slippery surface	417	42
Torn or loose covering	22	2
Objects on stairway	37	4
Inadequate lighting	70	7
Steps uneven or worn down	59	6
Loose or broken handrail	9	1
Steps unevenly spaced	15	2
Other	72	7
Hazardous conditions as factors contributing to accident (stairs with hazardous conditions only)		
Total	588	100
Hazardous condition(s) did not contribute to accident	27	5
Hazardous condition(s) did contribute to accident	561	95
Shoes as factors contributing to accident		
Total	995	100
Shoes did not contribute to accident	716	72
Shoes did contribute to accident	138	14
Don't know	141	14
Other factors contributing to accident		
Total ¹	962	(')
Walking too fast, running, or taking 2 steps at a time	85	9
Thought stairs were steeper than normal	36	4
Carrying object that was too big, too heavy, or which shifted position	78	8
Felt landing too small	6	1
Unable to see where you were stepping	94	10
Unable to hold handrail	74	8
Not paying close attention to where you were going	116	12
Was tired or fatigued	65	7
Had physical condition which contributed to the accident	18	2
Distracted by person on the stairs, noise, etc.	37	4
Other	31	3
Nothing else contributed to accident	503	52

¹ Because more than 1 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 questionnaire.

Table 9. Industry classification: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Standard Industrial Classification (SIC)	Number	Percent
Total	1,007	100
Agriculture, forestry, and fishing	5	(¹)
Mining ²	4	(¹)
Construction	60	6
Manufacturing	210	21
Transportation and public utilities	84	8
Wholesale trade	69	7
Retail trade	196	19
Finance, insurance, and real estate	87	9
Services	291	29
Other industries, n.e.c.	1	(¹)

¹ Less than 0.5 percent.

² Limited to oil and gas extraction.
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 10. Size of company: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Size of company	Number	Percent
Number of people employed in worker's company		
Total	956	100
1 to 10	159	17
11 to 49	228	24
50 to 99	120	13
100 to 499	218	23
500 or more	231	24

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 questionnaire.

Table 11. Age of worker: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Age	Number	Percent
Total	1,007	100
15-19 years	64	6
20-24 years	150	15
25-34 years	293	29
35-44 years	190	19
45-54 years	153	15
55-64 years	117	12
65 years or more	24	2
Not available	16	2

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 12. Sex of worker: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Sex	Number	Percent
Total	1,007	100
Men	517	51
Women	490	49

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

SOURCE: State workers' compensation reports.

Table 13. Occupation: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Occupation	Number	Percent
Total	1,007	100
Professional, technical, and kindred workers	70	7
Managers and administrators, excluding farm	93	9
Salesworkers	63	6
Clerical and kindred workers	184	18
Craft and kindred workers	129	13
Operatives, excluding transport	117	12
Transport equipment operatives	65	6
Laborers, excluding farm	59	6
Farm laborers and farm laborer supervisors	5	(¹)
Service workers, excluding private household	218	22
Private household workers	1	(¹)
Nonclassifiable	3	(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 14. Source of injury: Injuries resulting from falls on stairs, selected States, December 1981-April 1982

Source of injury	Number	Percent
Total	1,007	100
Bodily motion	53	5
Boilers, pressure vessels	1	(¹)
Boxes, barrels, containers	3	(¹)
Buildings and structures	5	(¹)
Furniture, fixtures, etc.	2	(¹)
Handtools, not powered	1	(¹)
Handtools, powered	1	(¹)
Hoisting apparatus	1	(¹)
Liquids, n.e.c.	1	(¹)
Metal items	3	(¹)
Vehicles	1	(¹)
Working surfaces	933	93
Floor	25	2
Ground	13	1
Sidewalks, paths, etc.	1	(¹)
Stairs, steps	893	89
Working surfaces, n.e.c.	1	(¹)
Person	1	(¹)
Nonclassifiable	1	(¹)

¹ 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.

Appendix A. Survey Explanatory Note

The survey was designed to develop information on injuries resulting from slips and falls to workers on stairs. 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. Falls from curbs or similar structures having only one step, escalators, portable or folding stairs, and stairs on vehicles were excluded. In addition, falls resulting from the structural collapse of the stairway, explosions, or assaults 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 which are 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-April 1982, 1,007 survey questionnaires were returned and found to be within the scope of the survey, resulting in a 64-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 on stairs. 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. Responses to question J.1 (type of surface) were classified by BLS.

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 on incomplete questionnaires were used in the tabulations. 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 were 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 Relations
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 On Stairs

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. What were you doing at the time of your accident? (Check one.)

- Walking up stairs
- Walking down stairs
- Running up stairs
- Running down stairs
- Working on stairs (for example: cleaning stairs)
- Other: (Describe) _____

B. Were you moving backwards as you were going up or down the stairs?

- No
- Yes

C. How often do you normally use these stairs? (Check one.)

- First time you used these stairs
- Less than once a day
- 1 to 4 times a day
- 5 to 10 times a day
- More than 10 times a day

D. How did your accident occur? (Check all that apply.)

- Tripped or slipped on object(s) lying on stairs: (Describe) _____
- Tripped on step
- Caught heel
- Slipped on step or slipped off edge of step
- Foot turned or twisted
- Lost balance
- Pushed or knocked down steps
- Missed a step
- Other: (Describe) _____

E. If you checked more than one response in question D, which event occurred first? (Check one.)

- Tripped or slipped on object(s) lying on stairs
- Tripped on step
- Caught heel
- Slipped on step or slipped off edge of step
- Foot turned or twisted
- Lost balance
- Pushed or knocked down steps
- Missed a step
- Other

F. Where did you fall to? (Check one.)

- Down to landing or bottom of stairs
- Part way down the stairs
- Up the stairs or to the same level
- Over side of stairs or railing to surface below
- Did not fall to surface (caught railing and stopped fall, etc.)
- Other: (Describe) _____

G.1 About how many steps did you fall down? (Check one.)

- None
- One step
- 2 to 4 steps
- 5 to 8 steps
- 9 to 12 steps
- More than 12 steps (indicate approximate number _____)
- Don't know

G.2 How many steps were there in the staircase? (Check one.)

- 2 to 4 steps
- 5 to 8 steps
- 9 to 12 steps
- More than 12 steps (indicate approximate number of steps between landings _____)
- Don't know

H. Were you carrying or holding anything at the time of your accident? (Check one.)

- No
- Yes—holding object(s) with both hands: (Describe object) _____
- Yes—holding object(s) with one hand only: (Describe object) _____

I.1 Were there handrails on the stairs? (Check one.)

- No
- Yes—on one side
- Yes—on both sides
- Yes—on both sides and down the center

I.2 If there were handrails on the staircase, were you holding on to the rail when you started to fall? (Check one.)

- Yes
- No—hands were not free to hold on to rail
- No—let go of rail for a moment
- No—there was no rail at that spot
- No—rail was out of reach
- No—did not think it was necessary
- No—other reason: (Describe) _____
- Don't remember

J.1 Did the stairs have any hazardous conditions? (Check all that apply.)

- Steps broken or in bad condition
- Slippery surface: (Describe) _____
- Torn or loose covering
- Objects on stairway
- Inadequate lighting
- Steps uneven or worn down
- Loose or broken handrail
- Steps unevenly spaced
- Other: (Describe) _____
- No hazardous conditions

J.2 If the stairs had any hazardous conditions, did they contribute to your accident?

- No
- Yes: (Explain) _____

K. Did the shoes you were wearing contribute to your accident?

- No
- Yes: (Explain) _____
- Don't know

L. Did anything else contribute to your accident? (Check all that apply.)

- Walking too fast, running or taking 2 steps at a time
- Thought stairs were steeper than normal
- Carrying object that was too big, too heavy or which shifted position
- Felt landing too small: (Describe) _____
- Unable to see where you were stepping
- Unable to hold handrail
- Not paying close attention to where you were going
- Was tired or fatigued
- Had physical condition which contributed to the accident: (Describe) _____
- Distracted by person on the stairs, noise, etc.
- Other: (Describe) _____
- Nothing else contributed to accident

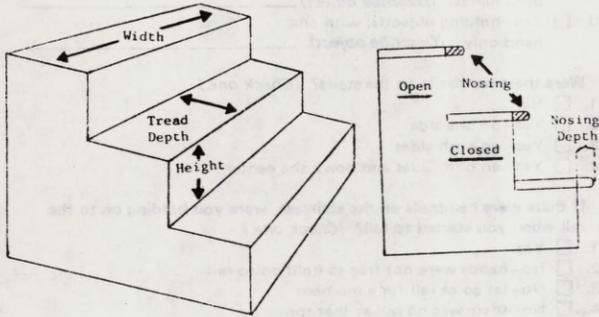
CONTINUE ON REVERSE SIDE

M. Where were the stairs located? (Check one.)

- 1. In an office or public building
- 2. In a store, restaurant or hotel
- 3. In an industrial building (factory, warehouse, plant, etc.)
- 4. In a house or other residential building
- 5. Outside
- 6. In a building under construction
- 7. Other location: (Describe) _____

N. Were the stairs enclosed by walls? (Check one.)

- 1. Yes—on both sides
- 2. Yes—on one side
- 3. No—open on both sides
- 4. Other: (Describe) _____



O. How wide were the stairs (see picture)? (Check one.)

- 1. Less than 2 feet
- 2. 2 to 4 feet
- 3. 5 to 8 feet
- 4. More than 8 feet

P. How high was each step (see picture)? (Check one.)

- 1. Less than 7 inches
- 2. 7 to 8 inches
- 3. More than 8 inches
- 4. Don't know

Q. How deep were the treads (see picture)? (Check one.)

- 1. Less than 10 inches
- 2. 10 to 12 inches
- 3. More than 12 inches
- 4. Spiral stairs—depth varies
- 5. Don't know

R. Are your responses to O, P and Q estimates or did you measure the steps? (Check one.)

- 1. Estimates
- 2. Measurements

S. Were the backs of the steps open (see picture)?

- 1. No—closed
- 2. Yes—open

T. Did the stairs have nosing (see picture)? (Check one.)

- 1. Yes—how deep was the nosing:
 - 1. About 1 inch
 - 2. More than 1 inch
 - 3. Don't know
- 2. No
- 3. Don't know

U. What was the surface of the steps? (Check one.)

- 1. Carpet
- 2. Runner
- 3. Concrete, stone, brick or marble
- 4. Metal or metal grate
- 5. Wood
- 6. Tile
- 7. Other: (Describe) _____
- 8. Don't know

V. Did the steps have any slip-resistant features? (Check all that apply.)

- 1. Nonslip mats
- 2. Nonskid strips
- 3. Slip-resistant paint
- 4. Roughened surface
- 5. Other: (Describe) _____
- 6. None
- 7. Don't know

W. 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) _____

X. 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

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

Y. 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

--	--	--	--	--	--	--	--	--	--

Z. 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 and how it could have been prevented. (For example, indicate if elevators or escalators were available.)

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
NTIS Accession No. PB83 207985 (1978)
- 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)

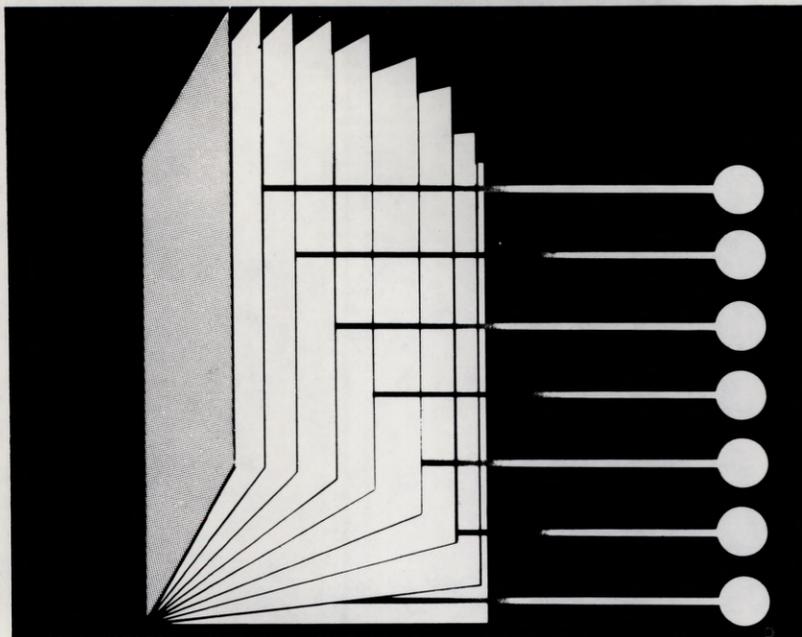
Reports available from the Office of Occupational Safety and Health Statistics, U.S. Department of Labor, Room 4014, 601 D Street, N.W., Washington, D.C., 20212 or regional offices:

- 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:

- Injuries Related to Servicing Equipment
Bulletin 2115 (1981)
- Back Injuries Associated with Lifting
Bulletin 2144 (1982)
- Work-Related Hand Injuries and Upper Extremity Amputations
Bulletin 2160 (1982)
- Injuries in Oil and Gas Drilling and Services
Bulletin 2179 (1983)
- Injuries Resulting From Falls From Elevations
Bulletin 2195 (1984)
- Injuries in the Logging Industry
Bulletin 2203 (1984)

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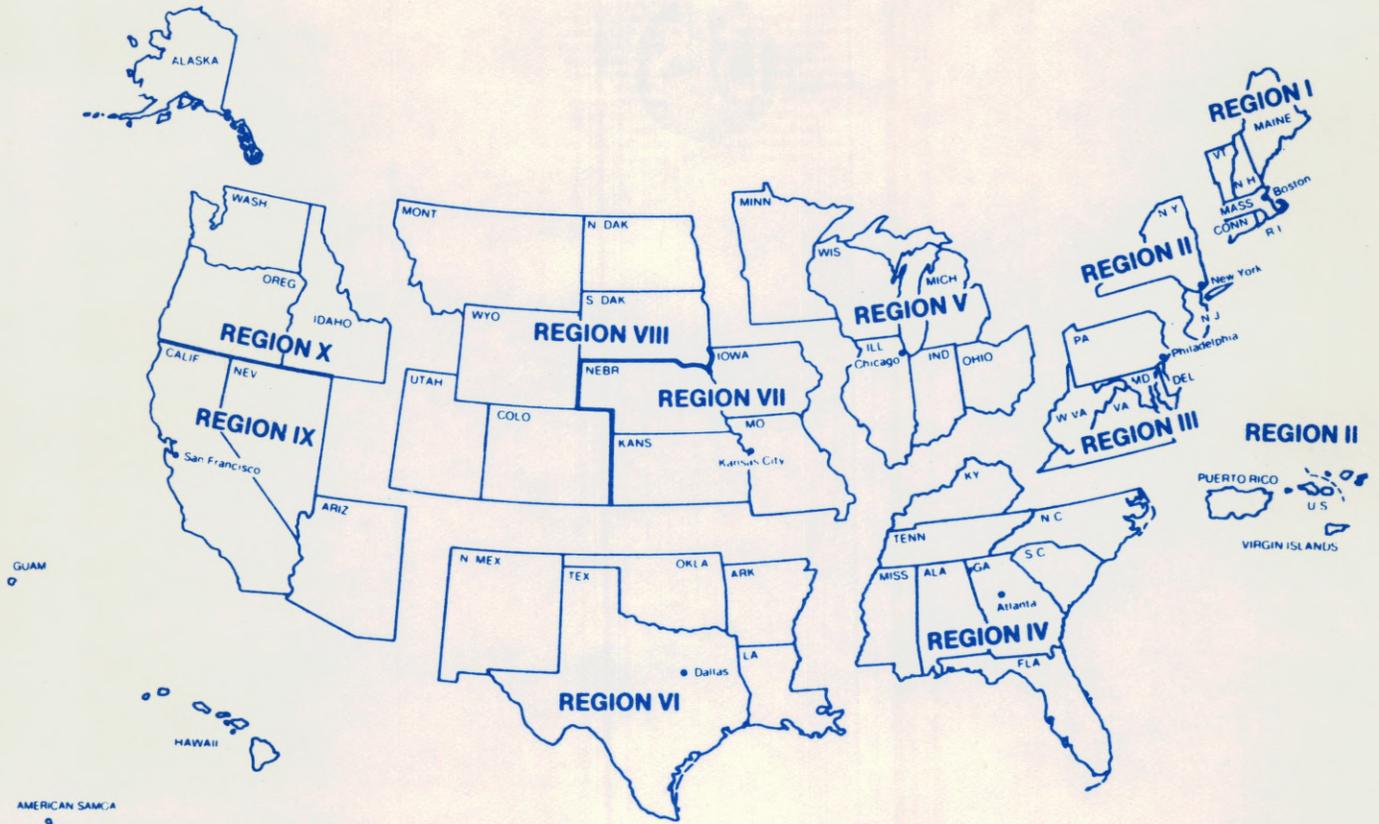
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