

Meeting the Global Demand of Sports Safety

The Intersection of Science and Policy in Sports Safety

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Abstract

Sports and physical activity are transforming, and being transformed by, the societies in which they are practised. From the perspectives of both competitive and non-competitive sports, the complexity of their integration into today's society has led to neither sports federations nor governments being able to manage the safety problem alone. In other words, these agencies, whilst promoting sport and physical activity, deliver policy and practices in an uncoordinated way that largely ignores the need for a concurrent overall policy for sports safety.

This article reviews and analyses the possibility of developing an overall sports safety policy from a global viewpoint. Firstly, we describe the role of sports in today's societies and the context within which much sport is delivered. We then discuss global issues related to injury prevention and safety in sports, with practical relevance to this important sector, including an analysis of critical policy issues necessary for the future development of the area and significant safety gains for all. We argue that there is a need to establish the sports injury problem as a critical component of general global health policy agendas, and to introduce sports safety as a mandatory component of all sustainable sports organizations.

We conclude that the establishment of an explicit intersection between science and policy making is necessary for the future development of sports and the necessary safety gains required for all participants around the world. The Safe Sports International safety promotion programme is outlined as an example of an international organization active within this arena.

1. Sport in Contemporary Society

Sports and physical activity are transforming, and being transformed by, the societies in which they are practised. Competitive sport has become the centre of a multinational industry producing

services and products with strong links to media networks. Globally, broadcasts of major sport events provide forms of entertainment in the media market and provide opportunities to display new consumer goods, ranging from sports equipment to a variety of products that are marketed to be

associated with a sporting and rewarding lifestyle, e.g. soft drinks, home electronics and cars. For instance, the televised 2007 US SuperBowl game was watched by more than 90 million viewers globally and attracted advertisers willing to spend \$US2.5 million on each 30-second commercial. The downside of these advertising and media imperatives, which rely on the entertainment value of fierce sporting competition and the charisma of sporting stars, is that little attention is paid to the risk for 'industrial diseases' caused by both direct extreme physical loads and indirect consequences of economic exploitation among professional athletes.

At the same time, public health agencies are actively promoting physical activity in adults, while physicians and educators are joining forces in bringing play, particularly physically challenging unstructured outdoor play, back into children's daily lives.^[1] Too often, however, these efforts neglect to ensure that the exercise is performed without unnecessary injury risk. For example, the facts that physical exercise programmes for the elderly may be associated with risks for falls, and that promotion of new activity opportunities for children and adolescents (such as home trampolines and skateboard parks) introduces new injury risks are often ignored. There seems to be a perception that if physical activity advocates were to talk about safety issues, people would not be active. In fact, the converse is true, as unsafe activity is one of the major barriers towards ongoing physical activity.^[2] It seems clear that preventing injuries from occurring in the first place, and thereby delivering safe sport, should be a major positive physical activity promotion goal and incorporated into broad health promotion agendas. From the perspectives of both competitive and non-competitive sports, the complexity of their integration into today's society has led to neither sports federations nor (local) governments being able to manage the safety problem alone. In other words, these agencies, whilst promoting sport and physical activity, deliver policy and practices in an incomplete way that largely ignores the need for a concurrent overall policy for sports safety.

This article reviews and analyses the possibilities of developing overall policies for sports safety from a global viewpoint. Because this paper is more of a position paper than a critical review of the

literature, a systematic review was not undertaken. PubMed was employed to search the MEDLINE databases using the terms 'sports injuries', 'sports injury prevention', 'sports safety' and 'sports policy'. From the basic set of abstracts of 6200 articles published since 1996, 350 articles were chosen as being potentially relevant to this the review. The reference lists of these articles were used to identify additional books and previously published materials relevant for the aim of the analysis. From this accumulated literature, only the articles of direct relevance to the positions and views presented in this review are referred to in this paper. The concluding analysis of the relevant texts was summarized in sections describing the social role of sports, global sports safety concerns, the structural underpinnings for promotion of sports safety, and the importance of the intersection between science and policy making in the formation of safe sport practices. Finally, the Safe Sports International (SSI) [www.safesportinternational.org] safety promotion programme, a new globally focused initiative to progress these issues, is outlined as an example of an international organization active in this intersection.

1.1 The Social Role of Sports: From Gameplay to Sports Industry

Even a cursory glance at the global news and media coverage would suggest that sport and physical activity have a more important position in social life today than ever before. Despite this attention, many modern public health concerns are associated with an increasingly sedentary lifestyle. For instance, in developed countries, the global obesity epidemic is reflected in a rapid increase in the prevalence of obesity and overweight, and their associated chronic medical conditions.^[3] The irony of this is that this 'epidemic' has evolved in spite of long recognition of the beneficial role of participation in games and sports for physical, mental and social development^[4] and the prevention of health problems.^[5,6] One explanation for this paradox can be found in the growing gap between physical activity and competitive sport. With increasing competition, the amount of practice required forces children to choose between sports at an earlier age, and less competitive individuals may be altogether removed from sports development

groups in adolescence.^[7] These circumstances may well be leading to fewer young people participating in traditional sports, and those who do participate being expected to compete for positions as professional athletes at increasingly younger ages.

Humankind has always played games based on physical challenges. Studies of traditional practices among Australian Aborigines and East African hunters suggest that these groups spent about one-quarter of their time finding and preparing food, and used the remaining time for different forms of play and music.^[8] In *Homo Ludens* (Man the Player),^[9] the Dutch anthropologist Johann Huizinga provided a comprehensive account of play in human culture. He recognized that when a person steps in or out of a game, he/she crosses a predetermined boundary that defines that game in time and space. To qualify as a game, participants should be able to cross this 'boundary for play' at their free will. Gameplay is thus circumscribed by a virtual or physical shield – Huizinga called this the 'magic circle' – which is a psychological boundary that stands between the participant and the 'real world'.^[10] In his further analysis, Huizinga linked the joyful and combative nature of play to education, art, religion and other essential elements of human culture and asserted that play "is a significant function" – that is to say, there is something 'at play' that transcends the immediate needs of life and imparts meaning to the action.^[9]

Today, the notion of a significant function of play has gained new, and differentiated, meanings adapted to the pre- and post-industrial societies. On the one hand, sports and physical activity is actively promoted by public health agencies and the maintenance of exercise habits with increasing age is encouraged. Progressively during the 20th century, however, sport as gameplay for fun and pleasure, has become accompanied by an emphasis on competitive athletics and professional sports. These latter physical activities are characterized by a spirit of dedication, sacrifice and intensity and with a prime aim of victory in the contest.^[11] In only a few decades, professional sport has become an important international industry that not only involves sportspersons, coaches and administrators, but also media companies, equipment manufacturers, marketers and advertisers. For example, the television rights for the 2006 FIFA (Fédération Internationale de

Football Association) football World Cup were sold for \$US6 billion, and sports sponsorship at a global level was estimated to be already worth approximately \$US20 billion in 1999.^[12] In 1999, the Council of Europe estimated that 3% of world trade concerned recreational and competitive sports, while the European Commission estimated that 2 million sports-related jobs had been created in the region between 1990 and 1999.^[13] In other words, the roles of sports in today's societies, and the contexts within which sports are delivered, are heterogeneous and not straightforward to overview or comprehend. Accordingly, the identification of global issues related to injury prevention and safety in sports requires careful examination, in particular if the analysis is to lead to the recognition of critical policy issues necessary for the future development of the area and significant safety gains for all.

2. Global Sports Safety Concerns

Just as safety became a significant problem that had to be addressed in the factories during the rapid industrial revolution of the late 19th century, so too are we witnessing a similar need in today's sports as they become more 'industrialized'. Safety has been defined by the WHO as the "state in which hazards and conditions leading to physical, psychological, or material harm are controlled in order to preserve the health and well-being of individuals and the community."^[14] Because sports and physical activity challenge human physical ability, it is likely they may always be associated with some element of risk of harm, at least to some participants. Nonetheless, most of the risks associated with sport participation, particularly for community level participants, can be minimized or controlled with the adoption of suitable prevention strategies.^[15]

In the international literature, injury is regarded as a limiting condition resulting from physical or mental harm to what is considered a normal human being. The assumptions of an average and static human body, however, do not have natural pertinence to all contexts. In high performance sporting activity, for example, human physical ability is challenged within the boundaries of rule-governed practices and games and is highly competitive. Accordingly, sports injuries are defined in

terms of how they adversely influence an athlete's ability to excel in performance according to the rules of the game or whether they exclude an athlete from further participation in that activity.^[16] Founded on this relative framework, sports injury is often defined in terms of 'time lost' from participation.^[17-19] Even though such a definition may be sound with regard to the nature of competitive sports, it does not take into account the broader context of *sport and physical activity* in today's societies, which encompasses a set of significantly different and dynamically changing activities, and which may or may not include an element of competition.

Some professional and competitive sports have become burdened with their own injuries to such an extent that they now represent forms of 'industrial diseases.'^[20] Overall injury rates are higher in sports entailing more frequent and powerful body contact, particularly because of collisions. Studies in English professional football, for instance, have shown that the risk for injury among players is about 1000 times the risk in other occupations normally considered as high risk, such as mining or construction.^[21]

Each sport has its own characteristic injury profile. Even though catastrophic injuries are relatively rare, pole vaulting, gymnastics, ice hockey and American football are examples of sports with a high incidence of acute severe injuries.^[22] Lower limb injuries are generally the most common in sports involving large amounts of running, jumping, landing and changing direction.^[23] The development of osteoarthritis and other adverse health outcomes secondary to sports injury is also a particularly important concern because of its association with poorer health-related quality of life and reduced participation in physical activity after retirement from sport.^[2,24]

There is now irrefutable evidence that the sports injury problem is not restricted to professional sports. Economic evaluations in general populations have suggested that participation in community sports by 20- to 45-year-olds leads to more costs through injuries than benefits through positive health effects,^[25] even though other studies have showed less conclusive results.^[26] For more than two decades, about every fifth unintentional injury treated in a healthcare setting in industrialized countries has been associated with sports

or physical activity.^[27] In 2006, 31 in every 1000 adult Germans sustained a sports injury during the previous year;^[28] the corresponding rate is 88 injured people per 1000 sports participants in the Canadian province of Québec.^[29] In the US, an estimated 7 million people receive medical attention for sports injuries each year, corresponding to 26 injury episodes per 1000 persons.^[30] Australia has recently reported 37 cases of medically treated sports injuries per 1000 active persons, with many injuries associated with adverse public health impacts.^[31]

Traditional sports safety approaches have been based on those for the prevention of general physical injury. However, a key point of the WHO definition of safety is that it has two dimensions: physical safety factors and an individual's internal feelings of being safe.^[14] This widening of the safety concept from merely the control of physical injury^[32] is particularly pertinent for sports and physical activity. For instance, although sexual harassment and abuse have been recognized problems in the workplace for more than three decades, the prevalence of sexual exploitation in sports and the consequences for survivors have only recently started to emerge.^[33]

A particular set of safety issues concerns children involved in competitive athletics. Young athletes have been reported to be at increased risk for specific types of acute physical harm, e.g. growth plate and apophyseal injuries and heat illness.^[34] Furthermore, their growing bodies are particularly susceptible to overuse injuries, e.g. little leaguer's shoulder, spondylolisthesis, Osgood-Schlatter disease and Sever's disease.^[35] Child athletes must be guided by gradual skills development, adapted for their psychological maturity, to ensure that the sport environment is a wholesome and emotionally rewarding experience for all levels of participation and competition.^[36] A focus on highly competitive sport has meant that since the 1970s, intensive training programmes have been provided to young people in sports such as gymnastics, figure skating, diving, football, ice hockey and tennis. In gymnastics, the average age for the best athletes has dropped from 25 years in 1965 to about 17 years at present.^[37] Today, governments and professional clubs organize development programmes specifically directed at young athletes in sports academies and specialized athletic centres. The selection of

talented children to the programmes' later stages is mainly based on their achievements in competitions, exposing them to increased risks of extensive physical and mental stress.^[38]

Despite the fact that many youth sports programmes are well balanced and integrated with schooling, the economic exploitation of child athletes has been compared to child labour.^[39] Given the personal and family sacrifices that are needed to attain competitive results, it is doubtful whether involvement of young children in some programmes could be described as gameplay. The International Labour Organisation (ILO) minimum age convention,^[40] ratified by 146 nations over the world, prohibits work for children under the age of 15 years, but allows 'light work' for children aged ≥ 13 years. It may be possible to compare a Canadian or Swedish ice hockey player, aged 14 years, who skates for a hockey club for more than 3 hours, 6 days a week to a child of the same age working on a farm in the developing world. However, in no country has the labour legislation has been specific enough to address the situation of young athletes.^[41]

The United Nations (UN) convention on the Rights of the Child, adopted in 1989 and ratified by all nations except Somalia and the US, remains the most powerful regulation available to judge whether competitive sports are compatible with 'the best interest of the child'.^[41] This convention regulates children's rights in relation to not only employers, but also parents, other adults, schools and healthcare delivery settings. Despite the fact that the convention has been in place for almost two decades, there are very few institutional programmes implemented for the surveillance of potential abuse of child athletes and taking action on child protection in sports (for an exception, see Sport England and the National Society for the Prevention of Cruelty to Children [NSPCC]).^[42]

Another area related to child sports safety is the dislocation of young people with sports talent from their family and friends. The shipping of young sportspersons between the developing world and professional clubs in Europe and the US has grown extensively during the last decade and has been described as 'sports trafficking'.^[43] For example, it is estimated that about 500–700 young baseball players are sent to the US from Latin America every year.^[44] The number of young

football players travelling from Africa and South America to Europe is not known; in the late 1990s, it was estimated that about 400 young players left Uruguay to play in Europe.^[45] Sports trafficking has only recently been brought to public attention, and reliable data to quantify this problem are largely lacking.

2.1 The Promotion of Sports Safety

The rapid development of sport and the global sports industry has occurred without concurrent development of safety initiatives. This means that the present safety-supporting environments for sport are largely under-developed or misplaced in comparison with aspects of societal duty of care. At the international policy level, in 2004 the UN issued the strongest statement available today on sports safety. In resolution 58/5,^[46] it is acknowledged that the hazards associated with sports span much more than just physical injury. Threats to the health and well-being of young athletes were stated to be related to "child labor, violence, doping, early specialisation, over-training and exploitative forms of commercialisation, as well as less visible threats and deprivations, such as premature severance of family bonds and the loss of sporting, social and cultural ties." Even though the international sports federations recognize these issues, few, if any, have the resources or the mandate to manage them on their own.

Lessons learnt from coping with emerging safety issues during the industrial revolution suggest that the management and promotion of sports safety will require multi-professional skills and concerted efforts from many different agencies. Such efforts will need to be implemented in 'globalized' communities, i.e. at local, national and international levels, along with joint efforts from individuals, companies, governments and other local agencies.^[47] Importantly, in the sporting context, these must include the national and international federations, as well as professional and amateur sports clubs.^[48] If sports safety is to repeat the success stories of safety improvements in factories and on roads, it must be prepared to modify physical, social, technological, political, and organizational structures and environments, as well as the perceptions and behaviours or organizations and individuals.

Advancing sports safety at the global level will require evidence-informed management and action by sports federations and clubs, on the one hand, and the authorities responsible for sports facilities and legislations in the civil society on the other. Such evidence-based sports safety promotion demands close involvement with researchers (to provide the evidence) and practitioners (to adopt the scientific knowledge into practice), which in turn requires a new methodological framework for sports safety research. The Translating Research into Injury Prevention Practice (TRIPP) model^[49] builds on the fact that only research that is adopted by sports participants, their coaches and sporting bodies will prevent injuries. Importantly, advances in sports safety will only be achieved if research efforts are directed towards understanding the implementation context for injury prevention, as well as continuing to build the evidence base for their efficacy and effectiveness of interventions. An example of the development of an intervention that has followed these principals is the protective eyewear promotion for squash players in Australia.^[50]

3. Science and Policies for Safe Sports

As early as 1976, it was noted that “we place an undue emphasis on the gifted athletes 15 to 22, a preposterous emphasis on a few professionals aged 23 to 35, and never enough on the mass of our population.”^[51] Other observers have pointed out that the strong financial support directed towards elite sports can only have a significant negative impact on how sports are socially perceived and structured, over and above allowing the wealthiest teams to win.^[52] For example, many communities invest in facilities for competitive sports, even if the investments simultaneously force them to cut resources in other areas for public spending.^[53] The fiercest critics assert that increased commercialization will lead to violation of traditionally highly valued aspects of sport, e.g. downplay of enjoyment, disregard of fair play, and neglect of increasing violence.^[54] Regardless of whether these critics are right or not, the demands that individuals, organizations and societies place on human physical and mental capabilities in different sporting contexts modify how injury risk is identified, accepted and managed. It is therefore imperative that injury

prevention and safety promotion in sport is adapted to the specific social construct of sporting practice and the culture of its delivery. For instance, the Lebanese Association for Sports Injury Prevention has developed a safe sport policy suitable for Lebanon and the Middle East countries in terms of sports regulations, and legislation proposals based on the specific conditions in the region.^[55]

The context-dependence of the injury problem implies that there is a significant role for sports scientists to play if social and ecological fallacy is to be avoided when addressing safety issues in sports policy making. Traditionally focused sports injury prevention research has contributed to the building of an evidence base about the magnitude of the injury problem, identification of risk factors and efficacy of interventions.^[56,57] Unfortunately, such approaches only indirectly impact on policy change, and from a global prevention perspective, contributions from traditional scientific knowledge may be insufficient.^[48,49] Jackson et al.^[58] argue that more research is needed into how to strengthen and garner community action before our health challenges can be effectively addressed.

The management of the sports injury problem will require a constant intermingling between scientific findings, contextual factors and values in both the scientific and the policy processes. Very few would argue that science and policy making are separate entities in today's societies.^[59] Sports science and sports policy are not only intersecting, but also co-evolving social domains. As an example, the development and implementation of sports safety policies is significantly influenced by differences between the distribution of the intervention costs and the corresponding distribution of benefits among groups of sports participants or communities. Sports injury researchers should contribute to the balancing of this decision process by conducting cost-effectiveness studies. This is an area where little work has been done, but the example from Québec of face guards for ice-hockey players shows the power of this information. After 1 year of enforcement among adult recreational players, the full face protector use rate increased from 25% to 88%. It was estimated that the regulation resulted in a net saving of \$Can1.9 million in healthcare costs alone, and a savings-cost ratio for the regulation of 1.87:1.^[60] Having said this, it also has to be acknowledged that concentrated

interests still often outweigh the interests of larger populations in policy making, particularly in the absence of cost-effectiveness information. Government and organizational decision makers expect criticism for decisions that impose costs rather than expecting recognition for providing new benefits.^[61] As a result, the most politically feasible environment for policy change is one of 'client politics', which offers visible benefits for a specific group while imposing diffuse costs and few disadvantages among other groups. In other words, the institutional environment predisposes for a bias among policy makers towards providing beneficial policy to organizations and population subgroups that both have a powerful societal voice and are, in the public opinion, regarded as 'deserving'. In the sports safety context, researchers can contribute to decreasing this bias by evaluating sports safety policies with regard to outcomes among less resourceful groups and, in the global setting, in developing countries.

For instance, building on experiences from other health policy areas,^[62] influence from the media coverage of certain sports and sportspersons can neutralize scientific knowledge in decisions regarding safety policies. The issue is that sports journalists often glorify injuries, with major sports stars 'battling on', injury making them even bigger

heroes. The message given is that it is 'alright to play with injury if you are going to win'^[63] and 'hero' status is often afforded to athletes who do so. This message, however, tells parents and other significant stakeholders that sport is an inherently high-risk activity, and this may lead to parents actively preventing their children from playing certain sports.^[64] In such situations, based on their experiences as media consumers, not only may those targeted by sports safety programmes respond negatively to the interventions themselves, but also the general public may regard them as 'not deserving'.^[65] This element of injury glorification in the dramaturgy of sports journalism is an example of influence on sports policy that can be counteracted by properly targeted sports safety research. If an intersection between sports science and sports policy can be established, a series of practical and theoretical issues associated with sports safety, such as the media reports of injuries, can be addressed by exchange of ideas and knowledge. To be able to manage such a shared arena, the basic processes in the intersection need to be made explicit. These processes can be defined as social courses of action that encompass relations between scientists and actors involved in sports policy making, and that allow for dialogue, co-evolution and joint improvement of policy making (table I).

Table I. Intersection between science and policy in the area of sports safety (adapted from van den Hove,^[66] with permission from Elsevier. Copyright © 2007)

Manifestations of sports safety science	Examples of intersection with policy in sports
<i>Outputs</i>	Definitions of objective knowledge Integration of scientific knowledge in sports safety policy making (explanations, predictions) Sports safety research contributes to emergence of novel issues on sports policy agenda, and establishes safety during physical exercise at the health promotion agenda
<i>Processes</i>	
Defining and describing a sports safety problem, and designing potential solutions	Coordination between scientific and policy process
Organization and funding of research	Sports research policy is driven by political considerations, with appropriate funding and infrastructure support Results of sports safety research influence prioritisation in sports policy
Quality and validation processes	Requirement of scientific validation in sports policy processes
Education and training processes	Policy influence on orientation of education and training Influence of education and training on role of science in policy
Networking processes	Channelling scientific sports safety knowledge to policy makers and practitioners
<i>Sports safety scientists</i>	Scientific experts participating in policy processes Scientific experts influencing policy by reporting their values and interests

3.1 Safe Sports International

International sports safety programmes are yet to critically evaluate sports safety policies and injury prevention programmes with regard to outcomes for a broad range of client groups, covering the spectrum of those who are socially disadvantaged to those from wealthy Western countries. At the global level, it is particularly important that the estimated and factual effects of institutional sports safety interventions in the third world country context be considered.

SSI is an impartial non-profit programme for global promotion of sports safety that was established in 2006. It originates from the Safe Communities movement,^[67] but is autonomous with regard to its policy and scope. An important underpinning for the operation of the SSI programme is the sports safety experience from Québec, Canada. In 1979, to significantly contribute to the establishment of safe environments, the government of Québec adopted the *Act Respecting Safety in Sports*, which created the Québec Sports Safety Board (QSSB).^[68] The QSSB has not been in operation since 1998, but the Act is still in place. The Québec Ministry of Education, Leisure, and Sport is responsible for its application. The SSI management group includes representatives from all continents to ensure its global relevance. SSI has nine operational objectives covering general principles, scientific needs and policy goals. These are outlined in table II, table III and table IV. Through addressing these objectives, the ultimate goal of SSI is to establish a sports safety colloquium shared by sportspersons, sports scientists, sports officials, and agencies that are responsible for implementing and administering policies at national and international levels.

Table II. General objectives of Safe Sport International (SSI)

To bring community sports back into health, promoting the 'magic circle of gameplay', while also accommodating the pursuit of excellence by developing a scientifically informed international platform that brings together socially and geographically defined communities having an interest in increasing sports safety
To advance the level of 'industrial safety' in professional sports by distribution of information and empowerment of athletes, and supporting sports federations and other agencies with responsibility for the establishment of safe sports environments
To recognize and act on the synergies between global health promotion efforts and safety promotion

Table III. Policy objectives of Safe Sport International (SSI)

To advocate and promote international efforts in sports injury prevention research that significantly contribute to the evidence base for the effectiveness and efficacy of all sports safety prevention measures
To care for the rights of child athletes to remain children (United Nations convention on the Rights of the Child, ILO C138)
To assist developing countries in sports injury initiatives by disseminating information about the evidence base on sports safety and by establishing international networks
To advocate national and international policy, and to guide governmental and sports body formal responses to the sports injury problem

A central tenet of SSI is that young sportspersons have the right to health and well-being, to be achieved by a balance of sports industry needs, safety-orientated scientific knowledge and evidence-based actions. The aim of the programme is 2-fold: to establish the sports injury problem firmly on the global health policy agenda, and to introduce sports safety as a mandatory component in the establishment of sustainable sports organizations. The programme is founded on a solid base of sports injury epidemiology and proceeds by accepting that the interaction between science and politics plays a critical role in health affairs, and that sports safety should not be excluded from this interplay.

It is recognized that in addition to scientific evidence, public perceptions regarding the severity and solvability of the sports safety problem, responsibility issues and the social position of affected populations all influence organizational and governmental responses.^[69] The SSI programme aims to collate scientific evidence for identifying when large-scale transformation of sports safety policy can and should be implemented, thus dynamically highlighting the actual critical processes in the safety policy development. The programme also addresses how fragmented agencies, resistant commercial interests and other economic constraints can lead policy makers in sports to adopt a 'minimal change' strategy in safety policy rather than making comprehensive reforms when faced with urgent problems.

SSI is adopting a working method that supports the formation of partnerships between sports safety researchers and socially defined sports-specific communities, addressing locally identified problems. In parallel, through co-operation with general safety promotion and injury prevention

Table IV. Scientific objectives of Safe Sport International (SSI)

To recognize that there are particular implementation challenges in the sports injury context that justify the employment of a context-specific framework for the transfer of research results to practice settings and to develop innovative methodologies to allow this to occur

To work towards the standardization of concepts and definitions such as sports injury and sports safety, as these are critical for adding to the research evidence base, the evaluation of implemented safety programmes and the monitoring of both spatial and temporal trends in injury rates

To advocate and support, where appropriate, the formal evaluation of sports safety programmes, particularly those implemented in community settings

programmes, SSI mediates alliances with geographically defined communities in efforts to develop safe local environments for physical activities. The programme uses electronic media and the Internet strategically to reach its goals, as these have previously been successful as community mobilization strategies in health promotion.^[70] In doing so, it takes advantage of recent advances in technical designs for computer networks for the supporting of broad health promotion programmes.^[71]

The formation of SSI is a direct response to the need to establish the sports injury problem as a critical component of general global health policy agendas, and to introduce sports safety as a mandatory component of all sustainable sports organizations. It is thereby recognized that the establishment of an explicit intersection between science and policy making is necessary for the future development of all sports and the necessary safety gains required for participants around the world. Accordingly, the SSI safety promotion programme is organized particularly to be active in this intersection.

4. Conclusion

Although incremental responses to sports safety problems are starting to become established in many settings, particularly in the more wealthy Westernized countries, they are likely to remain restricted to local issues or to particular groups of athletes. At the community level, erroneous public beliefs that 'sports injury is inevitable' can lead to sports safety issues being downgraded in importance in favour of other health problems that are perceived to be more important or preventable. In the commercial sports industry setting, scientific

evidence can become outweighed by industry opposition and economic arguments.

In recent years, there has been a growing activity around the topic of science-policy interfaces.^[72] A key reason behind the emergence of this concept is that it captures a series of practical experiences and needs, and reflects theoretical and methodological interrogations. Organizations such as SSI can contribute to overcoming the inertia against the adoption of radical and comprehensive safety policies in sports by networking, empowerment of deprived groups, and impartial analyses of scientific evidence and accumulating information about the key components of partnerships for health promotion gains. Scientific evidence is the central asset in this process, as it can be applied to both particular safety policy processes (e.g. the use of protective equipments in specific sports) and general issues at a global scale (e.g. concerning children's rights in the professional sports context). However, the mere availability of evidence is not enough for policy change to take place. A series of methodological issues in the interface between science and policy in sports safety still need to be solved before the interaction can become efficient. These problems include improvement of the interface transparency – in particular with regard to sportspersons and the public, translation of scientific knowledge into policy-relevant knowledge (and of policy statements into scientific evaluation questions), the development of dissemination channels for scientific knowledge to the various potential user groups, and the establishment of science-policy interfaces in a democratic context.

In summary, opening windows of opportunity for sports safety policy change will require significant shifts in the public perception of the injury problem and in the distribution of control of the strategic power within sport.^[73] This will only be achieved when there is a convergence of problem understanding among scientists and policy makers. The strategy for global sports safety organizations, such as SSI, must therefore be defined with regard to opportunities for accommodating and balancing scientifically validated policy alternatives against the priorities of political leaders, international sports organizations, commercial interests and the public opinion. Given the complex integration of sport in today's societies, a viable constituency for sports safety can only be mobilized, and sustainable

policy innovations reached within reasonable periods, if a stable global infrastructure for negotiating such convergences can be established.

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