



## Work-Related Skin Disorders in Washington State, 1993-1997

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### Summary

**Introduction:** The National Institute for Occupational Safety and Health (NIOSH) has long considered dermatologic conditions to be one of the leading types of work-related diseases and injuries in the United States.<sup>1</sup> Occupational skin disorders are the most commonly reported occupational illnesses (not including those from

acute or repeated trauma). In Washington State, there are close to 1000 State Fund workers' compensation (WC) claims accepted each year for work-related

skin disorders leading to absences from work or medical expenses. SHARP has been evaluating work-related skin disorders in Washington State for 5 years. We use a method called "surveillance" to evaluate skin problems in Washington workers. Our surveillance system involves the systematic identification of case information.

We identify cases of these skin disorders from two separate sources. The first is the collection of workers' compensation claims filed for skin disorders, and the second is the collection of cases from physicians who treat those with work-related skin disorders. Those physicians reporting cases of work-related skin diseases

make up our "sentinel provider network." Information on the nature of the skin disorder is collected, as is information about the worker's industry and occupation. The case information from both the provider network and

workers' compensation claims also includes the exposure or source that caused the skin problem. SHARP analyzes and summarizes this information to identify and target high-risk industries and occupations for prevention activities. The analysis identifies the most frequently reported sources or causes of skin problems in Washington workers. This information can also be used to identify local companies experiencing problems with occupational skin disorders. SHARP can then

#### **Key Terms:**

**Dermatoses-** skin disorders.

**Allergic dermatitis-** inflammation, redness, itchiness, and/or skin irritation caused by contact with a substance to which the individual has become *sensitized*.

**Irritant dermatitis-** inflammation, redness, itchiness, and/or damage to the skin caused by direct contact with a skin irritant *without* prior sensitization.

**Surveillance-** information for action.

**Sensitization-** Development of an allergic response to a substance after exposure.

**SIC Code-** Standard Industrial Classification Code.

**FTE-** Full-time equivalent employee. Each FTE contributes 2,000 hours/year.

**Incidence rate-** Number of new cases of a disease that occur during a specified period of time in a population at risk for developing the disease.

<sup>1</sup> CDC/NIOSH. Leading work-related diseases and injuries: Dermatologic conditions. MMWR 1986;35:561-563.

contact the company for consultative site visits to provide assistance.

The case reports focus on dermatitis, which is an inflammatory reaction of the skin to various types of substances or injuries. However, the inflammation can be either irritation or allergy based. Dermatitis that is related to irritation is called “irritant contact dermatitis” while that related to allergy is called “allergic contact dermatitis.” Allergic contact dermatitis involves sensitization to a specific substance, which results in an exaggerated inflammation of the skin when exposure to that substance occurs. Skin disorders can be serious and disabling. Workers who become sensitized to chemicals in their workplace may be forced to change occupations.

**Methods:** Washington State Fund workers’ compensation claims accepted for dermatologic conditions from 1993 through the first two quarters of 1997 were abstracted and analyzed. Data collected from the provider network from April 1, 1994, through June 30, 1997, were also compiled and analyzed. Analyses of these data include incidence rates by industry (Standard Industrial Classification code-SIC) and frequency of reported industry, occupation, source and skin disorder descriptor (based on ANSI Z16.2 codes).

**Findings:** There were close to 5,000 State Fund claims accepted for work-related skin disorders from April 1, 1993, through June 30, 1997, roughly 75% of all dermatologic claims filed. Overall, it appears that the number of claims being reported is decreasing over the study

period. The reason for this is unclear, but it is being seen in most types of workers’ compensation claims. It could be related to lower rates, reduced reporting or changes in incentives to report work related skin disorders, a reduction in the acceptance rate for skin-disorder claims, or a change in the industrial make-up of the Washington State workforce.

### **Industry**

When considering the data by year from 1993 to 1997, the industries with the highest frequency of accepted dermatologic claims include Eating and Drinking Places; Agricultural and Production Crops; Health Services; Construction Special Trade Contractors, Business Services; and Wholesale Trade, Non-Durable Goods.

When combining Washington State Fund data from 1993 through 1997, we find that the four most frequently reported industries include: Eating and Drinking Places; Deciduous Trees, Fruits; Skilled Nursing Care Facilities; and Help Supply Services (Figure 1).

The overall incidence rate of work-related skin disorders in workers covered by the Washington State Fund is 0.8 claims per 1,000 FTE-years. Figure 2 shows the rates of skin disease in the ten major industry sectors. The industries with the highest rates of occupational dermatoses include Agriculture, Forestry and Fishing (2 cases per FTE per year); Manufacturing; Retail Trade; and Construction.

In order to prioritize industries for intervention purposes, we developed a Prevention Index, which takes into account both the frequency and the rates of accepted occupational

skin disease claims by industrial sector (Table 1). **Prevention Index**=[*Frequency Rank + Incidence Rank*]/2. Sporting and Athletic Goods, Boat Building and Repairing, Deciduous Tree Fruits, and Skilled Nursing Care Facilities were the top four industries identified in this process.

The State Fund and sentinel data can be compared. The workers' compensation data best represent industries that are covered by the State Fund. Sentinel cases provide a window of insight into the self-insured industries in Washington State. Industries most frequently identified in these data include: General Medical and Surgical Hospitals; Eating Places; Aircraft; Colleges, Universities, Professional Schools, Junior Colleges; and Beauty Shops.

### **Occupation**

The most frequently reported occupations in the accepted State Fund workers' compensation claims include: Farm workers, Laborers (except construction); Miscellaneous food preparation; Cooks; and Nursing aides, orderlies and attendants (Table 2).

### **Source**

Chemicals are by far the most frequently reported source of contact dermatitis in the workers' compensation data, followed by Plants, trees and vegetation; Clothing, apparel and shoes (which includes gloves); Food products; and Coal and petroleum products (Table 3).

The sentinel provider data allow sources to be more specifically targeted. The most frequently reported source is Latex, followed closely by Chemicals, then Soap and water. Epoxy ranked fourth and Cleaning agents ranked fifth (Table 3).

### **Sources linked**

specifically to the most frequently reported industries are provided in Table 4.

Eating and drinking places, which ranked first, listed

Chemicals as the most frequently cited source.

Clothing, apparel and shoes was the second most common source. Chemicals and chemical compounds were the most common source for 9 out of the top 10 industries reporting dermatologic claims. One of these, Transportation Equipment, includes the manufacturing of aircraft parts, as well as ship and boat building and repair.

Dermatologic claims filed in Health Services were most often associated with Clothing, apparel and shoes.

### **Cost of Skin Disorders in Washington**

Total medical bills from January 1993 through December 1997 for the Washington State Fund covered employers were \$1.5 million (median \$94 per claim) for skin disorders. Time loss payments were \$1.62 million. There were a total of 42,471 days of lost work during this time period.

### **Dermatoses in Agriculture**

High rates of skin disorders in the agricultural industry prompted further investigation of the Washington State Fund workers' compensation data in this industry. The overall rate in Agriculture, Forestry and Fishing is 2 claims per 1000-FTE years. The highest rate of skin disorders seen within agriculture is in the Crop Production: Fruits and Tree Nuts industry with a rate of 2.7 claims per 1000-FTE years. Table 5 shows the top 5 sources, industries and





occupations in the agricultural industry as identified by SIC code. Twenty-eight percent of the claims were attributed to exposure to vegetation. Chemical exposure was blamed for 26% of the

claims, while Insecticides were noted in 10%. The most common industry reported was Deciduous Tree Fruits, and the majority of workers filing claims had the occupational title of Farm Worker.

**Capture Re-capture Analysis**

Because we collected cases from two systems within the same geographic area, we were able to perform a special analysis that provided information on under-reporting of occupationally related skin disorders in workers' compensation data. Table 6 summarizes these results. Based on data collected over the project period, we estimate that the State Fund workers' compensation data under-represents the number of occupational skin disorders by more than four times.

**Conclusions:** These data show a significant amount of work-related skin disease in Washington State. Sporting Goods, Boat Building and Repair, Deciduous Tree Fruits, Skilled Nursing Care Facilities, and Plastics Products Manufacturing are industries to focus prevention efforts. The Fishing sector and the

Manufacturing sector are areas where special intervention should focus. Specific sources or exposures of concern include chemicals, vegetation, latex, epoxy resins, and soap and water.

Work-related dermatoses are preventable. Prevention efforts should include the following components:

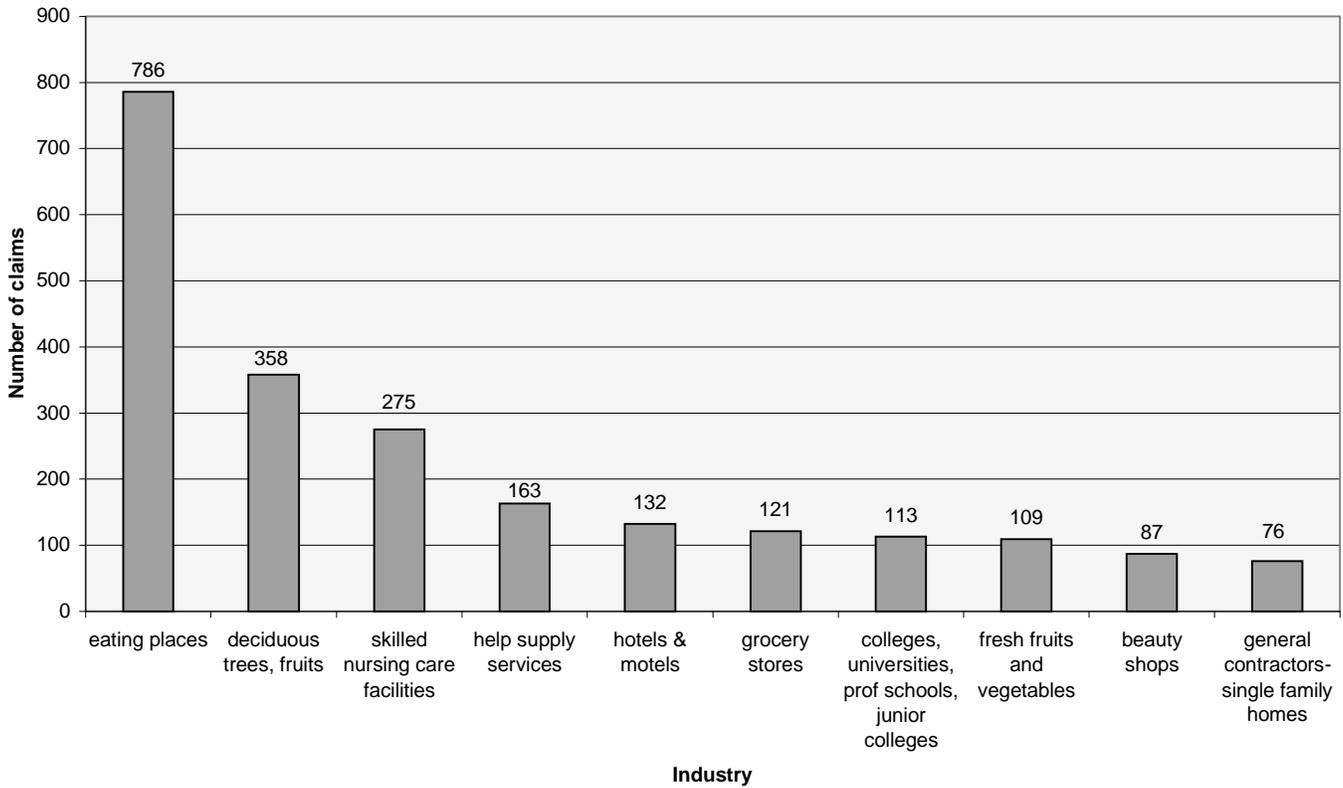
- ◆ Substituting products less likely to cause dermatitis for products having a high likelihood of causing dermatitis;
- ◆ Practical engineering controls that eliminate or reduce exposures;
- ◆ Education about high-risk exposures and personal protective equipment;
- ◆ Appropriate procedures for selecting gloves;
- ◆ Skin care programs that include tips for hand washing, moisturizing and using barrier creams; and
- ◆ Quick diagnosis and treatment for new cases of dermatitis.

**What is SHARP doing?** SHARP is working with specific Washington companies with high rates of dermatitis to help them prevent skin problems and to reduce the number of workers' compensation claims. We are also developing a hazard evaluation tool to help employers and employees identify dermatologic risks. In addition, we are developing educational materials for specific industries.

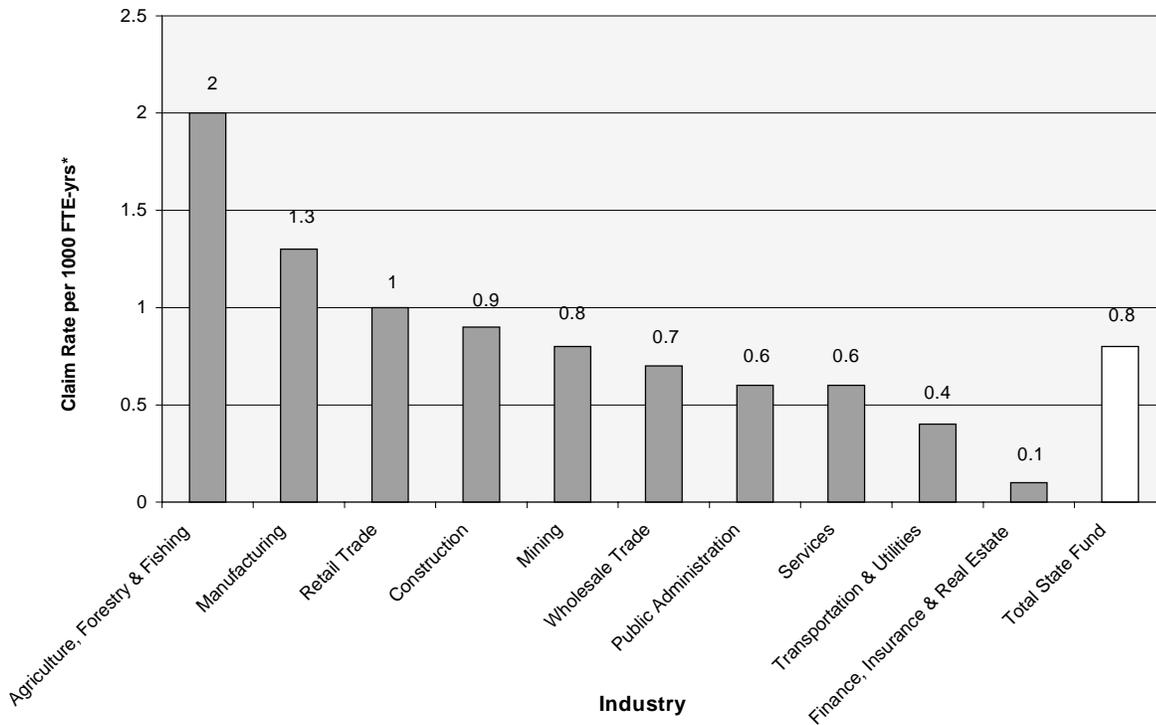
	<b>Web sites of interest:</b>	
	<b>LATEX</b>	<b>CONTACT DERMATITIS</b>
	<a href="http://pw2.netcom.com/~nam1/index.html">http://pw2.netcom.com/~nam1/index.html</a>	<a href="http://www.mc.vanderbilt.edu/vumcdept/derm/">http://www.mc.vanderbilt.edu/vumcdept/derm/</a>
	<a href="http://www.cdc.gov/niosh/latexfs.html">http://www.cdc.gov/niosh/latexfs.html</a>	<a href="http://www.derma.med.uni-erlangen.de/">http://www.derma.med.uni-erlangen.de/</a>
	<a href="http://www.cdc.gov/niosh/latexalt.html">http://www.cdc.gov/niosh/latexalt.html</a>	<a href="http://www.njc.org/msuhtml/msu_contact_derm.html">http://www.njc.org/msuhtml/msu_contact_derm.html</a>

**Figures**

**Figure 1. Accepted Washington State Fund Claims for Occupational Skin Disorders - Five-Year Total by Industry**



**Figure 2. Accepted Washington State Fund Claims for Occupational Skin Disorders - Claims Rate by Major Industry Sector, 1993-1997\***



\*Only includes data from the first two quarters of 1997.

**Tables****Table 1: 4 Digit SICs—Top Ten Prevention Index Rankings for Accepted State Fund Workers' Compensation Claims for Skin Disorders 1993-1997**

<i>SIC</i>		<i>Freq*</i>	<i>Freq Rank</i>	<i>Rate per 1000 FTE -yrs</i>	<i>Rate Rank</i>	<i>Hours in Ten Thousands</i>	<i>Prevention Index</i>
3949	Sporting and Athletic Goods, NEC	50	13	7.4	16.5	1359	15.75
3732	Boat Building and Repairing	39	16	5.4	23.5	1447	20.75
0175	Deciduous Tree Fruits	224	2	3.0	53	14900	28.00
8051	Skilled Nursing Care Facilities	177	3	2.8	59	12700	31.50
3089	Plastics Products, NEC	41	15	3.2	46.5	2587	31.75
2092	Fresh or Frozen Prepared Fish	25	31	3.4	36.5	1490	34.75
9512	Land Mineral Wildlife Conservation	53	12	2.7	63.5	3922	38.75
7231	Beauty Shops	62	9.5	2.6	68	4738	39.75
5148	Fresh Fruits and Vegetables	78	6.5	2.5	73.5	6159	40.50
2033	Canned Fruits and Vegetables	28	24.5	2.8	59	1970	42.75

\*Number of accepted claims

**Table 2: Accepted Washington State Fund Claims for Occupational Skin Disorders—Top Five Occupations by Total Number of Claims, 1993-1997\***

<i>Occupation</i>	<i>Number (percent) of Claims</i>
Farm workers	505 (7.9)
Laborers except construction	369 (5.8)
Miscellaneous food preparation	219 (3.4)
Cooks	204 (3.2)
Nursing aides, orderlies and attendants	202 (3.2)

\*Only includes data from the first two quarters of 1997.

**Table 3: Top 5 Sources of Exposure for Occupational Skin Disorders- Accepted State Fund Workers' Compensation Claims and Sentinel Provider Cases, 1993-1997\*.**

<i>State Fund</i>		<i>Sentinel Provider</i>	
<i>Source</i>	<i>Number (%) of Claims</i>	<i>Source</i>	<i>Number (%) of Claims</i>
Chemicals	3209 (50)	Latex	43 (12)
Plants, trees, vegetation	446 (7)	Chemicals	38 (11)
Clothing, apparel, shoes	436 (7)	Soap and Water	38 (11)
Food products	166 (3)	Epoxy	20 (6)
Coal and petroleum products	112 (2)	Cleaning Agent	19(5)

\*Only includes data from the first two quarters of 1997.

**Table 4: Accepted Washington State Fund Claims: for Occupational Skin Disorders- Top 10 Industry Sectors By Total Claims With Most Frequently Reported Sources- January 1993 through September , 1997**

<i>SIC code</i>	<i>Description</i>	<i>Count</i>	<i>Source 1</i>	<i>Source 1 count</i>	<i>Source 2*</i>	<i>Source 2 count</i>
58	Eating and drinking places	152	Chemical & chemical compounds	101	Clothing, apparel, shoes	12
01	Agricultural production-crops	111	Chemical & chemical compounds	49	Plants, trees, vegetation	19
80	Health services	108	Clothing, apparel, shoes**	44	Chemical & chemical compounds	30
37	Transportation equipment	68	Chemical & chemical compounds	41	Glass items, nec***	10
73	Business services	63	Chemical & chemical compounds	38	Coal and petroleum products	2
51	Wholesale trade non-durable goods	55	Chemical & chemical compounds	36	Plants, trees, vegetation	4
17	Construction special trade contractors	53	Chemical & chemical compounds	20	Miscellaneous	6
30	Rubber and misc. plastics products	42	Chemical & chemical compounds	21	Glass items, nec***	7
20	Food and kindred products	41	Chemical & chemical compounds	18	Food products	5
82	Educational services	40	Chemical & chemical compounds	18	Clothing, apparel, shoes	9

\*unknown sources not included

\*\*Clothing, apparel, shoes source category includes gloves.

\*\*\*Glass items, nec includes fiberglass

**Table 5: Accepted Washington State Fund Claims: for Occupational Skin Disorders- Top 5 Sources, Industries and Occupations: Number (percent) of Accepted Claims in Agriculture-By Source, Industry and Occupation 1994-1997.**

<i>Source</i>	<i>Number (%) of Claims</i>
Vegetation	125 (28)
Chemical (unspecified)	107 (24)
Insecticide not elsewhere classified	43 (10)
Soap/detergent not elsewhere classified	12 (3)
Chemicals not elsewhere classified	8 (2)
<i>Industry</i>	<i>Number (%) of Claims</i>
Deciduous Tree Fruits	199 (45)
Ornamental floriculture & nursery products	40 (9)
Field crops, except cash grains, NEC	29 (7)
Lawn and garden services	25 (6)
Dairy farms	20 (4)
<i>Occupation</i>	<i>Number (%) of Claims</i>
Farm workers	257 (58)
Groundskeepers/gardeners except farmers	25 (9)
Supervisors- farm workers	17 (6)
Nursery workers	16 (4)
Laborers, except construction	16 (4)

<i>Sentinel Providers<sup>b</sup></i>	<i>Workers' Compensation<sup>a</sup></i>			Total
		YES	NO	
YES		54	177	231
NO		1041	~3350	~4391
Total		1095	~3527	~4622

<sup>a</sup> Approved Washington State Fund workers' compensation claims with injury in King and Yakima counties between April 1, 1994 and June 30, 1997.

<sup>b</sup> Sentinel provider data are from cases diagnosed between April 1, 1994, and June 30, 1997 for King, Yakima, and Pierce counties for people working for companies using State Fund workers' compensation insurance.

~Estimated cases, if applied statewide.

## Workplace Health and Safety Problems?

SHARP is available to help you address a wide range of occupational health concerns. Our staff assists workers and employers with complex health and safety issues, delivers seminars, presents research findings, provides independent scientific review of issues, and publishes information.

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