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Mass sporting and physical activity events – are they “bread and circuses” or public health interventions to increase population levels of physical activity?

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Abstract

Background: Large-scale, one-off sporting or physical activity events are often thought to impact population physical activity levels. This paper reviews the evidence and explores the nature of the effect.

Methods: A search of the published and grey literature was conducted to July 2005 using relevant databases and web sources. Personal contacts yielded additional data. Impacts are described at the individual, societal and community, and environmental levels.

Results: Few quality evaluations have been conducted. While mass sporting events appear to influence physical activity related infrastructure, there is scant evidence of impact on individual participation at the population level. There is some evidence that events promoting active transport can positively affect physical activity.

Conclusions: The public health potential of major sporting and physical activity events is often cited, but evidence for public health benefit is lacking.
Introduction

Large scale, one-off sporting events, ranging from global, elite “mega-events”, such as the Olympic Games, to participatory “mass events”, such as city road races, are often thought to have an impact on the physical activity behavior of the host population, or, in the case of major media events, populations world wide. Anecdotally, there is a perception that mega-events create euphoria amongst populations which translates into motivation and enthusiasm for being active.

In the case of mega-events, the legacy of increased physical activity participation is often quoted in the bidding process. For example, the 2012 Olympics in London will, according to the candidate file of the recent successful bid, “inspire a new generation to greater sporting activity and achievement, helping to foster a healthy and active nation” (1). Newspaper reports following the Sydney Olympic Games claimed a “rising of the couch potatoes” (2). If such effects do indeed occur, then the potential public health impact of major sporting events may be considerable.

In the health promotion field, community-wide physical activity events are used to encourage populations to adopt more active lifestyles, e.g. walk/bike to school/work days, or activity events such as “Agita Galera” in Brazil(3). Considerable resources are often targeted at such strategies, both in developed and developing countries (4). This review explores the evidence for effects of these major events on population physical activity.
**Scope of the review**

For the purpose of this review, an “event” is included if it is short-term, discrete, and organized, rather than a longer term purposive communications campaign (5). Three other event reviews examined sports development (6), travel-related campaigns and travel behavior (7) and a recent review of the effectiveness of health-promotion events (8). The latter review did include two physical activity-related media campaigns, which were excluded in our review. The majority of the data presented in our paper were not included in any of the previous review papers.

Our review focuses on identifying evidence for two categories of sporting event as well as for health promotion events. These include:

i. elite sporting events, such as the Olympic Games, or World Cup soccer or rugby, which have worldwide appeal and media coverage. The population is involved primarily as spectators in such events.

ii. non-elite sports participants, such as mass city road races and biking events. Here, the appeal of the event lies in its potential for community-wide participation.

iii. major health promotional events designed to increase physical activity behavior amongst the population, such as Walk or Ride to Work Days.

A plethora of smaller events have been implemented by health professionals to promote physical activity, e.g. health screening days, or “try it” days. These are generally targeted at smaller population segments or communities and are omitted from this review.
Measuring the impact of major events on physical activity

Major events may result in community changes at many levels. For example, new sporting facilities or improved existing facilities and improved transport access are usually a tangible infrastructural legacy. Less tangible are the regularly cited societal and community benefits, such as civic pride, social cohesion, and a strengthening of community volunteerism (6, 9). Coaching or volunteer expertise is a human resource which may enable physical activity involvement, and also build the capacity of communities (6). The use of major sporting events to consolidate the national sporting or physical activity identity or culture is also mentioned.

At the individual level, the primary measure of interest is physical activity participation prior to, and following, the event. Less robust antecedent measures such as “intention to be physically active” should also be considered. For the purposes of this review, a broad view of physical activity has been adopted.

Theoretically, mass events might be an opportunity to increase awareness about the benefits of moderate-intensity physical activity, and could be used to encourage populations to trial the behavior or to access newly constructed facilities. Only a few mass events are underpinned by specific behavior change theories (10). Few theories have been proposed for mass sporting events, except perhaps the suggestion that elite high profile events and athletic role models may have a “trickle down” effect on general community participation (11, 12). Most of the support for this hypothesis is anecdotal.
Alternatively, elite events may have a “discouragement effect”, as people in the general population see that level of performance as unattainable for them (13).

At the community level, the impact of major events is sometimes described in terms of enhanced community spirit, civic pride, or social cohesion. This includes greater volunteerism, an increased collective sporting identity or physical activity culture. It is hypothesized that major events might encourage community sentiment which might be a potential mediator of future physical activity involvement. At the environmental level, availability of, and access to facilities is an influence on physical activity behavior (14).

The most tangible legacy of major sporting events is infrastructure development, which might improve physical environments to support population level physical activity.

Methods

A search of the published literature was conducted using the SportsDiscus, Pubmed, CINAHL, PsycInfo, Dissertation Abstracts, ISI Web of Science, Journals@Ovid and Cochrane databases. Keywords were combinations of the following search terms:- physical activity and/or sport and/or exercise or Olympics or Games; mega, mass, or special event or campaign; health and/or health promotion; participation; population; evaluation or impact; walk, cycle, active commuting. Sports agency, event, health promotion and government websites were examined, as well as physical activity-related conference abstracts for 2005. Personal contact was made with government agencies responsible for sports development and evaluation, with university research centers in the
UK, Canada and Australia, and with directors of major sporting events to capture relevant evaluations of a sports or activity-related nature.

Effects of major events on physical activity - Individual level

Major Sporting Events

In spite of the claims commonly made by mega-event organisers regarding post-event increases in population physical activity or sporting involvement (1), few evaluations of this nature have been conducted, and fewer still have been published.

National annual monitoring of physical activity was carried out each year in November in Australia; these telephone based surveys of representative population samples, were compared before and after the September 2000 Olympic Games in Sydney (15). There was no change in the proportion meeting the US Surgeon General recommended guidelines for physical activity following the Olympics. The data, expressed as continuous minutes of physical activity, also did not change.

Over the same time period, the Australian Bureau of Statistics carried out sport and recreation participation surveys (13). These representative household surveys reported quarterly on “any physical activity or sports participation in organized or unorganized activity”. Survey responders recalled participation in any activities or sport in the previous 12 months. The rates of ‘any participation in sport and physical activities’ declined from 59% of all adults in the August and November 1998 surveys, to 56 and
54% in 1999, and 49 and 51% respectively in August and November 2000. There were slight increases from August to November 2000 for females (44 to 47% participated) compared to males (53.8 to 55%) but since both of these were reports of 12 month period prevalences, the data are best compared with the same months in the previous year, and were lower in 2000 than in 1999 and 1998. These data do not point to evidence for a ‘trickle down’ effect or a ‘discouragement effect’ in the general population.

It appears that only one other evaluation directly measured population physical activity post-event. Face to face interviews in 2002 and one year later in 2003 with a representative cross-section of 3600 local adults showed that the Manchester Commonwealth Games had no impact on participation in sports activities, which excluded walking, 4+ times in the last 4 weeks, or at least once in the last 12 months (16).

Another outcome measure might be the numbers of adults and children enrolling in sporting clubs resulting from mass events. Following the 1992 Winter Olympics (Albertville) and Summer Olympics (Barcelona), officials from 35 clubs across 6 Olympic sports in Christchurch, New Zealand were surveyed as well as national sports organizations (11). Of 35 clubs, 24 indicated that club membership numbers had not increased as a result of the Games, and 6 indicated that they had experienced an increase in membership enquiries. The 1994 soccer World Cup finals in the USA reportedly increased soccer club membership substantially in that country (17). The U.S. Youth Soccer Association reported that in the follow-up to the World Cup its membership
increased by 9% to 2.1 million, and the American Youth Soccer Association reported that their membership increased by 14% to half a million.

There were reports in the popular press in Australia following the Sydney Olympics regarding the “rising of the couch potatoes” (2); this report described interviews with senior executives and sports development officers who attested that sports associations enquiries and membership had increased. No objective data were reported to verify this anecdotal observation.

Recently, Sport Scotland assessed the Scottish women’s curling teams 2002 Winter Olympic gold medal (18). A range of quantitative and qualitative surveys suggested that visits to ice rinks for curling increased by 6% between 2001/02 and 2002/03, while club membership increased by 3%. This is a low prevalence sport, so did not impact population physical activity levels.

**Mass participation events**

There is a paucity of research on the impact of mass participation sporting events on subsequent sport and physical activity involvement. Some events, such as the London or Boston Marathons, for example, are heavily over-subscribed. The London marathon draws spectator numbers in the range of 300,000 to 500,000 and television coverage is sold to over 100 countries (19), so it is possible that the event may have a wide impact. It is likely that participants are selected, as those who participate are already at least somewhat active prior to the event.
Of more public health potential is the recent observation that marathons and road races have attracted an increased percentage of walkers (close to 40% of participants in the Honolulu Marathon, for example, walk the event) which suggests that such events are not just for the fittest segment of the population and have mass reach potential. There are no evaluations which have assessed pre-event PA patterns, or tracked the post-event physical activity involvement of participants.

Health promotion events

Considering the long-term existence of mass physical activity events in health promotion, there is a surprising dearth of evaluative studies. Recently, evaluation data have been reported following mass events designed to promote active travel. For example, Australia’s Walk to Work Day event was evaluated amongst a randomly sampled population-based cohort of 1100 adults in Australia’s major metropolitan areas (20). Changes from pre-post campaign in total minutes spent walking increased by 16 min/week among employed participants (p<.05) and by 21 min/week among passive commuters (i.e. no active transport habitually used). There was no significant change in vigorous physical activity.

Another paper by the same research group evaluated the effect of Walk Safely to School Day (WSTSD) among New South Wales (NSW) elementary schoolchildren (21). The number of participating schools increased (from 2001 to 2004), i.e. 496, 717, 708 and 751 respectively. In 2002 a telephone survey was conducted during the 2 weeks following the
event with randomly selected eligible households (912 eligible households, 812 interviewed, 89% response rate). At a population level, WSTSD increased the prevalence of walking to school by 6.8%. Thus, WSTSD had a small short-term behavioral effect on children who did not normally walk to school, consistent with findings from the adult-targeted Walk to Work Day campaign described previously (20).

The participation of Canadian schools in International Walk to School Day on October 8th, 2003 was evaluated by Go for Green (22). A total of 1,932 schools registered in 2003, which was an increase on 1,432 in 2002 and 1,082 in 2001. Limited evaluation data on individual-level participation was collected among participating schools.

In Switzerland, car-free human powered mobility (HPM) events have taken place since 2000, with a total of 220,000 participants counted at 7 events in 2004 (23). An evaluation was undertaken at 3 events in 2004 and between 37% and 82% participated for the first time. Amongst those who were insufficiently active, 30.1% indicated a likelihood of walking or cycling more in daily life. Amongst those who had participated in earlier events, 53.5% reported that this had motivated them to become more active.

Another Australian active commuting event, the Ride to Work Day in Victoria in 2004, has been evaluated (10). In 2004, registered participation reached 5,577 (60% male, 40% female), an increase of 66% from the previous year and a 296% increase over two years. In 2003 and 2004, 16.4% and 22%, respectively, were first time riders. A survey of
registered first time participants 5 months after Ride to Work Day 2003 demonstrated that
23% were still riding to work (the Ride to Work and Beyond! Project) (10).

One other small-scale evaluation was the California Bike Commute Week (24). It is the
largest event of its kind in the U.S., with 25,000 participants, and 35% first-time riders
to work. According to the website, 70% of these first time riders will continue to bike to
work, but no there are no details of the methodology used. Other events encouraging
cycling may attract those who already cycle and are sufficiently active for health (25, 26).

Mass health promotion events

Several mass single-day health promotion events target physical activity behavior change.
For the most part, such events are embedded within broader campaigns, with multiple
strategies and community-wide initiatives. This is true also of developing countries:-mass events are used as a component of the national physical activity promotion strategy
in the Philippines, Malaysia, Fiji, Thailand and Brazil (4). One good example is the Agita
Galera (active community day), the largest event in the Agita Sao Paulo communitywide
physical activity program (27). It is a yearly mega-event. The major assessment is
through the population reach of the initiative, with over 6000 public elementary and high
schools and more than 6 million children involved. The program is comprised of a group
discussion about the importance of physical activity, followed by a 30 min walk to a
neighborhood open space. The event is supported by school PE committees, manuals,
posters, banners, a web site and other resources, and it attracts large amounts of unpaid
media. An evaluation of physical activity behavior change has been conducted in one
Mass events and population physical activity

school (28), but this was in response to a year-long initiative and not to the one-off Agita
Galera day.

Effect of major events on physical activity - Societal and Community level

Whilst environmental legacies are the most obvious post-event benefit, there may be
social and community benefits following major events. Such benefits might include skill
development within communities, increased social interaction and social capital, or the
development of physical activity or sporting “culture” (9). The 1988 Winter Olympics in
Calgary were cited where a feeling of civic pride and social cohesion was reported by
citizens (9). In theory, volunteer programs might attract new people into sport or physical
activity, and contribute to social regeneration and social capital (29), but data from
Manchester indicate that the program attracted mostly Caucasian volunteers (92%) who
already were active (30).

Communities may benefit from the associated physical activities that often take place
around major events. Passport 2k was an activity program for young people which
capitalized on Manchester’s hosting of the Commonwealth Games in 2002 (31). Passport
2k targeted 11-15 year olds from disadvantaged communities across the north west,
usually offering 2 weeks of activities during the summer holiday period. By 2003,
programs were operating in 16 areas across the north west, involving 5,390 young people.
Young people were signposted from the summer activities onto permanent programs in
their local community. According to the post games report (32) curriculum packs were
sent to 33,000 schools, and 95 schools participated in further coaching initiatives.
Major sporting events are often regarded as a showcase for the sporting prowess of a host nation, and a chance to consolidate the national sporting identity or culture (33). Thus, the potential of major events to consolidate the sporting or physical activity culture is worth considering, although no attempts have been made to measure it. Sugden and Tomlinson (17) reviewed the impact of the 1994 soccer World Cup finals upon contemporary USA sports culture and “space”. They utilized a multi-method approach including survey databases, media representation of the sport, participant observation, and sponsorship data. The authors described how soccer culture reached “only partially and unevenly into the sports cultures and space of the USA” (p.255), and the authors concluded that the impact of the successful USA staging upon USA sports culture and upon soccer itself was minimal.

According to Waitt (34) “euphoric mass consciousness” was generated amongst Sydneysiders before and during the 2000 Olympic Games, and a sense of belonging to a national and Sydney “community” was the most commonly expressed reward from hosting the Games. No details are given on the methodology used for obtaining the qualitative data quoted, and there is no evidence whether these feelings translated into a longer-term impact on any physical activity-related behaviors. Waitt described the impact on collective identity, emotion and consciousness. He likened the Games to the ancient Roman formula of “bread and circuses” where social unrest was controlled by providing the public with appropriate sites, signs and symbols. Again, no measures to indicate changes in population levels of collective identity were provided.
Effect of major events on physical activity at the environmental level

The long term benefits or residual effects of hosting a major event are frequently referred to as the “legacies” from the event. The most common types of legacies are physical facilities, supporting infrastructure and financial resources. Brown (35) analysed how the winter Olympics enriched community legacies for recreational open space in selected European and American Olympic sites. In general, the recreational infrastructure of the areas studied had been improved and had been a catalyst for other important improvements. The legacy of the 2002 Commonwealth Games in Manchester lies mainly in facilities and supporting transport infrastructure which has been developed (36, 37). Interviews with major stakeholders identified these new facilities as being amongst the key benefits (38). Similarly, following the 1988 Winter Olympics in Calgary, 21% of Calgarians (400 interviewees) cited the Olympic facilities as one of the key benefits for citizens and the city (39). The infrastructural legacy of hosting the 1999 Rugby World Cup for Wales, and Cardiff were the Millenium Stadium, the accelerated development of transport services and pedestrian improvements in the city centre, and a redevelopment of the river walk area adjacent to the stadium (40). An historical perspective by Chalkley and Essex (41) confirms that the infrastructural legacy, both in terms of sporting facilities, and urban development and transport, has been experienced by most host cities of major events.

There have been no analyses of the post-event impact of these environmental changes on the subsequent physical activity participation of host communities. Data on facility usage
following the Manchester 2002 Commonwealth Games appear to provide the only proxy measure of post-event population physical activity. In the first year of operation at the Aquatics Centre, some half million swimming sessions were sold, exceeding the anticipated target by about 10% (32). Sixteen schools were using Sportcity facilities under the school sport coordinator project in 2003(37).

Brown (42) has highlighted that the creation of new stadia does not necessarily deliver expected economic and social benefits. New infrastructure can antagonize and alienate communities as well as benefit them, and there is no guarantee that the money could not be better spent elsewhere. The development of major sporting facilities may also draw funding away from smaller projects in communities or schools (43). Overall, resident satisfaction in Manchester with provision of, and access to, recreation and leisure facilities and services, including children’s play areas and parks/green spaces, increased greatly between 1999 and post-Games in 2002. The elite athletic facility, Sportcity, has reportedly played an important role in enabling local people to access leisure and recreational facilities (43).

### Discussion

Our search indicated that there is much rhetoric but limited evidence that major or mass sporting events impact physical activity participation at the individual, community or environmental level. This concurs with the Whitelaw and Watson review of events and campaigns in the wider health promotion field (8). There are some good examples of
evaluations of travel behavior change (20, 21), and these have demonstrated a small but
positive event effect on physical activity. Evaluations of the impact of major sporting
events on physical activity behavior are scarce, and suggest either a modest effect (13), or
no effect (15) on physical activity behavior. There are some data investigating whether
major events had an effect on sporting club membership, but methodologies have
generally been poor. There is better evidence of the environmental infrastructure
development resulting from major sporting events, but, with the exception of evaluations
following the Manchester 2002 Commonwealth Games, no data supporting the
translation of greater facility provision. There are limited data suggesting an impact of
major events at the community or societal level in terms of human resources, community
programs, volunteer programs and capacity building (9, 37). Mass events are usually
assessed in terms of the economic impact of the event itself with a piecemeal and
fragmentary approach to research and analysis with some attention to tourism-related
image of the event host, urban regeneration and community pride (19, 44-46). Although
benefits and costs are incurred immediately and over the longer term, evaluations are
usually short-term (45).

The problem may be a lack of coordination between the sport sector organizers of these
mass events and public health decision makers. Even if major events had the potential to
make a difference, they generally have failed to engage with the health sector to take the
opportunity to promote the moderate intensity physical activity message. The ancillary
media attention and community focus could also have been channeled into improving
public awareness about physical activity and health, in both developed and developing countries (47).

The myriad of claims by hosts of major sporting events about the physical activity-related spin-offs for host populations need to be considered with caution. There are undoubtedly methodological difficulties in measuring the impact of major events on physical activity outcomes, but such designs, as with the evaluation of any mass campaign, are possible and can provide reasonable evidence for specific intervention effects (48).

It may be that the primary agenda of mass sporting events is not a serious public health opportunity, and that events are more in the arena of short term public entertainment, as ‘bread and circuses’, rather than a missed public health opportunity. Although some civic infrastructure results, this has not been shown to relate to population physical activity levels. No examples from mass events, with shared interagency planning and a clear public health agenda can be identified to counter this view.

Whenever mass events might have had some impact on physical activity, the event has been embedded in a broader, strategic developmental approach, e.g. the Manchester 2002 Commonwealth Games (37), and Bike to Work (10) or Walk to Work or School days (20, 21). Such events use an interagency planning approach, including public health input and direct consideration of community physical activity. Organized and well resourced inter-agency campaigns, supported by community-wide programs, coherent policies and facilitative environments may be required to increase participation levels (49). Similarly,
Coalter (29) has suggested that the 2012 Olympic Games in London may act as a catalyst within a broader social strategy (including changing outcomes such as public attitudes, government investment in schools, and developing local infrastructure). It would require direct commitment to evaluate this approach, and clear epidemiological designs to evaluate all of these outcome variables at the population level.

Given the considerable claims made by the hosts of some major events regarding an impact on population physical activity or sports participation and hence, a contribution to a broader health or social agenda, and the effort which is invested by professionals in, for example, active travel events, it is imperative that a greater evidence base support the effectiveness of such an approach. The public health potential of mass participation events for physical activity promotion remains to be realized. If we are to move beyond ‘bread and circuses’, future events should plan for integrated physical activity and sport-related events, and invest in research that provide a much better evidence base that currently exists for this approach.
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16

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139