

MEDICAL CONFERENCE WTF WORLD CHAMPIONSHIP MUJU July 2017

WORLD TAEKWONDO FEDERATION MEDICAL COMMITTEE

Paul Viscogliosi M.D.



Study of Injuries
In taekwondo
During the **last eight sport seasons**
Declared to the
“Mutuelle des Sportifs” insurance
In France



1. INTRODUCTION

- 1.1. Objectives
- The primary objectives of the World Taekwondo Federation's [WTF] 2017 Medical Report are twofold:
 - To assess the frequency and severity of injuries suffered by taekwondo athletes, from elite international level through to local/regional standard.
 - To ascertain whether the new rules introduced by the WTF in 2010 and 2015 have impacted the injury rate among taekwondo athletes.



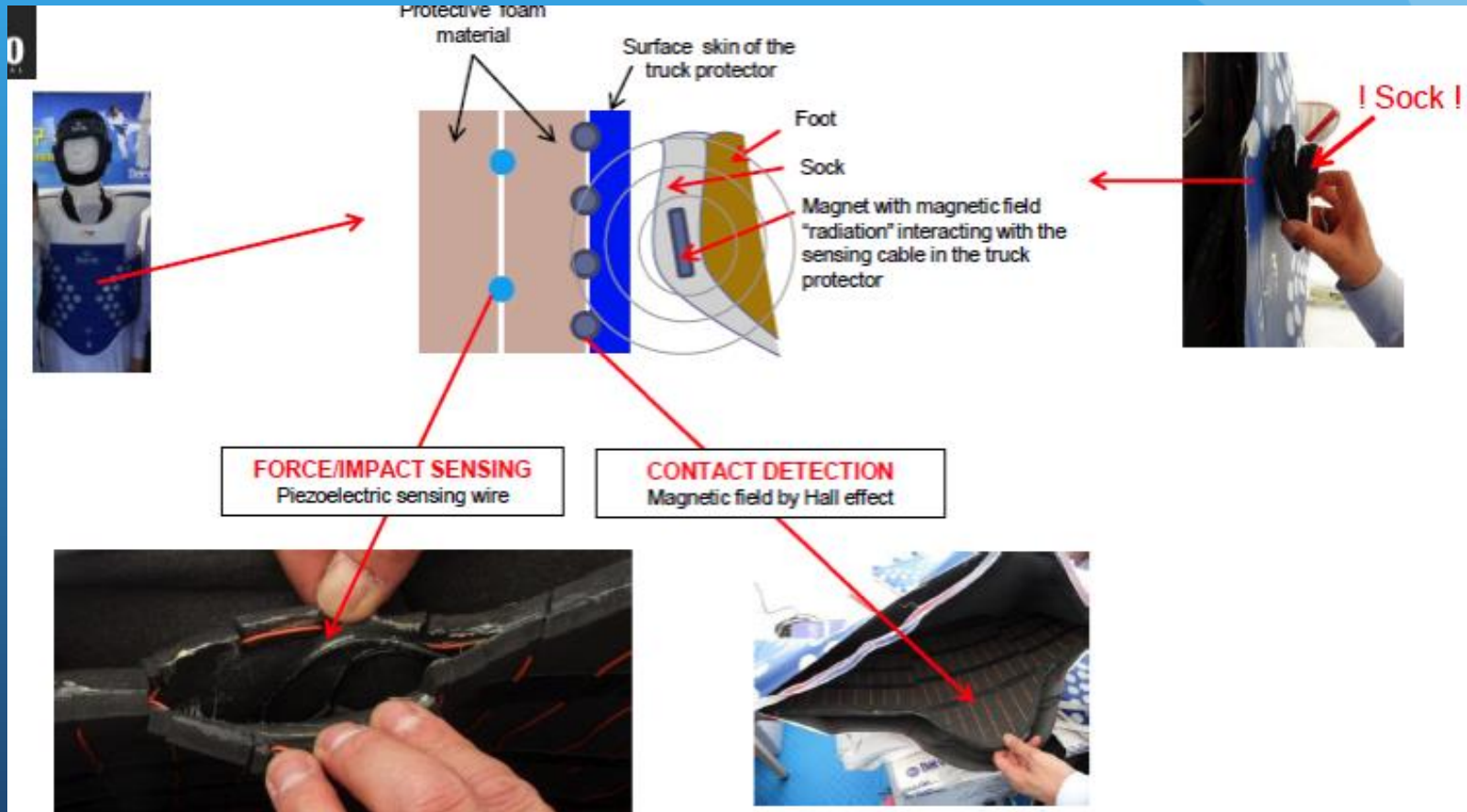
1.2. Context of the Study

1.2.1. Adjustments to rules governing the awarding of points

- In 2010 and 2015 the WTF adjusted the rules governing the awarding of points during competition.
- These rules were intended :
 - to reward the use of more technically advanced manoeuvres (i.e. turning kicks), thereby improving the sporting experience for athletes and spectators.
 - to use modern technology with PSS for the trunk protector & in a second time with PSS for the headgear
- A summary of the adjustments is below:



1.2.2. The Protector Scoring System [PSS]



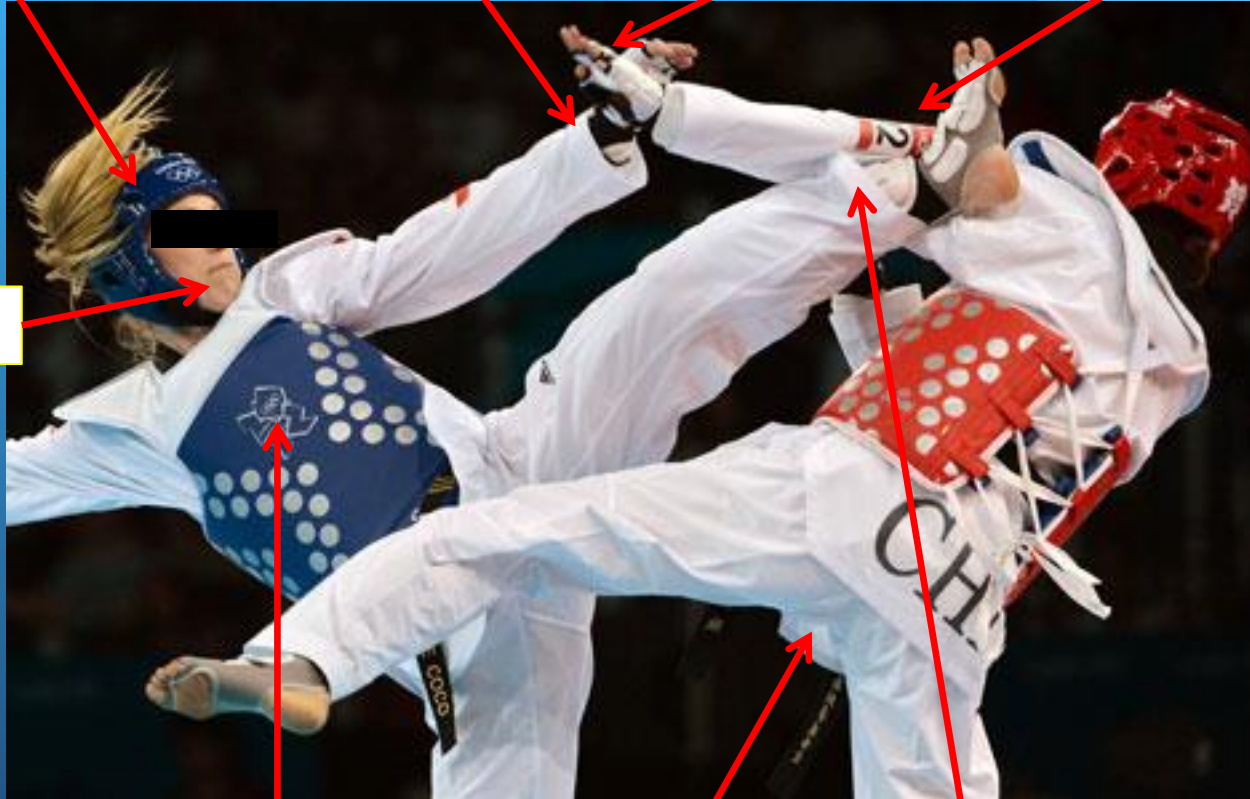
PSS Headgear

Forearm protection

Gloves

Socks

Mouthpiece



PSS (trunk protection)

Groin protection

Leg protection



1.2.3. Instant Video Replay [IVR]

Instant Video Replay [IVR] was introduced in 2010 to support the use of the PSS.

IVR allows coaches three chances to appeal a judge's decision per bout.

Six cameras monitor the bout from different angles.



2. CASE STUDY : FRENCH TAEKWONDO FEDERATION

- 2.1. Sources

The data were compiled from two sources:

- *Mutuelle des Sportifs* health insurance providers

2-4 Rue Louis David

75782 Paris Cedex 16 France

Tel: +33 1 53 04 86 20

- **French Taekwondo Federation**

25 Rue Saint Antoine 69003 Lyon France

Tel: +33 4 37 56 14 14



2.2. Methodology

In France, all members of National Federations recognised by the Ministry of Sport and the National Olympic Committee are required to have health insurance.

The insurance provider for the French Taekwondo Federation is *Mutuelle des Sportifs*.

The WTF Medical Committee requested a full breakdown of injury statistics from the *Mutuelle des Sportifs*, based on claims made for care and treatment by members of the French Taekwondo Federation. The policy holders were aged between 5 and 75 years old.



2.2.1. Injuries were grouped into the following eight categories:

- Genitourinary region
- Lower limb and pelvis
- Upper limb and scapular belt
- Spinal column and spinal cord
- Thorax/abdomen
- Head and face
- Miscellaneous abrasions
- Unidentified abrasions



2.2.2. Insurance statistics

The statistics cover a period of **eight taekwondo sport seasons**, from the 2008-2009 season to the 2015-2016 season.

The **first study** included two seasons using the old rules (2008-2009 & 2009-2010) and the two seasons following with the rules **firstly adjusted** (PPS HOGO) for the 2010-2011 & 2011-2012 seasons.

The **second study** included two seasons using rules (PPS HOGO) (2012-2013 & 2013-2014) and the two seasons following with the rules **secondly adjusted** (PPS HOGO & PSS HEADGEAR) 2014-2015 & 2015-2016 seasons.



Study of the first four seasons

2008 Points System

Points awarded by judges if moves deemed to have sufficient force and accuracy

- 1 point for fist to the body
- 1 point for kick to the body
- 2 points for kick to the head

Points System from 2010

Points awarded by judges if moves deemed to have sufficient force and accuracy

- 1 point for fist to the body

Points awarded automatically by PSS (see below)

- 1 point for kick to the body

Points awarded automatically by PSS (see below); additional technique point awarded by judges

- 2 points for turning kick to the body

Points awarded by judges for any accurate touch of the foot to the headgear – no minimum force requirement

- 3 points for kick to the head
- 4 points for turning kick to the head





Taekwondo points



2.3. Results: 2008-2009 season

Total number of policy holders: 48,024

	Number of injuries	Injury rate (injuries per 100 athletes, to 3dp)
Genitourinary region	1	0.002
Lower limb and pelvis	67	0.140
Upper limb and scapular belt	53	0.110
Spinal column and spinal cord	5	0.010
Thorax/abdomen	2	0.004
Head and face	24	0.050
Loss of consciousness	3	0.006
Miscellaneous abrasions	1	0.002
Unidentified abrasions	25	0.048
Total	181	0.377



2.4. Results: 2009-2010 season

Total number of policy holders: 48,458

	Number of injuries	Injury rate (injuries per 100 athletes, to 3dp)
Genitourinary region	1	0.002
Lower limb and pelvis	72	0.149
Upper limb and scapular belt	45	0.093
Spinal column and spinal cord	2	0.004
Thorax/abdomen	2	0.004
Head and face	32	0.066
Loss of consciousness	1	0.002
Miscellaneous abrasions	1	0.002
Unidentified abrasions	23	0.045
Total	179	0.369



2.5. Results: 2010-2011 season

Total number of policy holders: 51,464

	Number of injuries	Injury rate (injuries per 100 athletes, to 3dp)
Genitourinary region	1	0.002
Lower limb and pelvis	77	0.150
Upper limb and scapular belt	56	0.109
Spinal column and spinal cord	5	0.010
Thorax/abdomen	2	0.004
Head and face	23	0.045
Loss of consciousness	2	0.004
Miscellaneous abrasions	2	0.004
Unidentified abrasions	10	0.019
Total	178	0.346



2.6. Results: 2011-2012 season

Total number of policy holders: 52,397

	Number of injuries	Injury rate (injuries per 100 athletes, to 3dp)
Genitourinary region	4	0.008
Lower limb and pelvis	73	0.139
Upper limb and scapular belt	41	0.078
Spinal column and spinal cord	1	0.002
Thorax/abdomen	4	0.008
Head and face	24	0.046
Loss of consciousness	1	0.002
Miscellaneous abrasions	1	0.002
Unidentified abrasions	14	0.027
Total	163	0.311



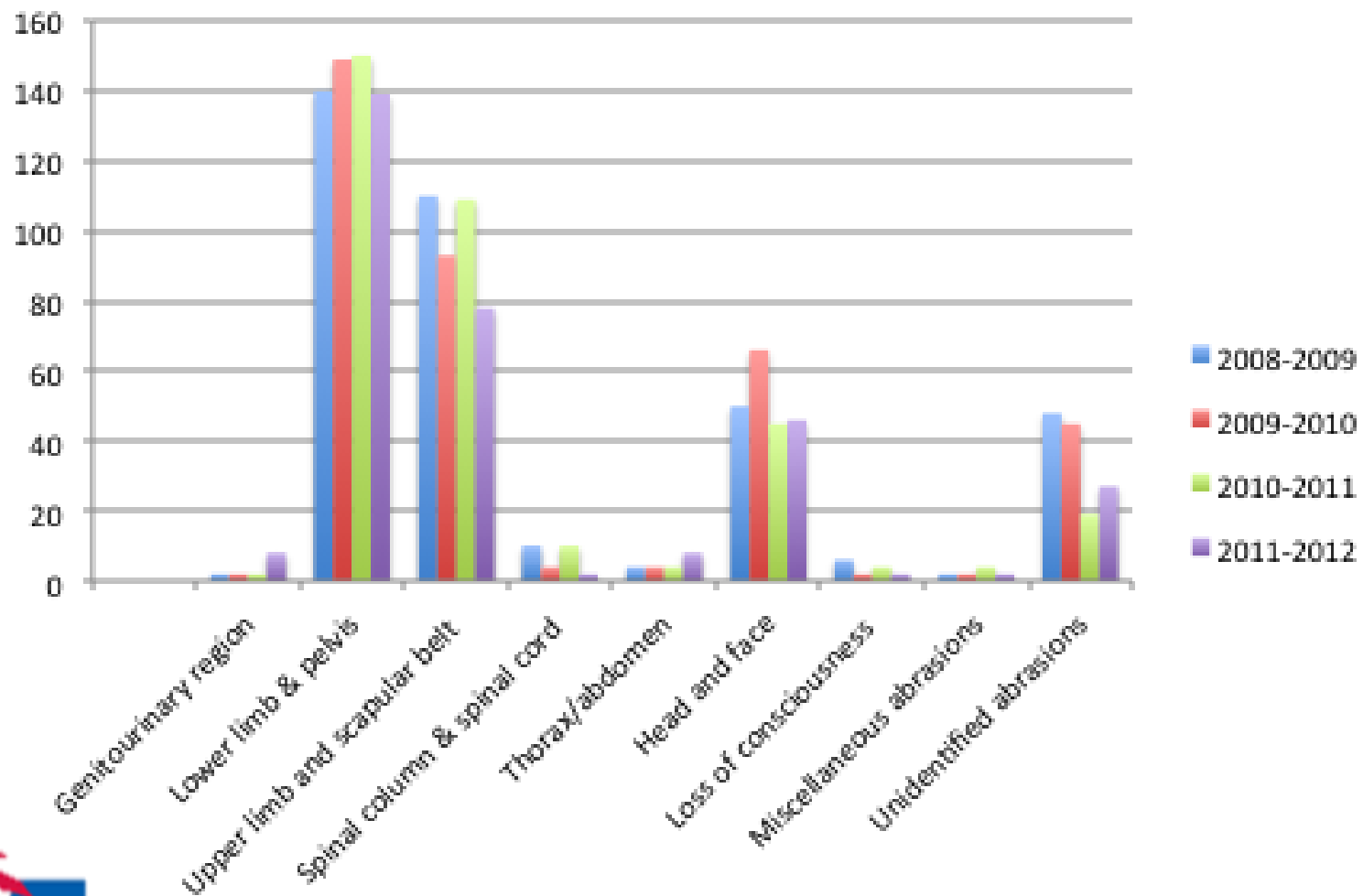
2.7. Results:

Summary for the first four seasons

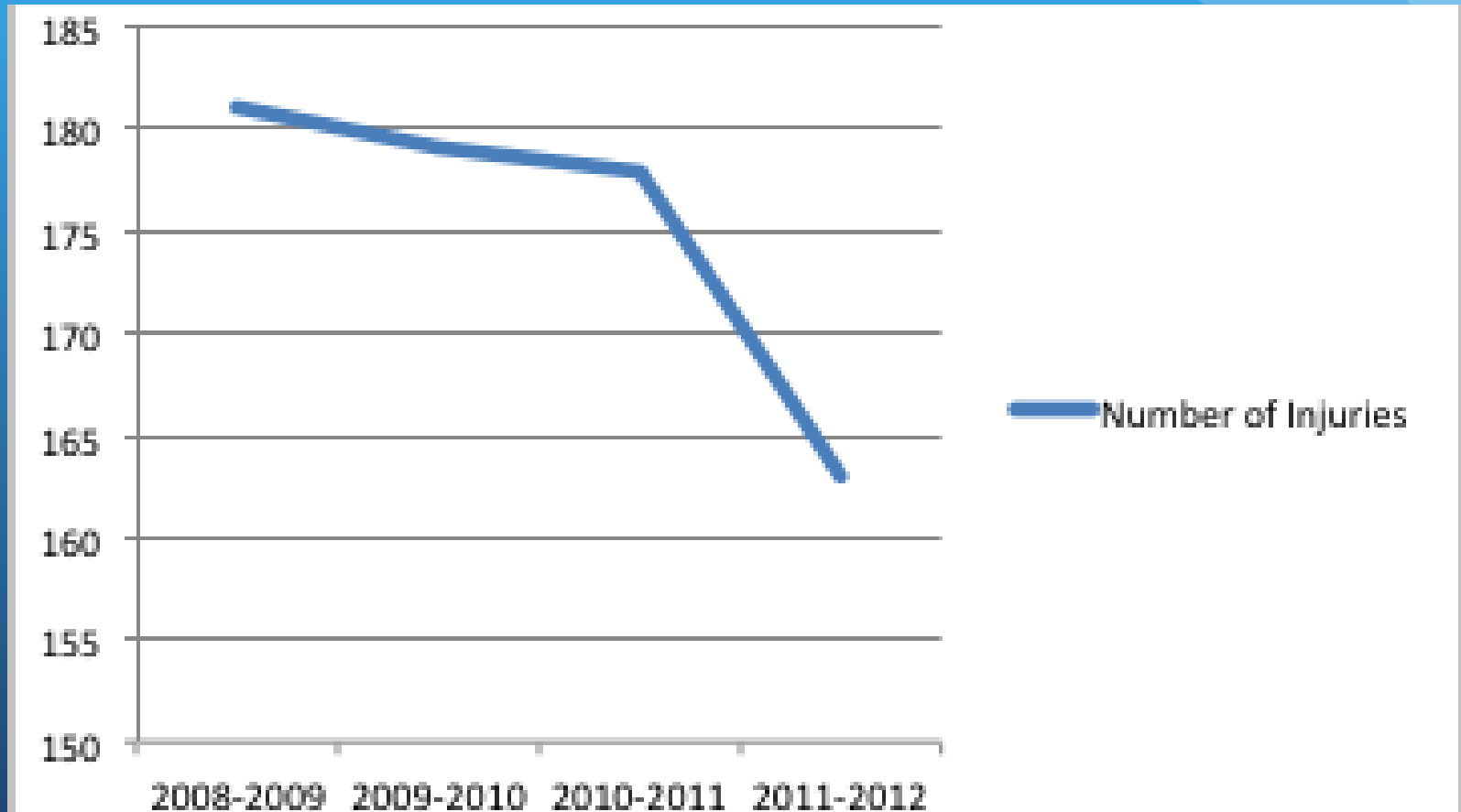
	2008-2009	2009-2010	2010-2011	2011-2012
Genitourinary region	0.002	0.002	0.002	0.008
Lower limb and pelvis	0.140	0.149	0.150	0.139
Upper limb and scapular belt	0.110	0.093	0.109	0.078
Spinal column & spinal cord	0.010	0.004	0.010	0.002
Thorax/abdomen	0.004	0.004	0.004	0.008
Head and face	0.050	0.066	0.045	0.046
Loss of consciousness	0.006	0.002	0.004	0.002
Miscellaneous abrasions	0.002	0.002	0.004	0.002
Unidentified abrasions	0.048	0.045	0.019	0.027
Total	0.377	0.369	0.346	0.311



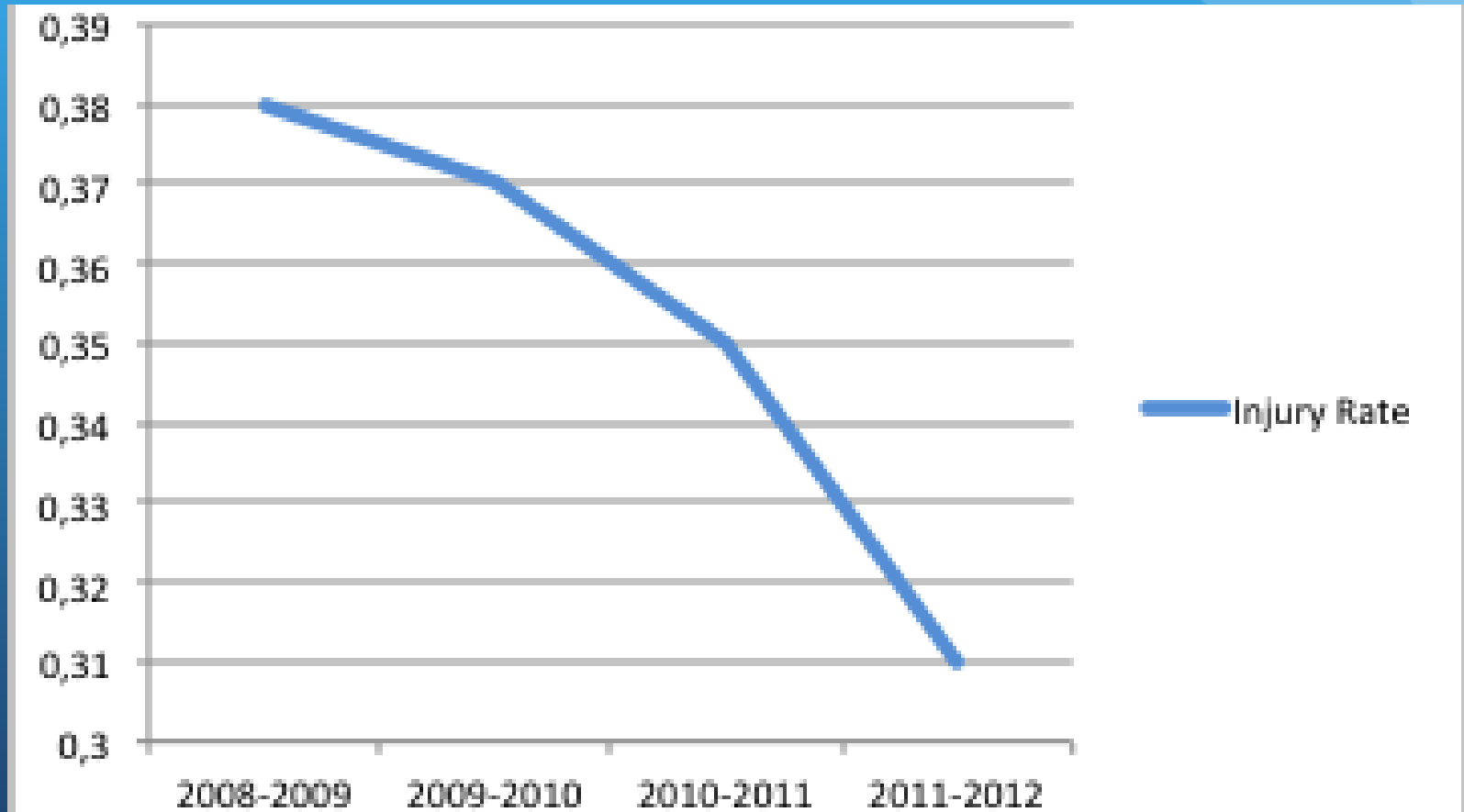
2.7.1. Injury Breakdown by Category Rate/1000



2.8.1 Number of Injuries



2.8.2. Injury Rate



2.8 Analysis of the first four seasons

- Total 18.4% reduction in injury rate for the period 2008-2012
- 16.2% reduction in injury rate since the amendments to the scoring system and the introduction of the PSS and IVR
- Just one reported knock-out among 52,397 registered taekwondo practitioners in the 2011-2012 season



3. Study of the last four seasons

Points System from 2010

Points awarded by judges if moves deemed to have sufficient force and accuracy (see below)

- 1 point for fist to the body

Points awarded automatically by PSS (see below)

- 1 point for kick to the body

Points awarded automatically by PSS; additional technique point awarded by judges (see below)

- 2 points for turning kick to the body

Points awarded by judges for any accurate touch of the foot to the headgear – no minimum force requirement (see below)

- 3 points for kick to the head • 4 points for turning kick to the head

Points System from 2015

Points awarded by judges if moves deemed to have sufficient force and accuracy (see below)

- 1 point for fist to the body

Points awarded automatically by PSS with force of hit to hogo (see below)

- 2 points for kick to the body

Points awarded automatically by PSS; additional technique point awarded by judges (see below)

- 3 points for turning kick to the body

Points awarded automatically by PSS to the headgear with slight hit to headgear (see below)

- 3 points for kick to the head

Points awarded automatically by PSS; additional technique point awarded by judges (see below)

- 4 points for turning kick to the head







IN RIO 2016



3.1. Results: 2012-2013 season

Total number of policy holders: 54,360

	Number of injuries	Injury rate (injuries per athletes, to 3dp)
Genitourinary region	3	0,0067
Lower limb and pelvis	74	0,137
Upper limb and scapular belt	38	0,070
Spinal column and spinal cord	4	0,007
Thorax/abdomen	1	0,002
Head and face	20	0,037
Loss of consciousness	0	0
Miscellaneous abrasions	3	0,006
Unidentified abrasions	18	0,033
Total	161	0,298



3.2. Results: 2013-2014 season

Total number of policy holders: 53,655

53655 13-14	Number of injuries	Injury rate (injuries per athletes, to 3dp)
Genitourinary region	2	0,004
Lower limb and pelvis	64	0,119
Upper limb and scapular belt	53	0,099
Spinal column and spinal cord	2	0,004
Thorax and abdomen	2	0,004
Head and face	28	0,052
Loss of consciousness	1	0,002
Miscellaneous abrasions	4	0,007
Unidentified abrasions	0	0,000
Total	156	0,291



3.3. Results: 2014-2015 season

Total number of policy holders: 54,054

54054 14-15	Number of injuries	Injury rate (injuries per athletes, to 3dp)
Genitourinary region	1	0,002
Lower limb and pelvis	67	0,124
Upper limb and scapular belt	28	0,052
Spinal column and spinal cord	1	0,002
Thorax and abdomen	1	0,002
Head and face	12	0,022
Loss of consciousness	2	0,004
Miscellaneous abrasions	2	0,004
Unidentified abrasions	0	0,000
Total	114	0,211



3.4. Results: 2015-2016 season

Total number of policy holders: 54,024

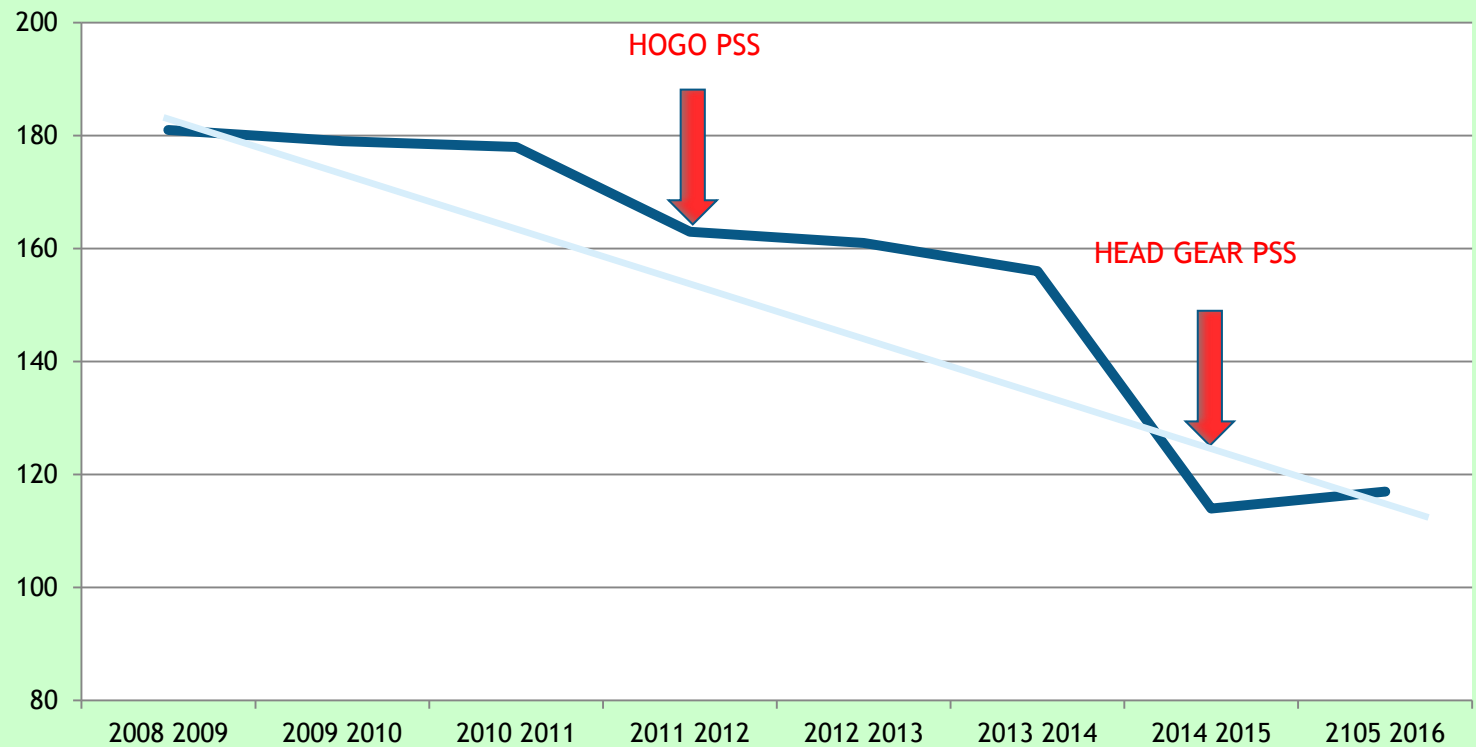
54024 15-16	Number of injuries	Injury rate (injuries per athletes, to 3dp)
Genitourinary region	1	0,002
Lower limb and pelvis	53	0,098
Upper limb and scapular belt	35	0,065
Spinal column and spinal cord	2	0,004
Thorax and abdomen	1	0,002
Head and face	20	0,037
Loss of consciousness	1	0,002
Miscellaneous abrasions	4	0,007
Unidentified abrasions	0	0,000
Total	117	0,217



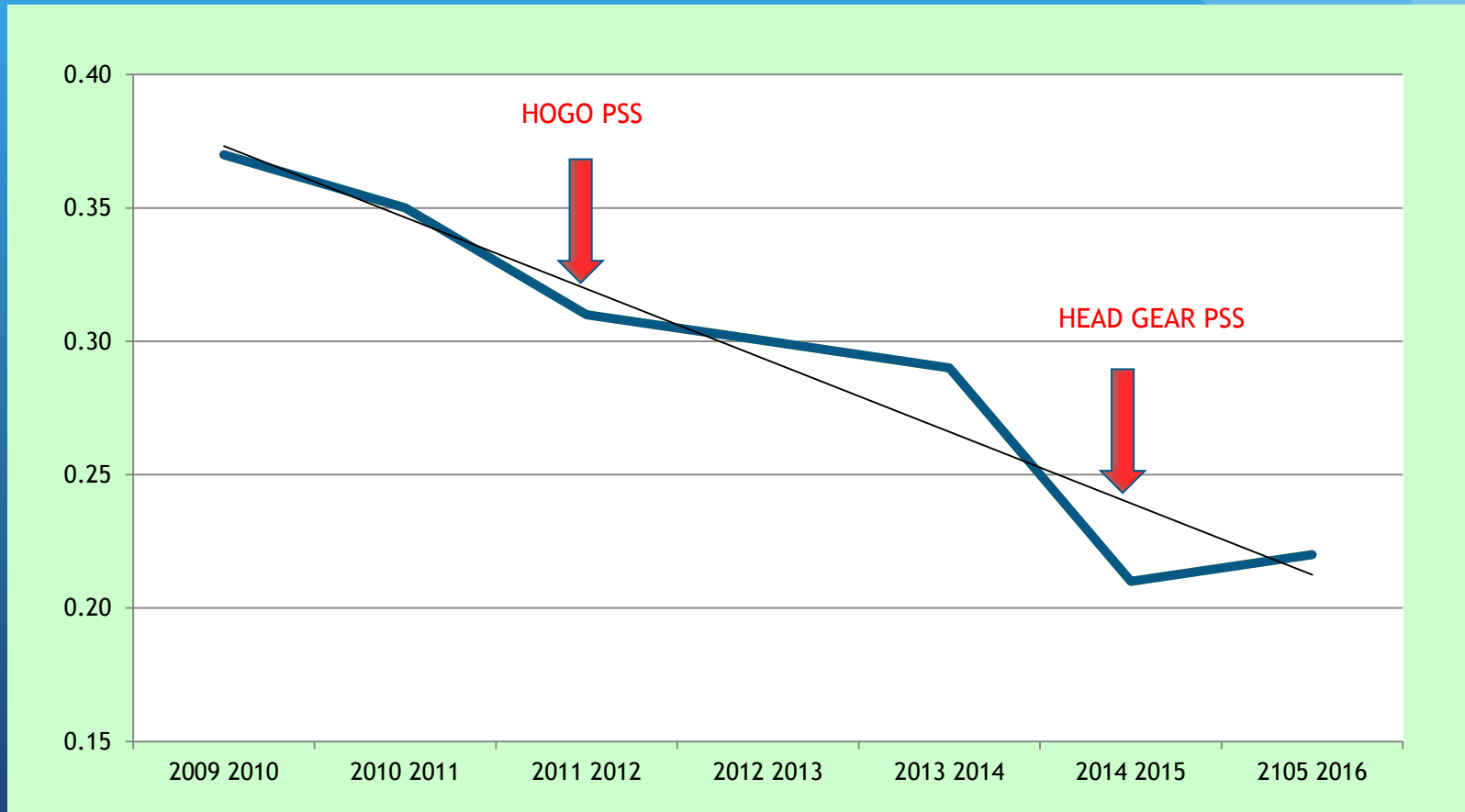
“3.3. Results: Summary for the eight seasons

Season	2008 ² 2009	2009 ² 2010	2010 ² 2011	2011 ² 2012	2012 ² 2013	2013 ² 2014	2014 ² 2015	2105 ² 2016	Total	Rate
² NB Policyholders	48024	48458	51464	52397	54369	53655	54054	54024	416,445	
Genitourinary region	1	1	1	4	3	2	1	1	14	0,003
Lower limb & pelvis	67	72	77	73	74	64	67	53	547	0,131
Upper limb & scapular belt	53	45	56	41	38	53	28	35	349	0,084
Spinal column & spinal cord	5	2	5	1	4	2	1	2	22	0,005
Thorax and abdomen	2	2	2	4	1	2	1	1	15	0,004
Head& face	24	32	23	24	20	28	12	20	183	0,044
Loss of consciousness	3	1	2	1	0	1	2	1	11	0,003
Miscellaneous abrasions	1	1	2	1	3	4	2	4	18	0,004
Unidentified abrasions	25	23	10	14	18	0	0	0	90	0,022
Total	181	179	178	163	161	156	114	117	1249	0,300
Rate	0,38	0,37	0,35	0,31	0,30	0,29	0,21	0,22	0,300	

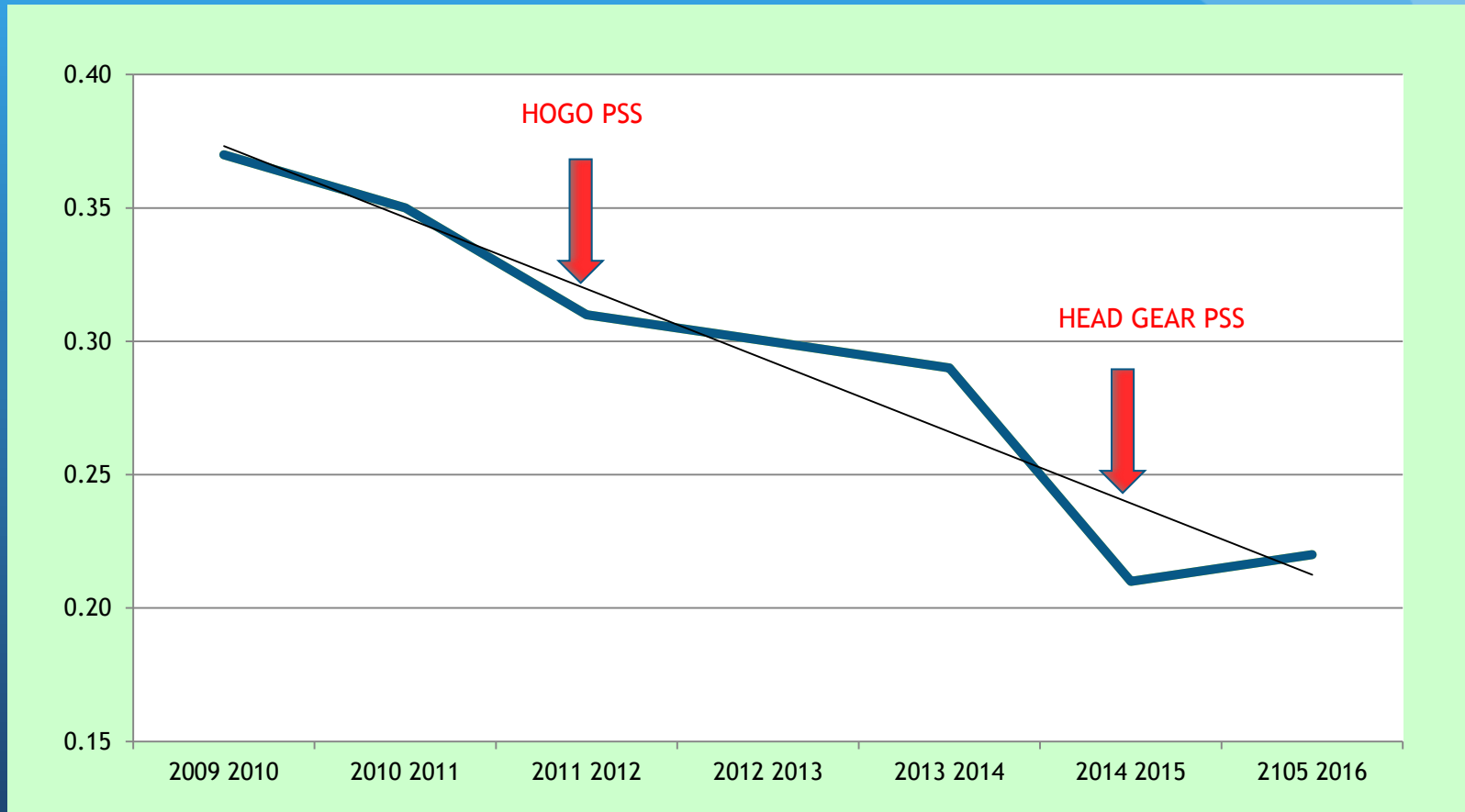
Number of Injury per season



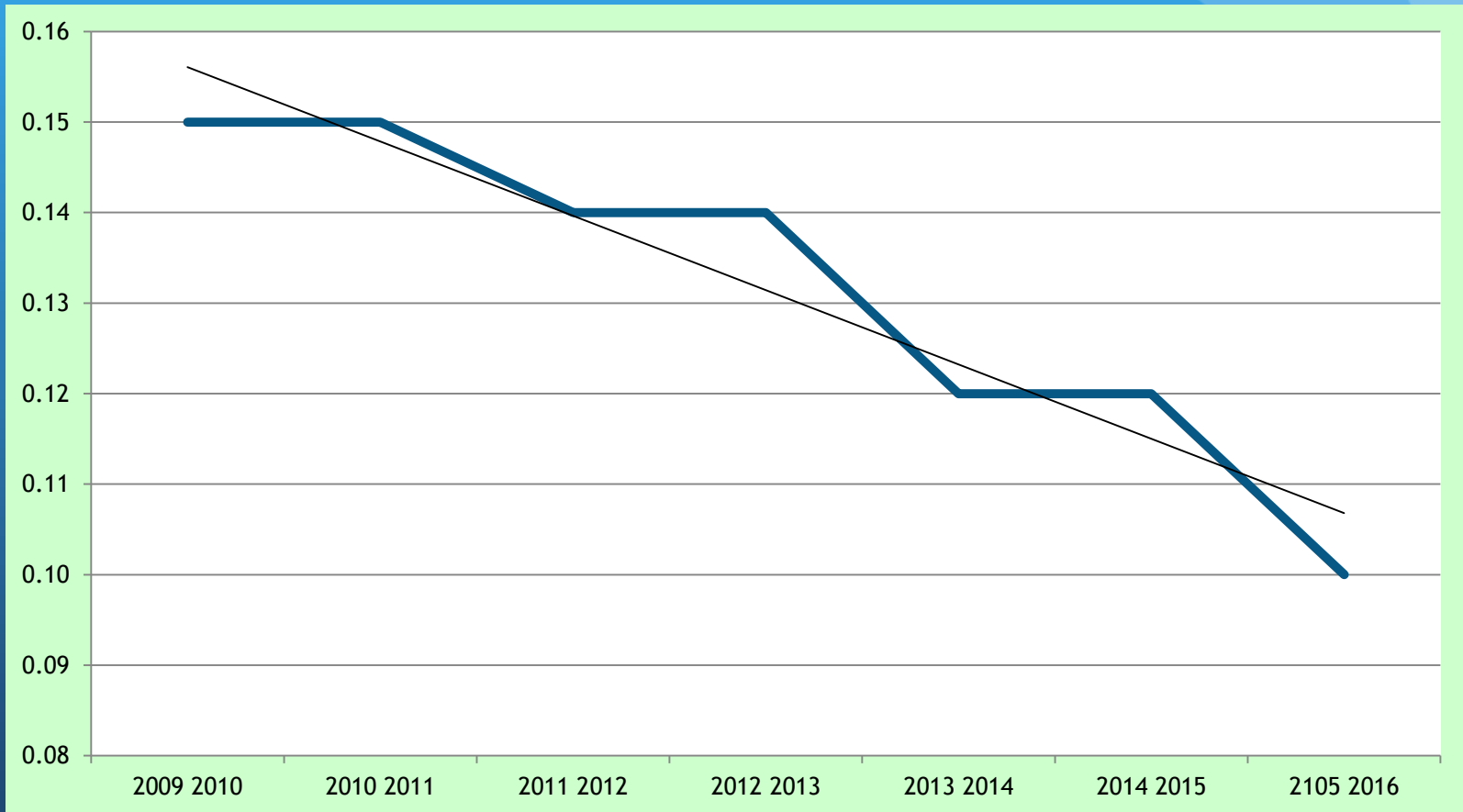
Injury Rate during the 8 seasons



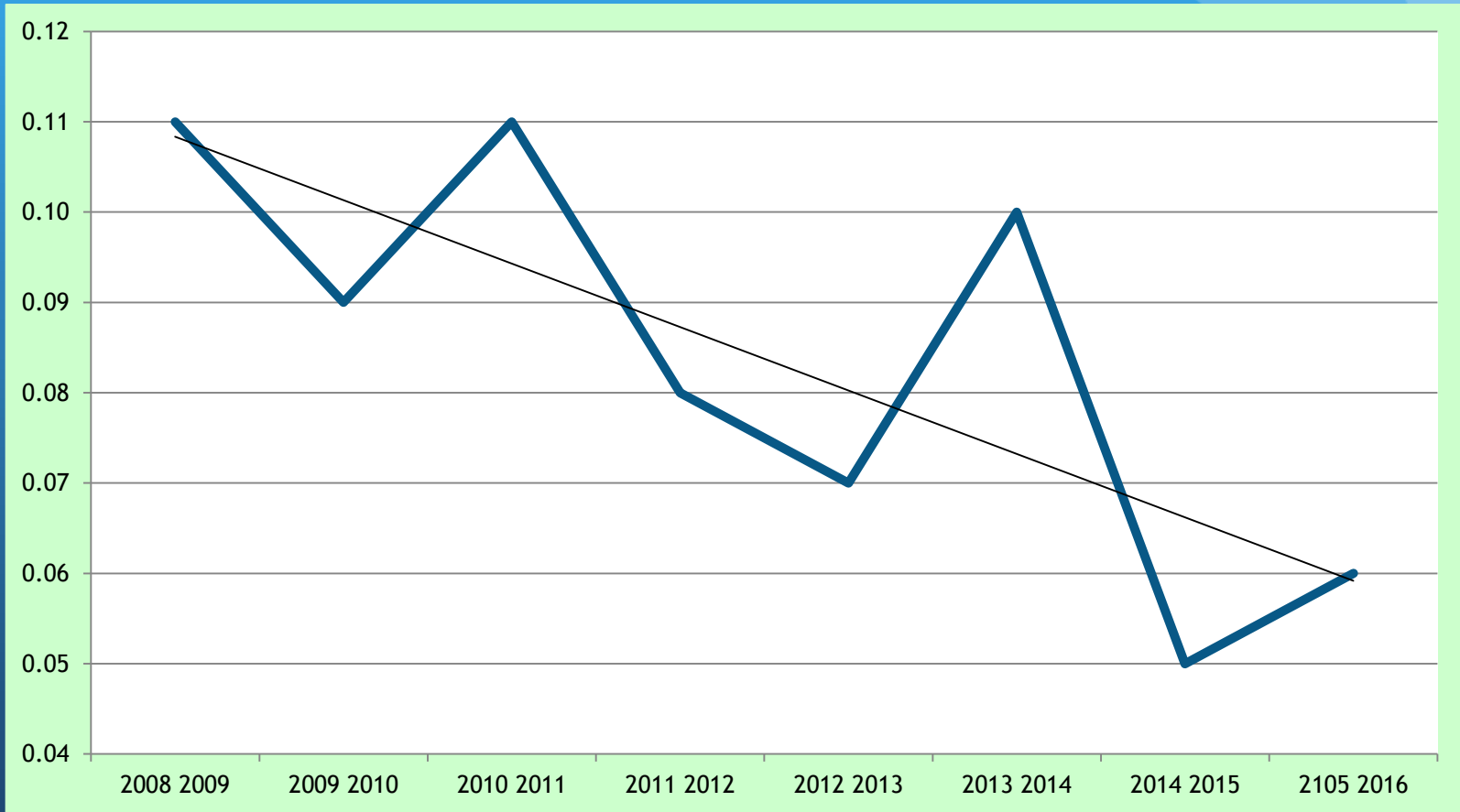
Injury Rate during the 8 seasons



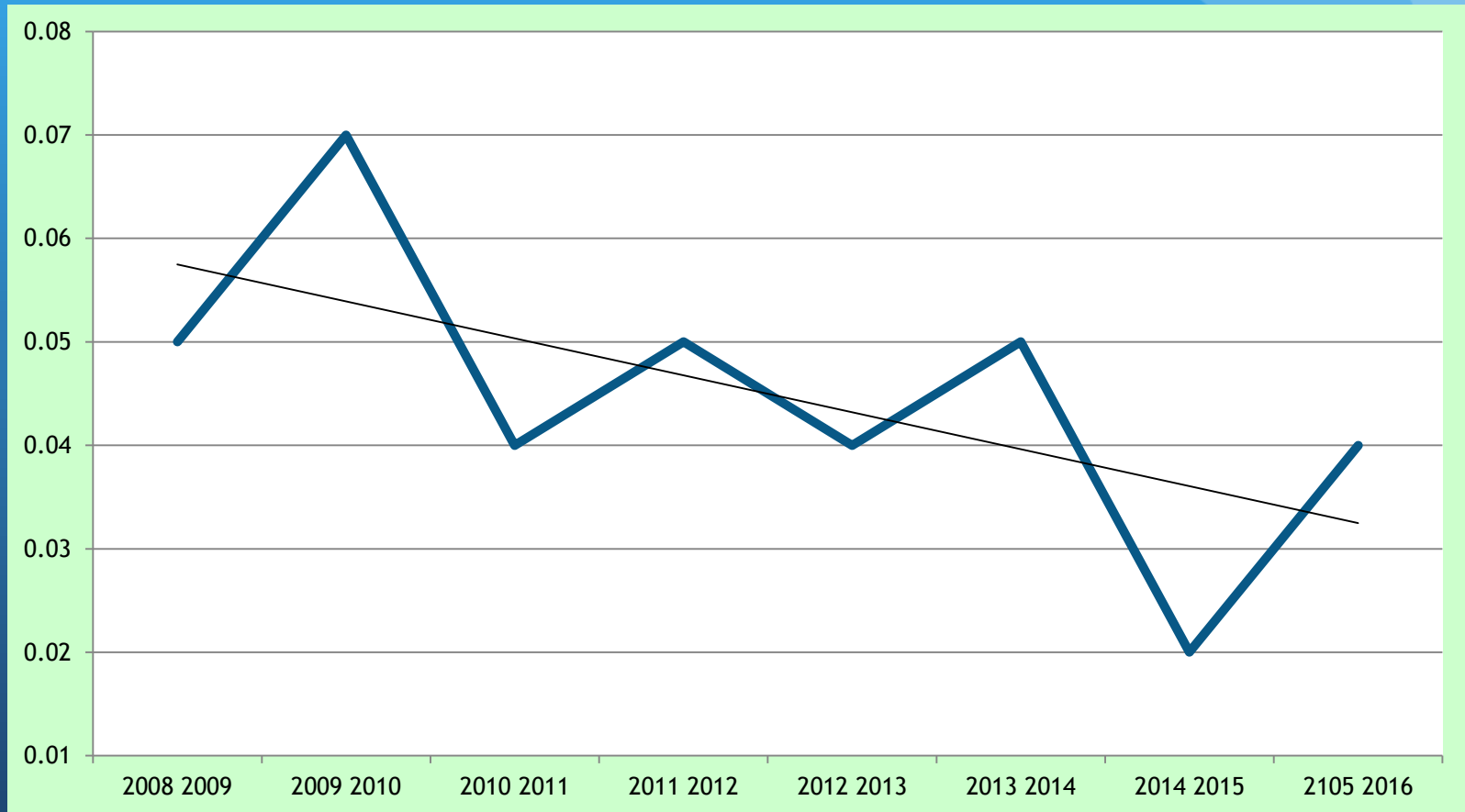
Rate of Lower limb Injury



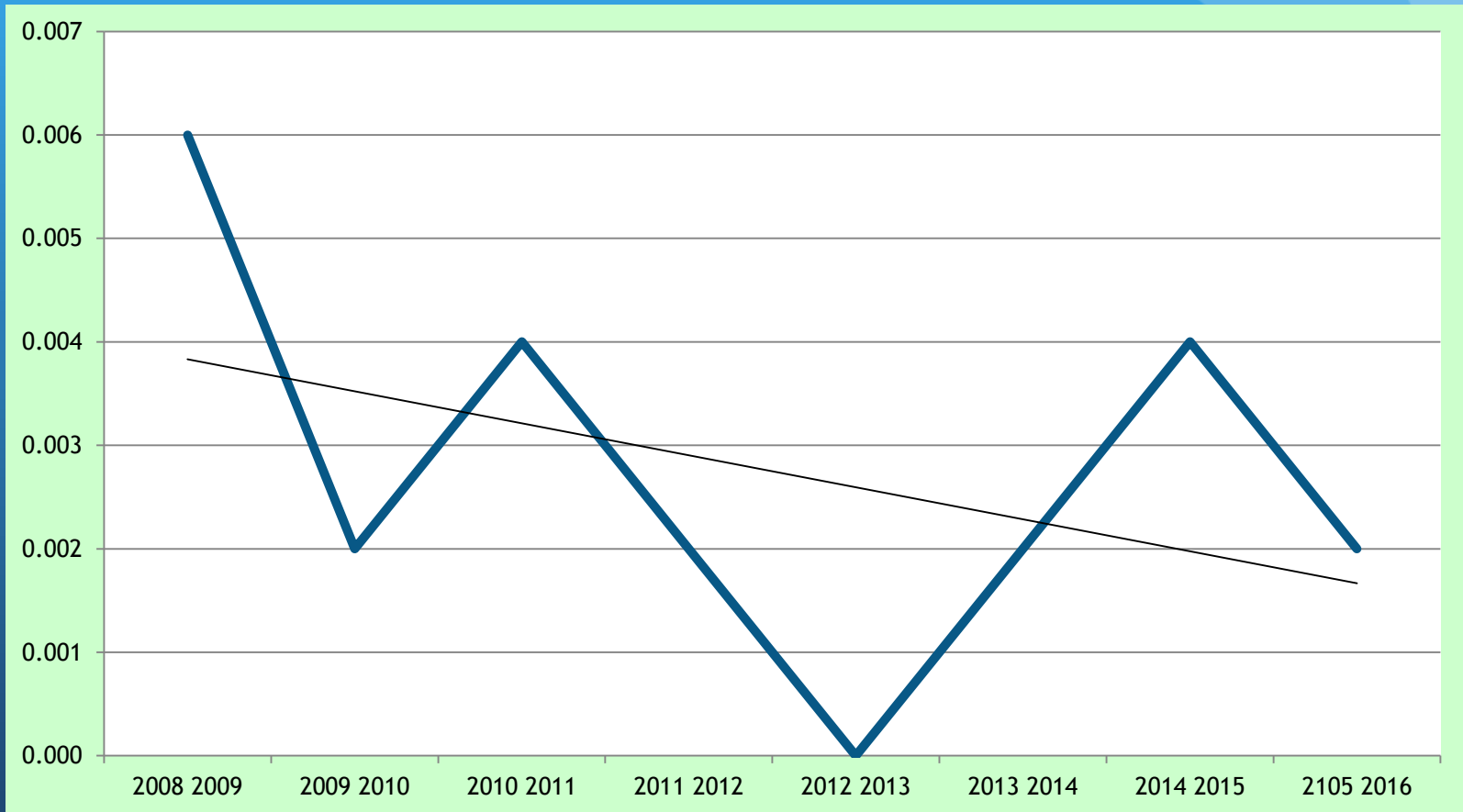
Upper Limb rate injury



Head Injury Rate



Loss of Consciousness



4. DISCUSSIONS

4.1. To ascertain whether the **new rules** introduced by the WTF in 2010 and then in 2015 have impacted the injury rate among taekwondo athletes.

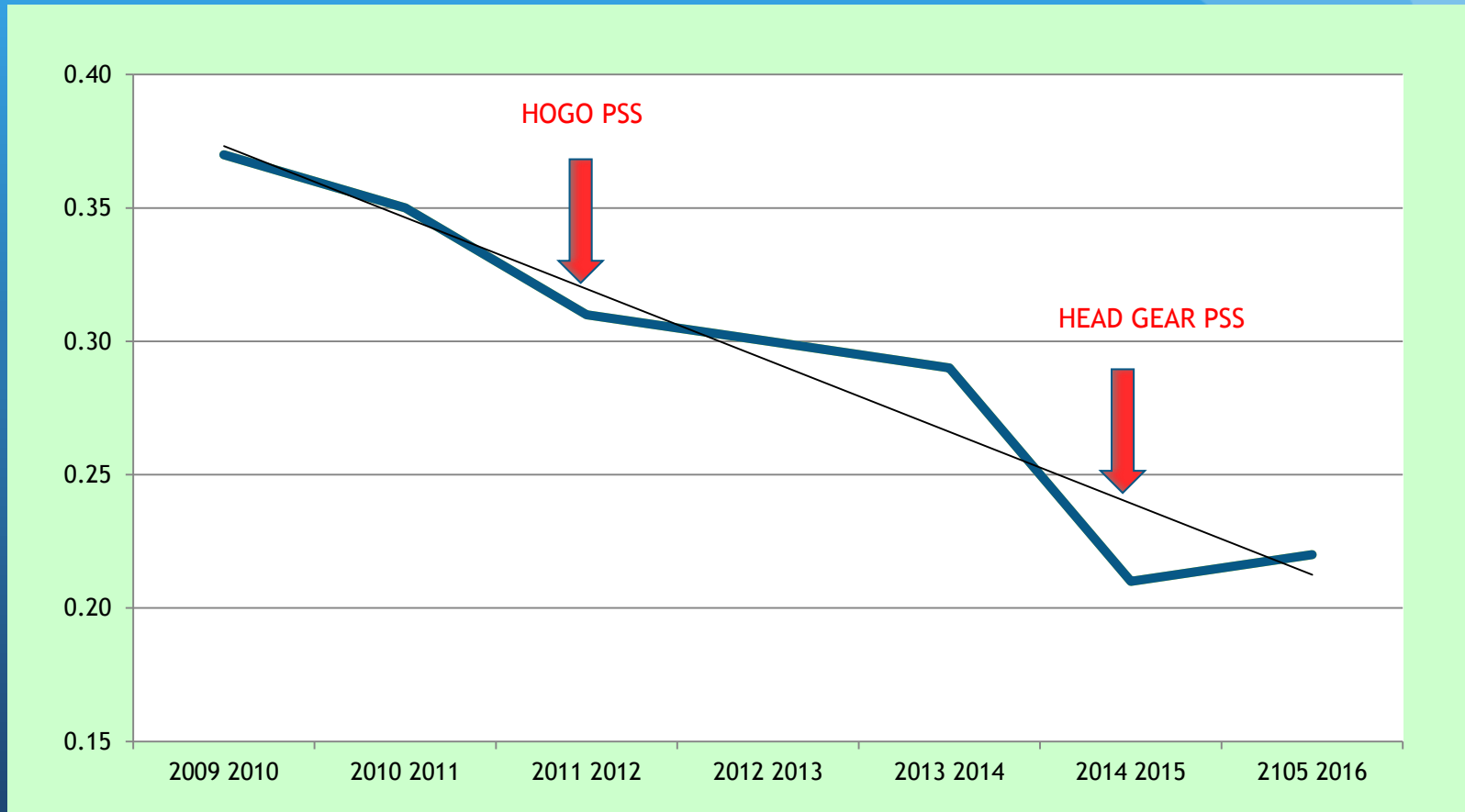
The injury rate among taekwondo **practitioners dropped consistently** year-on-year throughout the period of the study.

While the rate and severity of injuries was **decreasing** before 2010, the introduction of the new rules regarding scoring, along with the PSS and IVR, appears to have coincided with an **acceleration of that trend**.

The injury rate dropped by 18.42% the first four seasons; the last four seasons by 26.67%; during the period of **eight seasons by 42.11%**



Injury Rate during the 8 seasons



4.2. To assess the frequency and severity of injuries suffered by practitioners of taekwondo, from elite international level through to local/regional standard.

The number of serious injuries was consistently low throughout the period of the study, with loss of consciousness among the rarest categories of injury in each of the eight seasons.

These statistics corroborate anecdotal evidence which points to a marked shift in fighting styles since the 2010 rule changes.

Now that points can be scored with just a light touch to the head, the athletes' focus is primarily upon agility, accuracy and speed of movement, rather than generating maximum force.



5. CONCLUSION

Each time the rules have been changed the study shows a decrease in injury rate.

This in turn has resulted in fewer impact-related injuries.

Therefore, it is possible to conclude that the WTF's rule changes have helped to improve the welfare of taekwondo athletes.

Taekwondo has been classified a 'mild risk' sport by health insurers in France and elsewhere, and the results of this study fully corroborate that classification.

An injury rate of 0.30% places taekwondo among the safest Olympic contact sports.



Thank You For Your Attention

