Objective To determine in retired international athletes: (1) the prevalence of significant injury and early retirement, and (2) if those with generalised joint hypermobility (GJH) are more likely to sustain a significant injury.

Design Cross-sectional study.

Setting Data from a survey of retired Olympic athletes.

Patients (or Participants) 605 retired athletes, aged 40–97 years, 40% female ($n = 244$) who had competed internationally for Great Britain at the Summer and/or Winter Olympic Games.

Interventions (or Assessment of Risk Factors) Data collected on reasons for retirement from competitive sport including the type and location of significant injury. A validated line drawing instrument was used to measure generalised joint hypermobility (GJH) (Beighton $> 3/9$).

Main Outcome Measurements Injury-forced retirement from a competitive sports career.

Results Of those who replied to the questionnaire ($n = 714$), 84.7% ($n = 605$) were retired from sport, and 21.8% ($n = 132$) of those retired from sport reported that they had retired early because of injury. The main locations of injuries that were reported to be responsible for retirement from sport were the lower back (25.8%), knee (25.0%), lower leg (8.3%), ankle (7.6%), Achilles tendon (6.8%), shoulder (6.8%), hip (5.3%), and thigh (5.3%). The main types of injury reported to be responsible for early retirement from sport were soft tissue related (23.9%), injuries to the intervertebral disc (19.0%), intervertebral joint (18.2%), and cartilage injuries at the hip and knee (9.1%). Overall, GJH was not associated with a significant injury in female [OR 1.25; 95% CI, 0.62–2.50] or male athletes [OR 0.76; 95% CI, 0.35–1.65].

Conclusions Injury is a major cause of early retirement among high-level athletes. However, those with GJH were no more likely to sustain a significant injury.

187

EPIDEMIOLOGY AND IMPACT OF TRAVELLER'S DIARRHOEA ON PARTICIPANTS OF THE PRE-OLYMPIC TEST EVENT 'READY STEADY TOKYO 2019'

¹Nebojša Nikolić, ²Sergio Miglioni, ³Lidija Bilić-Zule. ¹World Sailing Medical Commission, London, UK; ²International Triathlon Union Medical Commission, Lausanne, Switzerland; ³University of Rijeka, Faculty of Medicine, Rijeka, Croatia

10.1136/bjsports-2021-IOC.172

Background Mass gatherings at major sport events such as Olympic Games pose unique health risks because having the large number of people in a small space can aid the spread of infectious diseases. That can also pose risks for athletes' health and can endanger their performance. Water quality testing of the fields of play (FOP) in Tokyo are showing potential environmental problems (temperature and water pollution) that could endanger the health and safety of the athletes. It is necessary to develop adequate preventive and mitigation measures that would be used in Tokyo Olympics. This research aims to provide international and local authorities with evidence-base for such an intervention.

Hypothesis Athletes of open water sports are more prone to gastrointestinal infections (TD) due to the exposure of polluted water on the FOP. This hypothesis has been tested by

investigating data obtained from the survey and identifying the influence of contact with the water of the FOP on athletes' health.

Design Cross sectional study.

Setting Pre-Olympic test event Ready Steady Tokyo 2019 (17–22 August)

Patients (or Participants) athletes (sailing and triathlon) and their accompanying teams on shore.

Main Outcome Measurements Surveys among athletes in contact with the water and their accompanying teams on shore. The whole population defined in investigation was approached. Anonymous TD questionnaire was distributed in hard copy and collected on the last day of the event. The online version was available for one month after the event for participants that omitted to fulfill it on site. Data were processed using MedCalc statistical software. The incidence of diarrhea, its duration, the number of stools, impact on performance was recorded.

Results The study presents the epidemiology and the impact of TD to athletes participating at Pre-Olympic test event Ready Steady Tokyo 2019.

Conclusions Conclusions on risk are made and compared with the data from Rio 2016 Olympics.

188

THE RETIRED OLYMPIAN MUSCULOSKELETAL HEALTH STUDY (ROMHS) COHORT: RECRUITMENT OF 3,357 OLYMPIANS AND 1,735 GENERAL POPULATION CONTROLS

^{1,2}Debbie Palmer, ³Dale Cooper, ⁴Carolyn Emery, ^{5,6}Mark Batt, ^{7,8}Lars Engebretsen, ^{9,10}Brigitte Scammell, ⁸Torbjørn Soligard, ⁷Kathrin Steffen, ^{4,10}Jackie Whittaker, ⁸Richard Budgett. ¹School of Applied Sciences, Edinburgh Napier University, Edinburgh, UK; ²Institute for Sport, PE and Health Sciences, Moray House School of Education and Sport, University of Edinburgh, Edinburgh, UK; ³School of Allied Health Professions, University of Leicester, Leicester, UK; ⁴Sport Injury Prevention Research Centre, Faculty of Kinesiology, University of Calgary, Calgary, Canada; ⁵Nottingham University Hospitals Trust, Nottingham, UK; ⁶Centre for Sport, Exercise and Osteoarthritis Versus Arthritis, Queens Medical Centre, Nottingham, UK; ⁷Department of Sports Medicine, Oslo Sports Trauma Research Centre, Norwegian School of Sport Sciences, Oslo, Norway; ⁸Medical and Scientific Department, International Olympic Committee, Lausanne, Switzerland; ⁹School of Medicine, University of Nottingham, Nottingham, UK; ¹⁰Department of Physical Therapy, University of British Columbia, Vancouver, Canada

10.1136/bjsports-2021-IOC.173

Background Elite athletes are exposed to high physiological training and competition loads and associated increased injury risk. While there is a wealth of evidence reporting the prevalence of injuries seasonally and during major games events, there are few studies examining injury risk across an elite athlete's entire sporting-career.

Objective Recruit a representative sample of Olympians who have retired from elite competition, and general population controls, in order to examine Olympic-career injury patterns and risk, and their association with current health status.

Design Cross-sectional survey of sporting and injury history, and general health.

Setting Olympians and the general population, from 209 countries worldwide.

Patients (or Participants) Athletes who had competed at a Summer and/or Winter Olympic Games and considered themselves retired from Olympic level training and competition;

members of the general population who had not competed at an Olympic Games.

Interventions (or Assessment of Risk Factors) Recruitment of participants took place over a 14-month period (Apr 2018–May 2019), during which an electronic survey was distributed, in eight languages, by email and social media through World Olympians Association and International Olympic Committee channels. Platforms included Olympians.org, National Olympians Associations, National Olympic Committees, International Federations, Athlete 365 and Olympic Studies Centre. Control recruitment also involved Olympian ‘buddies’, and regional leisure, medical and community centres.

Main Outcome Measurements Number and distribution of Olympian and control participants.

Results There were 4,745 Olympian and 2,462 control online survey entries. Data cleaning removed 1,388 Olympian and 727 control ineligible entries (e.g. blank, duplicate, incomplete, under-16 yrs) leaving 3,357 Olympian (age 16–97) and 1,735 control (age 16–88) completed questionnaires, from 131 and 73 Countries (respectively) eligible for data analysis.

Conclusions The distribution of Olympians and controls recruited to the study, and recording of lifetime injury history, sport and exercise exposure and general health measures, will allow analyses of risk factors associated with Olympic-career injury and current health status.

189

PREVENTING HEAT STRESS BEFORE THE TOKYO OLYMPIC GAMES, THE CASE OF OPEN WATER

¹Robin Pla, ²Anaël Aubry. ¹*French Swimming Federation, Clichy, France;* ²*Vital Concept-BandB Hotels Cycling Team, Loudéac, France*

10.1136/bjsports-2021-IOC.174

Background A huge heat stress is expected during the Tokyo 2020 Olympic Games, especially for the open-water swimming event. Literature is scarce about the physiological responses to open-water swimming events in warm water.

Objective The purpose of this study was to collect data from Tokyo's thermal environment one year before the Olympic Games and to observe the physiological responses of swimmers participating in the test event.

Design Individual deep body temperatures were collected before, during and after an open-water 5-km race. Thermal environment was also collected. After the race, a simple questionnaire was administrated to the swimmers, to evaluate their perceived heat stress.

Setting The study took place during the open-water swimming Olympic test event in Tokyo.

Patients (or Participants) Three world-class open-water swimmers (two males and two females) participated in the study. All were selected by the french swimming federation.

Interventions (or Assessment of Risk Factors) Some pre-cooling strategies were used before the race as wearing cooling jacket, drinking cold beverages, putting a wet towel on the neck.

Main Outcome Measurements The main outcome of the study was to report the individual temperature regulation in order to prevent hyperthermia syndrome for the next Summer Olympic Games.

Results At the end of the race (8:00 AM), the water temperature was 30.3°C and the relative humidity was 61.1%. Individual body temperatures were 39.2°C, 39.5°C and 39.7°C

whereas the average body temperature at the beginning of the race was 37.2°C. The survey findings indicate that swimmers perceived a high to very high heat stress during the race.

Conclusions The Olympic organizing committee should consider these results to better avoid hyperthermia on open-water swimmers, in determining the timings on the events. The swimmers and background staffs need to use appropriate heat acclimatization strategies to reduce the risk of heat illness and to maximize swimming performance.

190

REFEREES CAN PREVENT INJURIES IN WRESTLING; AN EXPERIENCE FROM THE 2018 YOUTH OLYMPIC GAMES

^{1,2}Babak Shadgan, ¹Loukas Konstantinou, ¹Szabolcs Molnar. ¹*UWW Medical, Prevention and Anti-Doping Commission, Corsier-sur-Vevey, Switzerland;* ²*University of British Columbia, Department of Orthopaedics, Vancouver, Canada*

10.1136/bjsports-2021-IOC.175

Background Olympic wrestling styles can result in various types of soft tissue and musculoskeletal injuries. Head and face skin contusions and lacerations were the most common type of injuries, followed by ligament sprains, muscle strains and upper limb joint subluxations and dislocations. The main mechanisms of injuries are direct trauma, using legs and arms as levers, falling, and twisting; most injuries happen during the standing position when two wrestlers engage for a takedown and collide with their heads and limbs. It's while performing dangerous actions and some high-risk manoeuvres are forbidden based on current regulations of the United World Wrestling. Recognizing and stopping dangerous actions during wrestling competitions are the responsibility of the referee. We hypothesized that a prompt and proper action of referees to stop dangerous actions and faults could reduce the incidence and severity of wrestling injuries.

Objective To study the potential effect of a proactive and cautious referee practice on reducing the rate and severity of wrestling injuries during international level junior championships.

Design Prospective observational study.

Setting Competitive world-level junior wrestlers.

Participants 768 Junior wrestlers.

Interventions Wrestling referees of 2018 Youth Olympic Games that was held on October 2018 in Buenos Aires were instructed to be extremely careful, prompt and proactive in stopping high-risk and dangerous actions. Data and specifications of injuries among 110 participant wrestlers in 2018 Youth Olympic Games have compared with injuries occurred among 658 wrestlers who competed at 2018 Junior World Championships on September 2018 in Trnava/Slovakia governed by a routine referee practice.

Main outcome measurements Rate, severity, type, location and mechanism of injuries.

Results Rate of wrestling injuries during 2018 Junior world championships and the 2018 Youth Olympic Games were 10.64% and 4.54% respectively.

Conclusions Proactive and cautious actions of wrestling referees to promptly stop dangerous actions has the potential to significantly reduce the rate and severity of injuries in wrestling.