A successful nationwide implementation of the ‘FIFA 11 for Health’ programme in Brazilian elementary schools

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ABSTRACT

Objectives To deliver a nationwide implementation of the ‘FIFA 11 for Health’ programme in Brazil and to compare the outcomes with results obtained previously in Sub-Saharan Africa.

Method A cohort study among 3694 Brazilian children aged 9–12 years within 128 elementary schools situated in 12 cities in the five Regions of Brazil. The ‘FIFA 11 for Health’ programme contains 11 90 min sessions: the first 45 min serve to encourage physical activity through the development of football skills (Play Football) and the second 45 min provide a vehicle for delivering 10 health messages (Play Fair). We measured preintervention and postintervention health knowledge (29-item questionnaire) and the children’s evaluation of the programme (6-item questionnaire).

Results Mean age of the children across the five Regions was 10.6 years (range 9.2–11.6). The mean preintervention health knowledge score for the five Regions was 60.2% (range 53.8–65.3%); the mean postintervention score was 78.6% (range 70.7–86.8%); thus the mean increase in health knowledge was 18.4% (range 13.6–29.1%). 91% of the children gave a positive evaluation for the programme (range across five Regions: 82.3–96.7%).

Summary The study showed that the ‘FIFA 11 for Health’ programme, which was originally developed in English and translated into another language, was delivered successfully with results equivalent to those previously obtained in Sub-Saharan Africa. The programme was effective across the five Regions of Brazil.
The aim of the present study was to report the implementation strategy, outcomes and conclusions from a collaborative (FIFA, Brazilian Football Confederation and Brazilian Ministries of Health, Education and Sport) nationwide implementation of the ‘FIFA 11 for Health’ programme. The programme previously used in Africa was reviewed with representatives from the Ministry of Health to confirm its relevance to the health issues prevalent in Brazil.

As a result, minor changes to words and phrases were made within various Sessions and Session 5 (play football: shielding; play fair: use a treated bed net) was replaced with a new Session 5 (Play Football: Control the ball; Play Fair: Control your weight); this latter change was made because malaria was considered only to be a significant health problem in the North Region, whereas overweight was viewed to be important in all Regions of Brazil. The Play Football and Play Fair sessions included within the revised programme and the health issues addressed in each session are summarised in Table 2. In addition, one of the health statements (“Not having sex is an effective way to avoid getting HIV/AIDS”) used in Sub-Saharan Africa to assess children’s knowledge about the prevention of HIV/AIDS and sexually transmitted diseases was not included in the Brazilian questionnaire at the request of the Ministry of Health, as it was considered to be inconsistent with Brazilian culture. The revised ‘FIFA 11 for Health’ course manual, activity cards and preintervention and postintervention health knowledge questionnaires were translated from English into Brazilian-Portuguese.

The Ministry of Education agreed to deliver the ‘FIFA 11 for Health’ programme within the curriculum of elementary schools (children aged 6–14 years); the appropriate municipal education authority gave final approval for individual schools.

A National Project Leader and 12 city coordinators were recruited from the Brazilian Football Confederation to work with the F-MARC ‘FIFA 11 for Health’ Project Leader to facilitate the implementation. The planned timetable for the project, from May 2013 to June 2014, took account of the academic year, national holidays, school curricula and examination schedules and the availability of F-MARC master instructors to deliver the teacher training courses. The 12 host cities for the 2014 FIFA World Cup Brazil (North: Manaus; North-east: Fortaleza, Natal, Recife, Salvador; Centre-West: Brasilia, Cuiabá; South-east: Belo Horizonte, Rio de Janeiro, São Paulo; South: Curitiba, Porto Alegre) were venues for implementation. Schools recruited within each of the cities were selected by the local education authorities and were intended to represent the range of academic abilities within the cities. The numbers of

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### Table 1  Leading health-related causes of death, life expectancy and under 5 mortality rate

| Rank | World | Brazil |
|------|-------|--------|
| 1    | Coronary heart disease | Coronary heart disease |
| 2    | Stroke | Stroke |
| 3    | Influenza and pneumonia | Diabetes mellitus |
| 4    | Lung disease | Influenza and pneumonia |
| 5    | Diarrhoeal diseases | Hypertension |
| 6    | HIV/AIDS | Lung disease |
| 7    | Lung cancers | Lung cancers |
| 8    | Tuberculosis | Liver disease |
| 9    | Diabetes mellitus | Inflammatory heart disease |
| 10   | Hypertension | Stomach cancer |

**Life expectancy, years** 70 74

**Under 5 mortality rate/1000 live-births** 48 14

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### Table 2  ‘FIFA 11 for Health’ programme content and health issues addressed by each session

| Session | ‘Play Football’ activity | ‘Play Fair’ health topic | Health issues addressed in Session |
|---------|--------------------------|--------------------------|------------------------------------|
| 1       | Warming up               | Play football (exercise)  | Cardiovascular disease, stroke, diabetes, overweight, obesity |
| 2       | Passing                  | Respect girls and women  | Gender violence, rape, mental abuse, HIV/AIDS, STDs |
| 3       | Heading                  | Protect yourself from HIV and STDs | HIV/AIDS, syphilis, chlamydia, gonorrhoea |
| 4       | Dribbling                | Avoid drugs, alcohol and tobacco | Lung disease, kidney disease, gender violence, mental health |
| 5       | Controlling              | Control your weight      | Obesity, overweight, diabetes, cardiovascular disease |
| 6       | Defending                | Wash your hands          | Diarrhoea, cholera, dysentery, typhoid |
| 7       | Trapping                 | Drink clean water        | Diarrhoea, cholera, dysentery, typhoid |
| 8       | Building fitness         | Eat a balanced diet      | Overweight, obesity, diabetes, cardiovascular disease |
| 9       | Shooting                 | Get vaccinated           | Influenza, polio, smallpox, meningitis, tuberculosis, tetanus |
| 10      | Goalkeeping              | Take your prescribed medication | Cardiovascular disease, hypertension, diabetes, HIV/AIDS |
| 11      | Teamwork                 | Fair play                | Review of all health issues discussed in Sessions 1 to 10 |
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Table 3  Number of cities, schools, teachers and children taking part in the intervention and the evaluation sample population completing pre and postintervention questionnaires

| Parameter (values at start of intervention) | Region North | North-east | Centre-West | South-east | South | ALL regions |
|--------------------------------------------|--------------|------------|-------------|------------|-------|-------------|
| Intervention population                     |              |            |             |            |       |             |
| Number of cities                            | 1            | 4          | 2           | 3          | 2     | 12          |
| Number of schools                           | 11           | 40         | 19          | 33         | 25    | 128         |
| Number of teachers                          | 23           | 79         | 35          | 64         | 48    | 249         |
| Number of children                          | 374          | 1209       | 557         | 893        | 661   | 3694        |
| Evaluation subpopulation                     |              |            |             |            |       |             |
| Number of cities                            | 1            | 4          | 2           | 3          | 2     | 12          |
| Number of schools                           | 11           | 18         | 5           | 14         | 16    | 64          |
| Gender*; % boys% girls                       | 48.7/51.3    | 51.1/48.9  | 51.4/48.6   | 61.0/39.0  | 51.7/48.3 | 52.7/47.3  |
| Age of children*; mean, years (SD)           | 11.0 (1.2)   | 11.3 (1.0) | 11.6 (1.5)  | 10.8 (1.0) | 9.2 (1.0) | 10.6 (1.4) |
| Prequestionnaires (number of children)       | 310          | 494        | 146         | 338        | 412   | 1700        |
| Postquestionnaires (number of children)      | 310          | 458        | 118         | 269        | 400   | 1555        |

*As recorded at the start of the intervention.
18.4% with the lowest increase being observed in the North-east Region (13.6%) and the highest in the South (29.1%).

The overall preintervention and postintervention levels of health knowledge together with the overall change in health knowledge in each Region, as seen in figures 1 and 2, show the

| Session number and health statement | Region and stage of intervention (% correct responses) |
|-------------------------------------|-------------------------------------------------------|
|                                    | North | North-east | Centre-West | South-east | South | ALL Regions |
|                                    | Pre   | Post       | Pre         | Post       | Pre   | Post       | Pre         | Post       |
| S-1 Football injuries can be prevented by warming up correctly | 57.6  | 73.7+      | 62.0        | 83.1+      | 65.8  | 83.5+      | 64.0        | 86.7+      | 62.4  | 78.2+      |
| Regular exercise helps to prevent being overweight | 65.1  | 72.4       | 82.9+       | 77.1       | 87.3+ | 71.7       | 78.8+       | 79.4       | 89.7+ | 73.0       | 83.5+ |
| Minimum daily amount of exercise required to stay healthy | 35.1  | 69.8+      | 57.9        | 72.2+      | 47.8  | 74.1+      | 63.0        | 82.7+      | 39.4  | 85.8+      | 49.2   | 77.3+ |
| S-2 Important for boys to listen to girls | 62.3  | 86.6+      | 69.2        | 81.6+      | 64.5  | 82.1+      | 64.7        | 82.2+      | 58.2  | 95.0+      | 64.0   | 85.6+ |
| Boys should help to protect girls from harm | 84.6  | 89.4       | 80.0        | 86.4#      | 77.9  | 83.8       | 85.0        | 87.6       | 80.5  | 94.2+      | 81.8   | 89.0+ |
| Football is just for boys | 83.9  | 91.0+      | 87.1        | 89.4       | 95.1  | 94.9       | 90.4        | 95.1+      | 87.9  | 94.2+      | 88.1   | 92.4+ |
| S-3* You can get HIV by touching someone with HIV/AIDS | 76.7  | 85.1+      | 80.8        | 84.6       | 84.5  | 84.9       | 81.0        | 88.1+      | 83.0  | 94.0+      | 80.9   | 88.6+ |
| You can tell whether people have HIV by the way they look | 90.5  | 93.8       | 89.3        | 90.8       | 95.8  | 97.4       | 94.6        | 96.3       | 91.7  | 96.0+      | 91.7   | 94.0+ |
| Minimum daily amount of exercise required to stay healthy | 45.6  | 59.5+      | 63.6        | 78.0+      | 69.0  | 80.2§      | 65.1        | 82.1+      | 53.1  | 80.7+      | 58.5   | 76.0+ |
| S-4 It is possible to become addicted by starting to smoke cigarettes | 62.5  | 80.8+      | 69.0        | 82.2+      | 60.7  | 87.2+      | 72.3        | 87.3+      | 57.9  | 89.0+      | 65.1   | 77.5+ |
| People who smoke cigarettes have more health problems | 91.7  | 92.5       | 88.9        | 90.8       | 95.8  | 97.4       | 94.6        | 96.3       | 91.7  | 96.0+      | 91.7   | 94.0+ |
| It is my choice whether or not I take drugs | 33.9  | 54.7+      | 39.7        | 65.5+      | 72.4  | 84.6§      | 67.4        | 82.1+      | 66.5  | 91.7+      | 62.0   | 81.5+ |
| People who smoke cigarettes have more health problems | 47.6  | 72.5+      | 60.7        | 77.6+      | 72.4  | 84.6§      | 67.4        | 82.1+      | 66.5  | 91.7+      | 62.0   | 81.5+ |
| S-5 After washing, it is OK to dry my hands on my shirt | 55.5  | 71.1+      | 73.1        | 80.0§      | 75.2  | 82.9       | 70.1        | 82.4+      | 57.2  | 85.2+      | 65.6   | 80.2+ |
| You can see germs on your hands | 39.1  | 60.5+      | 43.9        | 63.3+      | 56.3  | 71.3#      | 47.6        | 69.8+      | 33.4  | 81.1+      | 43.5   | 69.1+ |
| How long should I wash my hands to remove germs | 70.4  | 87.6+      | 70.0        | 86.4       | 70.0  | 86.4       | 70.0        | 86.4       | 70.0  | 86.4       | 70.0   | 86.4 |
| S-6 If I can stop taking medication as soon as I feel better | 44.9  | 70.7+      | 54.9        | 76.3+      | 62.4  | 83.2+      | 57.7        | 82.1+      | 45.0  | 88.9+      | 51.9   | 79.5+ |
| People with diabetes can die if untreated | 79.5  | 75.6       | 79.6        | 81.0       | 72.0  | 79.3       | 73.6        | 86.7+      | 78.6  | 89.9+      | 77.5   | 83.3+ |
| The right medication can help people with HIV to live longer | 43.4  | 58.7+      | 51.5        | 64.4+      | 45.4  | 63.2+      | 51.2        | 65.0+      | 44.6  | 79.8+      | 47.8   | 67.3+ |
| Mean values: | 53.8  | 70.7       | 62.0        | 75.6       | 65.3  | 79.3       | 64.2        | 80.1       | 57.7  | 86.8       | 60.2   | 78.6 |

Bold face is used in table 4 for the mean values for all the sessions to differentiate these values from all the other values shown in the table. Statistical tests refer to comparisons of the postintervention and preintervention values for the same Region. §p ≤ 0.05; #: p ≤ 0.01; ¶: p ≤ 0.005; +: p ≤ 0.001.

*The Ministry of Health would not allow children to be asked the question "Not having sex is an effective way to avoid getting HIV/AIDS" (which has been used in previous interventions).
change in health knowledge for each health topic (session) within each Region. The children’s overall ratings for the programme (table 5) were all high: the lowest scores being recorded in the South-east Region (82.3%) and the highest in the South (96.7%), which may reflect the high postintervention knowledge scores recorded in the South Region.

Table 6 provides a comparison between the ‘FIFA 11 for Health’ intervention results obtained in the five Regions of Brazil with results previously reported for eight countries in Sub-Saharan Africa.1–3

DISCUSSION
The 10 highest ranked health-related causes of premature death, life expectancy and the under 5 mortality rate for Brazil are compared with values for the rest of the world in table 1. The top seven health-related causes of early mortality in Brazil also appear in the top 10 diseases causing early mortality for the world as a whole. Life expectancy in Brazil (74 years) is higher than the world average (70), but in South America, only Bolivia (68) and Guyana (63) have lower values than Brazil.8 In contrast, the under 5 mortality rate in Brazil (14/1000 live-births) is much lower than the world average and lower than that in all South American countries apart from Chile (9) and Uruguay (7).8

Comparing the results obtained in this study with those reported previously for eight countries in Sub-Saharan Africa shows that the overall results on both continents were similar for all measurement parameters: preintervention and postintervention knowledge levels, change in knowledge levels following the intervention, and the children’s overall satisfaction with the programme. Furthermore, the range of results recorded across the five Regions of Brazil also mirrored the range of results obtained across the eight individual countries in Sub-Saharan Africa. These similarities in health knowledge and learning are surprising considering the differences in social, economic, education, health and infrastructure facilities on the two continents.6 8 This result can be viewed in two ways: either the health knowledge of children in Africa is higher than expected or the health knowledge of children in Brazil is lower than might be expected; it is not possible to resolve this question from the data currently available but it is perhaps a question worthy of future investigation, as it could affect the ways in which health education is pursued on both continents.

Lessons learned
It is important to reflect on the lessons learned from implementing the ‘FIFA 11 for Health’ programme in a country the size of Brazil. The results obtained from the intervention can be considered to represent the individual Regions and Brazil as a whole, as the total intervention population comprised children from 12 cities within the five Brazilian Regions and the evaluation subpopulation represented schools from each of these cities. In addition, the evaluation subpopulation met the criteria obtained from the sample size calculation. From this perspective, the results could be used to support arguments for the expansion of the programme throughout Brazil. The implementation received extensive media coverage before and during the 2014 FIFA
World Cup Brazil\(^{12–14}\) which generated interest and enhanced the status of the programme among the children attending the course. Of particular benefit was the support provided by government ministers and 2014 FIFA World Cup Brazil location physicians from the Brazilian Football Confederation who attended media events to add their support to the programme.\(^{12,14}\)

A limitation during the first stage of teacher training was the absence of Brazilian-Portuguese speaking master instructors; however, this was addressed by the use of experienced Spanish/English-speaking instructors, who could converse effectively with the teachers, and through the availability of local physicians who were fluent in Brazilian-Portuguese and English and who could therefore act as translators for the instructors to assist in answering detailed medical questions raised in relation to individual health topics. Language was not an issue during the larger second round of cascade-training courses, as the 22 local teachers who had implemented the programme during the first stage, presented these courses with the support of experienced Spanish/English-speaking master instructors.

A major limitation of the study from the perspective of future expansion of the programme across Brazil was that none of the implementations took place in a Brazilian favela, where the benefits of the programme would be expected to be high but where implementation issues would be expected to be different from those encountered in the areas and schools included in the study.

From the beginning, it was anticipated that implementing the ‘FIFA 11 for Health’ programme in Brazil would present challenges related to language and logistics and the implementation schedule was designed to address these issues; however, two further factors arose during the planning stages. Owing to the size and population of Brazil (Regional populations ranged from 15 to 85 million), the implementation created the same number of human resource requirements and logistic issues as would be required to deliver simultaneous implementations in five medium-size countries in Africa. This situation was compounded by the devolved nature of healthcare and education delivery in Brazil,\(^{15}\) as this meant that an agreement reached with a Ministry at Federal level did not necessarily translate to an agreement with local authorities at the State or Municipal level: a situation that resulted, on occasion, in differences of opinion on the course content and the implementation strategy, which led to stretched time-lines in order to reach compromise arrangements.

The WHO 2013–2020 Global Action Plan for NCDs proposed worldwide targets to reduce the risk of premature mortality from cardiovascular disease, cancer, diabetes and chronic respiratory diseases by 25% and to reduce the level of physical inactivity by 10%\(^{16}\); these targets are very pertinent to Brazil as these issues have been identified as the major causes of premature death in the country.\(^{10,17}\) Unsurprisingly, therefore, the Brazil Ministry of Health’s 10-year health plan focuses on addressing the prevalence and causes of these diseases.\(^{10}\) The ‘FIFA 11 for Health’ programme addresses each of these issues and the results from the present study have demonstrated that the programme offers an effective health education option for children in all Regions of Brazil. From a wider perspective, it is anticipated that the ‘FIFA 11 for Health’ programme and its associated course materials could be translated successfully into other languages and could be implemented equally successfully in many other countries and cultures.\(^{18}\)

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### Table 6
A comparison of the results recorded for Brazil and the results reported previously for countries in Sub-Saharan Africa.\(^{1–3}\)

| Country          | Mean values | Health knowledge questionnaire results, % | Overall programme rating, % |
|------------------|-------------|-------------------------------------------|-----------------------------|
|                  | Age, years  | Preintervention | Postintervention | Change |                  |
| Ghana            | 13.5        | 61.3           | 86.4            | 25.1    | 94.7              |
| Malawi           | 13.1        | 74.7           | 85.0            | 10.3    | *                 |
| Mauritius        | 12.9        | 69.3           | 87.1            | 17.8    | 88.5              |
| Namibia          | 11.4        | 57.9           | 85.3            | 27.4    | 97.8              |
| South Africa     | 13.3        | 55.2           | 69.3            | 14.1    | 92.3              |
| Tanzania         | 11.3        | 71.3           | 86.4            | 15.1    | 97.7              |
| Zambia           | 11.7        | 57.5           | 74.7            | 17.2    | 93.2              |
| Zimbabwe         | 11.5        | 57.8           | 76.2            | 18.4    | 96.8              |
| Sub-Saharan Africa | 12.3      | 63.1           | 81.3            | 18.2    | 94.4              |
| North Region     | 11.0        | 53.8           | 70.7            | 16.9    | 91.9              |
| North-east Region| 11.3        | 62.0           | 75.6            | 13.6    | 88.7              |
| Centre-West Region| 11.6      | 65.3           | 79.3            | 14.0    | 92.7              |
| South-east Region| 10.8        | 64.2           | 80.1            | 15.9    | 82.3              |
| South Region     | 9.2         | 57.7           | 86.8            | 29.1    | 96.7              |
| Brazil           | 10.6        | 60.2           | 78.6            | 18.4    | 90.7              |

*Bold face is used in table 6 for the mean values for sub-Saharan Africa as a whole and for Brazil as a whole to differentiate these values from the values for the individual countries in Africa and the individual regions in Brazil.*

*Satisfaction questionnaire not distributed in Malawi.*
Contributors CWF designed and coordinated the implementation; analysed and interpreted the data; wrote the draft paper; approved the final submission. EST, MF, DN acted as local project coordinators in Brazil; collected questionnaire data; reviewed the draft paper; approved the final submission. AJ assisted with the implementation; reviewed the draft paper; approved the final submission. JD liaised with the Brazilian Ministries of Health, Education and Sport and the Brazilian Football Confederation; reviewed the draft paper; approved the final submission.

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Competing interests CWF acts as a research consultant to F-MARC; EST, MF and DN are employed by the Brazilian Football Confederation; AJ is employed by CWF; acts as a research consultant to F-MARC; reviewed the draft paper; approved the final submission. AJ assisted with the implementation. AJ assisted with the implementation; reviewed the draft paper; approved the final submission. JD is Chairman of F-MARC.

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