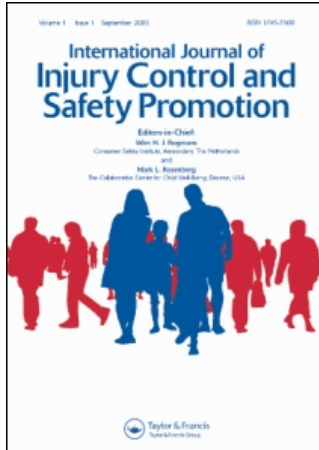


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SHORT REPORT

Activity and place – Is it necessary both to identify sports and leisure injury cases in ICD-coded data?

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Introduction

A number of studies have used ICD coded deaths, hospital admissions or emergency department presentations to describe sport/leisure injuries (Cassell, Finch & Stathakis, 2003; Dempsey, Layde, Guse & Hargarten, 2005; Gabbe, Finch, Cameron & Williamson, 2005; Mitchell & Hayen, 2006). These routinely collected data have been coded according to either the ICD-9 or ICD-10 versions, and sport/leisure injury cases have been identified through specific codes.

In Australia and New Zealand, hospitalisation data are coded according to the Australian modification of ICD-10 (ICD-10-AM) (National Centre for Classification in Health, 2002). The ICD-10-AM is unique in that it has over 200 activity codes identifying sport/leisure activities. Like other ICD versions, it also has a place of occurrence code indicating sport/athletics area. Most analyses of ICD-10-AM coded sport/leisure injuries have identified cases based on activity codes alone. The relationship between sport/leisure activity codes and the sport/athletics place codes has not been previously reported. It is currently not known if the addition of place codes in selection strategies would lead to more cases being identified.

This paper explores the relationship between ICD-10-AM activity and place codes for the identification of sport/leisure injuries. This is relevant to other regions considering expanding their ICD-schema in the future. Improved case selection from routinely collected and coded injury data will also contribute to the identification and surveillance of sports injury cases to inform the development of prevention strategies.

Methods

Injury hospitalisations, for the period 2003–2004, were extracted from the routinely collected data in the Inpatient Statistics Collection (ISC), which is a census of records of all inpatient separations from all public, private and repatriation hospitals, private day procedures centres and public nursing homes in New South Wales (NSW) (Centre for Epidemiology and Research, 2006). Transfers between hospitals and across units within a hospital were excluded to minimise multiple counting of cases.

Cases were all NSW (Australia) hospitalisations, of NSW residents of any age, with an ICD-10-AM principal diagnosis indicating an injury (S00-T35, T66-T71, T73, T75, T79-T95 and T98). The sport/leisure activity at the time of injury was identified from one of over 200 ICD-10-AM codes referring to sport/leisure activity (U50-U72) (National Centre for Classification in Health, 2002). Whether or not the injury occurred in a place for sport/athletics was identified from the place of occurrence codes. The distribution of sport/leisure activity and sport/athletics place codes was obtained across selected ICD external cause groups, most relevant to sport/leisure injuries.

Results as presented as the proportion of all injury hospitalisations. All analyses were carried out using SAS, version 8.02 (SAS Institute, 2000) or Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

Results

During 2003–2004, there were 182,951 injury-related hospital separations recorded in the ISC. Of these, 55.6% had activity codes definitely not related to sport/leisure and 13.8% had specified sport/leisure

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activity codes; 30.6% had a missing/unspecified activity code. In contrast, only 7.1% of cases had a sport/athletics place code; 52.4% had place codes definitely not related to sport/athletics and 40.5% had missing/unspecified place codes.

Table 1 shows that 85.2% of all injury-related hospitalisations could not be positively identified as a sport/leisure injury based on either an activity or place code. Almost twice as many sport/leisure injury cases were identified using activity codes (15.8%) as were identified using place codes (7.1%). Using either activity or place codes only increased the number of identified cases by 1%, relative to using activity codes alone (14.8% vs. 13.8%, respectively). Across ICD external causes, the proportion of cases with only a sport/athletics place code was small. Three external cause categories (drowning, overexertion and strenuous or repetitive movements, struck by/against) had >30% of cases with a sport/leisure activity code. Only two external cause categories had >20% cases assigned to a sport/athletics place.

Discussion

Identifying sport/leisure injury hospitalisations based on activity codes alone yields a larger number of cases

than using place codes alone. As adding place code selection to activity code selection did not identify many more cases, on a frequency basis, defining sport/leisure injuries based on activity alone is appropriate for incidence estimation.

Using the sport/athletics place code clearly does not identify all relevant sport/leisure cases. This is not surprising, as not all sport/leisure injuries occur in sport/athletics areas (Finch, Valuri & Ozanne-Smith, 1998; Cassell et al., 2003). This raises the issue of whether or not the concept of place is relevant to defining sport/leisure injuries. This study suggests that knowledge of the activity alone can identify most relevant cases, although it is acknowledged that information about place can inform prevention efforts.

The identification of sport/leisure hospitalisations depends upon accurate and specific information being recorded about the nature of the activity at the time of injury. Given the large number of missing/unspecified values, improvements in routinely collected hospitalisation data appear warranted (Finch & Boufous, 2008). Refinement of ICD-10-AM codes may be required to enable coders to more easily classify both the activity at the time of injury and the type of place in which the injury occurred.

Table 1. Proportion of New South Wales injury hospitalisations identified as being sport/leisure injuries based on ICD-10-AM activity and place codes.

ICD External Cause	codes	n	CASES IDENTIFIED AS BEING SPORT/LEISURE INJURIES				
			% with ONLY a sport/leisure activity code A	% with ONLY a sport/athletics place code B	% with BOTH a sport/leisure activity code AND a sport/athletics place code C	% with EITHER a sport/leisure activity code OR a sport/athletics place code A + B + C	% not sport related*
Drowning	W65-W74, V90, V91, V21	346	30.1	6.4	7.8	44.2	55.8
Overexertion and strenuous or repetitive movements	X50	4854	13.3	0.9	26.6	40.8	59.2
Struck by/against	W20-W23, W50-W52	11400	12.4	1.5	20.9	34.9	65.1
Transport accidents	V01-V99	28998	12.2	1.4	2.6	16.3	83.7
Fall	W00-W19	71879	8.0	0.9	6.7	15.5	84.5
Exposure to unknown factor	X59	19708	5.7	0.6	8.5	14.8	85.2
Others	All other codes	45766	3.1	0.5	0.9	4.6	95.4
Total		182951	7.6	0.9	6.2	14.8	85.2

*Includes cases for which the activity and place codes have missing or unspecified values.

Note: The overall % with a sport/leisure activity code is the sum of the numbers in columns A and C. The overall % with a sport/athletics place code is the sum of the numbers in columns B and C.

Information about the external causes of injury and the place where the injury occurred is needed for injury prevention efforts. Further research is needed to understand why (and when) activity and place codes do not agree. Given the importance of the external causes of overextension and strenuous or repetitive movements, drowning and struck by/against, efforts should be first directed at these categories.

Unfortunately, it was not possible to verify any of the ICD-10-AM codes in these hospitalisation cases through an independent audit of hospital records or against an external source, such as emergency department records. Furthermore, it was not possible to separate sport from leisure in the activity codes. Future studies could undertake such verification, particularly of cases with missing/unspecified codes, and compare these findings with other data coding systems to explore the ratio of sport to leisure injuries.

In conclusion, the common practice of using ICD-10-AM activity codes alone to identify sport/leisure cases is likely to be appropriate in incidence studies. However, further research is needed to verify this claim, particularly given the current large number of cases with missing/unspecified activity codes.

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