



IIHF INJURY REPORTING SYSTEM 2008-09

INTRODUCTION

The IIHF introduced the IIHF Injury Reporting System (IRS) during the 1998-99 season. The IRS reports on the various types of injuries that occur in IIHF championships and the causal factors (mechanism of injury, area of ice, etc.) identified with these injuries. The IRS has finished its eleventh season and will be in its twelfth year of operation.

The IRS allows the IIHF to determine the trends of injuries in championships and also allows comparison with other leagues and sports that use a similar system. The data will help the IIHF make sound recommendations from the injury information in making the sport of ice hockey safer for all the participants.

The IIHF Medical Committee also introduced in the last five years the concept of the Game Injury Report where team physicians will submit a report after every game outlining the number of injuries. This method should allow the collection of injuries to be more complete and accurate than in previous years.

A computerized version of the IRS system was developed by Dr. Markku Tuominen and used as a pilot project for the 2006-07 season.

METHODOLOGY

The following information covers the 2008-09 season. Medical Supervisors who participated in IIHF championships were responsible for the collection of data in their respective championship and helped team physicians complete the IRS forms. Game Injury reports were collected from each team physician after every game to determine whether an injury occurred.

The definition of an injury was made in accordance with accepted international norms. The reporting of an injury and the completion of a form was made only when one of the following criteria was observed:

1. A player missed the rest of the game or the next day.
2. A player sustained a facial laceration.
3. A player had a dental injury
4. A player sustained a concussion
5. A player suffered a fracture

Reports were submitted for the following IIHF Championships:

1. 2009 IIHF World Championship
2. 2009 IIHF World Senior Championship Division IA
3. 2009 IIHF World Senior Championship Division IB
4. 2009 IIHF World Senior Championship Division IIA
5. 2009 IIHF World Senior Championship Division IIB
6. 2009 IIHF World U20 Championship
7. 2009 IIHF World U20 Championship Division IA
8. 2009 IIHF World U20 Championship Division IB
9. 2009 IIHF World U20 Championship Division IIA
10. 2009 IIHF World U18 Championship
11. 2009 IIHF World U18 Championship Division IA
12. 2009 IIHF World Women Championship
13. 2009 IIHF World Women U18 Championship
14. 2009 IIHF Final Olympic Qualification Group E Men
15. 2009 IIHF Final Olympic Qualification Group F Men
16. 2009 IIHF Final Olympic Qualification Group G Men
17. 2009 IIHF Final Olympic Qualification Group C Men
18. 2009 IIHF Final Olympic Qualification Group D Men

INJURY RATE

The injury rate is used as a basis for calculating the risk of injury and can be used in comparison with other IIHF championships and other leagues (CHA) and sports (football, basketball). The injury rate was calculated using the following formula: # injuries / # players (team) x # games x 1,000 to give the number of injuries per 1,000 player-games.

The rate of injury was highest in the Senior Men Championship and lowest in the Women Championship.. The World U20 Championship had a significant increase in the injury rate from the previous year but was lower than the U18 championships.

	2005	2006	2007	2008	2009
World Senior Championships	34.5	26.6	27.5	36.3	32.85
World U20 Championships	29	33.5	22.1	15.9	31.10
World U18 Championships	16.4	17.9	20.1	16.8	21.99
World Women Championship	11.3		11.5	10.2	12.24

The rate of injury increased in the U20 championships, especially in the World U20 Championship.

	2001	2002	2003	2004	2005	2006	2007	2008	2009
World Championship	21.0	25.1	29.2	35.7	34.5	20.2	33.3	40.6	40.58
World U20 Championship	25.4	15.6	24.1	45.2	29	45.5	19.5	13.2	41.99
World Championship Div I	18.0	22.7	19.6	36.6	37.9	18.1	21.1		21.21
World Championship Div. II	10.7	21.2	12.1	33.3	33.3	21.3	18.2		21.20
World U18 Championship	11.4	11.5	16.0	20.9	19	23.5	58.0	23.5	21.99
World Women Champ.	4.0	3.2	15.2	27.5	11.3	15.3	15.9	10.2	15.91

The injury rate has remained the same as the previous year in the World Senior Men Championship. This injury rate as in 2008 is very high compared to the previous years. The World U20 Championship had a much higher injury rate than the previous year. The World Junior U18 Championship remained the same as the previous year which is similar to 2004-06 years.

The total injury rate for all Championships increased in the year 2008-09 and reverses the downward trend of the last two years. There is a great increase in the risk of injury from the World U20 Championship. The U18 Championship had a similar injury rate as in 2007-08. The rate of injury in the World Women Championships was the lowest of the different groups.

INJURIES BY BODY PART

Facial Injuries

The World Senior Championship had the greatest number of facial injuries. There was a progressive decrease in the number of facial injuries as the age level decreased (U20, U18) and as the division was lowered (Division I, Division II). The World U20 Championship had a significant increase in the number of facial injuries in the 2008-09 season. This number is a decrease from last year.

The full facemask is mandatory at the U18 Championships and a greater percentage of players wear the half or full visor in the lower division. It is interesting to note that facial injuries including lacerations (3) still occur in the U18 even though all players wear a full facemask.

Concussions

Concussions accounted for a small yet significant percentage (7.2%) in the 2009 Championships. The total number was 12 and this number represents a small decrease in the last year. There were 5 concussions in the WJU20 championship. The risk of a concussion decreased slightly in 2009.

1999	11
2000	11
2001	3
2002	6
2003	3
2004	13
2005	12
2006	18
2007	11
2008	15
2009	12

Dental Injuries

There were 15 dental injuries reported. This number represents an increase from the 2008 season and is much higher than other years. It is important to note that there was a new IIHF rule introduced 4 years ago so that all players in the U20 age group are required to wear a custom made mouth guard. This rule and the lax application of the rule especially with regards to stick infractions may account for the increase in the number of dental injuries.

1999	7
2000	4
2001	5
2002	10
2003	7
2004	10
2005	8
2006	10
2007	2
2008	6
2009	15

Eye Injuries

There was one eye injury reported during the World Senior Championship. The player recovered completely from his injury. It has been observed that the visor being used by many players does not cover completely the nose area and decreases the protection area of the eye.

Upper Body Injuries

Upper body injuries made up 24% (43) of all injuries in 2009. This number is an increase over the last 3 years.

1999	15
2000	13
2001	20
2002	19
2003	29
2004	39
2005	54
2006	33
2007	30
2008	30
2009	43

Shoulder injuries comprise the majority of upper body injuries (46.55%). The majority of shoulder injuries were AC joint sprains. Wrist and hand /finger injuries were the next commonest group in the 2009 calendar year (25.6%). This number is higher than the previous year and may be caused by the higher number of stick injuries.in the past year.

Lower Body Injuries

Lower body injuries showed an overall decrease in the number of injuries (45) in the past year and they accounted for a similar percentage as the upper body category (24.6%). Knee injuries (15) were again the largest group affected in the lower body category. This number is a decrease from the last two seasons. The knee made up 33.3% of the injuries in the group.

There was a decrease in the number of reported knee injuries in the 2009 calendar year.

1999	8
2000	9
2001	5
2002	19
2003	10
2004	21
2005	15
2006	13
2007	30
2008	21
2009	15

Ankle injuries were the next highest group and accounted for 22.2% of lower body injuries. Thigh injuries were the third largest group (13.3%). These percentages are similar to the previous year.

Spinal Injuries

There were six (6) spinal injuries in the 2009 calendar season. This number is almost the same as the previous year (7) but there was one serious spinal injury (neck) that required surgery.

1999	3
2000	4
2001	2
2002	3
2003	4
2004	8
2005	15
2006	7
2007	12
2008	7
2009	6

Trunk Injuries

The total number of trunk injuries remained relatively the same in the 2008-09 season

1999	6
2000	4
2001	6
2002	6
2003	6
2004	2
2005	16
2006	7
2007	10
2008	6
2009	5

The clavicle and rib fractures accounted for the majority of injuries to this area.

INJURIES BY DIAGNOSIS

Lacerations were the largest group in this category (25.3%). They accounted for 41 injuries which is almost similar to the previous year (42). Contusions and sprains made up the next largest group and accounted for 22.2% and 19.1% respectively of the total injuries by diagnosis. The fracture category was the next highest group at 13% (21) and is an increase over the previous year (4%).

Neurotrauma was almost at the same percentage group (7.4%) as the previous year. The number of concussions has decreased slightly over the last year. But the overall number is similar as in previous years (2004, 2005 and 2006).

1999	3
2000	8
2001	3
2002	6
2003	3
2004	13
2005	12
2006	18
2007	11
2008	15
2009	12

Dislocations / subluxations were responsible for a very small percentage (5.6%) of injuries during the 2008-09 calendar year. The number of dislocations has remained relatively the same as last year. They involve predominantly the shoulder.

1999	8
2000	4
2001	7
2002	6
2003	3
2004	5
2005	17
2006	3
2007	10
2008	10
2009	9

CONTACT WITH THE BOARDS

The majority of injuries occurred away from the boards (66.0%). This trend is apparent in all championships over the eleven years and is the same as last year (66.4%).

CAUSE

The majority of injuries were still caused by body checking (27.8%). A high number (34) and percentage (21%) of injuries were caused by the stick. This percentage is the same as last year (22%). Head checking caused 8% of the injuries. The puck caused 17.3% of injuries.

Checking from behind injuries were approximately the same in the last year and remained at 6.2% of the injuries. These percentages are similar to the 2008 season.

1999	3
2000	3
2001	1
2002	9
2003	6
2005	15
2006	10
2007	12
2008	13
2009	10

There were 4 fighting injuries during the 2009 season.

PENALTY

A penalty was called on the play in only 13.6 % of the injuries. This percentage is a decrease from the 2008 season (20.4%) but still higher than the 2006 season (11%). Most of the injuries (86.4%) did not involve a penalty. Penalties were called in only 17.6 % of stick injuries, 30% in hitting from behind injuries and 30% in checking to the head injuries. This percentage for these potentially dangerous injuries is a decrease from the previous year where 26% of stick injuries, 43% of checking from behind injuries and 35% of hitting to the head injuries were called a penalty.

RETURN TO PLAY

The majority of players who were injured returned to play within one week (62.4%). In the 2009 year, there was an increase in the number of injured players (11.7%, n=19) that

remained out of play longer than three weeks, which reflected the seriousness of the injuries. This number represents an increase over the 2008 season.

1999	10
2000	10
2001	6
2002	20
2003	27
2004	19
2005	28
2006	11
2007	17
2008	13
2009	19

TYPE OF INJURY

The vast majority of injuries (90.1%) were acute in nature and this trend is evident in all eleven years.

POSITION

The wing position was the most commonly injured position at 39.5% considering that there are two wing positions. The next highest group was the defence position at 37%. The centre is injured 16% of the time. The goalkeeper is the least injured in all the positions (1.9%).

TYPE OF SITUATION

Regular play (80.2%) accounted for the majority of injuries in the 2008-09 calendar year. The power play situation was responsible for only 2% of the injuries. The penalty killing situation was responsible for approximately 5% of the injuries.

ZONE

The home zone (1, 2, 3) was the highest zone of injury (38.8%). In the past ten years, the neutral zone was always the highest zone of injury. The lowest zone of injury is the visitor zone (25.9%). This statistic is different as the neutral zone had always been the highest zone of injury.

PERIOD

The distribution of the injuries by period reveals that the rate of injury was fairly similar in all three periods. The third period had the highest percentage of injured players (34%) during the game. There are very few injuries sustained during the practices in the Championships. There were few overtime injuries (0.6%). Interestingly, there were also injuries in the warm-up (2.5%)

First	29.8%
Second	28.0%
Third	34.2%
Practice	2.5 %
Overtime	0.6 %

ANALYSIS

The IIHF Injury Reporting System has been in operation for the last eleven years. Medical Supervisors in cooperation with the team physicians were able to collect 167 injury reports for 18 championships and this information is valuable in analyzing trends and injury patterns in the IIHF championships. The IIHF was able to report on 278 games in the 2009 calendar year. For the third year, a computerized system was used to accumulate the injury data and proved very beneficial and efficient in giving the injury information for the year 2008-09 season. There were again a significant number of reported injuries in the 2009 season.

The IIHF Medical Committee introduced the concept of Game Injury reports 5 years ago whereby the team physician submitted an injury report after every game. The rate of collection in the 2009 season was again almost 100% due to the cooperation of the team physicians and the diligence of the Medical Supervisors. The collection of these reports may reflect the accurate reporting of the injuries. The reporting of injuries has improved as team physicians, Medical Supervisors become familiar with the system and appreciate the usefulness in assessing injury trends for all hockey players so that prevention can be instituted in the sport.

The total injury rate has increased over the last year

1999	17
2000	25
2001	16
2002	20
2003	18
2004	30
2005	29
2006	20

2007 23
2008 21
2009 27

The injury rate is the highest in Senior Men and World Junior U20 Championship and lowest in the World Women Championship. The injury rate is higher this year in the U20 Championships and the World Senior Championship. The injury rate in the World Junior U18 Championship increased slightly this year. The Women Championships have the lowest rate of injury because the players are obliged to wear a full facemask and there is no body checking in the women game. The injury has remained relatively stable and low in the women's game.

Facial injuries are still responsible for the greatest number of injuries in IIHF championships. A discouraging trend is the increase in the number of facial lacerations and dental injuries in the World U20 Championship compared to the previous year. Of interest in the facial category is the number of sticks that caused a facial laceration where no penalty was called (82%). The percentage of stick injuries where a penalty was called has increased in the last year. It is hoped that continued rigorous officiating and the fair play ideal will help to reverse this trend in the next year especially with respect to facial injuries. There was an overall increase in the number of facial lacerations in the last year although there were less games played or documented this year.

Concussions decreased minimally in IIHF Championships over the last year. There were 12 concussions in the 2009 calendar year. This number is a small decrease from the previous year (15) but is similar to the number of concussions in 2004, 2005, 2006. The concussions occurred mainly in the World Championship and World U20 Championship. (5). There were also concussions in the World Junior U18 World Championship (1) and one concussion in the World Women Championship. The no head-checking rule was introduced 2 years ago but seemed to make no difference in the number of concussions over the past 4 years as the number has remained relatively the same.

Dental injuries (15) were increased substantially in the 2009 season. This number is a increase from the previous year. All players in the U20 Championships are obliged to wear a mouth guard. It is also important to note that the IIHF organized a mouth guard program at the World U20 Championship for those teams that did not have access to a custom made mouth guard. This program has been in operation for the last five years and has now ended as the majority of teams are able to obtain a custom made mouth guard for their players.

It is very interesting to note that a penalty was called in only 13.6% of injuries. In other words no penalty was called 86.4% of the time. This statistic is disturbing as many of the injuries caused by a stick to the face or forearm/wrist area were not assessed a penalty. There was optimism as the more rigorous officiating and the emphasis on enforcing stick infractions,

checking from behind and head checking has resulted in a higher number of penalties being called in these injury situations. However, this trend was reversed in the 2009 season where 83% of injuries did not involve a penalty. During the 2005-06 season, only 19% of stick injuries involved a penalty whereas in the season 2007-08 a penalty was called in 26% of these injuries. In the 2008-09 season there were even fewer stick penalties (18.3%) called for this infraction. There were 34 stick injuries (18%) which is an increase from last year.

Shoulder injuries make up the greatest percentage of upper body injuries. The shoulder injuries occurred in all championships. AC joint separations continue to make up the majority of these injuries, followed by dislocations/subluxations (9), which is similar as in the last year. The wrist injuries were the same as in the past season. Wrist and hand injuries continue to be the second highest group in the upper body category.

Lower body injuries were decreased in the 2008-09 calendar year. Lower body injuries accounted for 26.8% of the injuries. However, knee injuries decreased in the 2008-09 season from 30(2006-07) to 21(2007-08) to 15 knee injuries in the last season. They occurred in all championships on a uniform basis. This number is lower than in the previous two years. They occurred in all Championships. Most of the injuries were caused by a body check.

There was one serious spinal injury in the past year. The other spinal (5) injuries were mild in nature and did not cause much absence from play. There were also a small but significant number of checking from behind (10) and head checking injuries (13) in the 2008-09 season. This number is similar to the previous year but there were less games played in this 2008-09 season making the injury rate from these types of infractions higher than the previous year.

There were few injuries that involved the trunk area (3.0 %) including the chest, abdominal and pelvic area. These injuries were mainly in the clavicle and rib area.

The majority of injuries occurred this year in the home zone away from the boards. This trend is different than the last ten years where the neutral zone always had the greater percentage of injuries. The visitor zone was the lowest zone of injury.

There seems to be a higher risk in the injury rate at the wing position but the difference between the wing and defense and center position is very small. The risk of injury in the goalie position is the lowest of all the positions.

There were a greater number of injuries in the third period but again the difference was small between the third period and the other two periods. This trend reverses a trend whereby the second period was often the highest period of injury.

Regular play (5/5) accounted for the vast majority of injuries. There is less contact in the power play or penalty killing situation that accounts for very few injuries.



Most players return to play within one week. However, there were a small percentage of players (11.7%) who could not return to play within three weeks because of the serious nature of the injury. This percentage is an increase from last year (10%) In the World Senior Championships, only 7% of injured players were out of action longer than 3 weeks. The majority of players returned to play within three weeks in the Women Championships (96%).

CONCLUSION

The computerized version of the IRS system should continue to be used with small modifications in the 2009-10 season.

The IIHF Injury Reporting System should be used in all championships where a Medical Supervisor is present. Medical Supervisors and Directorate Chairmen play a vital role in encouraging team physicians to submit the forms before the end of the championship. The Game Injury Reports have enabled the IIHF Medical Committee to determine the true rate of injuries as team physicians are reporting all of the injuries occurring in the IIHF Championships.

There should be no changes in the no body-checking rule and the use of the full visor in the women's game as the injury rate is usually much lower than in the men's game. Injury reports should continue to be collected for all the Women Championships so that accurate information can be collected on the injuries in the women's game. The 2008-09 season was able to record all of the injuries in the women championships and in the new World Women U18 Championship. The rate of injury was very low.

The enforcement of the rules especially stick infractions has perhaps been less vigilant in the past year as the number of injuries related to the stick especially in the area of the face (lacerations) increased from the previous year. There was also one eye injury at the World Senior Championship.

The no head-checking rule should be strictly enforced to decrease the number of concussions in the upcoming season.

Stick infractions should continue to be strictly enforced, as there were a number of injuries (81.4%) where a penalty was not called.

The results were discussed with the Director of officiating Konstantin Komissarov who is also concerned about the high number of injuries especially caused by the stick which did not involve a penalty. A new project was discussed whereby the Medical Supervisors at the WC, WU20 and WU18 championships would review on a daily basis during the Championship with the Referee Supervisor the injuries by video to validate the injury reports submitted by

the team physician and also determine whether a penalty should have been assessed in an injury situation. In this way, feedback can be given directly to the Referee Supervisor and hopefully this strategy can lead to a better understanding of the injuries and their causes,

The checking from behind rule should continue to be strictly enforced, and this vigilance is needed to reduce the number of injuries in the 2010 season.

The use of custom made mouth guards should be strictly enforced in the U20 Championships in order to decrease the number of dental injuries. It was noted that many players who sustained an injury even in the U20 group were not even wearing a mouth guard.

The decrease in the number of knee injuries is an encouraging sign and the enforcement of body checking (low hits) to the lower body should be strictly enforced.

The serious injury rate (return to play after three weeks) should continue to be closely monitored in the 2009-10 season in all Championships as there was an increase in the serious injury rate (>3 weeks) from last year.

The promotion of fair play and respect, rigorous officiating, 2-referee-system and application of stick infractions, new rules (no head checking) and proper equipment, including the use of mouth guards, will hopefully eventually lead to a reduction in injury rates over the next years. There was an apparent decrease in the overall injury rate until the 2008-09 season where the trend has been reversed and has led to a higher injury rate similar to the 2006-07 season.