

# Getting Answers

*What can BLS data reveal about disabling injuries?*

**By Theodore K. Courtney and Barbara S. Webster**

**T**HE U.S. BUREAU OF LABOR STATISTICS'S (BLS) annual survey of occupational injuries and illnesses (SOII) is a frequently utilized source of data on national occupational morbidity. In 1992, BLS introduced an expanded survey method that collects more detailed data on cases with days-away-from-work (DAFW). While the new method provides detail on the body part, nature of injury, extent and certain antecedents of these cases, the published data are most often presented univariately. This makes it difficult to assess the extent of many common injuries.

Although the Internet offers expanded access to SOII data, getting correct answers about injuries and illnesses from the data can still be a challenge. This how-to-oriented article introduces the BLS SOII DAFW system and identifies key considerations for using the data. Questions regarding the most frequent and severe types of occupational injury in the U.S. are used to illustrate three common approaches (publication-based, web-based and specific data requests) to accessing the data. Limitations

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and common pitfalls in data interpretation are also discussed. In addition, guidance is provided on the most appropriate method to approach the data for a specific question. Internet links are provided to allow readers to further explore the topic.

The Bureau of Labor Statistics's (BLS) annual survey of occupational injuries and illnesses (SOII) is a frequently utilized source of occupational safety and health data in the

U.S. Its advantages include a yearly sample of more than 150,000 establishments in U.S. industry and ready availability to occupational safety and health (OSH) professionals, scientists and policymakers, as well as to the media and other audiences (Abraham, et al 3).

Prior to 1992, SOII offered few details on occupational injuries and illnesses. Reported injuries, which made up more than 92 percent of the national experience, were combined into a single reporting category; occupational illnesses, which made up the remainder, were only slightly better detailed into seven categories. Although OSH professionals could directly access counts or incidence rates for a given industrial class(es), they could not directly access information on the nature of, quantitative severity of, and events or exposures contributing to the majority of occupational injuries and illnesses.

During this time, the survey also provided a limited amount of data on counts and averages of lost workdays by industrial class. However, these statistics were heavily influenced by the sampling method that collects data for a given calendar year very close to the end of that year. This limitation resulted in a substantial underestimate of actual lost workday severity (Oleinick 231; Murphy, et al 130).

In 1992, BLS exercised existing statutory authority to begin asking surveyed establishments to report more details on worker injuries and illnesses from existing first report of injury documents (Abraham, et al 3). This revised SOII collects data on the case, the individual and the contributing incident for injuries/illnesses that involve at least one day away from work (DAFW; Table 1). It also collects data on the number of days lost due to absence from work (DAFW) or restricted work activity. To account for the problem of underestimation of lost time, BLS reports data from this part of the survey as both a frequency distribution of lost time (percent and count of cases involving one to three days, 30 or more days, etc.) and a single summary statistic, the median number of DAFW. After reduction by trained coders, data

**Table 1**

## Expanded Data Requested by the BLS Annual Survey on Cases with DAFW Since 1992

Employee/Demographic Characteristics	Case & Incident Characteristics
Name	Date of Injury/Illness
Social Security Number	Number of Days Away from Work
Length of Service	Number of Days of Restricted Work Activity
Race/Ethnic Background	Return to Work During Year (Yes/No)
Age or Date of Birth	Description of the activity preceding incident
Sex	Description of how injury/illness occurred
Occupation (Title)	Description of injury or illness
	Description of the object or substance that directly harmed the employee

are presented in various publications, including the annual Occupational Injuries and Illnesses: Counts, Rates and Characteristics bulletins (USDL Bulletin 2478 1; USDL 98-157 1).

While the new SOII data offer the potential for improving the profession's knowledge of the causes and consequences of occupational injuries and illnesses, detailed data on these cases—including the nature of injury (NOI), affected body part and incident characteristics—have been reported univariately (characterized by only one variable) in most instances (Courtney and Webster 60; 622). For example, back injuries and illnesses made up 27 percent of BLS-reported DAFW cases in 1994—but what were those injuries and illnesses? Fractures accounted for six percent, and sprains, strains and tears accounted for 43 percent of DAFW cases that same year—but what body parts were injured?

Answers to such questions exist within the DAFW data, but getting to them can prove challenging (Courtney and Webster 60; 622). Using typical questions as illustrations, this article presents three approaches to finding the answers and details data limitations.

### Test Questions

The search for answers begins with a set of basic, commonly asked questions:

- 1) What are the leading injuries involving DAFW by body part and NOI?
- 2) Which injuries are associated with the longest absences from work?
- 3) How extensive of a problem is back pain?
- 4) What are the most frequent disabling injuries and illnesses to the upper extremity? The most severe?

### Approaches to Answers

#### BLS Publications

BLS publications are widely available. However, one limitation of the published data is that injuries or illnesses are generally only described by a single characteristic. For example, one can learn from the

**Table 2**

## Published vs. Actual Leading Natures of Injury—1994

"Selected" Rank Order*	Actual Rank Order (unpublished)
Strains, sprains	Strains, sprains
Bruises, contusions	Bruises, contusions
Cuts, lacerations	Cuts, lacerations
Fractures	Fractures
Carpal tunnel syndrome	Back pain, hurt back
Heat burns	Carpal tunnel syndrome
Tendonitis	Heat burns
	Foreign body
	Dislocations
	Punctures
	Tendonitis

\*From BLS Release USDL 96-163, Table 4

published data how many disabling injuries involved particular building materials, yet one cannot discern what types of injuries were suffered or how the workers were injured by those objects.

The issue of data selection is another concern. When the table title in a BLS publication contains the word "selected," it means BLS has selected which data to present to its consumers. This also means that it has excluded some data which might logically be expected as part of the presentation. For example, in the first presentation of detailed 1994 DAFW data (USDL 96-163 1), BLS provided what appeared to be the seven most frequent natures of injury in the U.S. However, several natures of injury that would have appeared in a complete rank-order list were not "selected." Table 2 shows the contrast between what was reported and what the data actually con-

*When the table title in a BLS publication contains the word “selected,” it means BLS has selected which data to present. This also means that it has excluded some data which might logically be expected as part of the presentation.*

tained. While the selections may be based on various factors, including BLS’s perceptions of what data are more interesting or useful than others, the net result can be confusing.

Given these limitations, one can obtain the following answers to the test questions from the published 1994 data:

1) *Sprains, strains and tears* were clearly the most frequent nature of injury, with 963,500 cases or about 43 percent of cases with DAFW. But what parts of the body were affected?

2) Based on published data, *carpal tunnel syndrome (CTS)* was the most disabling condition with a median number of DAFW of 30, followed by *hernia and fracture*.

3) One NOI category called *“back pain, hurt back”* made up about three percent of DAFW cases.

One cannot answer the fourth question posed because no cross-tabulation of upper extremities with injury types or number of DAFW were reported in the publication.

### Special Data Requests

Another potential strategy for obtaining answers is to ask BLS for a special run of the DAFW data. This has many advantages. The requestor can specify content, resolution or level of variables, and outcome fields s/he desires, which reduces the selection biases inherent in the publications. Resulting data are certified by BLS as being of publishable quality and accuracy. However, to use this method, the requestor must have a good understanding of the data structure and how the system works; s/he must also know what level of coding to specify and what fields are desirable. Depending on the complexity of the request, BLS may need several weeks to several months to complete its response.

Answers to the test questions obtained from the special request data are (Courtney and Webster 60):

1) *Back sprains, strains and tears*, followed by *leg sprains, strains and tears*, were the two most common injuries involving DAFW (Table 3).

2) The most disabling injuries were related to *fractures* especially of lower extremities (Table 4). *CTS* made up 98 percent of *wrist disorders of the peripheral nervous system*. While this disorder was presented as the most disabling condition in 1994 BLS publications, it actually ranked eighth when contrasted with other NOI by body part.

3) *Back sprains, strains and tears* were the largest part of back injuries and illnesses (Table 5), while *nonspecified back injuries and disorders* (98 percent of which was *back pain, hurt back*) ranked second.

**Table 3**

## Top 10 BLS SOII Injuries & Illnesses Ranked by Estimated Frequency—1994

Rank	Body Part	Nature of Injury	Number Reported Cases	Incidence Rate*
1	Back, including spine, spinal cord	Sprains, strains, tears	490,094	60.70
2	Leg(s)	Sprains, strains, tears	96,807	11.99
3	Finger(s), fingernail(s)	Cuts, lacerations	81,837	10.14
4	Shoulder, including clavicle, scapula	Sprains, strains, tears	72,288	8.95
5	Ankle(s)	Sprains, strains, tears	71,617	8.87
6	Back, including spine, spinal cord	Nonspecified injuries and disorders	63,426	7.85
7	Multiple body parts	Sprains, strains, tears	55,963	6.93
8	Leg(s)	Bruises, contusions	39,965	4.95
9	Wrist(s)	Disorders of the peripheral nervous system	39,088	4.84
10	Face	Foreign bodies (superficial splinters, chips)	34,916	4.32
<b>Total of all cases in 1994</b>			<b>2,236,639</b>	<b>277.00</b>
<b>Subtotal of top 10 combinations</b>			<b>1,046,001</b>	
<b>Percentage of all DAFW cases</b>			<b>46.8%</b>	

\*Incidence rates represent the number of new cases per 10,000 full-time workers per year.

4) Since BLS considers the shoulder separately from the upper extremities, shoulder data had to be combined with upper extremity data in order to perform these analyses. The upper extremity and shoulder “top 10” were a mix of traumatic and gradual onset injuries (Table 6). In terms of severity, *shoulder fractures* had a median of 40 DAFW followed by *wrist disorders of the peripheral nervous system* with 30 median DAFW (Table 7).

The severity estimates provided in these tables are median values, not mean values. Disability duration studies of low back pain, upper extremity musculoskeletal disorders, and injuries and illnesses in general have confirmed substantial differences between median and mean lost time due to the influence of less frequent but very high severity injuries [Cheadle et al 190; Hashemi, et al(a) 937; Hashemi, et al(b) 261; Williams, et al 2329]. Therefore, these severity data cannot be pooled and the total count of DAFW cannot be estimated.

#### BLS Website

A good compromise between BLS publications and specific data requests is to access the electronic data table files on the BLS website—[www.bls.gov/iif/home.htm](http://www.bls.gov/iif/home.htm). This site has far more tables than the publications, and many typically desirable, two-way cross-tabulations are available—including body part-NOI. These are generally available as either text or PDF files. The site is also relatively easy to use.

One concern with this method is that the data are only detailed on the vertical axis, while the horizon-

tal axis is condensed into BLS-selected categories in order to reduce space. As a result, the precise cross-tabulation desired may not be available. In addition, only two-way comparisons are currently available. The frequency and incidence rate data presented in tables 3 through 6 could be extracted from

tables on the website. However, the data on median DAFW could not be recreated from the website nor could the results presented in Table 7 because median DAFW data are available only by one other characteristic (e.g., body part or NOI). At this time, three-way comparisons (body part, NOI and event coding) can only be accomplished through the direct request approach.

Two query tools (“Create Customized Tables”) are available to help the user find answers about a specific condition or characteristic from existing data tables. Using these tools, the user can look up certain specific one- or two-way comparison questions such as, “What was the incidence rate of fractures due to falls to a lower level from 1992 to 1999?”

*The BLS website has far more tables than the publications, and many typically desirable, two-way cross-tabulations are available. These are generally available as either text or PDF files. The site is also relatively easy to use.*

**Table 4**

### Top 10 BLS SOII Injuries & Illnesses Ranked by Median DAFW—1994

Rank	Body Part	Nature of Injury	Number Reported Cases	Median Days Away from Work
1	Multiple body parts	Fractures	3,660	69
2	Pelvic region	Fractures	2,453	60
3	Leg(s)	Fractures	10,763	53
4	Shoulder, including clavicle, scapula	Fractures	3,505	40
5	Back, including spine, spinal cord	Dislocations	12,874	34
6	Multiple body parts	Fractures and other injuries	5,475	32
7	Back, including spine, spinal cord	Fractures	3,850	31
8	Wrist(s)	Disorders of the peripheral nervous system	39,088	30
9	Ankle(s)	Fractures	14,229	30
10	Wrist(s)	Fractures	12,646	27
<b>Total of all cases in 1994</b>			<b>2,236,639</b>	<b>5</b>
<b>Subtotal of top 10 combinations</b>			<b>108,543</b>	
<b>Percentage of all DAFW cases</b>			<b>4.9%</b>	

**Table 5**

## Most Frequent BLS SOII Back Injuries & Illnesses—1994

Rank	Nature of Injury	Number Reported Cases	Median Days Away from Work
1	Sprains, strains, tears	490,094	6
2	Nonspecified injuries and disorders	63,426	6
3	Bruises, contusions	14,293	4
4	Dislocations	12,874	34
5	Traumatic injuries and disorders, unspecified	7,963	10
6	Dorsopathies	4,180	9
7	Fractures	3,850	31
8	Sprains and bruises	2,608	5
9	Nonclassifiable	2,347	7
<b>Total all back cases, 1994</b>		<b>606,545</b>	<b>6</b>
<b>Subtotal of top 10 combinations</b>		<b>601,635</b>	
<b>Percentage of all back DAFW cases</b>		<b>99.2%</b>	

### Which Approach?

Table 8 (pg. 30) summarizes the various methods of access to these data. For OSH professionals with Internet access, the BLS website will likely provide the best middle-ground solution. Special data requests, while permitting deeper examination of the data, should be reserved for cases where a question cannot be answered based on the various BLS publications or web-based data.

As noted, to use the request approach, one must be familiar with SOII design and particularly with the coding system (OIICS). (For additional discussion of research methodologies, findings and data structures, see Courtney and Webster 60; 622).

### Other Web-Based Resources

OSH professionals can use several online resources to better understand the survey

**Table 6**

## Most Frequent BLS SOII Upper Extremity & Shoulder (UE/S)\* Injuries & Illnesses—1994

Rank	Body Part	Nature of Injury	Number Reported Cases	Median Days Away from Work
1	Finger(s), fingernail(s)	Cuts, lacerations	81,837	3
2	Shoulder, including clavicle, scapula	Sprains, strains, tears	72,288	7
3	Wrist(s)	Disorders of the peripheral nervous system	39,088	30
4	Wrist(s)	Sprains, strains, tears	28,649	5
5	Hand(s), except finger(s)	Cuts, lacerations	27,360	4
6	Arm(s)	Sprains, strains, tears	24,628	7
7	Finger(s), fingernail(s)	Fractures	23,185	9
8	Finger(s), fingernail(s)	Nonspecified injuries and disorders	17,373	5
9	Arm(s)	Bruises, contusions	13,362	3
10	Hand(s), except finger(s)	Bruises, contusions	12,673	3
<b>Total of all UE/S cases, 1994</b>			<b>616,335</b>	<b>**</b>
<b>Subtotal of top 10 combinations</b>			<b>340,443</b>	
<b>Percentage of all UE/S DAFW cases</b>			<b>55.2%</b>	

\*The BLS does not include the shoulder in its definition of upper extremity. The shoulder data has been added to the analysis.

\*\*The median DAFW for upper extremities is 6, while the median for the shoulder is 8.

data. The *BLS Occupational Injury and Illness Coding Manual* (OIICM) ([www.bls.gov/iif/oshoiics.htm](http://www.bls.gov/iif/oshoiics.htm)) describes how injuries and illnesses are coded into body part, NOI, exposure/event, source and other categories. The *BLS Handbook of Methods* ([www.bls.gov/opub/hom/homch9\\_a1.htm](http://www.bls.gov/opub/hom/homch9_a1.htm)) provides information on how the survey is conducted and the methods used to process the data.

Other data available on the BLS website include overall survey data on injuries and illnesses for comparing an establishment's incidence rates with the national experience of its industry. Guidance for performing such comparisons can be found at [www.bls.gov/iif/osheval.htm](http://www.bls.gov/iif/osheval.htm). The site also provides access to data on occupational fatalities ([www.bls.gov/iif/oshcfoi1.htm](http://www.bls.gov/iif/oshcfoi1.htm)).

### Conclusion

The OSH profession is increasingly advocating, seeking and using leading indicators (such as behavior-based safety and near-miss analysis) to better manage workplace safety. However, certain lagging indicators (injuries, illnesses and resulting disability) will continue to be important concerns. While analysis by single descriptive categories has its limitations (Meehan 40), detailed data on DAFW cases from the SOII are a resource for benchmarking and offer the potential to help identify injury mechanisms with the availability of multiple-category analyses. The illustrations used here are only a sample of the possible questions that could be investigated using the

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*One limitation of the published BLS data is that injuries or illnesses are generally only described by a single characteristic. For example, one can learn how many disabling injuries involved particular building materials, yet not what types of injuries were suffered.*

**Table 7**

## Top 10 BLS SOII Upper Extremity & Shoulder (UE/S)\* Injuries & Illnesses Ranked by Median DAFW—1994

Rank	Body Part	Nature of Injury	Number Reported Cases	Median Days Away from Work
1	Shoulder, including clavicle, scapula	Fractures	3,505	40
2	Wrist(s)	Disorders of the peripheral nervous system	39,088	30
3	Wrist(s)	Fractures	12,646	27
4	Arm(s)	Fractures	12,370	23
5	Finger(s), fingernail(s)	Amputations	11,658	22
6	Shoulder, including clavicle, scapula	Traumatic injuries and disorders, unspecified	2,892	21
7	Shoulder, including clavicle, scapula	Dislocations	6,170	20
8	Shoulder, including clavicle, scapula	Rheumatism, except the back	6,053	15
9	Hand(s), except finger(s)	Fractures	7,377	14
10	Multiple upper extremities locations	Nonspecified injuries and disorders	3,313	14
<b>Total of all UE/S cases, 1994</b>			<b>616,335</b>	<b>**</b>
<b>Subtotal of top 10 combinations</b>			<b>105,072</b>	
<b>Percentage of all UE/S DAFW cases</b>			<b>17.0%</b>	

\*The BLS does not include the shoulder in its definition of upper extremity. The shoulder data has been added to the analysis.

\*\*The median DAFW for upper extremities is 6, while the median for the shoulder is 8.

**Table 8**

## Comparison of Approaches to BLS DAFW Case Data

Source	Publications	Website	Special Requests
<b>How to</b>	Your organization likely already receives these. Check with your headquarters safety and health office. Also available at federal repository libraries and many other large university libraries.	Using an Internet browser, visit <a href="http://www.bls.gov/iif/home.htm">www.bls.gov/iif/home.htm</a> . Scroll down page to the following headings: Current Injury, Illness & Fatality Data •Nonfatal injuries & illnesses •Case & demographic characteristics	Phone: (202) 691-6170* Fax: (202) 691-6196 E-mail: oshstaff@bls.gov
<b>Advantages</b>	Wide availability. Official government report (web tables considered supplemental to published report).	Available to anyone with Internet access. Many tables with two-way comparisons. Print publications also available here as PDF or text. Key support documents such as <i>Occupational Injury and Illness Classification Manual</i> are included. Good support (e.g., definitions, FAQ). Provides two-way comparison query tools for looking at specific questions. See webpage section called "Create Customized Tables."	Can specify the nature of contrast desired. Eliminates BLS selection. Data are certified as "publishable quality" by BLS. Data are electronic and can be readily analyzed.
<b>Disadvantages</b>	Typically present I&I data univariately. Selective presentation of data. Difficult to manipulate (e.g., run sorts, analyses)	Horizontal table axis still selected. Three-way and some two-way comparisons not available. Still challenging to manipulate (can copy data tables as text files, then clean up in a spreadsheet).	Must specify exactly the comparison and coding levels desired. BLS completion of requests varies with complexity and available resources (typically a week to several weeks). Results are only as good as the criteria you selected.
<b>Recommendations</b>		Probably the best BLS option for most people on most questions.	Best used <i>after</i> you determine that the other sources cannot provide the information you are seeking. Particularly useful if selection effects are obscuring the comparison in which you are interested.

\*Anyone using these data should be familiar with the OIICM.

data. Used with appropriate caution and consideration, DAFW data from BLS can be a useful addition to an OSH professional's information assets. ■

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