

Work-related injuries to teens in Massachusetts: a comparison of cases actively reported to the Teens at Work: Injury Surveillance System with cases identified through the statewide emergency department data set in 2004

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Since 1993, the Massachusetts Department of Public Health's (MDPH) *Teens at Work: Injury Surveillance and Prevention Project (TAW)* has been collecting data on work-related injuries to persons under age 18 (hereafter referred to as teens) in Massachusetts. The two primary data sources are monthly reports of emergency department visits from a sample of hospital emergency departments, (the TAW ED data), and workers' compensation indemnity claims filed for lost wages due to injuries resulting in five or more days away from work (WC data).¹ Both data sources have been used to conduct sentinel case surveillance, however, population based surveillance has proved challenging. While the WC data are a census of all claims filed and thus representative, the TAW ED cases come from a convenience sample averaging nine out of approximately 91 Massachusetts² acute care hospitals and are not necessarily representative of all emergency department visits for work-related injuries by teens throughout the state. Notably the nature of injury varies markedly by data source. Given the limitations of the TAW ED data, it has not been possible to combine surveillance data from both sources to characterize the number and distribution of work-related injuries to teens under age 18 in Massachusetts. Our strategy has generally been to present data separately by data source and compute injury rates based on the more representative WC data only.

Starting in 2002, the Massachusetts Division of Health Care Finance and Policy began collecting data on all emergency department visits in the state. The data are compiled annually into the emergency department data set (EDD), similar to the hospital discharge data set available since the early 1990s.³ The present study was undertaken using this new statewide EDD data set to evaluate the representativeness of the TAW ED data and to guide future decisions about which data sources TAW should use for ongoing case ascertainment.

Methods:

In 1993, public health regulations were promulgated requiring hospitals to report work-related injuries to persons under age 18 to the Massachusetts Department of Public Health.⁴ These regulations allow MDPH to collect personally identifiable information from the hospitals. TAW enlisted a sample of hospitals to actively participate in the surveillance system. These hospitals submit monthly reports of all ED visits for work-related injuries to teens to TAW. The number of participating hospitals has changed over time since the surveillance system was first established in 1993, averaging nine reporting hospitals each year. Most hospitals identify cases by searching for patients under age 18 that have workers' compensation listed as the expected payer. Several hospitals include "injury at work" as a distinct data element in their systems. These hospitals also use this element to identify cases. The data reported includes personal and employer identifiers as well as diagnostic and demographic information. Cases from emergency department reports indicating a teen worker received "initial treatment" are entered into

¹ For a detailed description of the surveillance system see the Publication, *Protecting Young Workers: A Guide for Building a State Surveillance System for Work-Related Injuries to Youths*, available at www.mass.gov/dph/teensatwork.

² The number of acute care hospitals in Massachusetts has changed slightly over time due to hospital closings and mergers.

³ Note: The TAW ED data include data from these two data sources in addition to individual monthly reports from emergency departments.

⁴ 105 CMR 300.000 Reportable Diseases and Isolation and Quarantine Regulations

the TAW ED dataset. If the reports indicate that a patient received both initial and follow-up care at the emergency department, only the initial visit is entered. Occasionally, the initial hospital visit went unrecorded and only a follow-up visit is reported. In these cases the follow-up visit is entered in the dataset. Cases have to live or work in Massachusetts to be included in the dataset. The predictive value positive of workers' compensation payer codes for work-related injuries has been found to be 98% based on follow-up of interviews with ED-reported teen injury cases through 2004.

Six hospitals submitted data on cases to TAW for calendar year 2004. Data for 111 injuries with a date of injury in 2004 were downloaded from the larger TAW ED data set for use in the present analysis.

The new statewide ED dataset contains information about diagnoses, procedures, patient demographics, payer, and hospital costs. It does not contain personal or employer identifiers although it does contain a unique medical record number for each patient. It also contains a brief narrative field describing the reason for visit. (See Table A for a list of selected variables in the TAW ED and EDD data sets.) The EDD data are collected on a federal fiscal year (FY) (October 1 – September 30) thus to collect calendar year data is it necessary to combine annual EDD data files from two consecutive fiscal years.

For the present study, all visits for work-related injuries to teens under age 18 with a date of treatment within calendar year 2004 were extracted from the FY2004 and FY2005 EDD data files. Date of injury is not in the EDD dataset so date of treatment was used as a surrogate since emergency room visits often happen around the date of injury. Cases were initially defined as visits by persons between the ages of 13.1 and 17.9 years, regardless of diagnoses and with either payer designated as workers' compensation or with several variations of the word 'work' in the narrative description field 'reason for visit'. (See Table B for phrases.) A total of 1,119 cases were identified using this methodology; 844 were identified only by payer source, 76 using the text search only, and 199 using both methods. In April 2006, letters were sent to the medical records departments at 68 hospitals requesting face sheets from the identified medical records under the MDPH's authority in 105 CMR 300.00. Letters were not sent to hospitals submitting monthly reports to TAW during that time period. Second letters were sent after approximately three months to hospitals not responding. Follow-up phone calls were made in which hospitals were given the option of running electronic reports instead of photocopying medical records. Medical records were received from all 68 hospitals (the last was received 5/29/07), and for all but 64 cases. Some hospitals had already archived records due to the long lag time; therefore, the hospital only sent the records available at the time the request was received. The 64 cases without medical records were excluded from subsequent analysis, leaving 1055 cases. These cases were similar to the initial case group with respect to age, gender, and race.

For the hospitals reporting monthly to TAW, information on 104 cases was abstracted from the TAW ED dataset and combined with data for the other EDD cases. After deleting duplicates, cases that were illnesses, cases not work-related, and out-of-state residents, a total of 914 EDD cases remained for the analysis. (See Table C.) Twenty-nine percent (22/76) of the cases identified by searching the text field only were included in the analysis.

The EDD dataset includes up to 6 diagnoses coded according the International Classification of Diseases (ICD) CM (ninth edition).⁵ These ICD 9 codes are assigned by medical records coders at the hospitals. TAW staff routinely codes narrative information on diagnoses in the TAW ED records according to the Occupational Illness and Injury Classification (OIIC) system developed by the US Bureau of Labor Statistics.⁶ Because the TAW ED data were already coded using OIICS, ICD-9 codes in the EDD were converted to OIICS nature codes using a crosswalk developed by TAW staff for this purpose. (See

⁵ International Classification of Diseases 9th Revision Clinical Modification, March 1980.

⁶ Bureau of Labor Statistics Occupational Injury and Illness Classification www.bls.gov/iif/oshtc.htm

Appendix A.) Only the principal diagnosis code in the EDD record was recoded, even though there was more than one diagnosis code field and often a narrative description of the injury was included. We made the decision to disregard the information in the narrative field because the ICD-9 codes are what would be readily available for ongoing surveillance. We also observed several instances (10 cases) in which similar narrative descriptions were assigned different ICD-9 codes by different hospitals. For example ‘___ pain’ was coded as sciatica; musculoskeletal disorder, nec; tendonitis; arthritis; and pain. These 10 cases were excluded from the final analysis.

Industry and occupation information in the TAW ED is routinely coded by TAW staff according to the 1997 North American Industrial Classification System (NAICS)⁷ and Bureau of Census 1990 Occupation Codes (COC)⁸. Industry and occupation in the medical records obtained for the EDD cases was likewise coded by TAW staff according to NAICS and COC.

Frequency distributions of the EDD cases and the TAW ED cases were computed by age, gender, race, injury type, industry sector, and occupation group and compared. Injuries were grouped into broad OIICS injury categories for this comparison. Chi square tests were calculated to test for significant differences between the data sets using SAS software version 9.1.⁹

Results:

Information on age, gender and race/ethnicity was available for 99%, 99%; 100%, 100%; and 98%, 85% of cases in both the TAW ED and EDD datasets respectively. Information on industry was not available for 34% and 35% of the TAW ED and EDD datasets respectively. Occupation was missing for the majority of cases in both data sets: 70% in TAW ED and 88% in EDD. Cases with missing information were excluded from the comparisons for those variables.

The TAW ED and EDD cases were similar with respect to race/ethnicity, industry sector, and nature of injury. They differed by age ($p < .005$) with the TAW ED cases being significantly younger. Approximately 19% of the TAW ED cases were 14 or 15 years of age compared to 8% of the EDD cases. The TAW ED cases were also more likely than EDD cases to be male (70% vs 61%); this finding was marginally significant ($p=.0532$). In both datasets over 80% of the cases were white.

The EDD and TAW ED cases differed significantly with respect to industry distribution ($p < 0.03$). The statewide dataset had more cases in accommodation and food services (39% vs 23%) and health care (11% vs 8%) compared to the TAW sample. However the TAW sample had more cases in retail (34% vs 26%), construction (11% vs 5%) and administrative services (7% vs 3%) than the statewide dataset.

The occupation distributions of the two groups differed substantially with 42% of the TAW ED cases employed in technical sales and administrative support occupations compared to 64% of the EDD cases. A chi square test was not performed for this comparison given the large numbers of cases with missing occupation information.

Injury type categories were collapsed as much as possible to decrease the number of cells with missing data or small numbers. While the EDD dataset had more burns than the TAW sample (12% vs 7%), the TAW sample had more fractures than the EDD data set (7% vs 4%). However, differences between the two datasets were not statistically significant. (See Table D.)

⁷ Office of Management and Budget, North American Industry Classification System, United States 1997 Manual available at <http://www.census.gov/naics>

⁸ Bureau of Census 1990 Occupational Classification System Manual available at <http://www.census.gov/hhes/www/ioindex/ioindex.html>

⁹ The SAS Institute, Cary, North Carolina.

Missing Industry Information

Further analysis was conducted to examine patterns of missing industry information in the EDD data set by injury type and by hospital. The percentage of cases missing industry information was similar across injury types. (See Table E.) However the extent of missing information varied markedly by hospital. Eight of the 68 hospitals had no employer information available at all, and an additional 16 hospitals had more than 50% of the industry information missing. (See Table F.) Insurance guarantor information was also available in the medical records, even if employer was missing. However, guarantor information was not used to identify the employer since it could not be determined whether the insurance guarantor was the employer of the teen or the parent. The only exception to this was if the employer information was missing and the guarantor was an employer teens are very likely to work at such as a fast food restaurant, in these cases the guarantor would be coded as the employer.

Discussion

In this study we compared cases of injuries to working teens actively reported to the TAW surveillance system by a sample of hospital emergency departments with cases identified through a new statewide dataset of all ED visits in the state. The actively reported cases accounted for 8.5% of all cases treated in EDs that year. Findings indicate that the cases in the TAW ED sample were not representative of ED cases statewide with respect to age, gender, and industry. Thus active reporting is useful to identify sentinel cases; however, the data are of limited usefulness for population-based surveillance.

In turn, the EDD data set is a useful source of population-based data on the extent and nature of work-related injuries to teens treated in emergency departments in the state. However, this data set does not include information about employer, industry or occupation, limiting its usefulness for targeting prevention efforts. In addition, it is not useful for sentinel case surveillance because the data do not become available to the Massachusetts Department of Public Health for up to 18 months after the close of the fiscal year. Requesting medical records to obtain missing information on industry and occupation proved to be labor intensive and took up to 13 months to complete. This process did not yield much new information regarding industry and occupation as this information was missing in many of the medical records. Based on previous experience with emergency department records, the extent of missing information is believed to be a reflection of what the hospitals actually submitted to MDPH rather than what may be available in the full medical records. Employer name is available in the TAW ED reports approximately 87% of the time. In a recently completed study evaluating use of ED records for occupational injury surveillance in general, employer information was available for over 80% of the work-related injury cases seen in emergency departments.

Based on the results of this analysis we plan to continue use of the TAW ED data for sentinel based surveillance and the EDD data for population-based surveillance. We are currently in the process of recruiting new hospitals into the TAW ED sample based on the number of injuries in 2004 and the number of work-related asthma cases. It would be useful to repeat this study every 5 years to continue to assess the representativeness of the TAW ED sample and to calculate the true burden of work-related injuries to teens in Massachusetts. Workers' compensation data should be continued to be used as it is for both sentinel based and population based surveillance. The EDD data will be useful to calculate information about race while the workers' compensation data will be useful to calculate information about industry. This study lends itself to a capture recapture study using the EDD and WC datasets with personal identifiers.

Table A: Selected Variables in the Teens at Work Emergency Department dataset & the Statewide Emergency Department dataset (EDD)

TAW Select Variables

record id
 hospital name
 patient name
 patient address
 patient phone number
 sex
 age
 date of birth
 race
 date of injury
 injury type ²
 occupation ²
 employer name ²
 employer address

EDD Select Variables

medical record number
 hospital id number
 patient name ¹
 patient address ¹
 patient phone number ¹
 sex
 age
 date of birth
 race
 dates of visit
 diagnosis codes (icd-9)
 occupation ^{1,2}
 employer name ^{1,2}
 employer address
 payer source
 hospital comments ¹

¹ Information pulled from the medical record

² Data coded by TAW staff

Table B: Words Used In the Narrative Text Search

Words Included

“At work”
“Atwork”
“@ work”
“@work”
“Work injury”
“Workinjury”
“Work related”
“Work-related”
“Workrelated”
“Work”
“At wrk”
“Atwrk”
“@ wrk”
“@wrk”
“Wrk injury”
“Wrkinjury”
“Wrk related”
“Wrk-related”
“Wrkrelated”
“Wrk”

Words excluded

“Work up”
“Blood work”
“Yard work”
“Lab work”
“Not working”
“Working out”
“Bl work”

Table C. EDD 2004 records by Inclusion Status

Total records identified	1119
Included	914
Excluded	205
<i>lives and works in different state</i>	12
<i>not work-related</i>	35
<i>duplicate</i>	45
<i>not received</i>	64
<i>illness</i>	49

Table D. Distribution of EDD and TAW ED by demographics and employment characteristics

	EDD		TAW ED			
	n	%	n	%		
Age						
14	17	1.9	3	2.7	p=0.0005	
15	56	6.1	18	16.4		
16	282	30.9	37	33.6		
17	557	61.1	52	47.3		
missing/<14 ¹	2		1			
total	914		111			
Gender						
males	556	60.8	78	70.27	p=0.0532	
females	358	39.2	33	29.73		
missing/unknown ¹	0		0			
total	914		111			
Race ²						
<i>white</i>	765	85.6	79	82.3	p=0.4938	
<i>black</i>	24		3			
<i>hispanic</i>	71	7.9	11	11.5		
<i>other</i>	34	3.8	6	6.3		
<i>missing ¹</i>	20		17			
total	914		116			
Industry ²						
<i>agriculture</i>	4	0.7	0	0	p=0.0282	
construction	31	5.4	8	11.0		
<i>manufacturing</i>	15	2.6	2	2.7		
<i>wholesale</i>	7	1.2	0	0		
retail	147	25.7	25	34.2		
<i>transportation & warehousing</i>	6	1.1	1	1.4		
<i>information</i>	6	1.1	0	0.0		
<i>finance & insurance</i>	1	0.2	0	0		
<i>real estate</i>	7	1.2	2	2.7		
<i>professional services</i>	2	0.4	1	1.4		
administrative services	17	3.0	5	6.8		
<i>educational services</i>	8	1.4	1	1.4		
health care	62	10.9	6	8.2		
<i>arts and recreation</i>	9	1.6	1	1.4		
accommodation & food services	222	38.9	17	23.3		
<i>other services</i>	18	3.2	2	2.7		
<i>public administration</i>	9	1.6	2	2.7		
<i>missing ¹</i>	343		38			
total	914		111			
other	92	16.1	12	16.4		
Occupation ³						
managerial and professional spec	3	2.7	1	3.0	P=0.2689	
tech, sales, admin support	11	10.0	10	30.3		
service	70	63.6	14	42.4		
farming, forestry, fishing	5	4.5	2	6.1		
precision prod, craft, repair	5	4.5	0	0.0		
operator, fabricator, laborer	16	14.5	6	18.2		
missing ¹	804		78			
total	914		111			
Injury						
open wounds	448	49.4	53	55.8		
surface wounds and bruises	154	17.0	12	12.6		
burns	112	12.3	7	7.4		
sprains, strains, tears	107	11.8	10	10.5		
fractures	34	3.7	7	7.4		
other	52	5.7	6	6.3		
missing ¹	7		16			
total	914		111			

¹ Missing values are not included in the calculations.

² Only bold categories included in chi square test. Values in italics combined to equal 'other' for chi square testing.

³ No chi square test performed.

Table E. Missing industry information by injury type

Injury type	# of records	# industry missing	% industry missing
dislocations, fractures	37	19	51
sprains	107	37	35
open wounds	448	160	36
surface wounds & bruises	154	62	40
burns	112	35	31
concussions	8	4	50
effects of environmental conditions	1	1	100
other traumatic injuries	40	15	38
missing	7	3	43

Table F. Missing Industry Information by Hospital

Hospital ID number	# of records	# industry missing	% industry missing
1	2	1	50
2	3	0	0
3	4	1	25
4	30	24	80
5	12	5	42
6	4	2	50
7	28	6	21
8	10	2	20
10	7	1	14
16	2	2	100
25	11	3	27
27	14	2	14
39	23	12	52
40	7	3	43
41	17	5	29
49	17	5	29
50	25	25	100
52	5	2	40
53	2	0	0
57	6	3	50
59	6	6	100
62	27	11	41
66	7	4	57
68	22	8	36
70	18	11	61
71	23	0	0
73	9	2	22
75	9	5	56
77	14	3	21
78	5	5	100
79	27	6	22
81	13	4	31
83	7	2	29
85	7	0	0
88	8	0	0
89	1	1	100
91	4	3	75
97	35	8	23
98	4	0	0
99	43	43	100
100	5	3	60
101	5	5	100
104	3	0	0
105	6	2	33
106	20	1	5
107	14	5	36
109	7	4	57
110	15	3	20
112	8	0	0
114	21	7	33
115	20	0	0
116	15	9	60
119	12	2	17
122	23	5	22
123	56	7	13
124	35	13	37
126	5	2	40
127	8	0	0
129	23	8	35
131	30	16	53
132	7	4	57
133	12	7	58
138	7	1	14
139	9	0	0
141	14	14	100
145	13	0	0
457	2	1	50

Appendix A. Crosswalk between International Classification of Disease (ICD-9 CM) and Occupational Illness and Injury Classification System (OIICS)

ICD-9 CM Code	OIICS Code	OIICS Nature Description
29632	5229	Organic mental disorders--neurotic or psychotic, n.e.c.
30000	5210	Anxiety, stress, neurotic disorders, unspecified
37024	1256	Disorders of the eye, adnexa, vision; Welder's flash
37049	1252	Disorders of the eye, adnexa, vision; Conjunctivitis--non-viral
37205	1252	Disorders of the eye, adnexa, vision; Conjunctivitis--non-viral
37230	1252	Disorders of the eye, adnexa, vision; Conjunctivitis--non-viral
37999	1250	Disorders of the eye, adnexa, vision, unspecified
462	1410	Respiratory system diseases, acute respiratory infections (including common cold)
5191	1420	Other diseases of upper respiratory tract, unspecified
6235	1639	Diseases and disorders of the genital tract, unspecified
68100	1812	Infections of the skin and subcutaneous tissue; Cellulitis and abscess
68110	1812	Infections of the skin and subcutaneous tissue; Cellulitis and abscess
6823	1812	Infections of the skin and subcutaneous tissue; Cellulitis and abscess
6926	1822	Contact dermatitis and other eczema
7080	1839	Other inflammatory conditions of the skin, n.e.c.
71943	1710	Arthropathies and related disorders (arthritis)
71946	1710	Arthropathies and related disorders (arthritis)
71947	1710	Arthropathies and related disorders (arthritis)
7231	1790	Musculoskeletal system and connective tissue diseases and disorders, n.e.c.
7242	0210	Sprains, strains, tears
7243	1721	Dorsopathies; Sciatica
7245	1729	Dorsopathies, n.e.c.
72632	1733	Tendonitis
72743	1735	Ganglion/cystic tumor
7295	1790	Musculoskeletal system and connective tissue diseases and disorders, n.e.c.
7802	4111	Loss of consciousness--not heat related
78039	4112	Convulsions, seizures
7821	4130	Symptoms involving skin and other integumentary tissue, unspecified
7840	4141	Headache, except migraine
7847	4149	Symptoms involving head and neck, n.e.c.
78650	4164	Chest pain
78652	4164	Chest pain
8056	0120	Fractures
80701	0120	Fractures
81000	0120	Fractures
81200	0120	Fractures
81305	0120	Fractures
81342	0120	Fractures
81344	0120	Fractures
81500	0120	Fractures
81503	0120	Fractures
81504	0120	Fractures
81600	0120	Fractures
81601	0120	Fractures
81602	0120	Fractures
81610	0120	Fractures

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ICD-9 CM Code	OIICS Code	OIICS Nature Description
81611	0120	Fractures
8220	0120	Fractures
8248	0120	Fractures
82521	0120	Fractures
8261	0120	Fractures
8362	0110	Dislocations
8363	0110	Dislocations
8409	0210	Sprains, strains, tears
8419	0210	Sprains, strains, tears
84200	0210	Sprains, strains, tears
84210	0210	Sprains, strains, tears
84213	0210	Sprains, strains, tears
8449	0210	Sprains, strains, tears
84500	0210	Sprains, strains, tears
84509	0210	Sprains, strains, tears
84510	0210	Sprains, strains, tears
84513	0210	Sprains, strains, tears
8460	0210	Sprains, strains, tears
8469	0210	Sprains, strains, tears
8470	0210	Sprains, strains, tears
8471	0210	Sprains, strains, tears
8472	0210	Sprains, strains, tears
8474	0210	Sprains, strains, tears
8479	0210	Sprains, strains, tears
8488	0210	Sprains, strains, tears
8489	0210	Sprains, strains, tears
8500	0620	Concussions
85011	0620	Concussions
8505	0620	Concussions
8509	0620	Concussions
8708	0300	Open wounds, unspecified
87200	0300	Open wounds, unspecified
8730	0300	Open wounds, unspecified
87320	0300	Open wounds, unspecified
87340	0300	Open wounds, unspecified
87341	0300	Open wounds, unspecified
87342	0300	Open wounds, unspecified
87343	0300	Open wounds, unspecified
87344	0300	Open wounds, unspecified
87349	0300	Open wounds, unspecified
87360	0300	Open wounds, unspecified
8770	0300	Open wounds, unspecified
8794	0300	Open wounds, unspecified
8798	0300	Open wounds, unspecified
88100	0300	Open wounds, unspecified
88101	0300	Open wounds, unspecified
88102	0300	Open wounds, unspecified
88112	0300	Open wounds, unspecified
8820	0300	Open wounds, unspecified
8821	0300	Open wounds, unspecified

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ICD-9 CM Code	OIICS Code	OIICS Nature Description
8822	0300	Open wounds, unspecified
8830	0300	Open wounds, unspecified
8831	0300	Open wounds, unspecified
8832	0300	Open wounds, unspecified
8840	0300	Open wounds, unspecified
8850	0311	Amputations, fingertip
8860	0311	Amputations, fingertip
8900	0300	Open wounds, unspecified
8910	0300	Open wounds, unspecified
8911	0300	Open wounds, unspecified
8920	0300	Open wounds, unspecified
8930	0300	Open wounds, unspecified
9108	0400	Surface wounds and bruises, unspecified
9130	0400	Surface wounds and bruises, unspecified
9140	0400	Surface wounds and bruises, unspecified
9150	0400	Surface wounds and bruises, unspecified
9156	0400	Surface wounds and bruises, unspecified
9160	0400	Surface wounds and bruises, unspecified
9166	0400	Surface wounds and bruises, unspecified
9168	0400	Surface wounds and bruises, unspecified
9181	0490	Surface wounds and bruises, n.e.c.
9190	0400	Surface wounds and bruises, unspecified
920	0430	Bruises, contusions
9212	0430	Bruises, contusions
9213	0430	Bruises, contusions
9219	0430	Bruises, contusions
9221	0430	Bruises, contusions
9222	0430	Bruises, contusions
92231	0430	Bruises, contusions
92232	0430	Bruises, contusions
92300	0430	Bruises, contusions
92303	0430	Bruises, contusions
92310	0430	Bruises, contusions
92311	0430	Bruises, contusions
92320	0430	Bruises, contusions
92321	0430	Bruises, contusions
9233	0430	Bruises, contusions
92401	0430	Bruises, contusions
92410	0430	Bruises, contusions
92411	0430	Bruises, contusions
92420	0430	Bruises, contusions
92421	0430	Bruises, contusions
9243	0430	Bruises, contusions
9248	0430	Bruises, contusions
92720	0971	Crushing injuries
9273	0971	Crushing injuries
9283	0971	Crushing injuries
9300	0440	Foreign bodies (superficial splinters, chips)
9301	0440	Foreign bodies (superficial splinters, chips)
9309	0440	Foreign bodies (superficial splinters, chips)

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ICD-9 CM Code	OIICS Code	OIICS Nature Description
931	0440	Foreign bodies (superficial splinters, chips)
9400	0510	Chemical burns
9403	0510	Chemical burns
9404	0500	Burns, unspecified
94112	0501	First degree burns, unspecified
94117	0501	First degree burns, unspecified
94120	0502	Second degree burns, unspecified
94121	0502	Second degree burns, unspecified
94124	0502	Second degree burns, unspecified
94128	0502	Second degree burns, unspecified
94129	0502	Second degree burns, unspecified
94213	0501	First degree burns, unspecified
94221	0501	First degree burns, unspecified
94222	0501	First degree burns, unspecified
94224	0501	First degree burns, unspecified
94300	0500	Burns, unspecified
94310	0501	First degree burns, unspecified
94311	0501	First degree burns, unspecified
94312	0501	First degree burns, unspecified
94313	0501	First degree burns, unspecified
94321	0502	Second degree burns, unspecified
94322	0502	Second degree burns, unspecified
94323	0502	Second degree burns, unspecified
94325	0502	Second degree burns, unspecified
94400	0500	Burns, unspecified
94401	0500	Burns, unspecified
94408	0500	Burns, unspecified
94410	0501	First degree burns, unspecified
94413	0501	First degree burns, unspecified
94415	0501	First degree burns, unspecified
94416	0501	First degree burns, unspecified
94417	0501	First degree burns, unspecified
94420	0502	Second degree burns, unspecified
94421	0502	Second degree burns, unspecified
94422	0502	Second degree burns, unspecified
94423	0502	Second degree burns, unspecified
94424	0502	Second degree burns, unspecified
94425	0502	Second degree burns, unspecified
94426	0502	Second degree burns, unspecified
94427	0502	Second degree burns, unspecified
94428	0502	Second degree burns, unspecified
94522	0502	Second degree burns, unspecified
94524	0502	Second degree burns, unspecified
94525	0502	Second degree burns, unspecified
9460	0500	Burns, unspecified
9462	0502	Second degree burns, unspecified
94800	0590	Burns, n.e.c.
95901	0900	Other traumatic injuries and disorders, unspecified
95914	0900	Other traumatic injuries and disorders, unspecified
95919	0900	Other traumatic injuries and disorders, unspecified

Appendix A. Crosswalk between International Classification of Disease (ICD-9 CM) and Occupational Illness and Injury Classification System (OIICS)

ICD-9 CM Code	OIICS Code	OIICS Nature Description
9593	0900	Other traumatic injuries and disorders, unspecified
9595	0900	Other traumatic injuries and disorders, unspecified
9597	0900	Other traumatic injuries and disorders, unspecified
9874	0959	Other poisonings and toxic effects, n.e.c.
9878	0959	Other poisonings and toxic effects, n.e.c.
9895	0951	Animal or insect bites, venomous
9925	0720	Effects of heat and light, unspecified
9948	0930	Electrocutions, electric shocks
V015	2291	Rabies
V016	2130	Syphilis and other venereal diseases, unspecified
V045	2291	Rabies
V1585	9999	Nonclassifiable
V583	9999	Nonclassifiable
V5889	9999	Nonclassifiable
V642	9999	Nonclassifiable
V6759	9999	Nonclassifiable
V713	9999	Nonclassifiable
V7189	9999	Nonclassifiable
075	2295	Infections Mononucleosis
2765	4119	General symptoms, n.e.c.
29633	5229	Organic mental disorders--neurotic or psychotic, n.e.c.
30560	9999	Nonclassifiable
311	5290	Mental disorders or syndromes, n.e.c.
36441	1253	Disorders of the eye, adnexa, vision; Inflammation except conjunctivitis
4660	1410	Acute respiratory infections
64843	5290	Mental disorders or syndromes, n.e.c.
6824	1812	Cellulitis and abscess
7048	1894	Diseases of hair and hair follicles
78601	4161	Hyperventilation
78702	4179	Symptoms involving digestive and urinary system, n.e.c.
78906	4175	Abdominal pain; unspecified
8748	0300	Open wounds, unspecified
8842	0380	Multiple open wounds
9198	0400	Surface wounds and bruises
94111	0501	First degree burns, unspecified
94212	0501	First degree burns, unspecified
94414	0501	First degree burns, unspecified
95909	0900	Other traumatic injuries and disorders, unspecified
9778	0950	Other poisonings and toxic effects, unspecified
99832	9999	Nonclassifiable
V5883	9999	Nonclassifiable
V680	9999	Nonclassifiable
V689	9999	Nonclassifiable
V703	9999	Nonclassifiable
V726	9999	Nonclassifiable