Measuring attendance: issues and implications for estimating the impact of free-to-view sports events

Keywords

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RESEARCH PAPER

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Abstract

A feature of many non-elite sports events, especially those conducted in public places, is that they are free-to-view. The article focuses on the methodological issue of estimating spectator attendance at free-to-view events and the consequences for impact evaluation. Using empirical data from three case studies, the article outlines various approaches to measuring attendance and discusses the key issues and implications for evaluating free-to-view sports events.

Executive summary

Since the mid-1990s, literature on major sports events has grown considerably. This has enhanced knowledge and understanding of how events are organised, managed, marketed and, ultimately, measured in terms of their contribution to societal outcomes. However, most previous research focuses on pay-to-view events, with free-to-view events receiving considerably less attention. This paper focuses on estimating spectator attendance at free-to-view events and the implications of this for evaluating impact. It is a methodological issue is particularly relevant to non-elite events, as many are conducted in public places (such as roads, parks, beaches and open waters), and are consequently free-to-view.

Measuring attendance accurately is important for a number of reasons. It indicates the popularity of an event, which is of interest to organisers, funders and potential sponsors; it is considered to be a valuable performance indicator for some events, and it is an important factor in measuring economic, environmental and social impacts of events.

This paper uses empirical data from a marathon event, a cycling road race and a motorsport event to examine various approaches to measuring spectator attendance at free-to view events. For each event, a spectator survey was undertaken to establish patterns of spectator behaviour. Details are given on how the surveys were carried out and then used, together with other sources of information, to derive aggregate estimates of attendance.

The paper suggests there are a number of considerations that researchers, event organisers and event funders need to take into account when measuring spectator attendance at free-to-view events. Firstly, that the sampling techniques used for the spectator surveys, will be determined by factors such as the spatial layout and length of the course, access to spectator areas and existing local intelligence. Secondly, that repeat viewing within a single event, either at multiple locations or on multiple days, can often be a source of error within estimates of spectator attendance (and incidental or casual attendance) and that this can serve to inflate attendance figures. The paper also suggests that a major challenge in estimating spectator attendance can be reconciling the expectations of event organisers with rigorous and robust measurement of actual spectator attendance, which can often produce estimates lower than anticipated.

The paper concludes that, despite the challenges outlined above, obtaining robust measurement of attendance is fundamental to ensuring the reliability of event monitoring and evaluation. It argues that there is a need to move towards a more rigorous, empirically-based framework for measuring spectator attendance at free-to-view events. This will give organisers a more reputable method for evaluating events and more credible information for use in marketing and for potential sponsors of free-to-view events in the future.

RESEARCH PAPER

Introduction

Since the mid-1990s there has been a marked increase in major sports event evaluation. This evaluation information has led to a greater understanding of the way that events are organised, managed, marketed and ultimately measured in terms of their contribution to economic, social and environmental outcomes. Furthermore, it has generated an evidence base, which is increasingly used to rationalise and justify the bidding for, and hosting of, sports events. However, much of the growth in sports event evaluation literature has focused on events that spectators pay to view (Collins et al, 2009; Gibson et al, 2008; Jinxia & Mangan, 2008; Johnsen et al, 2004; Lakshman, 2008; Porter & Fletcher, 2008; Rathke & Ulrich, 2008; Soderman, 2008; Solberg & Preuss, 2007; Sterken, 2006), with free-to-view events receiving considerably less attention.

This paper focuses on measuring spectator numbers and attendance at free-to-view events and the implications of this for evaluating impact. This is a methodological issue that has received limited consideration in academic literature. Previous studies on the topic of attendance at sports events have focused on issues such as factors affecting attendance (Funk et al, 2009; Lambrecht et al, 2009), spectator motives for attending (Sack et al, 2009), attendance profiling (Graham, 1992), perceptions of attendees (Dale et al, 2005), predicting audience numbers (Chen et al; 2009) and evaluation of impacts associated with attendance (Wood, 2005). However, there appears to be a genuine gap in knowledge about the processes involved in estimating attendance figures at free-to-view events. This is a particularly significant issue for non-elite events, given that they are often conducted in public spaces, such as roads, parks, beaches and open waters, and are consequently free-to-view.

Accurate measurement of attendance at sports events is significant for several reasons. It is often used as an indicator to assess the popularity, or reach, of an event for the purposes of public relations, sponsorship, financial monitoring or service level agreement monitoring. Furthermore, some events use it as a pre-determined performance indicator – for example, certain events may have equity targets set for them, such as the percentage of local people attending, or the level of engagement by other targeted groups such as children and young people. Fundamentally, though, spectator attendance is a precursor to other measures linked to the economic, environmental or social impacts of an event. Therefore evaluation of these impacts is ultimately dependent upon reliable and accurate measurement of the number of people attending.

Arguably, attendance measurement at ticketed or pay-to-view events is a relatively simple exercise, especially those taking place within the confines of a fixed venue such as a stadium, or where there is a record of how many people can be accommodated. However, this is not always the case, and measurement of spectators at pay-to-view events can be problematic. For example, attendance figures for English football matches are frequently based on the number of tickets sold (including season tickets), rather than on how many people actually viewed the event.

> ***"Coca-Cola Championship club Charlton have admitted that they calculate match day attendances to include the number of season tickets sold – regardless of whether the holders actually turned up or not."*** *Daily Mail, 2008*

This is a not uncommon practice for estimating attendance, and there are numerous other examples of English football clubs calculating attendance on the number of tickets sold rather than people passing through the turnstiles. Moreover, there are examples of other pay-to-view events at which spectator attendance has also been somewhat exaggerated, including Formula 1 Grand Prix events and county cricket matches in England.

> ***"The official attendance for the Turkish Grand Prix a fortnight ago was said to be 20,000, which in itself is dismal. But it is now believed that figure has been exaggerated and that the true number of tickets sold was closer to 7,000."*** *Smith, 2009*

> ***"In January 2009, the England and Wales Cricket Board trumpeted the fact that over 550,000 had been to County Championship matches last summer. Wisden reveals the absurdity of that claim, which is built on erroneous figures – epitomised by a healthy crowd of almost 12,000 supposedly attending the Glamorgan v Worcestershire game in September. In reality the match saw not a single ball bowled. The true figure for Championship attendance would, in all probability, have been under half a million. At best, this was incompetence; at worst dishonest and deliberately misleading."*** *Wisden, 2009*

Given the errors associated with measuring attendance at ticketed events, the complexity of estimating credible crowd sizes at open access, free-to-view events, where there are no ticket sales to draw upon, becomes even more apparent.

Using empirical data from a marathon event, a cycling road race and a motorsport event, this paper examines a range of approaches used to measure attendance at free-to-view events. Drawing upon evidence from the three case studies presented, it discusses the methodological issues arising and looks at the key considerations for estimating spectator attendance. It argues that robust measurement of attendance is fundamental to ensuring the reliability of event monitoring and evaluation. It concludes by suggesting that, despite the challenges highlighted, there is a need to move towards a more rigorous, empirically-based framework for measuring spectator attendance at free-to-view events in order to provide managers, researchers, event organisers and policy makers with a more reputable method for evaluating events in the future.

TABLE 1 Case study events

TYPE OF EVENT	FREQUENCY	LOCATION	YEAR
MARATHON	ANNUAL	UK	2000
CYCLING ROAD RACE	ANNUAL	UK	2005-06
MOTORSPORT	IRREGULAR	BRITISH ISLES	2009

Case studies and research

This section presents empirical data from the three case studies listed in Table 1. The events were selected because they were free-to-view, occurred in public places and covered large distances – all of which are factors that make the measurement of spectator attendance challenging. The events were also selected because of their varied spatial layout and scale, which necessitates different approaches to attendance measurement. The data presented was collected and analysed by independent research consultants on behalf of event organisers or sponsors and, in each case, was gathered as part of an economic impact evaluation. To maintain client confidentiality, and given that much of the data presented is not available in the public domain, two of the events have been given pseudonyms.

For each event, a spectator survey was undertaken to establish patterns of spectator behaviour (including repeat or multiple viewing across the event) and to establish levels of viewing by 'casuals' within the overall attendance figures. Consideration of repeat viewing is particularly important at free-to-view events that take place in public places, because people can often watch the event from more than one vantage point. Therefore, by applying a repeat viewing factor to account for the movement of people from one location to another, it becomes possible to calculate the actual number of different people in attendance. Failure to do so can result in double counting of individuals. Another relevant consideration for estimating attendance at free-to-view events is to differentiate between 'event-specific' attendance and 'casual' attendance. This is because when an event is held outside the confines of a traditional venue (e.g. a stadium or arena) it is quite possible that people who are simply passing through the event location (e.g. town centre) are included in the attendance estimate. Discounting 'casual' attendance is also commonly recommended for the purpose of event economic impact evaluation, to avoid double counting (Crompton 2001, 1995) and is considered a relevant issue for estimating spectator attendance.

The following case studies detail the sampling techniques used for spectator surveys and illustrate how this data is used, together with other sources of information, to establish overall viewing figures.

The London Marathon

The London Marathon involves both elite and non-elite participants, but is largely a mass participation, free-to-view running event. It is included as a case study because it exemplifies the challenges faced by researchers and event organisers in trying to estimate crowd attendance at a very large participant and spectator event. The data presented was gathered as part of an economic impact evaluation in 2000 (Coleman, 2003), which is in the process of being repeated in 2010. While the data is taken from the event several years ago, the methodological challenges of trying to estimate spectator attendance it

TABLE 2 Adjusted spectator numbers: marathon and cycling road race

	MARATHON	CYCLING (STAGE 1)	CYCLING (STAGE 2)	CALCULATION
TOTAL SPECTATORS (BASELINE ESTIMATE)	480,000	11,500	23,000	A
REPEAT VIEWING FACTOR	1.60	1.12	1.12	B
ACTUAL SPECTATORS	300,000	10,268	20,536	C = A / B
MAIN REASON FACTOR	0.942	0.870	0.921	D
EVENT SPECIFIC SPECTATORS	282,600	8,933	18,913	E = C X D

demonstrates remain relevant to the focus of this paper and are complementary to the other two event examples included.

Estimating spectator attendance at the London Marathon is especially challenging due to the large numbers and disparate nature of spectators along the 26 mile route. In 2000 media reports suggested that there were up to one million people in London watching the event. However, for this to be the case there would have been crowds of six deep on either side of the route for the entire 26 miles, which was clearly not so based on scrutiny of BBC television coverage and primary research undertaken on the race day. Spectator attendance was derived using a combination of methods, including a spectator survey with 1,005 spectators on race day, observations of crowd densities and detailed analyses of aerial and other television footage and stills photography.

A baseline estimate was initially derived by estimating crowd densities along the route, using the assumption that five spectators could stand side by side along a standard 2.5m crash barrier. Hence, if the crowd was five deep on both sides of the road at a given point, this represents 50 spectators (i.e. 5 x 5 x 2). There were occasions along the route when densities achieved such levels, for example in 'honey spot' locations at historically popular landmarks and vantage points (e.g. Birdcage Walk, St James's Park, Tower Bridge, Cutty Sark and Canary Wharf). Analysis of the television coverage, stills photography and measurements of the crowd densities at given points along the route (recorded by researchers) resulted in an estimated baseline attendance figure of 480,000.

This 480,000 baseline estimate was then adjusted using information derived from the spectator survey. Along the route, 855 spectator surveys were administered at a series of 'honey spot' locations. A smaller sample of 150 surveys was also conducted in the less popular areas along the route; 20 researchers administered the surveys using random sampling techniques.

The selection method used when interviewing a group of people was to ask the person with the next birthday to complete the questionnaire, as recommended in Sport England's Model Survey Package (Sports Council, 1995). The data revealed that 5.8% of people were out in London but not specifically attending the marathon (casuals) and the remainder watched the event from an average of 1.6 different locations along the route (the repeat viewing factor). The adjustments were applied on the basis that spectators may have just chanced upon the marathon and consequently their attendance was not a function of their intention to watch the race. Moreover, spectators were free to move around London and watch from more than one vantage point, which, without the adjustment, would overinflate the total number of different spectators.

As demonstrated in Table 2, the application of these two adjustments resulted in a final figure of 282,600 different people being in London specifically to watch the race. This figure was presented to the police and they confirmed that it was in the right 'ballpark'.

The London Marathon clearly illustrates the difficulty in accurately estimating spectator numbers at a very large open access event. While the attendance figure in 2000 was derived using a range of methods, including primary research, 282,600 still represents a rudimentary, albeit informed, estimate of the total number of different spectators attending the event. However, it provides a baseline from which to compare the two examples of free-to-view events that now follow.

Cycling road race

The second case study was a non-elite cycling event held in the UK as part of the annual sporting calendar. Data were collected in 2005 and 2006 from two separate stages, both of which were one-day affairs. The first stage was a 192km linear route and the second was a 1.6km criterium (circular) stage located within a city. Each of these posed different methodological challenges in terms of estimating spectator attendance. For both stages, a spectator survey was undertaken, again in order to establish the proportion of spectators watching the event by chance and the amount of repeat viewing across the length of the course. The spectator survey was then used, together with other sources of information, to estimate total spectator attendance.

Stage 1

For Stage 1, the linear route, one of the key methodological challenges was the large distance covered by the event (192km). Spectator attendance was derived by identifying a series of honey spot locations around the course. Honey spots were key areas of the race where it would be reasonable to expect large numbers of people to congregate, and included the start, finish, sprints and climbs. These locations were identified as being the 'most exciting stages of the event' in the official event programme. In total, eight sites were identified, covering approximately 7.5km of the course. The total number of people in each location was derived by a combination of methods such as hand held counters, analysis of television footage and police and marshals' estimates. The baseline attendance figure for spectators in the honey spots was estimated to be approximately 11,500.

In each of the honey spot locations, 423 spectator surveys were administered to derive information on spectator behaviour. As with the London Marathon, a challenge with this event was that the course was designed specifically to allow spectators to watch the event from more than one location. The spectator surveys revealed that the average number of locations attended by each spectator was 1.12 (repeat viewing factor). The survey also found that 13% of spectators were in the honey spot locations by coincidence (casuals), which is not surprising since many of the honey spots were in the vicinity of ordinarily busy locations. Accordingly (as shown in Table 2) for Stage 1 the actual number of event specific spectators was adjusted to 8,933.

Whilst the honey spots were identified as the key viewing locations, these sites only accounted for 7.5 km of a 192km route, therefore there was considerable potential for people to watch the event along the other 184.5km. Event organisers claimed that, in addition to the spectators in the honey spots, an additional 46,000 people watched some part of the race along the route. This figure equates to an average of 250 people per km over 184km. However, without any credible evidence to support it, this estimate was considered overly ambitious and was refuted by the research team on the basis of their observations at the event, and from analysis of the television coverage of areas other than the honey spots which revealed very few spectators. The research team argued that, since it was the honey spots that were designed to be the spectator vantage points, it would be unreasonable to expect the claimed audience turnout elsewhere. Furthermore, it was argued that, since the race passed through the streets of busy

TABLE 3 Crowd densities and spectator numbers: Cycling road race - stage 2

SECTION	DISTANCE (METRES) (A)	NO. CRASH BARRIERS (B)	PEOPLE DEPTH (C)	SPECTATORS (D)	SIDE OF ROAD (E)	TOTAL SPECTATORS (F)
START/ FINISH	400	160	5	4,000	2	8,000
LOCATION 1	150	60	4	1,200	2	2,400
LOCATION 2	375	150	3	2,250	2	4,500
LOCATION 3	550	220	3	3,300	2	6,600
LOCATION 4	125	50	3	750	2	1,500
TOTAL	1,600	640	3.59	11,500	2	23,000

NB: B = A / 2.5 (length of crash barrier); D = B x C x 5 (number of people along crash barrier); F = D x E

towns and cities along the route, there would inevitably be people going about their daily lives and it would be inappropriate to consider these people as event-specific spectators. Thus, the research team concluded that the most justifiable number of different event specific spectators at Stage 1 of the cycling event was 8,933, which is the figure derived for the honey spot locations only. It was this figure that was subsequently used for estimating the economic impact attributable to the event, to avoid exaggerating the estimated impact.

Stage 2

Stage 2 of the cycling event took place in a tightly defined area of a 1.6km circular circuit. In essence, the whole of the circuit was considered to be a honey spot. The approach employed to estimate spectator numbers, as with the London Marathon, was to use crash barriers along the circuit as a reference point. For the duration of Stage 2, researchers were at the event site taking measurements of crowd densities at various points around the circuit. The derivation of spectator numbers was underpinned by the following assumptions:

- Barriers were on both sides of the road for the entire 1.6km loop giving a total of 3.2km of barriers.
- Each barrier measured 2.5 metres and accommodated five people (side by side).
- 1.6km of roads require 640 barriers (1,600 m / 2.5 m) per side.

As shown in Table 3, the crowd densities varied in each section of the circuit. Using the assumptions stated, and the observations of crowd densities around the route, the baseline estimate for the spectators along the circuit was 23,000. This is equivalent to a spectator depth of 3.59 people all the way round a 1.6km course on both sides of the road. In addition, television coverage of the race was used to verify crowd densities along the length of the circuit. The crowd measurements taken by the research team at the event site were found to be broadly consistent with the observations from television monitoring.

A spectator survey of 595 people was carried out at various sections of the circuit. The survey found that the average number of locations attended by each spectator (repeat viewing factor) was 1.12. Furthermore, the survey revealed that for 8% of spectators the event was not their main reason for

TABLE 4 Format of motorsport event

DAY OF EVENT	NO. OF STAGES	TOTAL DISTANCE (KM)
DAY 1	8	142.28
DAY 2	6	133.36
DAY 3	5	51.84
TOTAL	19	327.48

being in the area. Therefore, as shown in Table 2, the number of event specific spectators was estimated to be 18,913.

As with Stage 1, organisers claimed that Stage 2 had additional spectators over and above the number estimated by the research team. This was supposedly based on police estimates, according to which 60,000 people passed through the area surrounding the event. The organisers did not acknowledge that the location of the event in the city centre would have had a considerable impact on this estimate and, given that the event took place at the weekend, it was highly likely that there were significant numbers of casual spectators. Consequently, the research team decided to base their attendance figure and economic impact calculation on the defendable and more credible figure of 18,913 event specific spectators.

Motorsport event

The third and final case study was a three-day 'edition' of an international elite motor sport event held in the British Isles in 2009. A significant investment was made by public sector agencies to secure the event for the host area. Research was commissioned by the event sponsors to provide an indication of the return on their investment in terms of economic impact on the host area. This involved undertaking interviews with the key groups attending the event, predominantly spectators, in order to understand their attendance patterns and spending behaviour.

Unlike the previous examples, the motorsport event took place over three days and was therefore conducive to repeat viewing over multiple days. Moreover, as shown in Table 4, each day of the event was split into several stages that spread across several kilometres. Each stage had a number of designated spectator viewing areas, so it was possible for spectators to view the event on more than one day, as well as from more than one location, or more than one stage on the same day.

Rather than adopting the top-down approach used in the marathon and the road cycling race, whereby spectator attendance was derived by establishing a crude baseline attendance figure and adjusting this for factors such as repeat viewing and casual attendance, spectator attendance for the motorsport event was estimated using a bottom-up approach. This was partly due to the difficulty in estimating overall viewing figures, resulting from a paucity of local information and absence of alternative credible evidence. Estimates of attendance were, therefore, primarily generated using the spectator survey.

Again, methodological challenges for this event were the large distances covered by the various stages, and subsequent choice of appropriate spectator locations to collect survey information. Organisers were asked to advise on the potential locations where large crowds might be expected but ultimately the survey locations chosen were those that complied with health and safety regulations, given the unpredictable nature of motorsport events and the potential for injury to competitors and spectators alike.

TABLE 5 Derivation of spectator numbers – motorsport event

NO. OF OFFICIAL PROGRAMMES SOLD DURING EVENT	7,879	A
% OF SPECTATORS WHO BOUGHT A PROGRAMME	25.5%	B
ACTUAL SPECTATORS	30,898	C = A / B
REPEAT VIEWING FACTOR 1 (AVG. LOCATIONS ATTENDED ON DAY OF INTERVIEW)	2.03	D
REPEAT VIEWING FACTOR 2 (AVG. EVENT DAYS ATTENDED)	2.46	E
TOTAL SPECTATORS (BASELINE ESTIMATE)	154,298	F = C X D X E

The spectator survey was used to derive a bottom-up estimate of spectator attendance. Based on 1,303 responses to the survey across 31 different spectator viewing areas, it was estimated that around one in four spectators had access to an official event programme (25.5%). According to official sources, there were 7,879 programme sales made during the event. Consequently, as shown in Table 5, it was estimated that 30,898 different spectators actually attended the event. Allowing for multiple days viewing (on average 2.46 days per person) and attendance at more than one location on the day of interview (on average 2.03 different locations per person), an aggregate baseline attendance figure of approximately 154,298 spectators was derived. This figure was triangulated with estimates of spectator attendance at the survey locations, which were derived based on observations from the research team and a sample of crowd size estimates provided by event marshals for their respective jurisdictions.

A major challenge in estimating attendance at the motorsport event was trying to reconcile the estimates produced by the research team with those produced by the event organisers. Immediately following the event, organisers suggested that spectator attendance for the event was approximately 270,000. This was higher than the corresponding figure released for the previous edition of the event (257,000). The official attendance figures were thought to be overstated for a number of reasons.

The methodology adopted by event organisers to estimate attendance in the main spectator locations was considered by both the research team and event funders to be highly unorthodox. In short, this was based on an assessment of the amount of damage to the grassed areas of fields from which people viewed the event and then applying an average of two people per square metre to derive an aggregate figure for each location. Such an approach is prone to error as it assumes that the fields were packed to capacity (which they were not) and does not allow for the movement of people from one point to another within a given location.

The assumptions used by event organisers to derive spectator numbers away from the main viewing areas also seemed overly ambitious. For example, organisers estimated an additional 40% of spectators at other locations along the route on Day 1 and 50% on Day 2 and on Day 3. Furthermore, their estimate for the final stage of the event made an allowance of 25% more spectators in 'buildings etc' which, again, served to inflate estimated crowd sizes. Evidence from monitoring of television coverage of the event revealed only sporadic pockets of spectators at stage sections that were not promoted to be safe or viewer-friendly.

The weather conditions for this event were significantly worse than at the previous editions, which had claimed attendance of 257,000. This was certainly the case on Day 1, when two stages had to be cancelled. Furthermore, post-event consultations with more than 100 accommodation providers in the host area, suggested that the event did not generate the anticipated effect on their business relative to the previous edition. Anecdotal evidence from marshals revealed that they too watched sections of the event days when they were not working. The treatment of marshals as spectators could have led to double counting of people attending the event.

Due to the reasons cited above, the research team had reason to believe that the official attendance figures were not credible and that using them would only artificially inflate the economic impact attributable to the motorsport event. Eventually, the research team and event sponsors (who were interested in finding out the real value of the event) made a collective decision to use the survey as the primary tool for estimating the audience figures and subsequent economic impact.

Methodological issues and key considerations for estimating spectator attendance

The case studies presented above highlight various approaches used to estimate spectator attendance at free-to-view events. The following discussion will now draw together the methodological issues raised and look at key points that need to be considered when measuring spectator attendance.

Key considerations for measuring spectator attendance are which methods are used to derive estimates and which sources of information are available. It is evident from the case studies presented in this paper that official estimates – whether they are from police sources, the media or event organisers – are often inaccurate. For free-to-view events that take place within a venue or restricted area, the dimensions of spectator access should be used as an initial guide to spectator attendance. However, many free-to-view events, such as those discussed, take place in public areas and therefore capacity constraints are generally not a limiting factor in terms of attendance. In such cases, other reasonable measures should be used as an initial guide for spectator numbers. For example, as for the marathon and the cycle road race, variables such as crash barriers, depth of crowd and length of course can be used as reference points. Other methods, such as aerial and other photographic evidence and television footage, also provide useful tools for estimating crowd densities, especially for those events that are remote or have difficult to access areas, such as the motorsport event. Fundamentally though, in each case study, the spectator survey was very important for estimating event specific attendance. Careful consideration, therefore, needs to be given to the sampling techniques used to collect survey data, as these will be affected by factors such as the spatial layout of the event, length of the course, access to spectator areas and local intelligence.

A further methodological consideration is the issue of repeat viewing within a single event, either across a course or over multiple days. This is often a source of error within estimations of spectator attendance and was a key consideration for the three events discussed above. Crowds at open access, free-to-view events are fluid. For events that take place over an extended distance, such as running, cycle and triathlon events, it is common practice for people to move around the course. Indeed, many courses are designed to maximise viewing in this way. Consequently, the significance attached to the repeat viewing cannot be emphasised enough, not least because, without its consideration, double counting of spectator numbers and, in turn, exaggeration of benefits linked to attendance are inevitable. For example, at the London Marathon, without the application of the repeat viewing factor the expenditure attributable to spectators would have been exaggerated by c. £9.2m (Coleman, 2003). Furthermore, if an event takes place on more than one day, then repeat viewing across multiple days is an important factor that must also be considered. This can be a significant source of error if not identified and can lead to discrepancies between official and other reported attendance figures, such as was the case for the motorsport event.

An additional methodological consideration for estimating spectator attendance at free-to-view events which take place in public places is the estimation of the proportion of casual spectators watching the event because they just happen to be in the area. This was an issue in the three case studies presented above. There should be a clear differentiation made between the actual spectator attendance and the event specific attendance. While this may not be relevant for some indicators, such as the popularity of the event, it is particularly pertinent for some types of event monitoring and evaluation, such as economic impact, where it is imperative to distinguish between people attending specifically for an event and 'casual' spectators in order to avoid exaggerating figures.

Finally, in the case of commissioned research, there is the methodological challenge of meeting client expectations and balancing this with the appropriate rigour in measurement. Once more this was an issue in all the case studies and remains a significant challenge to researchers undertaking evaluation studies that are linked with attendance measurement. Often event organisers overstate spectator attendance – as in the case of the cycling road race and the motorsport event – and a key challenge facing researchers is how to reconcile the differences between official figures and those derived as part of an impact evaluation study. It is important that estimates of spectator attendance are supported by a transparent audit trail of how such figures are derived to ensure that they are able to stand up to scrutiny.

Conclusions and implications for future free-to-view event impact evaluation

Measuring attendance at free-to-view sports events is not a straightforward process. While event organisers tend to have accurate records of accredited personnel, such as the number of participants and officials, this is frequently not the case for spectators. Attendance figures, therefore, often represent little more than educated guess work derived with limited academic rigour. This paper presents empirical data from three case studies to examine various approaches to spectator measurement at free-to-view events, and suggests several methodological considerations for estimating spectator attendance in the future. While the issues raised within the paper are relevant to free-to-view events in general, they are particularly pertinent to non-elite events, given that these are commonly held in public places, with greater levels of casual viewing.

Despite the lack of attention afforded to sports event attendance measurement within academic literature, this is an important methodological consideration in its own right. Although exaggerating crowd sizes may be beneficial for public relations, marketing and the perceived success of an event to a host community, region or country, it compromises the reliability of any monitoring and evaluation based on estimates of attendance. For example, common forms of economic impact evaluation involve surveying a sample of event attendees, then aggregating the findings upwards to derive estimates for the population in attendance. Assuming that the sampling has been conducted in a robust manner, the greatest source of error is likely to be the figure used to multiply the findings from the sample upwards to the population as a whole. Research commissioned by UK Sport (2004, 2006) has shown that, for the most part, the key determinant of total economic impact is the number of spectators attending an event. There is a very high correlation ($r = 0.90$) between the number of spectator admissions to an event and the economic impact attributable to that event (UK Sport, 2004). In this regard, a reliable estimate of the spectator attendance is critical to the accuracy of economic impact figures.

While exaggerating crowd sizes has the effect of overstating positives (e.g. economic impact), at the same time it can result in overstating the negatives (e.g. environmental impact) attributable to an event. Furthermore, other measures that are based on findings from a survey, such as the percentage of disadvantaged people attending the event, will be overstated if used subsequently to compute the absolute number of people from a particular group who attended an event. Thus, regardless of the rigour with which monitoring and evaluation data are collected, that data's true value is unreliable if attendance levels are inaccurate. The significance of accurate crowd estimates to meaningful evaluation cannot be overstated, especially at free-to-view, open access events. It has significant implications for measuring economic and environmental indicators and it is therefore vital that event organisers recognise the implications of misrepresenting the popularity of an event in terms of spectator numbers.

Accurate measurement of attendance is not only important for the monitoring and evaluation of various types of impact, but it is of great consequence to the marketing and sponsorship of free-to-view events. In marketing terms, reliable information on spectator attendance is important for targeting promotional materials. Furthermore, potential sponsors of free-to-view events are interested in both participant and spectator attendance, in order to evaluate the potential exposure and benefits that supporting an event might bring. Inaccurate information may impact on the ability of an event to sustain or secure funding in the future. Conversely, armed with accurate knowledge and information, appropriate strategies can be devised to grow an event and ensure sponsorship to help fund such events in the future is forthcoming.

This paper was essentially written to stimulate thinking amongst academics and practitioners about measuring attendance at free-to-view sports events. While it illustrates various approaches used to estimate spectator numbers, it does not offer a single concrete solution for attendance measurement. Rather, it puts forward a series of methodological issues to be considered in order to move towards a more systematic approach to attendance measurement. Undoubtedly, each and every event is unique, in terms of its spatial layout and spectator access points; however broad similarities can be drawn between certain types of events. Hopefully, the suggestions put forward in this paper will be of benefit to researchers and organisers of free-to-view events and contribute to the development of a more robust framework for measuring spectator attendance in the future.

Biographies

Larissa Davies is a senior research fellow at the Sport Industry Research Centre and a senior lecturer in geography at Sheffield Hallam University. Her PhD focused on valuing and measuring the economic importance of sport. Larissa specialises in the area of sport and urban regeneration. She has a particular interest in the role of sport in local economic development and regeneration and the tangible and intangible impacts of sport stadia, including the impact on property markets. Larissa also has an interest in methodologies used to measure and value sport. She has published various research articles in these areas.

Richard Coleman has 10 years experience in the evaluation of sport events relative to their economic impact and place marketing value for the host area. He has worked on numerous event evaluations for UK Sport and produced two economic impact review papers linked to their event investments in the past decade. Richard has managed and authored more than 20 event economic impact studies including Wimbledon Tennis, the London Marathon, World Snooker, the Tour de France in London and The Open Championship. Most recently, he has co-authored with Girish Ramchandani the content of www.eventimpacts.com (an event evaluation toolkit) for UK Sport and partners.

Girish Ramchandani is a trained economist and statistician with an MSc in sport management. He is a research fellow at the Sport Industry Research Centre at Sheffield Hallam University. Girish's main area of work is the evaluation of major sports and cultural events and venues in terms of economic impact and alternative indicators. His research interests also include sport/leisure facility management and analysis of performance in elite sport competitions and he is a published author in both of these subject areas.

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