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# **Injury surveillance in multi-sport events - the IOC approach**

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## ABSTRACT

**Background:** The protection of the athletes' health by preventing injuries is an important task for the international sports federations. Standardized injury surveillance provides not only important epidemiological information, but also directions for injury prevention, and the opportunity for monitoring long-term changes in the frequency and circumstances of injury. Numerous studies have evaluated sports injuries during the season, but only few have focused on injuries during major sport events such as World Championships, World Cups or the Olympic Games.

**Objectives:** To provide an injury surveillance system for multi-sports tournaments, using the 2008 Olympic Games in Beijing as an example.

**Methods:** A group of experienced researchers reviewed existing injury report systems and developed a scientific sound and concise injury surveillance system for large multi-sport events.

**Results:** The injury report system for multi-sport events is based on an established system for team sports tournaments and has proven feasible for individual sports during the IAAF World Championships in Athletics 2007. The most important principles and advantages of the system are comprehensive definition of injury, injury report by the physician responsible for the athlete, all injuries reported on a single page and daily report irrespective of whether or not an injury occurred. Implementation of the injury surveillance system, all definitions, the report form, and the analysis of data are described in detail to enable other researchers to implement the injury surveillance system in any sports tournament.

**Conclusion:** The injury surveillance system has been accepted by experienced team physicians and shown feasible for single- and multi-sport events. It can be modified regarding the specific objectives of a certain sport or research question, however, a standardised use of injury definition, report forms and methodology will ensure the comparability of results.

**Keywords:** injury report system, sport, athletes, tournament, review

## Introduction

The protection of the athletes' health by preventing injuries is an important task for the international sports federations and for the International Olympic Committee (IOC). Standardized assessment of sports injuries provides not only important epidemiological information, but also directions for injury prevention, and the opportunity for monitoring long-term changes in the frequency and circumstances of injury.<sup>1-6</sup> Finch et al<sup>4</sup> stated that injury surveillance during sporting events should be a part of the duty of care to the participants to help make future events safer. Therefore, the IOC has decided to conduct an injury surveillance study during the Olympic Games 2008 in Beijing.

Injury surveillance studies have been reported for different sport events, but the results of these studies cannot be compared with one another due to heterogeneous injury definitions, methods of data collection, observation periods, study designs and sample characteristics.<sup>7-10</sup> The need for an agreement on the definition and standards to be used in sports injury epidemiology has been expressed,<sup>2 9 11 12</sup> and consensus statements for certain sports, such as football<sup>13</sup>, rugby<sup>14</sup> and cricket<sup>15</sup> have been published. These consensus statements provide detailed approaches for injury surveillance studies within specific sports but they may not be appropriate where several diverse sports are being compared. Whilst some variations in methodology might be necessary to address the specific objectives of a particular sport, a broad consensus agreement on the methodology of sports injury surveillance would not only improve the scientific value of the studies on sports injuries substantially, but also help to generalise conclusions and recommendations, and combine the effort in injury prevention across different sports.

Injury surveillance systems for major sports events have been published by Harrison and Price<sup>16</sup>, Finch et al<sup>4</sup> and Junge et al<sup>5 17</sup>, but only the latter proved its feasibility in different types of sports tournaments.<sup>5 17-23</sup> It should not be neglected that several organisations have developed and implemented injury report systems to register injuries of specific groups of athletes during the season such as the Canadian Intercollegiate Sport Injury Registry (CISIR,<sup>24</sup>) and the National Collegiate Athletic Association Injury Surveillance System (ISS,<sup>25</sup>). These systems include injuries during tournaments of the athletes surveyed but are not tailor-made to monitor injuries during major sports events. In major tournaments - such as World Championships, World Cups or the Olympic Games - several teams with different backgrounds and diverse medical support participate and it is more difficult to obtain reliable information about the incidence, occurrence and characteristics of injury.

There are few injuries surveillance studies during single-sports tournaments, except for football<sup>5 18-22 26 27</sup> and rugby,<sup>28-31</sup> and even less for multi-sport events<sup>17 32 33 34 35</sup>.

The aims of the present project are to present standards for injury surveillance during major single- and multi-sports tournaments, and specifically to provide the methodology that will be applied during the 2008 Olympic Games in Beijing.

## METHODS

The feasibility and quality of an injury-report system is dependent on the definition of injury, the source of information, the characteristics of the injury documentation form and the

availability of exposure data.<sup>7 9 10</sup> In accordance with the guidelines of the Centers for Disease Control it should also be simple, flexible, acceptable, sensitive, representative and immediate/timely.<sup>2</sup>

The IOC **injury surveillance system for multi-sports events** is based on an injury-reporting system well-established for top-level international football<sup>5 18-22</sup> and handball<sup>23</sup> tournaments and already applied for all team sports tournaments during the Olympic Games 2004<sup>17</sup>. The acceptability of and the compliance with the procedure was excellent, as demonstrated by the response rate exceeding 90% in almost all tournaments at the Athens Olympic Games. The consistent findings in different studies demonstrated the high quality of the data obtained.<sup>17</sup> This injury-reporting system developed for team sports tournaments was modified to be applicable for both individual and team sports. The key **modifications** are presented in table 1.

Table 1: Characteristics of the injury report system applied in the 2004 Olympic Games in Athens<sup>17</sup> and the IOC approach for multi-sport events

	<b>Team sport events</b> (2004 Olympic Games <sup>17</sup> )	<b>Multi-sport events</b> (2008 Olympic Games)
Sport events included	team sports	individual and team sports
What is reported	match injuries	injuries due to competition or training
Who reports injury	team physician	physician of the national team (and physicians of the medical centre, polyclinic)
When injury is reported	after each match	daily
Injury report form	additional information on consequences of injury	additional information about sport event

While modifying the injury-reporting system, the most important principles and advantages of the established system were preserved such as the consensus definition of injury, injury report by the physician responsible for the athlete, report related to a time period independent of whether or not an injury occurred, and one report form per team (not per injury). The modified injury surveillance system was implemented and proven feasible during the World Championships of the International Association of Athletics Federations (IAAF) 2007 in Osaka.<sup>36</sup>

### **Definition of Injury**

Based on a recent international consensus on the definition and data collection procedures in studies of football injuries,<sup>13</sup> an injury was defined as *any musculo-skeletal complaint newly incurred due to competition and/or training during the tournament that received medical attention regardless of the consequences with respect to absence from competition or training*. This injury definition includes five aspects that can be modified in future studies: (a) all injuries that received medical attention (not only time-loss or reduced performance), (b) newly incurred (exclusion of pre-existing and not fully rehabilitated injuries), (c) in competition or training injuries, (d) during the period of the tournament and (e) exclusion of

illnesses and diseases.

**(a) All injuries that received medical attention:** The advantage of this broad definition of injury is that it becomes possible to assess the impact of the full spectrum of injuries from mild contusions to fractures.<sup>5 37</sup> This might be of importance in assessing the long-term consequences of injuries, since an analysis of injury sequences shows that minor injuries are often followed by moderate or major ones,<sup>38</sup> and acute complaints are a predictor of subsequent injuries<sup>39</sup>. In addition, athletes sometimes compete despite an injury.<sup>40</sup> Finally, an “all-encompassing” injury definition<sup>37</sup> does not leave it up to the physician to judge which injuries should or should not be included. The availability of additional information regarding *time-loss* in sport (estimated duration of subsequent absence from sport) allows expression of the incidence of time-loss injury and the possibility of comparing the results with studies that use that definition.

**(b) Newly incurred injuries:** In agreement with the consensus statements for football<sup>13</sup> and rugby<sup>14</sup>, pre-existing, not fully rehabilitated injury should not be reported; *re-injuries* (injuries of the same location and type) should only be reported if the athlete has returned to full participation after the previous injury.

### **Report by the responsible physician**

Injuries should be diagnosed and reported by qualified medical personnel (team physician, physiotherapist) to ensure valid information on the characteristics of the injury and a comparable standard of the data. It is advantageous if each team designates one contact person who will take part in the instructional meeting and will be accessible for questions. In general, the national team chief physician should be responsible for reporting the injuries of their athletes. The team physicians should report all newly incurred injuries (or the non-occurrence of injuries) daily on the provided injury report form and should return it daily to the study centre in the stadium or the study headquarters via fax. In the situation when the diagnosis (or the duration of absence) is revised later as more information about the injury becomes available, the team physician should report the injury again (with the previous data and location of injury to indicate that this is a revised report) and state the corrected information.

In order to receive also information about injured athletes of teams that do not have a physician or physiotherapist, injuries should additionally be reported by the medical centres (in the stadium/venues) and/or the polyclinic physicians of the local organisers using the same injury report form.

### **The injury report form**

A simple and concise injury report form regarding the most important variables was developed and tested according to the recommendations of Finch et al<sup>4</sup>. The standardised form comprises a single page on which all sports injuries that receive medical attention from the team physician during the day or, if no athlete is injured, the non-occurrence of injury should be described in tabular form (see appendix 1). The injury report form requires documentation of the following information: accreditation number of the athlete, sport and event, round/heat/training, date and time of injury, injured body part, type of injury, cause of injury and an estimate of the expected duration of subsequent absence from competition and/or training. For “sports and event” and “round / heat or training” the requested

information slightly differs between team and individual sports (see appendix 2 for details). Team sports are defined as sports where two teams of athletes who can be substituted during a match play against each other (football, handball, basketball, field hockey, baseball, softball, water polo, volleyball). All other sports (which do not allow the substitution of athletes during a match, heat or race) are considered as *individual sports*, even if some include team competitions. Definitions of all parameters to be documented are given on the back page of the injury report form (see appendix 2). The injury report form should be provided in the relevant languages.

**Accreditation number of the athlete:** The accreditation number of the athletes should only be used (a) to avoid double reporting of an injury by the team physician and the medical centre / polyclinics, (b) to recognize reports which provide revised information about an injury already reported and (c) to receive additional information about the injured athlete. Usually the organisers of the tournament (e.g. national/international sports federation or IOC) have a database with information on accreditation number, sex, date of birth, sport, event and country (sometimes also height and weight) of all registered athletes. Based on the accreditation number, this information can be added to the injury database. The advantage of using the accreditation number is that the team physician does not need to document these data, the injured athletes can be described in more detail and the injured athletes can be compared to uninjured ones. Furthermore, it facilitates the identification of the injury on video coverage for additional analysis.

The accreditation number of the athletes should not be entered into the injury database, and all data must be subsequently made anonymous. If it is not possible to document the accreditation number of the athletes for legal reasons in some countries, the injury report form has to be modified, and the team physicians and medical centre / polyclinics need to also report the age, sex and nationality of the injured players.

**Injured body part:** The physician should describe the location of injury in words and give the respective code(s) of the 24 injury locations (each eight of head and trunk, upper extremity and lower extremity) specified on the back of the form. The selection of injury locations is based on the review of other injury reporting systems (e.g.<sup>17 25 41</sup>), and the consensus statements for football<sup>13</sup> and rugby<sup>14</sup>. It allows comparison with other established coding systems such as the Orchard Sports Injury Classification System<sup>42</sup> and the Sports Medicine Diagnostic Coding System<sup>43</sup>. The locations can be summarised under a main heading (head, trunk, upper and lower extremity), or in future studies, be subdivided in more detailed categories (e.g. m. quadriceps, m. adductor, m. abductor and hamstrings).

**Type of injury:** The physician should describe the type of injury in words and give the respective code(s) of the 19 injury types stated on the back of the form. The selection of injury types is based on the review of other injury reporting systems<sup>16 17 25 41</sup> and the related consensus statements for football<sup>13</sup> and rugby<sup>14</sup>, which allows comparison with other established coding systems such as the Orchard Sports Injury Classification System<sup>42</sup> and the Sports Medicine Diagnostic Coding System<sup>43</sup>. The types of injury can be summarised under a main heading (muscle and tendon, joint and ligament, bone, skin, brain / spinal cord / peripheral nervous system and others), or in future studies, be subdivided in more detailed categories (e.g. concussion with and without loss of consciousness). In future studies, other medical problems such as illnesses, diseases, or psychological complaints can be included as separate categories.

**Cause of injury:** The physician should describe the mechanism or cause of injury in words and give *one or more* of the respective codes of the twelve causes stated on the back of the form. The selection of injury mechanism and causes is based on the review of the literature (e.g. <sup>4 16 25 41</sup>) and focuses mainly on extrinsic risk factors. Since cause of injury is important information for injury prevention, the selected causes cover a wide spectrum, of which some (e.g. rule violation, foul play) might only apply for team sports. The main injury mechanisms are defined as follows: An *overuse* injury refers to an injury resulting from repeated micro-trauma without a single, identifiable event responsible for the injury and a *traumatic injury* refers to one caused by a specific, identifiable event. Overuse injuries are divided in two groups based on the onset of symptoms. A *non-contact trauma* is defined as a traumatic event without contact with another athlete or object, such as a fall. The definition and recording of recurrent injury in injury surveillance studies has been outlined in detail by Fuller et al<sup>44</sup>. In agreement with recent consensus statements<sup>13 14</sup> a *recurrent injury* (re-injury) is defined as an injury of the same location and type which occurs after an athlete's return to full participation from the previous injury. *Contact* events are categorised as contact with another player, a moving object (e.g. ball, puck, racket) or a stagnant object (e.g. hurdles, net, goalpost). If it applies, it should be indicated whether or not the injury was caused by a violation of the rules of the respective sport. *Playing field conditions* (e.g. uneven ground) include alterations of the playing field by the *weather* (e.g. slippery ground.). In such cases, both codes should be provided.

**Absence in days:** The team physician is asked to provide an estimate of the number of days that the athlete will not be able to undertake their *normal* training programme or will not be able to compete. A follow-up of the injured players could improve the validity of the data, but might be impractical because some athletes participating in the Olympic Games have no associated physician or physiotherapist. In future studies, a follow-up of athletes estimated to be out of competition for more than seven days should be arranged with the responsible physician. The duration of absence from sport is regarded as an indicator of the severity of the injury.<sup>1 13</sup>

## IMPLEMENTATION

Beside the methodological issues outlined above, sufficient funding and ethical approval are pre-requisites for implementation of an injury surveillance project. The sports federations and medical representatives of all participating countries/teams should be informed prior to the championships and be requested to participate in the study. The athlete's informed consent to participate in the injury surveillance project should be included in his/her registration for the tournament. The team physicians should receive a booklet with detailed information about the study approximately one month before the tournament and should be invited to an instructional meeting one or two days prior the start of the tournament. They should be motivated to comply with the study and should be instructed on the correct procedures for completing the injury report forms by the leader of the project. During the tournament the returned injury report forms should be checked on a daily basis (for details see below) and the leader of the study should be available for questions and to provide motivation to the team physicians. Personal contact and good relationships between the staff conducting the injury surveillance and the physicians providing the injury data is of invaluable importance for the success of the project. It is recommended to pay special attention to team physicians with the most participating athletes. After some days, all team physicians should receive feedback on

the completeness of their reports and the first results to increase their compliance with the study. The team physicians, the physicians of the medical centre, all participating sports federations and the involved organising committees (e.g. National Olympic Committee) should receive a formal report of the study in adequate time after the end of the tournament.

### **Confidentiality**

It is of utmost importance that the confidentiality of all information is ensured. Regardless whether the accreditation number or the date of birth and sex of the athlete is documented, this information enables the identification of the injured athlete and must therefore be treated with strict confidentiality. All injury report forms should be stored in a locked filing cabinet and be made anonymous (or destroyed) after the tournament. The accreditation number of the athletes should not be entered into the injury database, and all data files should be anonymous. All analysis and the reports should be either for groups of athletes, or in a way that no individual athlete or team can be identified.

### **Quality control and response check**

During the championship, the returned injury report forms should be checked on a daily basis. First, it should be ascertained that all participating team physicians have returned at least one daily form and secondly the forms should be scanned for missing information. In case of double reporting by the team physician and the medical centre, the data should be compared and the discrepancies should be clarified. It might be important to analyse the number of injuries reported from different countries in relation to the number of registered athletes of the respective country to check if the injury rates are as expected. It is of great advantage to control the completeness and quality of the injury documentation during the championships, since the team physicians can immediately be contacted, open questions clarified and missing information added. Furthermore, the involved physicians learn during the process, the injury documentation becomes a routine procedure and prompt feedback increases the compliance with the system.

## **ANALYSIS OF DATA**

### **Preparation of data**

Before analysing the data, double reporting of injuries by the team physician and medical centre/polyclinic must be controlled for. If discrepancies between the reports cannot be clarified, the report of the medical centre should be excluded. Only injuries incurred in competition or training during the period of the championships should be included in the analysis. If an athlete injures two body parts (e.g. ankle sprain and abrasion of the knee) or incurs two types of injury in one body part (contusion and laceration of the calf) in one incident, this is counted as one injury with two diagnoses. If the same injury of an athlete is again reported with the same date of injury but a different diagnosis and/or duration of absence, this should be regarded as a corrected up-date of the injury report. If an athlete incurs the same type of injury at the same body part more than once during a championship this should be regarded as a recurrence and should not be counted as a new injury. Fuller et al<sup>13</sup> defined a recurrent injury as: „An injury of the same type and at the same site as an index injury and which occurs after a player's return to full participation from the index injury.“ If an injury was reported for the first time during a championships but the physician refers the cause as „recurrence of previous injury“, this injury is counted as an injury, since no details

about recovery from the previous injury are available, and it is assumed that the athlete was able to compete at the beginning of the tournament. Because of the complexity of judging the injuries, it is recommended that the input of the data is prepared and supervised by a person experienced in sports medicine.

### **Response rate and coverage**

First, the total number of teams or countries and athletes participating in the championships should be ascertained. Since all teams may not have a team physician, the response rate can be determined by dividing the number of team physicians participating in the injury surveillance project by the number of teams with a team physician. Subsequently, the number of received injury report forms and its percentage out of the expected forms should be calculated. While the number of athletes varies between teams, the coverage of athletes by the team physician's reports can be best estimated by multiplying for each team the number of athletes and the number of returned report forms, and relating the sum to the total number of athletes multiplied with the days of the championships. In addition, the number of injury reports from the medical centres should be determined and related to the number of athletes without a team physician. Finally, a comparison of the proportion of injuries reported by the team physicians and the medical centres in relation to the number of athletes in teams with and without team physicians might indicate the completeness of the injury reports.

### **Frequency and characteristics of injury**

It is important to distinguish between number of injuries and number of injured athletes, since an athlete can incur more than one injury during a tournament. It should be reported how many athletes incurred no injury, one injury and more than one injury. If an athlete has an unexpectedly high number of injuries, the data should be carefully inspected. Injuries in competition and training should be analysed and reported separately. It is recommended to present the frequency of different diagnoses (best in tabular form), instead of reporting the number of injuries for body part and type of injury unconnectedly. Concerning the cause of injury, at least the rate of overuse and traumatic injuries should be reported. However, for the development of preventive interventions, it is of interest to know how many athletes suffered a re-injury and how many injuries were caused by contact with another athlete or an object, by violation of rules, by equipment, by playing field properties or by weather conditions.

All injuries that result in the athlete being unable to undertake his or her normal training programme or being unable to compete at least the day after injury are classified as *time-loss injuries*. In accordance with Fuller et al<sup>13</sup> the severity of an injury is defined as the number of days the athletes will not be able to undertake their normal training programme or will not be able to compete. *Injury severity* is usually classified as minor (1 to 7 days, some studies further divide into 1-3 and 4-7 days), moderate (8 to 28 days), severe (>28 days), and career-ending injuries. The characteristics, circumstances and causes of severe and career-ending injuries should be described in detail together with information about the athlete (age, gender, type of sport).

### **Population at risk and exposure**

The importance of exposure data in injury surveillance has been frequently stated.<sup>10 45 46</sup> Similar to injuries, exposure should be analysed and reported separately for competition and training. Exposure can be expressed in different ways: in relation to the population at risk

(total number of athletes), in relation to the number of exposing situations (training session, match or competition) or in relation to exposure time (hours spend in competition or matches). While information about the population at risk and the number of competing athletes is usually available from the schedule and start lists of the championships, training exposure must be documented for each individual athlete. Exposure time in competition is difficult to determine for most sports (except for team sports with a fixed duration of the match), and it can be questioned if exposure time is the best basis for a comparison of risk exposure in multi-sport events.<sup>17</sup>

**Registered athletes** (population at risk): All athletes officially registered for the tournament by the governing body (entry list), independent of whether or not they participate in any competition.

**Competing athletes** (athletes exposed to competition): For *individual sports*, the number of competing athletes is defined as all athletes who start at least once in an event, irrespective of whether or not he/she finishes the event. Athletes who do not finish (DNF), who are disqualified (DQ) or whose result is not measured (NM) are counted as having started. If an individual athlete participated in more than one event, the athlete is counted in each event. Thus, the total number of competing athletes is not identical (but slightly higher) than the sum of the individual athletes. For *team sports*, the number of competing athletes is the number of players plus the maximum number of substitutes to be used in a match (as defined in the rules of the respective sport).

**Participations** (athletes' exposure in competition): For *individual sports*, the number of athletes starting in all heats, rounds, qualifications and finals are added up to the number of participations in a particular event or the championship. If an athlete starts more than once in the same or a different event, each start is counted. For *team sports*, the maximum number of players allowed on the field of play (as defined in the rules of the respective sport) multiplied by the number of teams and matches determines the number of participations (equivalent to player matches) in a particular event or the championship.

**Exposure hours:** For *team sports* with a fixed duration of the match, the total exposure hours can be calculated by multiplying the maximum number of players allowed on the field of play and duration of a match in hours with the number of matches.<sup>17</sup> For *all other sports* and for *training*, the exposure time must be documented individually.

### Calculation of incidence of injury

In a statistics primer on epidemiological concepts in sports medicine, Kuhn et al<sup>47</sup> defined incidence as the „number of new cases that developed over a specific period of time“ and distinguished between whether this figure is related to the population at risk or the exposure time. In studies on sports injury, the incidence of injury is usually expressed as (a) number of injuries per 100 or 1000 athletes, (b) number of injuries per 100 or 1000 athletes exposures or (c) number of injuries per 1000 hours training and/or competition. It has been stressed that injury rates should be calculated separately for training and competition.<sup>9 13</sup>

However, Junge et al<sup>17</sup> has previously described a methodological dilemma in comparing the incidence of injury in different sports. The number of injuries per athlete ignores the fact that a tournament is comprised of different numbers of competitions for each sport. An exposure-time related incidence (number of injuries per 1000 hours exposure) seems to be the most

accurate way, but it can be questioned if a comparison of “one hour football”, “one hour 100m sprint” and “one hour archery” makes any sense in the context of sports injury surveillance. Thus, in agreement with Junge et al<sup>17</sup> we recommend that an athlete’s individual risk of injury in multi-post events should be best expressed and compared as “injuries in competition per 1000 athlete’s participations”.

## **CONCLUSIONS AND RECOMMENDATIONS**

An injury surveillance system for multi-sports events was developed based on established injury-reporting system developed for team sports tournaments. The injury report system has proven feasible for team sports during the 2004 Olympics and for individual sports during the IAAF World Championships 2007. It will be applied during the 2008 Olympic Games in Beijing and should serve as a role model for future studies in single and multi-sport events. Implementation of the injury surveillance system, all definitions, the injury report form, analysis and reporting of data are described in detail to enable other researchers to implement the injury surveillance system in any sports tournament. The system can be modified to address the specific objectives of a certain sport or research question, however, a standardised use of injury definition, report forms and methodology will ensure the comparability of results.

### **What is already known on the topic?**

Numerous studies have evaluated sports injuries during the season, but only few have focused on injuries during major sport events such as World Championships, World Cups or the Olympic Games.

### **What this study adds?**

A concise injury surveillance system for multi-sports events was developed, has proven feasible for team sports and for individual sports. It will be applied during the 2008 Olympic Games in Beijing and should serve as a role model for future studies in single and multi-sport events. Standardised use of injury definition, report forms and methodology will ensure the comparability of results.

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**Appendix 1: DAILY INJURY REPORT FOR THE OLYMPIC GAMES**

Nation \_\_\_\_\_ Physician's name \_\_\_\_\_ Day of report \_\_\_\_\_

Contact details \_\_\_\_\_ tel./fax or e-mail \_\_\_\_\_

Please report: **All injuries (traumatic and overuse) newly incurred in competition or training during the Olympic Games regardless of the consequences with respect to absence from competition or training.**  
The information provided is for medical and research purposes and will be treated confidentially.

**Example:**

athlete's accreditation no. <b>1234569587979</b>		sport and event <b>Athletics, 100m (women)</b>		round / heat or training <b>quarter final / 1<sup>st</sup> heat</b>		day / time of injury <b>12.8. / 2:35 pm</b>
injured body part <b>wrist</b>	code <b>15</b>	type of injury <b>sprain</b>	code <b>10</b>	cause of injury <b>slipped and fell</b>	code <b>8</b>	absence in days <b>10</b>

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

athlete's accreditation no.		sport and event		round / heat or training		date and time of injury
injured body part	code	type of injury	code	cause of injury	code	absence in days

no injury in any athlete of our team today

Appendix 2: **DEFINITIONS AND CODES****Sport and event**

Please state for *team sports*: the sport only (e.g. football, handball, basketball),  
for *all other sports*: the sport and event (e.g. swimming - 4x 100m freestyle relay women; track  
- 110m hurdles men; Decathlon - high jump; Taekwondo - under 58kg; cycling – team sprint).

**Round / heat or training**

If the injury occurred during **competition**, please state:  
for *team sports*: the match number or opponent team,  
for *all other sports*: the **round** (e.g. first round, quarter-final, qualification, final) and **heat or group** (e.g. first heat, second run, first semi-final, qualifying group A).  
If the injury occurred at **another occasion**, please specify e.g. training, warm-up.

**Date and time of injury**

Please state **date** and **time** when the injury was incurred.

**Injured body part - Location of injury**

Head and trunk	Upper extremity	Lower extremity
1 face (incl. eye, ear, nose)	11 shoulder / clavicle	21 hip
2 head	12 upper arm	22 groin
3 neck / cervical spine	13 elbow	23 thigh
4 thoracic spine / upper back	14 forearm	24 knee
5 sternum / ribs	15 wrist	25 lower leg
6 lumbar spine / lower back	16 hand	26 Achilles tendon
7 abdomen	17 finger	27 ankle
8 pelvis / sacrum / buttock	18 thumb	28 foot / toe

**Type of injury - Diagnosis**

1 concussion (regardless of loss of consciousness)	11 strain / muscle rupture / tear
2 fracture (traumatic)	12 contusion / haematoma / bruise
3 stress fracture (overuse)	13 tendinosis / tendinopathy
4 other bone injuries	14 bursitis
5 dislocation, subluxation	15 laceration / abrasion / skin lesion
6 tendon rupture	16 dental injury / broken tooth
7 ligamentous rupture with instability	17 nerve injury / spinal cord injury
8 ligamentous rupture without instability	18 muscle cramps or spasm
9 sprain (injury of joint and/or ligaments)	19 others
10 lesion of meniscus or cartilage	

**Cause of injury**

1 overuse (gradual onset)	11 contact with another athlete	21 field of play conditions
2 overuse (sudden onset)	12 contact: moving object (e.g. ball)	22 weather condition
3 non-contact trauma	13 contact: stagnant object (e.g. net)	23 equipment failure
4 recurrence of previous injury	14 violation of rules (foul play)	24 others

**Estimated duration of absence from training or competition (in days)**

Please provide an estimate of the number of days that the athlete will not be able to undertake their normal training programme or will not be able to compete.		
0 = 0 days	14 = 2 weeks	> 30 = more than 4 weeks
1 = 1 day	21 = 3 weeks	>180= 6 months or more
2 = 2 days	28 = 4 weeks	
7 = 1 week		

## Appendix 3:

**Examples of how to record injuries**

1. A male high jumper sustained a hamstring injury during the early morning qualifying round that required immediate rest and treatment. The estimated time of recovery will be 30 days rehabilitation before he could return to full training.

athlete's accreditation no. <b>uvg 34765</b>		sport and event <b>High Jump (men)</b>		round / heat or training <b>Qualification</b>		date and time of injury <b>10<sup>th</sup>, 08:00 am</b>
injured body part <b>hamstring</b>	Code <b>23</b>	type of injury <b>strain</b>	Code <b>11</b>	cause of injury <b>Overuse</b> <b>(sudden onset)</b>	code <b>2</b>	absence in days <b>30</b>

2. A male football player suffered groin pain during the semi-final, which the team physician decided did not warrant immediate treatment; the athlete continued to take full part in training and competition.

athlete's accreditation no. <b>TAM 345672</b>		sport and event <b>Football (men)</b>		round / heat or training <b>Semi-final</b>		date and time of injury <b>24<sup>th</sup> Aug; 2<sup>nd</sup> half</b>
injured body part <b>groin</b>	Code <b>22</b>	type of injury <b>strain</b>	Code <b>11</b>	cause of injury <b>Overuse</b> <b>(gradual onset)</b>	code <b>1</b>	absence in days <b>0 days</b>

3. A decathlete sustained an ankle sprain during competition but continued to compete; the athlete received medical attention following the competition. The athlete completed full competition using ankle taping (with some pain) but aggravated the injury during the following day; the athlete then required rehabilitation and stopping from training. Estimated duration of treatment is two weeks.

**First Incident should be recorded as an injury:**

athlete's accreditation no. <b>gdfo25674</b>		sport and event <b>Decathlon - high jump</b>		round / heat or training <b>competition</b>		date and time of injury <b>10<sup>th</sup> Aug; 10:20</b>
injured body part <b>ankle</b>	Code <b>27</b>	type of injury <b>sprain</b>	Code <b>9</b>	cause of injury <b>non</b> <b>contact trauma</b>	code <b>3</b>	absence in days <b>0</b>

**Second Incident should also be recorded as a new injury:**

athlete's accreditation no. <b>gdfo25674</b>		sport and event <b>Decathlon - 1500 m</b>		round / heat or training <b>competition</b>		date and time of injury <b>21<sup>th</sup> Aug; 18:35</b>
injured body part <b>ankle</b>	Code <b>27</b>	type of injury <b>sprain</b>	Code <b>9</b>	cause of injury <b>recurrence of injury</b>	code <b>4</b>	absence in days <b>14</b>

4. A male swimmer slipped on wet ground and sustained a laceration to the leg during a morning training session; the physician sutured the cut but the swimmer missed the afternoon training session. The swimmer was able to take full part in competition on the following day.

athlete's accreditation no. <b>nfdl-35874367</b>		sport and event <b>swimming</b> <b>200m backstroke, men</b>		round / heat or training <b>Training</b>		date and time of injury <b>10<sup>th</sup> Aug; 7:00 am</b>
injured body part <b>calf</b>	Code <b>25</b>	type of injury <b>cut</b>	Code <b>15</b>	cause of injury <b>slipped</b> <b>on wet ground</b>	Code <b>3,</b> <b>21, 22</b>	absence in days <b>0</b>

5. A female 100 m runner suffered from an Achilles tendinosis, the pain increased during the second heat of the quarter final. She was able to run in the semi-final after treatment and with a brace.

athlete's accreditation no. <b>fglh45270634</b>		sport and event <b>athletics 100 m (women)</b>		round / heat or training <b>Quarter final, Second heat</b>		date and time of injury <b>12<sup>th</sup> Aug; 17:00</b>
injured body part <b>Achilles tendon</b>	Code <b>26</b>	type of injury <b>tendinosis</b>	Code <b>13</b>	cause of injury <b>overuse</b> <b>(gradual onset)</b>	code <b>1</b>	absence in days <b>0</b>

6. A female beach volleyball player sprained her left ankle on the 9th of August during training. She received treatment by the NOC PT, and then was taken to the Polyclinic for MRI and secondary treatment.

athlete's accreditation no. <b>TAM45 48753</b>		sport and event <b>Beach volleyball (women)</b>		round / heat or training <b>Training</b>		date and time of injury <b>9.Aug – 18:05</b>	
injured body part <b>ankle</b>	Code <b>27</b>	type of injury <b>sprain</b>	Code <b>11</b>	cause of injury <b>non-contact</b>	code <b>3</b>	absence in days <b>2 days</b>	

**Revised diagnosis (after MRI) should also be provided on the injury report form**

athlete's accreditation no. <b>TAM45 48753</b>		sport and event <b>Beach volleyball (women)</b>		round / heat or training <b>Training</b>		date and time of injury <b>9.Aug – 18:05</b>	
injured body part <b>ankle</b>	code <b>27</b>	type of injury <b>ligament rupt. no instability</b>	Code <b>8</b>	cause of injury <b>injury already reported</b>	code	absence in days <b>&gt; 30</b>	

7. A basketball player caught his finger in the opponents' jersey and sustained an injury to the 2nd MCP joint right hand.

athlete's accreditation no. <b>TAM 345126</b>		sport and event <b>basketball (men)</b>		round / heat or training <b>match no. 7</b>		date and time of injury <b>20.8., 6:37 pm</b>	
injured body part <b>finger</b>	Code <b>17</b>	type of injury <b>MCP I sprain</b>	Code <b>9</b>	cause of injury <b>contact with other player</b>	code <b>11</b>	absence in days <b>7</b>	

8. A male handball player sustained a trauma to his right knee during rotation in the 17th minute of the match. He was seen by the team PT who recorded the injury and treated the patient acutely. The player was then sent to the polyclinic where an MRI was carried out and the final diagnosis made which was a grade III tear of the MCL with apposite valgus grade III test at 20 degrees.

athlete's accreditation no. <b>TAM 53487</b>		sport and event <b>handball (men)</b>		round / heat or training <b>match against Ger</b>		date / time of injury <b>11.Aug – 17min</b>	
injured body part <b>knee</b>	Code <b>24</b>	type of injury <b>sprain</b>	Code <b>9</b>	cause of injury <b>non-contact</b>	code <b>3</b>	absence in days <b>7-10 days</b>	

**Revised diagnosis (after MRI) should also be provided on the injury report form**

athlete's accreditation no. <b>TAM 53487</b>		sport and event <b>handball</b>		round / heat or training <b>match against Ger</b>		date and time of injury <b>11.Aug – 17min</b>	
injured body part <b>knee</b>	code <b>24</b>	type of injury <b>ligament rupt with instability</b>	Code <b>7</b>	cause of injury <b>reported</b>	code	absence in days <b>&gt;180 days</b>	

9. A weightlifter fell to the floor during a lift and screamed due to pain in the left thigh. She was taken to the clinic at the venue where an ultrasound made the diagnosis of a quadriceps tear.

athlete's accreditation no. <b>TAM 3474239</b>		sport and event <b>weightlifting 69kg, women</b>		round / heat or training <b>qualifying</b>		date and time of injury <b>Aug 10, 14:30</b>	
injured body part <b>quadriceps</b>	Code <b>23</b>	type of injury <b>rupture</b>	Code <b>11</b>	cause of injury <b>overuse, sudden</b>	code <b>2</b>	absence in days <b>&gt;30 days</b>	

10. A male steeplechaser fell off the bus step and sprained his ankle while being dropped off at the stadium for his event.

**Incident should not be recorded as an injury as defined for this study.**