

Supplementary Table 1. Details of studies included in systematic review and meta-analysis

Study	Study Demographics					Outcomes Reported		
	Sport	Sample	Number of subjects	Age range	Male (%)	Concussion (N)	Denominator	Incidence (95% CI)**
Roberts et al (1999) ⁺	Hockey	NR	695	11-15	100	3	811 AE	3.7 (1.3 to 10.8) /1000 AE
Emery et al (2006) ⁺	Hockey	71 minor hockey teams	986	8-17	98	54	71,727 PH	0.75 (0.58 to 0.98) /1000 PH
Emery et al (2010) ⁺	Hockey	150 minor hockey teams	2,154	11-12	98	93	100,790 PH	0.92 (0.75 to 1.1) /1000 PH
Emery et al (2011) ⁺	Hockey	130 minor hockey teams	1,971	13-14	99	90	106,866 PH	0.84 (0.69 to 1.0) /1000 PH
DeLee et al (1992)	American football	100 High schools	4,399	Gr. 9-12	100	101	4,399 Players	22.9 (18.9 to 27.8) /1000 players
Powell et al (1999) ⁺	American football, baseball, basketball, soccer/football, wrestling, field hockey, softball, volleyball	235 High schools	NR	NR	50	1219	4,387,766* AE	0.28 (0.26 to 0.29) /1000AE

Zemper (2003)	American football	89 High schools	NR	NR	100	240	475,589 AE	0.50 (0.44 to 0.57) /1000 AE
Meyers et al (2004)	American football	8 High schools	NR	NR	NR	26	240 Team Games	108.3 (75.0 to 154.0) /1000 team games
Schulz et al (2004) ⁺	American football, Soccer/football, wrestling, basketball, softball, baseball, cheerleading	100 High schools	15,802	NR	50	607	3,335,000 AE	0.18 (0.17 to 0.20) /1000 AE
Couchman et al (2004)	American football	32 High schools	981	Gr. 9-12	100	70	10,606 Player games	6.6 (5.2 to 8.3) /1000 player-games
Gessel et al (2007) ⁺	American football, basketball, soccer/football, wrestling, baseball, softball	100 High schools	NR	NR	NR	396	1,730,764 AE	0.23 (0.21 to 0.25) /1000 AE
Lincoln et al (2011) ⁺	American football, lacrosse, soccer/football, wrestling, basketball, baseball, softball, field hockey, cheerleading	25 High schools	NR	NR	50	2651	10,926,892 AE	0.24 (0.23 to 0.25) /1000 AE
Kontos et al (2013) ⁺	American football	18 teams	468	8-12	100	20	11,338 AE	1.76 (0.99 to 2.54)/1000 AE

Hinton et al (2005) ⁺	Lacrosse	23 High schools	NR	15-18	100	83	387,358 AE	0.21 (0.17 to 0.27) /1000 AE
Lincoln et al (2007) ⁺	Lacrosse	23 High schools	8,638	NR	59	128	507,000 AE	0.25 (0.21 to 0.30) /1000 AE
Gomez et al (1996)	Basketball	100 High schools	890	14-18	0	8	107,353 PH	0.07 (0.04 to 0.15) /1000 PH
Messina et al (1999)	Basketball	100 High schools	973	14-18	100	11	169,885 PH	0.07 (0.04 to 0.12) /1000 PH
McMahon et al (1993)	Australian Rules football	54 teams	1,253	<15	99	15	30,459 PH	0.49 (0.30 to 0.81) /1000 PH
McIntosh et al (2001) ⁺	Rugby	16 teams	294	<15	100	9	1,536 AE	5.9 (3.1 to 11.1) /1000 AE
Marshall et al (2001) ⁺	Rugby	1 High school	NR	NR	NR	17	4,474 AE	3.8 (2.4 to 6.1) /1000 AE
Junge et al (2004)	Rugby	12 school teams	145	14-18	100	13	16,228.2 PH	0.80 (0.47 to 1.36) /1000 PH
Haseler et al (2010)	Rugby	NR	210	<17	100	3	1,636 PH	1.8 (0.62 to 5.4) /1000 PH
Pieter et al (1999)	Taekwondo	3 tournaments	4,258	6-16	79	38	7,606 AE	5.0 (3.6 to 6.8) /1000 AE

Abbreviations: AE=Athlete Exposures; PH=Player-hours

⁺ Included in meta-analysis

* Denominator re-calculated from data provided

** Overall incidence rate (irrespective of sport) calculated as (Number of concussions / Denominator) x 1000