Introduction to Measuring Attendance

Exaggerating crowd sizes can be common practice for the purposes of public relations, but it compromises the reliability of monitoring and evaluation that is based on estimates of attendance. This has implications for much of the research being undertaken at events, and we urge event organisers to recognise the implications of misrepresenting the popularity of an event in terms of spectator or audience numbers (or indeed competitor numbers at mass participation events). Exaggerating crowd sizes has the effect of overstating economic impact and at the same time overstating the carbon footprint attributable to an event. 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 is collected, its true value is unreliable if attendance levels are inaccurate.

Common forms of monitoring and evaluation involves conducting a survey of a sample of event participants and to aggregate the findings upwards to derive estimates for the population of participants. For example, it might be the case that 100,000 spectators attend a large scale equestrian event and event stakeholders wish to conduct an economic impact study. A research team would aim to interview around 1,000 spectators and then use the findings from this data to aggregate upwards on the basis that the 1,000 people interviewed are representative of all spectators. 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. For example the figure of 100,000 could have been used for the purpose of public relations, whereas in reality there were only 50,000 tickets sold. A practice such as this if left unadjusted would have the effect of doubling the economic impact attributable to the event.

At the majority of ticketed events there should not be a problem with spectator or audience levels as there are ticket sales databases which can provide accurate data with which to work. However, at free to view or open access events particularly along linear routes such as cycle races or cultural events that people can chance upon and drift in and out of such as Piping Live, there needs to be well reasoned estimates of the number of spectators for economic impact, environmental and social impacts. In particular, there should be a clear differentiation made between the number of attendances (throughput) and the number of different people (attendees) who generated the throughput figure.

For example there could be 90,000 admissions at a three day equestrian event which in turn could be made up of 90,000 different people attending once, 30,000 different people attending all three days, or numerous combinations of people and days in between these two extremes. Furthermore in the case of events that take place over an extended distance such as a cycle race or a carnival parade, there is the possibility that people can watch the event from more than one place on the same day. For example, in the case of the London Marathon, and similar events, it is possible (and common practice) for spectators to move around the course and see runners in whom they have an interest at numerous locations.

To illustrate the problems associated with overstating crowd sizes, consider the case of a cycling road race with an estimated attendance of 10,000. If the 10,000 crowd is all different people residing outside the host economy and their average spend is £10 per head at the

event, the economic impact would be £100,000. However, this is a free to view event andprimary research amongst a sample of 1,000 spectators indicates that they watch from an average of two different locations each, given that they are free to move around the route. Consequently, the 10,000 attendance becomes 5,000 different people when the repeat viewing factor of two is applied (i.e. 10,000/2) and the economic impact will be £50,000 applying the same expenditure figure. Furthermore, as explained above, left unchecked the carbon footprint attributable to spectators would also be overstated. In short, event organisers need to be aware that should they exaggerate crowd sizes, the net effect is to undermine the reliability of monitoring and evaluation that is dependent upon accurate crowd size estimates.

Moreover, any over inflation of crowd sizes is also likely to have downstream effects in terms of social impacts. For example, if half of the 10,000 attendance are from the host economy and 50% of our sample report that they are more likely to cycle as a result of their attendance at the event; it would appear that there are 2,500 people at whom to direct any cycling interventions designed to increase participation. However, as suggested previously, if people watched from an average of two locations then this would halve the potential target group. This in turn might be the difference between implementing a cycling participation initiative, or shelving it due to an apparent lack of interest.

Measuring Attendance at Ticketed Events

Attendance at ticketed events can be monitored by ticket sales, or tickets surrendered on entrance to gain admission. Where technology permits, other measures such as the total number of clicks on turnstiles can also be used as there can be no guarantee that all of those people who purchase a ticket for an event actually use them. The purpose of analysis is first to estimate the total number of attendances at an event, and then to down-weight it to the number of unique attendees by using a repeat viewing factor. We restate the requirement to differentiate between attendees and attendance, which applies not only to non-ticketed events but also ticketed events

For some types of monitoring and evaluation (such as economic impact assessment) it may be necessary to distinguish between those whose attendance at the event is their primary motivation for being in the local area and those who are 'casuals', that is, people who are in the locality for some other primary purpose and their attendance at the event is a secondary consideration. It is conventional practice to exclude casuals from calculations such as economic impact and carbon footprint estimates because the impacts made by such attendees cannot be attributed to the event.

Suggested considerations when measuring attendance at ticketed events

- Primary data source will be box office data, ticket sales and ticket distribution
- The number of tickets distributed or sold does not always equal the attendance at the event
- Ticket buyers may not be the people who use them (i.e. group bookings and one person not always representative of the group)
- Some of the larger ticketed events may operate a reuse policy whereby people who leave an event early would relinquish their tickets, to be sold on to other spectators wanting to watch the action.

Ticket sales and distribution may provide a broad indication of the nature of the audience attending, however, primary research is required to provide more detailed information on those attending (see Standard Impacts)

Measuring Attendance at Non-Ticketed Events

Having explained the importance of crowd sizes, it is perhaps worth explaining an 'open access' methodology in more detail. The approach developed as a result of the increasing number of open access events at which monitoring and evaluation work has been undertaken, particularly economic impact studies.

The methodology is based on crowd densities along the 2.5m crash barriers found on linear routes; the assumption being that these accommodate five people side by side. If barriers are on both sides of a 1km route and the crowd is one deep for its entirety then there would be 800 barriers (400 on each side of the road) and 4,000 spectators (5 x 800). Clearly this is the approach in simplistic terms, however, the final estimate is refined according to the experience of the research team at an event and with reference to their photographs and video footage at the event (and from event websites, blogs etc.). Moreover, where available, any recorded TV footage of the event plus aerial stills (where in some instances it is possible to count the people attending); is also used to derive crowd densities.

The 'no-stadium' methodology is particularly useful as a test of reasonableness for the estimates put out by event organisers. For example, if organisers claimed that an event attracted 100,000 spectators around a 1km course, it would be reasonable to expect crowd densities of around 25 deep on both sides of the road. If photographic and other evidence refute the expected crowd densities, then it is likely that crowd numbers have been overstated. In the case of large scale events, it is possible to derive a reasonably accurate estimate of attendance levels by surveying the community concerned after the event.

Some events report attendance figures on the basis of police estimates. We have interviewed two senior officers from the Metropolitan Police who have advised us that the police do not make any scientific estimates of crowd sizes and ideally do not like to have figures attributed to them. Any estimates attributable to the police are based on little more than hunches. Finally, any repeat viewing factor derived from primary research amongst spectators will be applied to derive an estimate of the number of different people en route. The 'open access' methodology can be adapted for crowds in open spaces such as free concerts based on the number of people per square metre.

Introduction to Profiling Attendance

Sex, age, socio-economic group, disability levels, ethnicity, educational attainment, employment status, home ownership and car ownership are some of the more commonly asked aspects of people's personal profile. The possible list of questions is almost exhaustive but needs to be balanced against considerations such as:

- Why do you want to know?
- How will the data be used?
- What impacts will collecting the data have on the time and cost of data collection?

Profile questions should be asked in a comparable way to national surveys so that valid questions are asked and where appropriate comparisons can be made with wider populations. If event organisers adopt practices such as those recommended, then it also becomes possible to make comparisons between events.

In an online survey of 2,250 London Freewheel participants (see LFW), the following Profile information was identified. For an example of how profiling questions might translate into a surveying tool, please see the IRB questionnaire.

Sex: 1,400 Male (62%); 853 Female (38%)

Age: Mean Age 42 years. Actual age was requested and the frequency distribution can be grouped according to national categories such as Census 16-17, 18-19, 20-24, 25-29, 30-44, 45-59, 60-64, 65-74, 75+ or Active People

Disability: 116 (5%) considered that they have a long standing illness or disability which limits their daily activities.

Employment: Work FT (30+ hrs/wk) 73%, Work PT (<30 hrs/wk) 9%, Self-employed 8%, Student 3%, Retired 5%, Not in paid work 8%

Ethnicity: White British 73%, White Other 15%, Mixed Race 2%, Black/Black British 2%, Asian/Asian British 2%, Other 5%. This is a truncated version of the groupings from the Census which may be too complex for the average survey.

Socio-economic: In terms of the socio-economic groups to which respondents might belong, the National Statistics Socio-economic Classification (NS-SEC) is now used. The questions necessary to derive NS-SEC are numerous and difficult to code, which may be more than is required by the average event evaluation. A pragmatic approach maybe to ask for the occupation of the main earner and the annual household income. Should event organisers wish to examine NS-SEC in more detail use the downloadable manual from ONS. Taking Part is another reference option when looking in more detail at young people.

Profiling Attendance by Residence

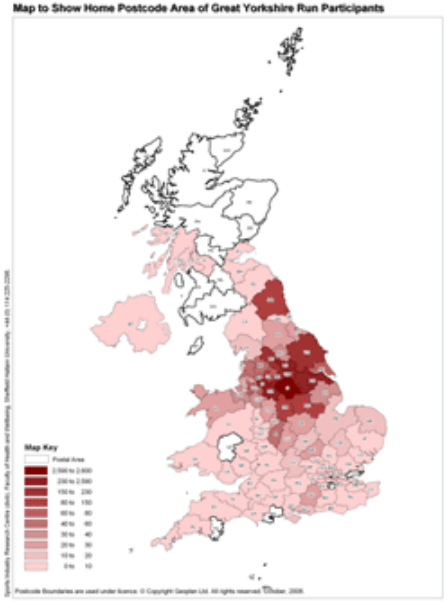
Profiling by residence may be required to identify other impacts (economic), or establish performance against targeted demographics (eg % of local residents or socio-economic categories engaged by the event).

Geographic analysis of survey results is made possible by the inclusion of a question asking for people's postcode. Although actual postcodes do not have legally binding boundaries, their positions can be plotted using a Geographic Information System (GIS) by making reference to a directory file, such as the National Statistics Postcode Directory. The advantage of this system is that the majority of people know their postcode, and are able to supply it when responding to a survey. The level of detail on any subsequent map is determined by the amount of postcode data recorded. Thus, a full (or unit) postcode can be plotted at street level, while the first two letters of a postcode are sufficient to identify the postal area (of which there are 124 in the UK). It is therefore possible to produce maps at a range of geographic scales with a suitable map 'theme' to show the results of the survey. The examples below demonstrate the difference between mapping survey data at postcode area and postcode district level (the first half of a postcode, sufficient to identify a post town).

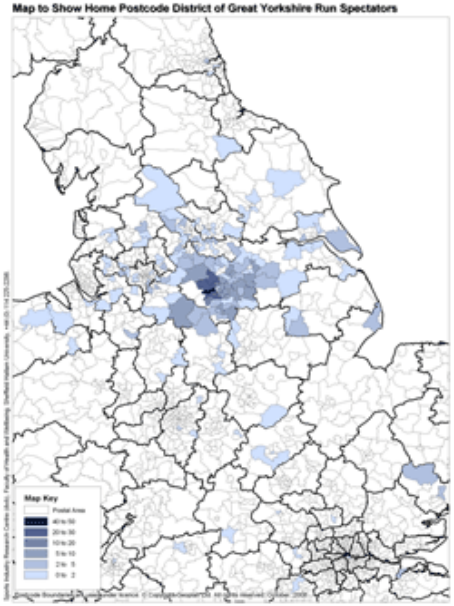
Unit postcodes are sufficiently accurate to be mapped to within 100 properties (with an average of 15 per postcode). Once plotted, this point data can be aggregated up to any other level of geography within the national statistics hierarchy (e.g. super output area, ward, local authority, county), enabling comparison with other geographic datasets, such as population counts or market segmentation directories. Other spatial analysis techniques can be used on postcode level data, such as hotspot mapping and travel distance modelling (see examples below). It is not possible however, to reverse-engineer the postcode from postcode area to unit postcode level. It is therefore preferable to collect full postcode data from survey respondents.

Local authorities and central government departments/agencies have access to spatial data sets under the Mapping Services Agreement (MSA) with central government. The MSA provides a wide range of data from a number of suppliers including Ordnance Survey, including road network, address and postcode data, boundary datasets and other topological data. Under the MSA, authorities are able to supply data to consultants under a 'contractor sub-licensing agreement', which is a standard contract template identifying the datasets to be used. The use of such data is tightly controlled by the terms of the contract, which usually requires that data is only used for the purpose for which it is supplied, and cannot be retained beyond the period of the contract. Acknowledgement of copyright is required at all times, and must refer to the relevant licence number.

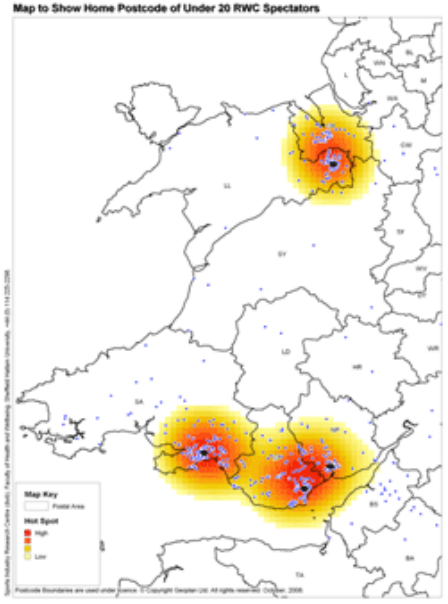
Map to Show Home Postcode Area of Great Yorkshire Run Participants



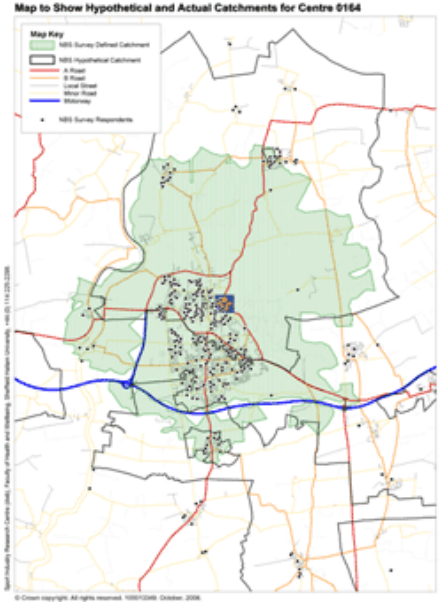
Map to Show Home Postcode District of Great Yorkshire Run Spectators



Map to Show Home Postcode of Under 20 RWC Spectators



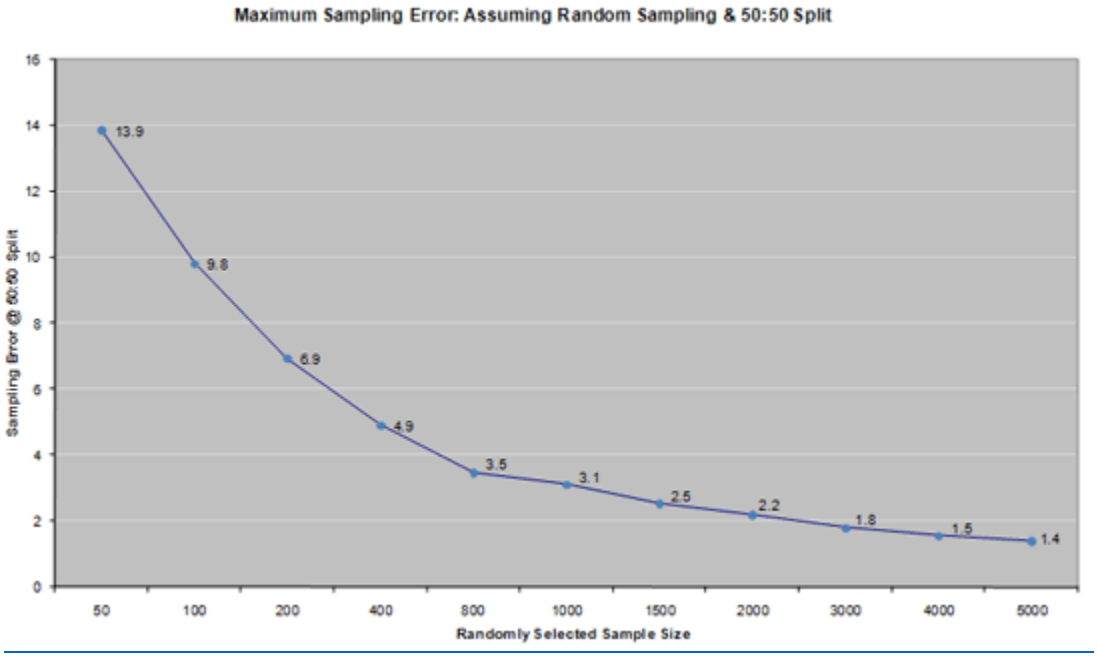
Map to Show Hypothetical and Actual Catchments for Centre 0164



Introduction to Surveying and Sampling Error

The value of survey data is entirely dependent on the quality of sampling. Whenever a sample is drawn from a population, the data relating to that sample will contain a degree of error. This error is known as sampling error. For large populations (over 1,000) it is the absolute size of a sample which determines sampling error, not the relative size of the sample compared with the population from which it is drawn.

To illustrate this point consider the case of polls featured on television news programmes. The adult population of the UK is 48 million, yet most commercially commissioned surveys tend to employ sample sizes of around 1,000 respondents. Assuming that these respondents have been drawn randomly from the adult population, then the maximum degree of sampling error attributable to a research finding would be +/- 3%. That is to say, if 50% of respondents in the 1,000 sample stated that they had been to the theatre in the last 12 months, then the 'true' (population) answer would lie somewhere between 50% +/- 3, i.e. somewhere between 47% and 53%. In order to halve the sampling error (i.e. to +/- 1.5%) it would be necessary to quadruple the sample size. The graph below shows the relationship between absolute sample size and maximum sampling error for that sample size, whilst the accompanying Table provides the sampling error for some milestone numbers at a variety of divisions within a sample



Sampling error at milestone sample divisions (assuming random sampling at 50/50 split)

Sample Size	Sampling Error
50	13.9
100	9.8
200	6.9
300	5.7
400	4.9
600	4.0
800	3.5
1000	3.1
2000	2.2
4000	1.5

Sampling error only applies to truly random samples, i.e. those which are representative of the populations from which they have been drawn. In the event related research to which this document refers, it is almost impossible to demonstrate that truly random sampling has been carried out. At many events there is only a limited window of opportunity to collect data from those attending. Consequently,

the pragmatic approach is to survey as large a sample as possible within the time and resources available (convenience sampling) in the hope that is represents the population as reasonably as possible and that the size of the sample minimises any potential biases. Where an event is small enough (in participant terms) or where particular groups are relatively low in number to make it cost effective, the entire population could be targeted. For example, at most events supported by UK Sport it has been possible to survey the majority of, if not all, media personnel attending, providing that access is facilitated by the event organisers.

In the case of undertaking survey research into non-attendees, random sampling is necessary and can be achieved by using household surveys, similar to the approaches employed for large scale national surveys such as Taking Part. However, the resource requirements for such initiatives will be well beyond the budgets of most events. With appropriate planning ('bolting in') it is possible to gain access to surveys of local communities, such as those routinely carried out by local authorities, cost effectively or indeed at no cost.

We would argue (where resources allow) for samples of c. 1,000 in line with those used in political opinion polls and to ensure that reasonable sub-samples can be achieved when the data is cut. This is especially important should an event have specific target groups at which it is aiming; or alternatively if this is the case we would suggest bespoke monitoring and evaluation which specifically targets such people; though once again this approach will be reliant on clearly stated aims and objectives.

As with all monitoring and evaluation, the design of research depends crucially on the intended use of the results. For example, if it is intended to sample people attending an event in order to identify certain groups of interest then there can be a major issue surrounding sample sizes. For example if people from minority ethnic groups are a group of interest, then in a random sample of 1,000 residents of the UK some 90 respondents would be expected to be members of a minority ethnic group. As can be seen in the graph above, if this was a random sample the sampling error would be around +/- 10 percentage points. Thus if 50% of the sub sample enjoyed the performance and we wished to aggregate upwards, the true answer would lie somewhere between 40% and 60%. Findings of this type do not allow much in the way of a meaningful interpretation or analysis. Thus in some cases, if there are particular groups at which outcomes are targeted, then (to reiterate) bespoke monitoring and evaluation of such groups is our recommendation rather than being solely reliant on the results of surveying.

Summary of Surveying Techniques

The following data collection techniques can be used to sample an event population. There are advantages and disadvantages to each which will need to be considered when developing/commissioning the research:

Administered surveys at the event

- Accurate data, good completion levels
- Costly and time intensive, often only narrow windows of opportunity, low(ish) sample sizes

Self completion survey at event

- Larger sample
- Maximise window of opportunity - best use of fieldworkers
- Less accurate data - trade off between sample size and data quality

Postal survey

- To event attendees post-event - beware if sales data shows lots bought by one person
- Need to collect addresses from non-ticketed events
- Can be costly dependent on sample size

Hybrid survey

- Distribute survey packs to those attending free events in the hope of them responding (free pen and SAE)
- Reach wide audience but no guarantees of success (sell them on an idea, incentivise)
- Bias as only certain types respond (though true of all surveys)

Online

- Distribute URL cards at event
- Collect emails at event

There may be instances where data is required from non-attendees or the population at large. In such cases access to local omnibus surveys such as Citizens Panels where simple, event specific questions can be included, is one option. Such surveys provide those purchasing questions with a means to get quick, relatively low cost answers to their questions without financing and organising a full

survey themselves. For more detailed feedback about a variety of event related topics a simple household or telephone survey would be a better option, but is likely to cost more than a question on an omnibus survey.

Case Study: Audience Representativeness 1

The following table demonstrates how Audience Representativeness can be defined once a basic profiling of a sample of the event population has been defined. In this case, the population from the 2008 World Junior Rugby Championships is compared with that of the UK population.

Demographic	IRB Rugby	UK	Ratio
Gender			
Male	73.6	49.1	1.50
Female	26.4	50.9	0.52
Age structure			
16 - 24	16.1	14.9	1.08
25 - 44	43.1	34.6	1.25
45 - 64	95.4	92.1	1.04
65+	7.4	23.4	0.34
Ethnicity			
White	95.4	92.1	1.04
Minority ethnic groups	4.6	7.9	0.58

Health (Limiting Long Standing Illness or Disability)			
No LLSI	94.7	78.0	1.21
	5.3	22.0	0.24
Ratio > 1	Over-representative		
Ratio = 1	Representative		
Ratio > 1	Under-representative		

Case Study: Attendance Representativeness 2

The case study below attempts to demonstrate how attendance profile data can be used in conjunction with existing benchmarks within the sector, to demonstrate how representative the event attendees are of those who regularly engage with the activity.

	Survey Indicator	Sample(%)	Benchmark (%)	Ratio (Sample / Benchmark)
U20 Rugby World Cup	% attended major rugby events in Wales previously	78.1	3.2 [1]	24.41
Glasgow Int'l Piping Festival	% engaged in piping	40.5	52.0 [2]	0.78
Great Yorkshire Run	% running for health, leisure or competition at least once a week	44.1	3.9 [3]	11.31
	% non - participants (last 4 weeks)	44.1	94.0 [4]	0.47
Tour of Britain (North West)	% taking part in cycling at least once a week	55.5	4.3 [3]	12.91
	% non - cyclists (last 4 weeks)	32.0	91.5 [4]	0.35
Ratio > 1	Over-representative			
Ratio = 1	Representative			
Ratio > 1	Under-representative			

Notes:

[1] % of UK adults that attended a live rugby union event in 2006 (Source: GB TGI, BMRB Quarter 4 2006/Mintel).

[2] Not entirely comparable to sample. Relates to % of adults in England participating in an arts activity. Source: Taking Part Survey (see http://www.culture.gov.uk/images/research/TP-surveyAnnualData-0607.pdf).

[3] Source: Active People Survey 2 (seehttp://www.sportengland.org/ngb_sport_factsheet_final_3.pdf).

[4] Source: Active People Survey 2 (seehttp://www.sportengland.org/aps2_all_sport_factsheet2.pdf).

Guidance: Measuring the Impact on Future Attendance

The collection of data in relation to this impact will need to take place at one or more points after the event – allowing at least six months before the research is undertaken. The results will help you understand the 'change impacts' of your event – ie. the impacts that stems from initial interaction with the event. We believe it is helpful to think of there being two types of change impact; indirect impacts – those where, as in this case, attendance at an event and a positive event experience might lead to further engagement with similar events; and induced impacts – that is, any subsequent (potentially long term) impact involving behaviour change following the initial round of impacts. Such impacts would ordinarily require requisite support systems to be in place rather than occur simply by putting on an event.

Once people have experienced an event, it may be worthwhile investigating whether or not participants feel that the event has had any sustained impact on them, particularly if there are planned social impacts attached to the event. These might include some of the questions detailed below.

On the basis of your attendance at event X, will you;

- **Attend the event again in the future?**
- **Take up the activity?**
- **Participate in the activity more frequently than you do currently?**
- **Attend similar events in future?**
- **Watch the activity on TV?**
- **Become an advocate for friends and family to take up the activity?**

There are no guarantees that what people say they intend to do is what they actually do, particularly if interviewed in a state of post event euphoria. This point relates to the Transtheoretical Model (TTM discussed in the Manual) and in order to move towards testing intentions, longitudinal research over a sustained period is required. This involves tracking the same sample of people over a period of time and usually involves monitoring a 'before' and 'after' state. The further in time from an event a change in behaviour is observed, the more problematic it is to attribute such change to the event, especially as there are likely to be multiple influences at play. Longitudinal research can be costly, hence event organisers should think clearly about the claims they make of their events in terms of what they might achieve and more importantly how they might demonstrate success. Furthermore, given the need to deliver reporting statistics soon after an event, organisers should consider whether longitudinal approaches to monitoring and evaluation are consistent with such timescales. This point links back to a recurring theme within this Toolkit and accompanying Manual for the need to be explicit about what is planned to be achieved, how it is to be achieved, and how any such achievements can be demonstrated.