

Health promotion through sport: international sport federations' priorities, actions and opportunities

Margo Mountjoy,^{1,2} A Costa,³ R Budgett,⁴ J Dvorak,⁵ L Engebretsen,⁴ S Miller,⁶ J Moran,⁷ J Foster,⁸ J Cari⁸

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¹Department of Family Medicine, Michael G. DeGroot School of Medicine, McMaster University, Hamilton, Canada

²Fédération Internationale de Natation (FINA), Lausanne, Switzerland

³Department of Medicine, McMaster University, Hamilton, Canada

⁴International Olympic Committee (IOC), Lausanne, Switzerland

⁵Department of Neurology, Spine Unit and Swiss Concussion Center Schulthess Clinic, Zurich, Switzerland

⁶International Tennis Federation (ITF), London, UK

⁷International Skating Union (ISU), Lausanne, Switzerland

⁸Association of Summer Olympic International Federations (ASOIF), Lausanne, Switzerland

Correspondence to

Margo Mountjoy, School of Medicine, McMaster University Waterloo Regional Campus, Kitchener, Ontario N2G 1C5, Canada; mmsportdoc@mcmaster.ca

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ABSTRACT

Objective To identify areas of priority and activity for international sports federations (IFs) with respect to athlete health and safety, and global health. Results serve to direct the work of the Association of Summer Olympic IF Medical and Scientific Consultative Group, the International Olympic Committee and to influence IFs' planning and priorities.

Methods The 28 IFs participating in the Summer Olympic Games (2016) were asked to rank the relative importance of 11 health-related topics and to report their activities or research initiatives on 27 identified topics using an electronic survey. A comparison with a similar survey (2012) was made.

Results The response rate was 100%. In general, the 'fight against doping' had the highest priority followed by 'image as a safe sport'. The topics with the lowest importance ratings were 'increasing the number of elite athletes', and 'health of the general population'. Despite ranking 'health of your athletes' as a top priority, IFs are not addressing all aspects of athlete health. In comparison with 2012, there was a significant decrease in priority for IFs is 'health of the general population'.

Conclusion Despite the widespread knowledge of the importance of the promotion of physical activity (sport) on global health, the decreasing priority and programming of the IFs on physical activity promotion is concerning. Although IFs have prioritised the protection of the health of elite athletes, there are gaps in programming demonstrating that IFs are missing important areas of athlete health. Improving recreational athlete health programming could also benefit population health as well as improve IF fan base and sport participation.

INTRODUCTION

Athlete performances at the Olympic Games and World Championships thrill audiences globally. The quest to be 'citius, altius, fortius' (faster, higher, stronger), as embodied in the Olympic motto, has motivated athletes since the inaugural modern Olympic Games in 1896. Elite athlete performance is associated, by its very nature, with an elevated risk of injury and/or illness.¹ It is, therefore, incumbent on all involved with sport, and in particular its international sports federations (IFs), to take steps to protect athlete health.² In that regard, Fuller and Drawer outlined a theoretical framework to facilitate IF risk management in sport.³ Athlete health protection is also the cornerstone of the Olympic Movement Medical Code⁴ and is embedded in the Olympic Charter in the Mission and Role of the IOC (#9).⁵ Documents such as these clearly

support the role and the obligation of the IFs to protect athlete health.

The Olympic Charter also supports the protection of athlete health (Article 26–1.8)⁵ and then goes one step further in identifying the role of the IF in the promotion of sport for all (#12)⁵—that is, for elite athletes and for those who participate in sport recreationally. According to the WHO, insufficient physical activity (PA) is the fourth leading risk factor for non-communicable diseases (NCDs) such as cardiovascular disease, diabetes and the metabolic syndrome.⁶ Furthermore, physical inactivity in children can lead to an increase in the risk of hypertension, diabetes, fractures, sports injuries and obesity.⁷ As one of the gatekeepers of PA, sport therefore has the ability to play an active role in improving global health through the prevention of NCDs. In 2003, the United Nations Inter-Agency Task Force on Sport for Development and Peace published a paper that identified the role of sport in improving both the quality and quantity of life through the reduction of NCDs.⁸ Two consensus statements by the IOC have been published in this field: one on the Fitness and Health of Children, which identifies the importance of sport as a tool for promoting PA in this population⁷ and the second on the Prevention of Non-Communicable Diseases, which outlines a prevention strategy aimed at motivating the sport community to action.⁹ The WHO and the IOC signed a memorandum of understanding in 2010 to collaborate in addressing the rising prevalence of NCDs.¹⁰ A publication of the IFs' opinions and activities in promoting health in their athletes and in the general population by Mountjoy and Junge reported that the IFs perceive the field of global health promotion to be of low priority and that only the Fédération Internationale de Natation (FINA) and the FIFA of the 35 participating IFs had programmes to promote PA.¹¹ It is arguable that the IFs leadership role in PA promotion is just as great, if not greater, than that of governments and NGOs, as the very reason for the existence of IFs is to organise and promote their respective sports around the world.

It is apparent that both athlete health protection and the promotion of PA to improve global health should be important responsibilities of the IFs, and the work of FINA and FIFA Medical Assessment and Research Centre (F-MARC) illustrates that the IFs have the capability to effectively promote PA. The objectives of the present study were to identify the current areas of priority and activity for IFs with respect to athlete health and safety and global health and to evaluate for changes in comparison



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Table 1 Characteristics of international sports federations (IFs) participating in the Olympic Games (OG) in 2016

IF	Sport	Individual/team sport	Year IF founded	No. of national federations	Year of 1st OG	Athletes at OG 2016
FINA	Aquatics	I/T	1908	207	1896	1450
WA	Archery	I	1931	162	1931	128
IAAF	Athletics	I	1912	214	1896	2283
BWF	Badminton	I	1934	186	1992	172
FIBA	Basketball	T	1932	213	1936	288
AIBA	Boxing	I	1946	200	1904	286
ICF	Canoe	I	1924	163	1936	330
UCI	Cycling	I	1900	186	1896	520
FEI	Equestrian	I	1921	134	1900	200
FIE	Fencing	I	1913	151	1896	213
FIFA	Football	T	1904	211	1900	504
IGF	Golf	I	1900	149	1900	120
FIG	Gymnastics	I	1881	148	1896	324
IHF	Handball	T	1946	197	1936	360
FIH	Hockey	T	1924	135	1908	384
IJF	Judo	I	1951	202	1964	390
UIPM	Modern Pentathlon	I	1948	110	1912	72
FISA	Rowing	I	1892	151	1896	547
WR	Rugby	T	1886	161	1900	288
WS	Sailing	I	1907	145	1900	378
ISSF	Shooting	I	1907	158	1896	390
ITTF	Table Tennis	I	1926	222	1988	172
WTF	Taekwondo	I	1973	208	2000	128
ITF	Tennis	I	1913	211	1896	172
ITU	Triathlon	I	1989	168	2000	110
FIVB	Volleyball	T	1947	221	1964	386
IWF	Weightlifting	I	1905	188	1896	260
UWW	Wrestling	I	1954	179	1896	344

I, individual sport; T, team sport (defined by the International Team Sport Federation Committee as two opposing groups of players on the field of play at the same time).

AIBA, Fédération Internationale de Boxe Amateur; BWF, Badminton World Federation; FIBA, Fédération Internationale de Basketball; FIE, Fédération Internationale d' Escrime; FIFA, Fédération Internationale de Football Association; FIG, Fédération Internationale de Gymnastique; FIH, Fédération Internationale de Hockey; FISA, Fédération Internationale des Sociétés d'Aviron (World Rowing); IAAF, International Association of Athletics Federations; ICF, International Canoe Federation; IFE, International Federation for Equestrian; IGF, International Golf Federation; IHF, International Handball Federation; IJF, International Judo Federation; ITF, International Tennis Federation; ITTF, International Table Tennis Federation; ISSF, International Shooting Sport Federation; IWF, International Weightlifting Federation; FINA, Fédération Internationale de Natation; FIVB, Fédération Internationale de Volleyball; UCI, Union Cycliste Internationale; UIPM, L'Union internationale de pentathlon moderne; WA, World Archery; WR, World Rugby; WTF, World Taekwondo Federation; WWW, World Wrestling Federation.

with 2012. The results are meant to direct the activities of the Association of Summer Olympic International Federations (ASOIF) Medical and Science Consultative Group and to influence the planning and priorities of the IFs and the IOC Medical and Scientific Commission.

Methods

The 28 IFs on the programme of the Summer Olympic Games (table 1) were requested to answer a survey on their priorities and programming regarding athlete and global health. The study was designed and supervised by the authors, while the facilitation and technical implementation of the online survey was supported by PriceWaterhouseCoopers (PWC). An introductory email from ASOIF was sent to the IF president, secretary general and medical chairperson containing explanatory instructions and access information to the survey. An online survey format was chosen to provide a user-friendly interface that ensured data accuracy and to allow the respondents the flexibility to complete the questionnaire at their own pace. The online platform also enabled multiple users within an IF to complete the questionnaire and facilitated efficiency in the management of the survey process. Confidentiality of the data was maintained through the

use of a password-protected access link and data storage system created by PWC. The study was conducted during a 6-week period from March to April 2016. Email prompts to encourage participation were sent as required.

Following an introduction, demographic data were recorded to ensure respondent authenticity and to facilitate corroboration of the data as needed. The content of the survey was based on a survey conducted in 2012 by Mountjoy and Junge to facilitate a comparison of IF priorities and programming over time.¹¹ The survey was composed of two parts: the first part asked the IFs to report the importance of 11 health-related topics on a 5-point Likert scale and to rank three of those topics in priority of importance (figure 1). The second part of the survey asked the IFs to identify programmes, guidelines or research activities in 27 health-related topics (figure 2). The complete survey can be found in appendix 1 (online version). The details of IFs were obtained from their official web-based home pages as well as the olympic.org website. Contingency tables were created for match-paired IFs (2012 and 2016 responses). The McNemar's test for paired nominal data was used to test for statistical significance. Significance was accepted at $p < 0.05$. All analyses were performed using SAS V.9.3 for Windows.

Table 2 IF ranking of identified health priorities

Health priority	# IF ranking 1	# IF ranking 2	# IF ranking 3	Ranking score*
Your sport is perceived to be a safe sport	11	6	5	50
Fight against doping	7	4	5	34
Health of your elite athletes	5	6	2	29
Your sport is perceived to be an enjoyable physical activity	1	2	4	11
Increasing the number of elite athletes	1	3	2	11
Increasing the number of recreational athletes	2	2	0	10
Elite performance of athletes in your sport	0	2	1	5
Increasing the number of spectators	0	1	3	5
Health of recreational athletes in your sport	0	1	2	4
Health of the general population	0	1	1	3
Protecting athletes against harassment and abuse	0	0	3	3

*Ranking score determined by the following formula: 3 points for rank #1, 2 points for rank #2 and 1 point for rank #3. IF, international sports federation.

RESULTS

Response rate and characteristics of the IFs

The characteristics of the 28 participating summer IFs are illustrated in table 1. The IFs range in size from 110 member national federations (Union Internationale de Pentathlon Moderne) to 222 (International Table Tennis Federation). Over 500 athletes participated in each of five IFs' sports (International Association of Athletics Federation (IAAF), FINA, World Rowing—Federation Internationale des Societes D'Aviron, Union Cycliste Internationale and FIFA) at the Olympic Games in 2016, totalling 47% of the athlete participation. The most recently added sports to the Summer Olympic Games programme are World Rugby (WR) and Golf (IGF),

which reappeared in the Olympic Sport Program in Rio de Janeiro in 2016. Six IFs represent team sports, and 21 IFs are individual sports; one IF (FINA) has both individual and team sport athletes. All 28 summer IFs responded to the survey indicating a response rate of 100%.

Health priorities of the IFs

The IFs' ratings of the perceived importance of the 11 health-related topics can be found in figure 1. While 96% of IFs identified the 'fight against doping' as the highest priority, in the overall ranking, it was ranked second in perceived importance behind 'your sport is perceived to be a safe sport'. The third-ranked topic was 'the health of your elite athletes'. The three lowest priorities of the IFs were 'increasing the number of elite athletes', 'health of the general population' and 'performance of elite athletes in your sport'. 'Protecting athletes against harassment and abuse' was identified by one IF as their third-ranking priority.

IFs health-related programmes/guidelines/research activities

Figure 2 demonstrates the IF programmes, guidelines or research activities of various health-related topics. Only one IF stated that it has no health-related programmes/guidelines/research activities. The most common health-related activities were 'injury prevention by regulation for equipment/venues' and 'first aid/minimum safety standards at events', each of which was reported by 93% of IFs. These were closely followed by 'injury surveillance during IF championships' (85%) and 'implementation of the Olympic Movement Medical Code' (70%). The least common activities of the IFs were 'technology based health risks' (15%), 'prevention of chronic disease in the general population' (11%) and 'relative energy deficiency in sport' (7%).

The number of activities reported by each IF ranged between 2 and 23, with most IFs identifying a total of 11 activities. Two IFs stated that they conducted 'other activities', but only one IF recorded the activity, which was 'education of team staff'. One of the least common activities was 'prevention of chronic

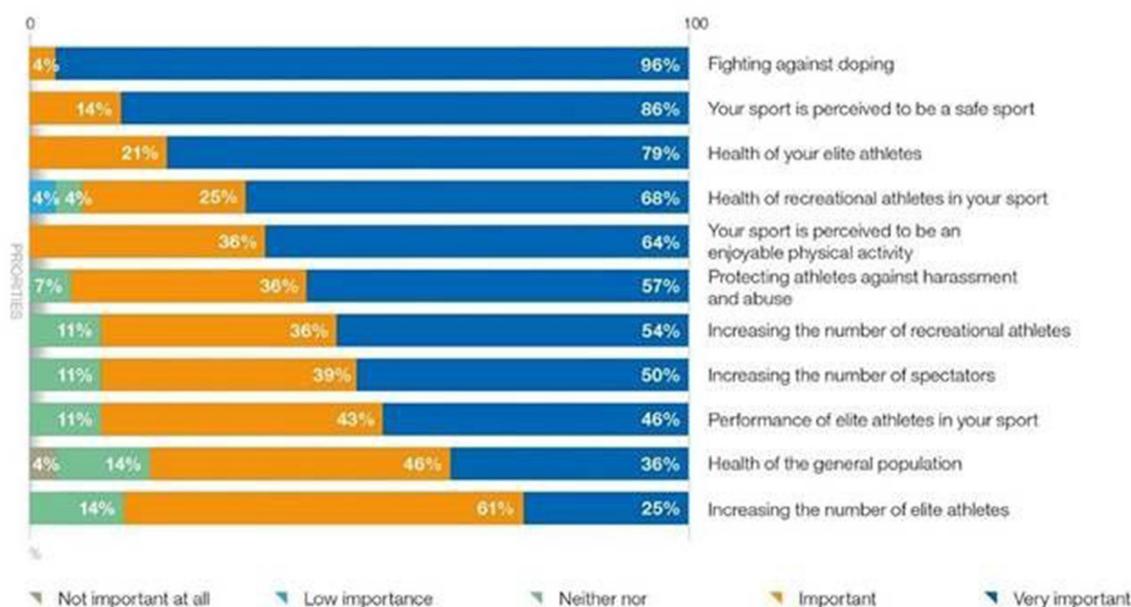


Figure 1 Importance of health priorities for the international sports federations.



Figure 2 Percentage of international sports federation health-related programmes, guidelines or research activities.

disease in the general population', which was specified by only two IFs.

A comparison of IF health priorities and activities since 2012

An analysis was completed to determine changes in IF health-related priorities and activities since 2012 in comparison with a similar study conducted by Mountjoy and Junge.¹¹ There was a decrease in priority of the following four non-elite athlete health-related topics: '*image as an enjoyable physical activity*', '*health of recreational athletes in your sport*', '*increasing the number of recreational athletes*' and '*increasing the number of spectators*'. The only parameter, however, that showed a statistically significant decrease was the '*health of the general population*' ($p \leq 0.01$).

In the 2016 survey, 12 new health-related topics were added to part 2 of the questionnaire addressing IF programmes, guidelines and research activities in comparison to the 2012 survey. Only two of these topics ('*implementation of the Olympic Movement Medical Code*' and '*nutritional supplementation use*') were implemented by more than 50% of the IFs. '*Relative Energy*

Deficiency in Sport (RED-S)' and '*technology based health risks*' were the two health-related topics with the lowest activity of the IFs (see table 3).

Figure 3 demonstrates the changes in IF health-related programmes, guidelines and/or research activities between 2012 and 2016. There is a positive trend or increase in IF athlete health-related activities such as '*first aid/minimum safety standards at events*', '*return to play after injury*' and '*post elite-career management*'. Conversely, there were fewer programmes in '*injury prevention by exercise programs*', '*prevention of chronic disease in general population*' and '*injury prevention by Fair Play campaigns*'.

DISCUSSION

Study limitations

This study was intentionally designed to target Summer Olympic IFs, thus the results and their implications are limited to this cohort. Inclusion of both Winter Olympic IFs and non-Olympic IFs would provide a broader understanding of IF health-related

Table 3 Number and percentage of international sports federations (IFs) with newly added IF health-related programmes, guidelines or research activities

IF health-related programmes, guidelines or research activity	# IF	% IF
Implementation of the Olympic Movement Medical Code	18	66.7
Nutritional supplementation use	14	51.9
Sport-specific concussion management	12	44.4
Medical licencing at IF championships/events	11	40.7
Rule changes based on sport-specific science	11	40.7
Team physician certification	11	40.7
Drug importation at IF championships/events	7	25.9
Age determination	7	25.9
Eating disorders/disordered eating	6	22.2
Protection of the athlete from harassment + abuse	6	22.2
Technology-based health risks	4	14.8
Relative Energy Deficiency in Sport	2	7.4

priorities and activities. Inherent in survey methodology is the risk of self-report bias. In addition, this study did not evaluate the quality of the reported activities/programmes and the reasons for any changes in those activities/programmes since 2012 as this analysis was outside the scope of the study.

Elite athlete health protection

As in 2012, most IFs were active in the area of elite athlete health protection. The ‘fight against doping’ was the highest priority for IFs, which is not unexpected as being a signatory to the World Anti-Doping Code is a prerequisite for participation in the Olympic Games. The IFs also reported high activity in several elite athlete-related topics such as ‘injury prevention by regulation’, ‘first aid/minimum standards at events’ and ‘injury

surveillance during events’. The trend analysis over time demonstrates that IFs have increased programming for their elite athletes since 2012 in the areas of ‘first aid’, ‘return to play after injury’ and ‘post elite career management’. These findings demonstrate that Summer Olympic IFs understand and take action in relation to their responsibility to protect athlete health.²

However, despite this improvement in elite athlete health programming, the comparison of IF activity between 2012 and 2016 reveals a decrease in elite athlete health-related programmes relating to ‘elite athlete mental health’, ‘injury surveillance at IF events’, ‘environmental conditions’, ‘nutrition/hydration’ and ‘injury prevention by Fair Play campaigns’. This shows that IFs could be doing more to protect elite athlete health. The need for (as an example) mental healthcare is demonstrated by a recent prospective study by Gouttebauge *et al* in football, which reported a prevalence of 12% for symptoms of mental distress and 37% for anxiety and/or depression.¹² Other important elite athlete health-related topics that have been identified in the scientific literature as important parameters in elite athlete health that are identified in this study as being of low priority for IFs include ‘eating disorders’¹³, ‘protection from harassment and abuse’¹⁴ and ‘Relative Energy Deficiency in Sport (RED-S)’¹⁵. Furthermore, although 24 IFs reported that they undertook programmes in ‘injury surveillance during IF championships’, only six IFs have published their results (IAAF,¹⁶ FINA,¹⁷ FIFA,¹⁸ WR,¹⁹ International Handball Federation,²⁰ Federation Internationale de Volleyball²¹ and despite 19 IFs reporting ‘pre-participation medical examinations’, only one IF published their activity (FIFA).²²

Promotion of sport for the improvement of global health

‘Health of the general population’ was identified as the second lowest priority for the IFs, and only three IFs identified activities directed towards ‘Prevention of chronic diseases in the general



Figure 3 The percentage change in the number of IF with health-related programmes, guidelines and/or research activities from 2012 to 2016. IF, international sports federation.

population'. Of these three IFs, only two IFs have programmes that address the public health crisis of NCDs caused by physical inactivity: F-MARC's 11 for Health^{23 24} and FINA's Swimming for All-Swimming for Life.²⁵ F-MARC's 11 for Health programme pairs football-based activities with health initiatives addressing PA promotion and education about healthy behaviours related to both communicable and non-communicable diseases. This programme has been successfully implemented around the world to school-aged children.^{23 24} FINA's Swimming for All-Swimming for Life programme has a dual benefit in that it has the potential to save lives through drowning prevention and to improve the quality and quantity of life through the promotion of PA and the subsequent reduction of NCDs. A learn-to-swim programme has been developed and is being implemented globally in collaboration with Unesco in all five FINA member continental federations.²⁵

One finding in this study that is of particular concern is the statistically significant decrease in IF priority in 'health of general population' between 2012 and 2016, particularly in light of the recommendation of the 2012 study on IF health activities by Mountjoy and Junge that 'International Federations should use the unique chance to contribute to the health of the general population by the promotion of physical activity through their sport'.¹¹ It appears that the recommendation has not been heeded. IFs have an obligation to develop 'sport for all', as mandated through the IOC Consensus Statement on the Fitness and Health of Young People,⁷ by Recommendation #51 of the Olympic Movement in Society Congress held in Copenhagen,

2009²⁶ and more recently by the IOC President, Mr Thomas Bach, in the introduction to the Olympic Agenda 2020²⁷:

[The Olympic Movement] has an interest and a responsibility to get the couch potatoes off the couch. Only children playing sport can be future athletes. Only children playing sport can enjoy the educational and health values of sport.

Furthermore, 'increasing the number of recreational athletes' was of low importance for the IFs (ranking 9 out of 12). This is a surprising finding, as the sustainability of a sport is dependent on the number of participants. Increasing the number of recreational athletes would also benefit global health through the promotion of PA to this section of the population.

Call to action

According to the WHO, NCDs cause approximately 38 million deaths annually, mainly in low-income and middle-income countries; over 40% of these deaths (16 million) occur before the age of 70 years. Physical inactivity alone is responsible for around 3.2 million deaths per year.^{6 28} PA has the power to reduce these numbers through its many health benefits, such as the reduction of prevalence of cardiovascular disease, cancers of the colon and breast, chronic respiratory diseases, diabetes, depression, obesity and osteoporosis with subsequent fractures of the hip and vertebral column.⁶ Despite the ethical responsibility and the integral role that sport has in relation to the promotion of PA for the health of the general population, the fact that IFs have decreased their priorities and programming in this area is concerning. In response to this result, the ASOIF Medical and Scientific Consultative Group developed a strategy to stimulate a change in knowledge and behaviour of the IFs and to inspire and motivate the political leadership of the IFs to action.

In November 2016, ASOIF, in collaboration with Sport Accord Convention, held an IF Forum in Lausanne Switzerland, entitled 'The Power of Sport to Drive World Health'. The attendees included presidents, secretary generals and medical commission chairpersons of the IFs from ASOIF, Association of International Olympic Winter Federations, Association of IOC Recognised International Sport Federation and Alliance of Independent Recognised Members of Sport. In total, there were 324 participants. The first part of the programme addressed 'Safe Sport', which focused on the improvement of elite athlete health, highlighting areas identified in this study that were reported as low priority by the IFs, such as athlete mental health, protection from harassment and abuse, Fair Play programmes and rule changes based on sport-specific science. The second part of the programme addressed 'Sport for Health' outlining the science on the health risks of physical inactivity along with the role of sport in mitigating these risks. A workshop followed these plenary sessions in which the participants identified potential solutions to collectively address the global health crisis. An action plan to promote sport as a tool to increase PA with the goal of creating a positive, long-lasting legacy through the improvement of global health was developed. This action plan comprises three steps, and is in compliance with the Olympic Agenda 2020 initiative through the implementation of strategies to enhance accessibility of sport for all.

The IF Forum concluded with a 'Declaration' identifying their commitment and intention:

Global health initiative through sport:

We, the International Federations, recognise and acknowledge our responsibility to promote health; for our athletes and for the global population.

Action plan for IF promotion of global health

1. Planning

- Develop partnerships with
 - ▶ other IFs
 - ▶ governments: education, health, infrastructure (sport facilities)
 - ▶ non-governmental organisations
 - ▶ WHO/Unesco/Unicef
 - ▶ media
 - ▶ industry/business
- Adaptation of the IF sports for various ages, physical abilities and cultures
- Adoption and adaption of existing programmes

2. Implementation

- raise awareness through education programmes
- development of an event legacy programme to engage physical activity in host cities
- engage national federations in dissemination and implementation
- provision of sport equipment
- dissemination in schools, public places, communities in crisis
- promotional strategy through
 - ▶ social media
 - ▶ athlete role models
 - ▶ major event signage
 - ▶ partnerships with broadcasting
 - ▶ programme branding

3. Evaluation

- monitor and evaluate programme uptake, sustainability and efficacy of health benefits.

Through collaborative action, and partnerships with non-sport entities, we will develop, implement and evaluate the effectiveness of programs to promote health through the Power of Sport.

CONCLUSION

While it is encouraging to see the increase in IFs' prioritisation of some aspects of the health of the elite athlete, focus should be given to all aspects of protection and promotion of athlete health both during and after retirement from sport. A more robust and comprehensive athlete health programme would ultimately result in longer athlete retention (eg, through reduced attrition due to injury) and improvement in sport performance.

The IFs did not identify recreational athlete health as a priority. Attention to this large group of individuals worldwide would benefit sport through the increase in healthy participating athletes as well as the fan base and sport market.

IFs have an obligation to develop and promote sport for all and are in a unique position to positively influence global health through the promotion of their sport to counteract the epidemic of physical inactivity and subsequent reduction in the prevalence of NCDs. The barriers to IF promotion of health in both the elite athlete and global populations should be identified, and effective solutions should be developed to deliver IF programmes that improve both athlete and global health. With vision and intent, funding and partnership, sport can have a positive impact on the global epidemic of NCDs through the promotion of PA.

What are the findings?

- ▶ International sport federations (IFs) are aware of and are actively working to protect many aspects of elite athlete health. However, IFs are not addressing several important components of athlete health.
- ▶ Despite the knowledge of the importance of physical activity in the promotion of global health, and the IFs' responsibility to encourage and promote sport for all, the IFs' priority and programming in this area has significantly decreased since 2012.
- ▶ IFs have committed through a joint Declaration and Action Plan to address their role in the promotion of physical activity to improve global health through sport.

How might it impact on clinical practice in the future?

- ▶ International Sport Federations will commence programing in areas of athlete health not being addressed.
- ▶ International Sport Federatoinis will develop research programs to develop evidence based information to better inform rule changes for athlete safety.
- ▶ International Sport Federations will recognize their role in promoting global health, and will develop programs accordingly.

Twitter @margo.mountjoy @asoif

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REFERENCES

- 1 Engebretsen L, Soligard T, Steffen K, *et al*. Sports injuries and illnesses during the London Summer Olympic Games 2012. *Br J Sports Med* 2013;47:407–14.
- 2 Engebretsen L, Steffen K. Protection of the elite athlete is the responsibility of all of us in sports medicine. *Br J Sports Med* 2015;49:1089–90.
- 3 Fuller C, Drawer S. The application of risk management in sport. *Sports Med* 2004;34:349–56.
- 4 Olympic Movement Medical Code. In force as from 31 March 2016. <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/Who-We-Are/Commissions/Medical-and-Scientific-Commission/Olympic-Movement-Medical-Code-31-03-2016.pdf>. (Retrieved 20 February 2017).
- 5 Olympic Charter. International Olympic Committee, August 2015. Lausanne/Switzerland. https://stillmed.olympic.org/Documents/olympic_charter_en.pdf. (Retrieved 20 February 2017).
- 6 World Health Organization *Updated* 2015 <http://www.who.int/mediacentre/factsheets/fs355/en/> (Non communicable diseases Retrieved 20 February 2017).
- 7 Mountjoy M, Anderson LB, Armstrong N, *et al*. IOC Consensus Statement on the health and fitness of children through sport. *Br J Sports Med* 2011;45:839–48.
- 8 United Nations Inter-Agency Task Force *Sport for Development and Peace: Towards Achieving the Millennium Development Goals* United Nations, New York 2003.
- 9 Matheson GO, Klügl M, Engebretsen L, *et al*. Prevention and management of non-communicable disease: the IOC consensus statement, Lausanne 2013. *Br J Sports Med* 2013;47:1003–11.
- 10 Health O, Who S. IOC Sign Healthy Activity Pact. 2010. *IOC Signs Memorandum of Understanding with World Health Organization*. Lausanne, Switzerland, and 21 July 2010. <http://www.olympic.org/media?articleid=94858>. (Retrieved 20 February 2017).
- 11 Mountjoy M, Junge A. The role of International Sport Federations in the protection of the athlete's health and promotion of sport for health of the general population. *Br J Sports Med* 2013;47:1023–7.
- 12 Goutteborge V, Aoki H, Verhagen EA, *et al*. A 12-Month prospective cohort study of symptoms of common mental disorders among European Professional Footballers. *Clin J Sport Med* 2016;1.
- 13 Bratland-Sanda S, Sundgot-Borgen J. Eating disorders in Athletes: overview of prevalence, risk factors and recommendations for prevention and treatment. *Eur J Sport Sci* 2013;13:499–508.
- 14 Mountjoy M, Brackenridge C, Arrington M, *et al*. The IOC Consensus Statement: harassment and abuse in sport. *Br J Sports Med* 2016:1019–29.
- 15 Mountjoy M, Sundgot-Borgen J, Burke L, *et al*. IOC Consensus Statement. beyond the Triad – RED-S in sport. *Br J Sports Med* 2014;48:491–7.
- 16 Feddermann-Demont N, Junge A, Edouard P, *et al*. Injuries in 13 International Athletics championships between 2007–2012. *Br J Sports Med* 2014;48:513–22.
- 17 Prien A, Mountjoy M, Miller J, *et al*. Injury and illness in aquatic sport: how high is the risk? A comparison of results from three FINA World Championships. *Br J Sports Med* 2017;51:277–82.
- 18 Junge A, Dvořák J. Football injuries during the 2014 FIFA World Cup. *Br J Sports Med* 2015;49:599–602.
- 19 Fuller CW, Taylor A, Raftery M. Epidemiology of concussion in men's elite Rugby-7s (Sevens World Series) and Rugby-15s (Rugby World Cup, Junior World Championship and Rugby Trophy, Pacific Nations Cup and English Premiership). *Br J Sports Med* 2015;49:478–83.
- 20 Bere T, Alonso JM, Wangenstein A, *et al*. Injury and illness surveillance during the 24th men's Handball World Championship 2015 in Qatar. *Br J Sports Med* 2015;49:1151–6.
- 21 Bere T, Kruczynski J, Veintimilla N, *et al*. Injury risk is low among world-class volleyball players: 4-year data from the FIVB Injury Surveillance System. *Br J Sports Med* 2015;49:1132–7.

- 22 Dvorak J, Grimm K, Schmied C, *et al.* Feasibility of precompetition medical assessment at FIFA World Cups for female youth players. *Br J Sports Med* 2012;46:1132–3.
- 23 Fuller CW, Thiele ES, Flores M, *et al.* A successful nationwide implementation of the 'FIFA 11 for Health' programme in Brazilian elementary schools. *Br J Sports Med* 2015;49:623–9.
- 24 Dvorak J, Fuller CW, Junge A. Planning and implementing a nationwide football-based health-education programme. *Br J Sports Med* 2012;46:6–10.
- 25 FINA Swimming for all - Swimming for Life. <http://www.fina.org/content/swimming-all-swimming-life> (Retrieved 20 February 2017).
- 26 The Olympic Movement in Society. Proceedings from the XIII Olympic Congress. *Recommendations of Theme 'Olympism and Youth'.* Olympic Congress 2009. Copenhagen, Denmark 2009.
- 27 Agenda O. Lausanne, Switzerland. 2020 <https://www.olympic.org/olympic-agenda-2020> (Retrieved 20 February 2017).
- 28 Lim SS, Vos T, Flaxman AD, *et al.* A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the global burden of disease study 2010. *Lancet* 2012;380:2224–60.