# Implementation of the FIFA 11+ football warm up program: How to approach and convince the Football associations to invest in prevention

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## ABSTRACT

In the last decade, injury prevention has received a lot of attention in sports medicine, and recently international sports-governing bodies, such as the International Olympic Committee, declared the protection of the athletes' health as one of their major objectives.
In 1994, the Fédération Internationale de Football Association (FIFA) established its Medical Assessment and Research Centre (F-MARC) with the aim 'to prevent football injuries and to promote football as a health-enhancing leisure activity, improving social behaviour'. Since then, FIFA has developed and evaluated its injury-prevention programmes 'The 11' and 'FIFA 11+' have demonstrated in several scientific studies how simple exercise-based programmes can decrease the incidence of injuries in amateur football players. This paper summarises 18 years of scientific and on-field work in injury prevention by an international sports federation (FIFA), from formulating the aim to make its sport safer to the worldwide dissemination of its injury-prevention programme in amateur football.

## INTRODUCTION

Football is played on an amateur or recreational level by almost 300 million people all over the world.[1] Besides being a healthy leisure activity, football, as a contact team sport, has a certain risk of injury. The medical treatment of football-related injuries could have a significant socioeconomic impact: for example, in Switzerland (with 7.9 million inhabitants), the healthcare costs for football injuries were nearly US$170 million in 2010.[2]

There is extensive literature on the frequency and characteristics of football injuries,[3–7] and several scientific studies on injury-prevention programmes in amateur football players have been published.[8–25] However, the implementation of injury-prevention programmes in the real world of sports represents a major challenge.[26 27] However the effectiveness of countrywide campaigns to reduce the incidence of football injuries has been proven.[28 29]

In 1994, Fédération Internationale de Football Association (FIFA) founded its Medical Assessment and Research Centre (F-MARC) in order to create and disseminate scientific knowledge on various medical topics in football, to reduce football injuries and to promote football as a health-enhancing leisure activity.

Eighteen years later, this paper summarises the historical background, development, scientific evaluation and dissemination strategies of FIFA's injury-prevention programmes ('FIFA 11+') in order to provide a model of how an international sports federation can make its sport safer.

### Development of injury-prevention programmes

The first scientific study on injury prevention in football was Jan Ekstrand's thesis in the 1980s.[30] For about 20 years, no other author published a research paper on the prevention of football injuries in general, and only a few studies investigated the prevention of recurrent ankle sprains[18 21 22] and/or severe knee injuries.[19 31] In 2000, Heidt *et al*[12] showed that the 42 female players who participated in the Frappier Acceleration Training Programme had less time-loss injuries than the control group. At the same time, F-MARC conducted its first study on the prevention of football injuries showing 21% fewer injuries in the intervention compared with the control group.[13] The interventions were focused on improving the structure and content of the training by educating and supervising the coaches and players. The programme included preventive interventions such as improvement of warm-up, regular cool-down, taping of unstable ankles, adequate rehabilitation, promotion of the spirit of fair play and 10 sets of exercises designed to improve coordination, stability of the ankle and knee, flexibility and strength of the trunk, hip and leg muscles. On the basis of the experiences with this pilot study and in cooperation with international experts, F-MARC developed a basic injury-prevention programme for amateur football players called 'The 11'.

'The 11' comprises 10 evidence-based or best-practice exercises (core stability, balance, dynamic stabilisation and eccentric hamstring strength) and the promotion of fair play. The programme was designed to reduce the most common football injuries (ankle and knee sprains, hamstring and groin strains). It can be completed in 10–15 min and requires no equipment other than a ball. 'The 11' was implemented in two countrywide campaigns (Switzerland and New Zealand) in cooperation with the national accident insurance company and the national football association.[28 29]

In Switzerland, the implementation of 'The 11' and its effect on the injury rate were carefully evaluated by an independent research company.[29] Four years after the launch of the programme, teams that included 'The 11' as a part of their warm-up had 11.5% fewer match injuries and 25.3% fewer training injuries than teams that warmed up as usual. In New Zealand, the implementation of 'The 11' resulted in a 2.4 dollars of return of investment for the national accident insurance company after



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2 years.[28] In a randomised controlled trial (RCT) conducted by the Oslo Sports Trauma and Research Center (OSTRC), the compliance of the intervention group was too poor for a statistically significant effect of the programme.[32]

On the basis of the experiences with 'The 11', 'PEP' (Prevent Injury and Enhance Performance programme)[10 16] and other exercise-based programmes[12 19 31 33] to prevent football injuries, an advanced version ('FIFA 11+') was developed in 2006 together with OSTRC and the Santa Monica Orthopaedic and Sports Medicine Research Foundation. 'FIFA 11+' is a complete warm-up programme with running exercises at the beginning and end to activate the cardiovascular system, and specific preventive exercises focusing on core and leg strength, balance and agility, each of three levels of increasing difficulty to provide variation and progression. It takes about 20 min to complete, and requires a minimum of equipment (a set of cones and balls). 'FIFA 11+' is time-efficient because it replaces the usual warm-up.

An RCT showed that young female teams performing the 'FIFA 11+' at least twice a week (as a standard warm-up before their training) had 37% fewer training injuries and 29% fewer match injuries, and severe injuries were reduced by almost 50%.[20] Compliance with 'FIFA 11+' was high, and players with a higher compliance had a significantly lower injury risk than others.[34]

In another RCT study on Canadian youth female football, Steffen *et al*[35] found that players with higher adherence to 'FIFA 11+' showed significant improvements in functional balance and reduced injury risk. Two recent studies in Italian amateur football players showed that the physiological warm-up effects of 'FIFA 11+' are similar to or even better than a standard warm-up routine, and that it enhances neuromuscular control (core/lower extremity) and knee flexor strength.[36 37]

Other authors have found improvements in static/dynamic balance, and thigh muscle strength in male football and futsal players after performing 'FIFA 11+'.[38–41]

## Development of a dissemination strategy

For F-MARC, the *coach* is the key person to promote injury prevention to his/her players. While the coach, especially at a low level, has to regard various aspects in the training (eg, physical preparation, tactics, fair play, team success), it is important to raise his/her motivation to implement an injury-prevention programme with his team. It is important to stress that regular and correct performance of the exercises is crucial for the preventive effect.

*Information material* on 'FIFA 11+' was developed, produced and made available for coaches and players. The material includes a detailed manual, an instructional DVD, a poster, a website and a promotional booklet with DVD. All material is available in the four FIFA languages (English, Spanish, German and French) and can be accessed on http://www.F-MARC.com/11plus.

'FIFA 11+' is best taught to coaches in a *workshop* that includes theoretical background knowledge and practical demonstration of the exercises as recently shown by Steffen *et al*[42] In a cluster randomised trial on different implementation strategies, the authors found that a preseason coach education workshop was more effective in terms of better compliance and decreased injury risk in players than other delivery methods (unsupervised website, additional supervision by a physical therapist) of the programme. After increasing the motivation of the coach and raising awareness of injury prevention, the exercises should be briefly explained and demonstrated. It is helpful to select a participant to perform the exercise, while the instructor highlights the correct execution of the exercises. The participants should then perform the exercises and be corrected by the instructor(s). The participants should get 'a feeling' for the exercises and appreciate the challenges behind each exercise. In the second half of the workshop, each of the participants should teach at least one of the exercises to the group and get feedback on this from the instructor.

For the *countrywide campaign* in Switzerland, 'The 11' was integrated with the coach education of the Swiss Football Association (Schweizerischer Fussballverband (SFV)) using a 'teach the teacher' strategy. All instructor coaches of the SFV were educated by sports physical therapists on how to deliver the programme to the coaches in their licensing or refresher courses. During a period of 3 years, 5000 licensed amateur coaches were subsequently instructed on how to perform 'The 11' with their teams and received the information material.[29] The same strategy was used in New Zealand, where 'The 11' was implemented as part of the 'SoccerSmart Program'.[28 43]

## Worldwide dissemination of 'FIFA 11+'

In 2009, FIFA started the dissemination of 'FIFA 11+' in its 209 Member Associations (MAs). On the basis of the experience with the countrywide implementation in Switzerland and New Zealand, and on the evaluations of other sports injury-prevention programme implementations (ie, rugby),[44 45] a guideline on how to implement the 'FIFA 11+' injury-prevention programme on a larger scale in amateur football was developed (see figure 1). The implementation is conducted either in close cooperation with MAs or via FIFA Coaching Instructor courses.

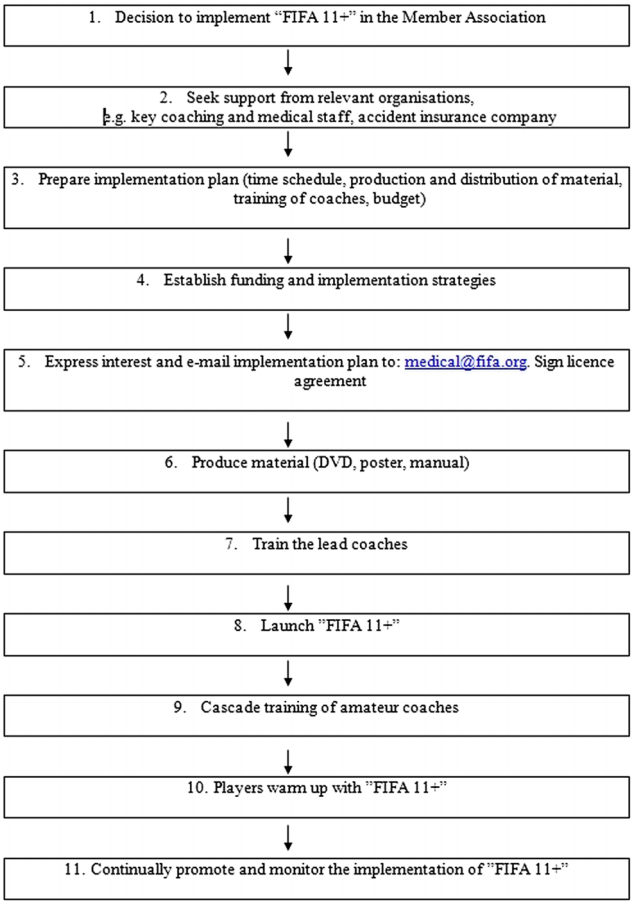


**Figure 1** Eleven steps to implement 'FIFA 11+'.

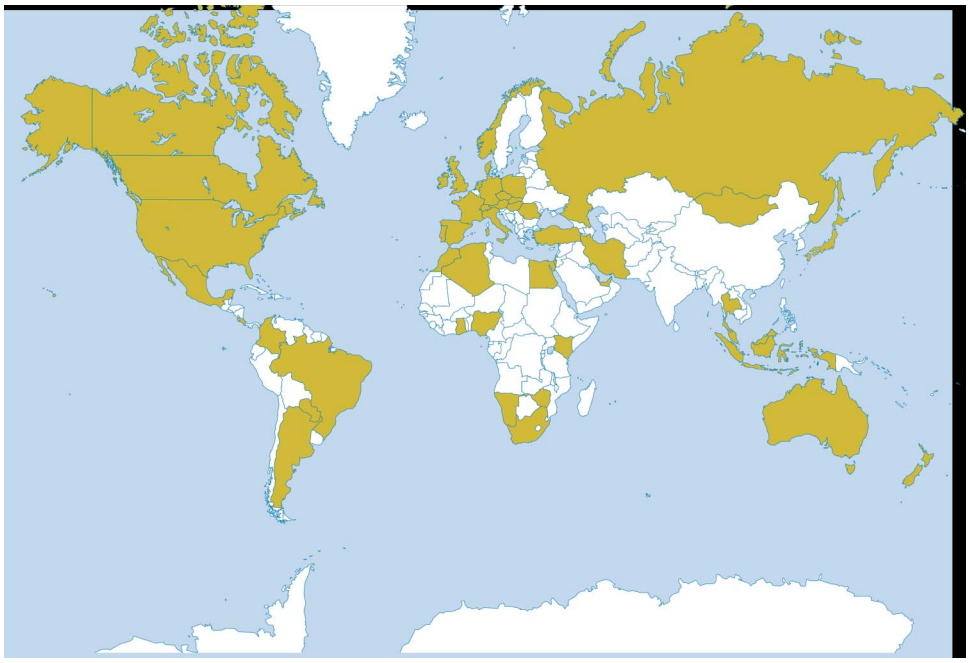

**Figure 2** The countries in the dark colour are the ones whose coaches attended a 'FIFA 11+' instructor course (2008–2012).

The national Football Associations of Spain, Japan, Italy, Brazil and Germany integrated 'FIFA 11+' in their coaching curriculum or in their physical training/education curriculum. Thus, the world football champions took the lead and acted as role models, and other MAs (Costa Rica, Hong Kong, Netherlands, Denmark, Poland, Hungary, Australia, England and Thailand) followed and signed the Licence Agreement with FIFA (see figure 1, step 5). Until now about 5000 coaches from more than forty countries have been instructed on how to implement the 'FIFA 11+' (figure 2). Even if this represents just about 25% of FIFA's MAs and a much lower percentage of all football coaches, it is an important step for the worldwide dissemination of the programme. F-MARC supports MAs in the preparation of educational material in the local language, as well as workshops for the first group of instructors to initiate the cascade training.

## Lessons learnt

The F-MARC team has gained experience during the years of dissemination of the injury-prevention programmes. It has been found that understanding the coach's character and highlighting the importance of the programme to the coach is especially important. Preventing injuries and thereby reducing the number of injured players means that the coach will have more players available for his/her ideal team. Therefore, it is not only information and education about the role of injury prevention that is important, but also speaking the same language as the coach. One of the keys while conducting a course is of 'proposing' rather than 'imposing' 'FIFA 11+'. The dialogue on the pitch with coaches is often more important than the distributed materials, thus allowing for friendly discussion and practical work with the preventive programme. Therefore, the choice of the instructors is crucial and F-MARC's best experiences have been with sports physiotherapists or athletic trainers who have an active involvement in football, because they already 'live and speak the football language'. Additionally, the cooperation with famous players and coaches acting as 'FIFA 11+' ambassadors (see teaser on https://vimeo.com/45562029 and http://www.f-marc.com/11plus) has helped significantly in the communication with coaches. 'FIFA 11+' has also been presented to the delegates of all MAs at the last two FIFA Medical Conferences (Zürich 2009, Budapest 2012). After initial enthusiasm from the interested MAs, F-MARC has experienced a wide range of dedication and compliance from those MAs to the proposed 'FIFA 11+' implementation guidelines. At the MA level, it has to be acknowledged that highly motivated people are needed in order to successfully plan, realise and constantly monitor a countrywide implementation.

## Conclusions and future directions

The two countrywide campaigns in Switzerland and New Zealand represent successful examples of injury prevention in amateur football.[28 29] Gianotti and Hume [46] introduced preimplementation and postimplementation cost outcome formulae to provide information regarding the success of a prevention programme. These data provide a return on investment for each dollar invested in the programme and cost-savings. Since the SoccerSmart Programme (including the 'The 11' programme) was introduced in New Zealand in 2004, the Accident Compensation Corporation (ACC) has invested NZ$650 000. Until June 2011, ACC has saved NZ$5 331 000: the return of investment has risen to 8.20 for each invested Dollar (personal communication of Dr S Gianotti, ACC, New Zealand). These data, together with the published results of the countrywide implementation in Switzerland, reinforce the hypothesis outlined by F-MARC back in 1994: prevention measures or programmes can not only reduce the incidence of football injuries, but also have the potential to save billions of dollars in health-related costs worldwide.[47]

In the next years, FIFA and F-MARC will continue the worldwide dissemination of 'FIFA 11+', with particular attention in seeking the best possible cooperation with MAs adopting the 'FIFA 11+' injury-prevention programme.

## What this paper adds

- A guideline on the steps necessary to implement a countrywide injury-prevention programme ('FIFA 11+') in amateur football.
- A better understanding of the role of the football coach as the key person in the implementation process.
- Prevention in community football not only reduces the injury incidence but also has a socioeconomic impact in terms of healthcare costs reduction.

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## Notes