Conclusions Successful development and implementation of preventive strategies against sports injuries in sport club settings continues. HA is currently planning new, modern strategies for implementation e.g. developing technological solutions (mobile and web applications) and webinars. Project is funded by Finnish Ministry of Education and Culture.

744 THE INCIDENCE OF PHYSICAL CONTACTS IN YOUTH ICE HOCKEY ASSOCIATED WITH BODY CHECKING EXPERIENCE

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Background Hockey Canada's 2013 body checking (BC) policy change was informed by evidence that BC leads to a >3-fold increased risk of injury compared with non-BC leagues. Video analyses found a reduction in high intensity physical contacts (PC) following this policy change. The association between BC experience and incidence of PCs has not been examined. As such, the incidence of intensity and types of PC were examined following the policy change in Pee Wee (PW) leagues (ages 11–12) with (Calgary) and without (Québec) BC experience.
Methods PW games were videotaped in Calgary (N = 21, with BC experience) and Québec City (N = 20, without BC experience), both non-BC leagues. Games were analysed using Dartfish with a validated observation system to quantify incidence of PC. Five levels of intensity (trunk contacts coded Level 1–5 intensity) and other types of PC (limb/head/stick). PC incidence rates per team-game and incidence rate ratios (IRR) (95% CI) were estimated to compare games between two cohorts.
Results In total 4433 trunk contacts in Calgary and 2667 in Québec were recorded. Of the trunk contacts, 97.5% (Calgary) and 95.7% (Québec) were classified as low level PC. The incidence of total trunk contacts (number of contacts per team-game) was higher in Calgary than Québec (IRR = 1.58, 95% CI: 1.40–1.79). There was no difference in high intensity contacts (Level 4 [IRR = 0.72 95% CI: 0.48–1.07], Level 5 [IRR = 1.21, 95% CI: 0.57–2.56]). The incidence of other PCs was lower in Calgary than Québec (IRR = 0.71, 95% CI: 0.53–0.96).
Conclusion Following a policy change disallowing BC, PW players with experience BC had a greater incidence of total trunk contacts but not greater high intensity contacts than players without BC experience. Players with no experience had a higher incidence of other PCs. These results inform a greater understanding of mechanisms of contact in youth ice hockey that will in turn inform injury prevention and player development.

745 AN ANALYSIS OF DENTAL TRAUMA AMONG YOUTH BASEBALL ATHLETES UTILISING SCHOOL INSURANCE BIG DATA IN JAPAN

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Background Japan Sport Council (JSC) collects more than 1,000,000 injury data per year and provides medical benefits for injured students who got hurt under the supervision of school. From 2005 to 2014, JSC provided disability compensation for a total of 1,520 sports-related injuries. Baseball was the most common cause of injuries in youth sports, and 474 injuries occurred in extracurricular activities during the period. Kusumoto *et al*.[1] found that eye trauma in baseball was the most common and that 196 cases occurred ([1] K. Kusumoto, Y. Nishida, K. Kitamura, M. Oono, T. Yamanaka, and Y. Sugimoto, "An analysis of ocular injuries among youth baseball athletes utilising school insurance big data in Japan," Safe Communities 2015 in Thailand, 2015). Kusumoto *et al*. also found that dental trauma was the second most common injuries in baseball. Therefore, in this study, we investigated dental injury among youth baseball athletes in Japan as a consecutive research.
Methods One hundred eighty-five injury cases were used for this research. First, we categorised these injuries by utilising JSC's injury severity grading chart defined by the Ministry of Health, Labour and Welfare in Japan. Next, types of injuries in each severity category were clarified based on dentists' diagnosis/evaluation.
Results These injuries consisted of four groups by the injury grading chart. The groups range from severe to minor condition as follows; 1) 1 case (severity), 2) 7 cases, 3) 29 cases, 4) 188 cases (minor). The types of injuries were as follows; 93 teeth fracture, 54 dislocation/subluxation of teeth, 15 pulpitis, 13 alveolar bone fracture, 12 periodontitis and so on. Additionally, the most dental trauma occurred at the central incisors of upper teeth, more than 110 cases.
Conclusion Baseball-related dental trauma is the second highest common injuries among youth athletes in Japan. Based on the results, we propose some preventive methods; 1) wearing a helmet attached a full face guard, 2) managing their practice fields where usually multi-groups practice at the same schedule, and 3) educating coaches, athletes, and parents with potential risks of broken teeth in baseball.

746 THE INCIDENCE OF BEHAVIOURS ASSOCIATED WITH BODY CHECKING EXPERIENCE AMONG YOUTH ICE HOCKEY PLAYERS

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Background Participation and injury rates in youth ice hockey are high. Results of recent studies show that for 11 and 12 years old players the risk of injury is significantly higher in leagues where body checking (BC) is permitted compared to leagues where it is not. The objective of this research was to determine whether the incidence and types of body contact differ for 13 and 14 years old players in leagues where BC commenced at age 11 (Calgary) versus 13 and 14 years old players in leagues where BC was delayed until age 13 (Québec City).
Methods A cohort study was conducted in Québec City and Calgary. Sixteen games for Calgary and fifteen for Québec City were randomly selected and retrospectively analysed. Games were

videotaped and analysed with a validated observation system allowing quantification of the intensity of physical contacts (PC). Five levels of intensity were coded. Level 1 represents the lowest intensity, and level 5 the highest. Different types of PC such as slashing and hooking were also observed. Multivariate Poisson's regression analyses were performed to compare games between the two cohorts. The results provided a body contact incidence rate per team game. Rates were adjusted for the game period, rink zone, and score difference.

Results A total of 5,610 incidences of body contact with the trunk and 3,429 other types of body contact were observed. Very light intensity (Level 1) trunk contact was more frequent in Québec City (adjusted incidence RR [ARR]: 1.71; 95% CI: 1.28–2.29). Hooking (ARR: 2.18; 95% CI: 1.42–3.32) and slashing (ARR: 3.35; 95% CI: 1.31–8.58) were more frequent in Calgary. Body contacts were made more often by defensive players (ARR: 1.28; 95% CI: 1.03–1.58) and on puck carriers (ARR: 1.47; 95% CI: 1.02–2.12) in Calgary.

Conclusions Results suggest that players' behaviours differ between players in leagues in which BC was permitted at age 11 compared to leagues in which BC was delayed until age 13.

747 THE INCIDENCE OF STRESS FRACTURES IN AMERICAN COLLEGIATE ATHLETES

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Background Stress fractures are common sports-related injuries; female and endurance athletes are known to be at a higher risk than the general athlete population. There are thousands of collegiate athletes in the United States competing in high-impact sports, but no large study has been conducted to determine the incidence of stress fractures in this population. Our objective was to calculate the incidence of stress fractures in National Collegiate Athletic Association athletes and investigate epidemiological trends in specific subgroups of athletes.

Methods Data were analysed from the NCAA Injury Surveillance Program from 2009–2010 to 2014–2015 academic years.

Results A total of 747 stress fractures resulting in time loss were reported during 18,054,757 athletic exposures (AE) for an overall rate of 0.53/10,000 AE (95% CI: 0.50, 0.57). The rate of fracture was higher overall among female athletes (RR = 2.06; 95% CI: 1.71, 2.47). Female cross country runners had higher fracture rates than males runners (RR = 1.77; 95% CI: 1.05, 2.98), but this was also noted in female versus male soccer (RR = 1.69; 95% CI: 1.09, 2.63) and basketball (RR = 1.69; 95% CI: 1.26, 2.28) players. The pre-season rate was larger than the regular-/post-season rate (RR = 3.27; 95% CI: 2.83, 3.78). The most common stress fracture locations were the metatarsals (38.8%, N = 290), tibia (20.7%, N = 155), and the lower back/lumbar spine/pelvis (13.4%, N = 100) and 22.5% (N = 165) of stress fractures were recurrent.

Conclusion Females had higher fracture rates of stress fractures than males; but future work needs to focus on improved screening tools for female athletes for all sports as our results found a gender disparity in additional sports from the well-known cross-country athletes. A fifth of fractures are recurrent, potentially highlighting the need to reassess post-injury return to play policies.

748 IMPLEMENTING MAJOR LEAGUE BASEBALL'S NEW HEALTH AND INJURY TRACKING SYSTEM (HITS)

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Background In 2010, Major League Baseball (MLB) and the Major League Baseball Players Association reached an agreement on an electronic medical records and injury tracking system. One goal of the system was to identify and monitor injury trends to better optimise player health and safety.

Methods Development of the surveillance system, HITS (Health and Injury Tracking System) database involved reviewing existing sports injury surveillance systems, consulting with the certified athletic trainers who record player injuries and illnesses, as well as experts who had experience with existing sports databases, and team physicians.

Results HITS includes all players from the Major and Minor Leagues rather than a sample of players from certain teams. The HITS system has a unique identifying number for each player; thus, data can be deterministically linked across various databases. Linking the data allows for investigation of injuries with regard to other key measures of exposure such as pitch count and number of hits, surgical outcomes data, personnel records to calculate cost data, and demographic data. Events included in HITS are any injury or physical complaint sustained by a player that affects or limits participation in any aspect of baseball-related activity, such as a game, practice, or warm up. Analysis of the HITS data has explored leading body parts injured during play including the hamstring, knee, shoulder, and head; select positions such as catchers; and key activities such as sliding.

Conclusions The implementation of HITS has advanced sports injury research overall and professional baseball research in particular. The richness of HITS is unprecedented and creates an opportunity to identify and monitor injury trends in baseball, and conduct epidemiologic research to better understand player risk, and optimise player health and safety through possible rules changes, equipment modifications, or medical education.

749 INJURY INCIDENCE AND LOCATION OF ACUTE INJURIES AT A NATIONAL LEVEL IN SEVEN POPULAR SPORT

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Background Acute injuries in sports are still a problem and the aetiology of injuries in different sports, at a national level, are limited. The aim of the study was to describe the body location of acute injuries in seven sports, which has previously been identified as high-risk sports with respect to incidence of acute injury and severity of injuries, at a national level.

Methods An epidemiological study was performed using insurance data between years 2006–2013. Sports was motorcycle,