**SUMMARY**

This paper discusses issues relating to the representativeness of data obtained from an audience measurement panel. The paper gives a broad overview of most factors which have a key influence on representativeness but concentrates on the practical activities which must be carried out on a regular basis in order to maintain the quality of the data. The paper reviews relevant statistical issues and describes the current methods employed for motivating panel members on the UK measurement panel, including a description of the tangible rewards and communicative procedures. However, the most important part of the paper describes and examines the role of ‘input’ quality control procedures. These procedures are applied to the data registered by individual panel members in such a way as to identify any system/meter malfunctions and, in particular, any deterioration in a panel member’s performance in button pressing activity. In the UK these ‘input’ procedures embrace a number of specific checks, including extreme viewing, nil viewing, unallocated button usage and uncovered viewing. When an individual fails a certain input procedure this initiates either a telephone call to the panel member or a special meter validation check. This process itself forms an important integrated part of the panel maintenance procedures described in the early part of this paper. Because this integrated approach is so important to the overall accuracy of the data the parameters used in the ‘input’ procedures are critical. The paper examines the reasons for choosing the currently used parameters and presents details of the number of checks made and their outcomes in terms of panel member errors, genuine behaviour, and system malfunctions. In summary, the paper demonstrates how important panel maintenance and ‘input’ quality control procedures are in ensuring that an audience measurement panel continues to provide consistent representative data.

**PART 1 - STATISTICAL BACKGROUND**

The representativeness of any sample, including one for television audience measurement, can only be achieved if the sample selection procedures rigorously follow the well established theoretical rules. These rules are well known to survey researchers and the current available literature already provides a more than adequate description. However, for the purposes of this paper it is appropriate to make a number of points about the level of recruitment success to an audience measurement panel. Such research vehicles, by their very design, demand a great deal from the prospective panel members. This includes the installation of a meter system which normally involves tampering with people’s televisions, video recorders and telephones, together with a long term commitment from all residents of the household to register all viewing sessions. Therefore it is not surprising that a relatively large proportion of selected homes actually refuse to join the panel. Typically the best one can hope for is a recruitment rate in the range 20 - 50% (the reader is cautioned that different panel operators have many different ways of calculating recruitment rates). When there is any level of refusal then there is a potential risk that recruitment bias will be introduced into the panel. Obviously the larger the refusal rate then the greater is the risk. However, refusals will not affect the representativeness of the panel results if there are no behavioural differences (which affect TV viewing) between recruits and refusals. Obviously, they are different to the extent that they are willing or otherwise to join a panel. But if this characteristic is the only difference then the recruitment rate is not a problem. How then does one guard against the possibility of recruitment bias? The answer isthrough the use of suitably designed panel controls.

In the UK the panel is recruited from the pool of potential recruits generated by a continuous Establishment Survey. The profile of the panel is continuously monitored against a large number of target profiles generated from the same survey. New panel recruits are selected to replace households who leave the panel with the objective of maintaining the target profile (ie. the correct panel balance). In this way the representativeness of the panel is maintained provided that the panel controls collectively provide the best set of discriminators which explain variations in viewing behaviour between individuals. For example, if every 16-24 year old viewed in exactly the same way and if every 25-34 year old viewed in exactly the same way, and so on, then Age of Individual would be a perfect panel control and indeed the only panel control required. Of course this is not the case and there are many controls all with differing explanatory power for different aspects of viewing. In addition, there may be other practical reasons for adopting a particular characteristic as a panel control such as: It is a key reporting audience category; It has a differential recruitment and/or drop out rate; It causes technical meter installation problems; It is a good determinant of other panel controls; It is differentially sampled, and so on. Nevertheless the important point is that the sampling and panel control procedures are a pre-requisite to ensuring that a panel is set up to deliver representative results.

Over time the panel will face other potential statistical problems which could jeopardise its long term representativeness and thereby introduce mortality bias into the panel. This will arise if length on the panel is related to a certain characteristic, which itself is a discriminator of viewing behaviour. It is worth pointing out one well known source of potential mortality bias, weight of viewing. Studies carried out a long time ago on the BARB panel demonstrated the need for a weight of viewing control. Without applying a continuous control for weight of viewing then the panel is in danger of becoming biased in favour of heavy viewers. More recent analyses on the current BARB panel continue to show this to be a very significant panel control. However, perhaps the most obvious long term problem is that the relationships between panel controls and viewing behaviour could change such that the set of controls used on the panel no longer possess the appropriate level of discriminatory ability. In addition new controls become necessary to reflect changes in the broadcasting environment. To combat these potential problems it is essential to carry out regular reviews of the panel controls. In the UK we carry out extensive analyses of variance on the panel controls at six monthly intervals as well as continuous monitoring of recruitment and drop out rates for a full range of demographic/control characteristics.

**PART 2 - RESPONDENT CO-OPERATION**

The sampling procedures and the panel controls may be perfect on an audience measurement panel but the quality of data can be totally destroyed by the respondents’ level of co-operation. It is one thing to ensure that the panel contains the best set of homes to satisfy the representativeness criterion but quite another to be confident that the panel members are performing the required tasks accurately all the time.

The traditional check on the accuracy of a peoplemeter system is to carry out a telephone co-incidental study. Such surveys are designed to measure the extent to which individuals correctly use the remote handset devices. The method employed is to telephone panel homes and obtain a statement from the home about which individuals were viewing television in the panel home at the time of the telephone call. The independent statement is subsequently compared with the individual’s viewing status recorded by the meter system. These comparisons are used to calculate a number of accuracy measurements. Perhaps the most meaningful accuracy measurement is the ‘overall accuracy’ calculated for only those homes where a television set was turned on in the home. In the UK this measurement is typically in excess of 90 per cent - indicating that over 90 per cent of individuals have a meter button status which agrees with their claim. In addition the errors which do occur compensate to give an overall reporting viewing index of 100%. This is a good result and must indicate that the procedures which are applied on the UK BARB panel for motivating panel members must be having some effect!

The panel maintenance procedures on the BARB panel may be described under the two headings, monetary rewards and panel contact.

**Monetary Rewards**

Payments to panel members account for a significant proportion of the total costs of running a panel. This is, of course, how it should be. However, one must be careful to reach a balance between not paying enough and paying too much. Underpayment will have a detrimental effect on recruitment levels while overpayment will encourage people to join the panel for the wrong reason, which in turn can lead to longer term problems with co-operation. Also the form of the monetary reward must appeal to all types and ages of people because the panel is indeed a sample of the population. Finally, a peoplemeter panel requires the co­ operation of all individuals in the household and therefore the reward must be designed to appeal to the individual. This can best be achieved by a combination of an individual’s personal reward together with a family/group reward. Individuals can be personally motivated by knowing that the family/group will benefit from their individual actions.

On the UK’s BARB panel these requirements are satisfied by giving cash rewards in a number of different ways:

Individuals receive their own choice of retail store gift voucher once every six months. All individuals on the panel receive exactly the same value of gift voucher. This payment is paid in advance of services rendered.

Every household receives an annual cash payment (paid by cheque). This payment is paid at the end of each year’s service.

Every household is given an equal chance to win a cash prize every month from the panel lottery. The prizes range in value from £25 to £500 and every month each household has a 1 in 100 chance of winning one such prize.

A recent survey of the panel was carried out to obtain views from panel members about panel membership and, in particular, their level of satisfaction with the monetary rewards. The survey results indicated that members were indeed satisfied. This in itself is not particularly surprising because the panel members joined the panel in full knowledge of the monetary rewards they would receive. What is interesting is that about half the panel would be willing to sacrifice some of their payment if RSMB made charitable donations on their behalf. This will now be something which RSMB will develop with panel members over the next few months.

**Panel Contact**

Keeping in contact with panel members is recognised as an important panel maintenance activity. At the ESOMAR conference in Toronto it was shown that contact can significantly reduce the level of panel drop outs. This is clearly the case in the UK where natural drop out from the panel is less than 12% per year. In addition there are other reasons why contact with the panel has an important role to play in maintaining the quality of results. Being a member of an audience research panel should be put across to panel members in a very positive way. In the UK our aim is to promote the concept of being part of a club, a member of a group. This is achieved through the panel contact procedures. The first procedure to briefly mention is the monthly panel newsletter which contains features about panel members, competitions, topical articles and so on. However, by far the most important contact procedure is the telephone contact which is initiated through the quality control ‘input’ checks. These are described in detail in the next section.

**PART 3 - QUALITY CONTROL PROCEDURES AND CONTACTS**

RSMB’s quality control procedures start with the following premise about the recording of viewing behaviour by panel members and the peoplemeter system:

The panel will provide accurate input data for processing if, and only if:

* The Peoplemeters work properly
* Panel members are motivated and understand their task
* The demographic characteristics of the panel are accurate and up to date.

Accordingly, daily checks are carried out on the peoplemeter data by AGB, the contractor responsible for the metering of BARB panel homes, while RSMB update panel members’ demographics on a daily basis. In addition to these routine internal procedures, RSMB conduct quality control checks involving panel member contact and it is these checks which are the subject of this section.

The checks which are implemented each week are designed primarily to identify problems which panel members may have with the task of recording viewing on the peoplemeter system. Problems may arise because of some loss in motivation on the part of the panel member, or misunderstanding of the task. In addition the checks are useful in picking up some meter problems or demographic changes before the other routine procedures do so.

The checks are triggered by examination of each panel member’s recent viewing data and panel members are then contacted on the telephone by RSMB’s panel liaison team. The checks themselves fall into four broad categories:

Nil Viewing Extreme Viewing

Uncovered Set Viewing Unallocated Button Pushing

Each check is triggered by different parameters which are designed to identify problems which could affect the representativeness of the data while avoiding unnecessary repetitive contact. For example nil viewing by an individual is checked after three weeks of nil viewing. If this time period is shortened to two weeks then 50% more calls would be generated, almost all of which would turn out to be genuine cases of nil viewing, rather than problems. If, however, the period was extended to four weeks or more, problems would go undetected for too long. Each parameter chosen is designed to provide the best compromise between the need to be responsive to real problems and a desire not to contact panel members unnecessarily.

**Nil Viewing**

This can hide a multitude of sins. Checks embrace nil viewing by homes and individuals, nil viewing to particular TV sets or Video usage, and nil viewing to particular channels. By doing these checks, problems as diverse as a malfunctioning peoplemeter handset on the second set, individuals who have left the home and homes which have ceased to subscribe to cable television have been uncovered. As mentioned previously three weeks’ nil viewing is the parameter used.

**Extreme Viewing**

RSMB’s approach to extreme viewing is to check occurrences of long viewing sessions. Individuals who have registered themselves as viewing continuously for four hours or more are contacted.

**Uncovered Set Viewing**

Put simply, uncovered set viewing means that the meter is registering that a television set is on, but that no-one is viewing. This could be genuine, but checking can also reveal meter problems or panel member laziness. Uncovered set viewing of more than 20 minutes a week accounting for more than 6.5% of total viewing by the home is checked.

**Unallocated Button Pushing**

Each panel member has a nominated button on the peoplemeter handset. If a button has been pressed for over an hour in a week and that button has no person allocated to it then a check is triggered.

The following deals with the outcomes of these checks.

**Outcomes of Quality Control Checks - All Checks**

Tying in with the threefold aim of the checks, the outcomes can be divided into three positive results, namely

suspected meter fault

re-education of panel members identification of demographic change

In addition, the checks yield genuine behaviour and, as with all research, other answers which don’t fit readily into any of the previous categories. Re-education of panel members and changes in demographics can be considered as ends in themselves, but suspected meter faults require further investigation, either in the form of an on-line system check or in some cases an engineer’s visit to the home.

Now the results. Typically 10,000 queries are checked every six months on the BARB panel. Individual homes often generate more than one query at a particular time. Therefore, more than one query can be addressed with any single contact. This means that in practice there are about 200 of the 4700 panel homes being contacted each week.

The following table shows the level of the various outcomes over the last two years. It can be seen that the most common outcome is genuine behaviour. It might be argued that a quality control check which yields genuine behaviour is a waste of time and effort and only checks which reveal problems should be undertaken. Certainly constant contacting of panel members for trivial reasons should be avoided as it is a waste of resources and an irritant to panel members. However, if only non-genuine behaviour is found it is very likely that the quality control system is identifying only a small number of the problems which exist and is therefore inadequate.

It can also be seen that the level of suspected meter faults has fallen over this period. This is probably due to the more experienced panel members being able to detect and report faults before a check is generated.

**Outcomes of all Quality Control Contacts (Percentages)**

|  |  |
| --- | --- |
|  | **6 months ending** |
|  | **Jan 92** | **Aug 92** | **Jan 93** | **Aug 93** |
| **Total Queries** | 100 | 100 | 100 | 100 |
| **(10,000 per 6 months)** | % | % | % | % |
| **Genuine Behaviour** | 40 | 44 | 51 | 51 |
| **Suspected meter fault** | 16 | 11 | 6 | 6 |
| **Re-education** | 16 | 34 | 25 | 28 |
| **Demographic Change** | 6 | 2 | 3 | 2 |
| **Other** | 22 | 10 | 16 | 14 |

**Outcomes by Query Type - Nil Viewing**

The table below gives outcomes for three different nil viewing queries and demonstrates the different value of each. Homes Nil viewing to Total TV by a home often yields a suspected meter fault (34%) with a high proportion of the 15% "other" being due to panel members already having notified the meter operator (AGB) of a suspected fault. Nil viewing by individuals often identifies people who have left the household. Finally, although yielding a high level of genuine behaviour, the nil viewing by homes to BBC2 query does identify some suspected meter faults which might otherwise go undetected and cause bias in the viewing data.

**Nil Viewing (6 months to Aug 93)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **by** | **to** | **Queries** | **Genuine Behaviour****%** | **Suspected Meter Fault****%** | **Re­ education****%** | **De mog Change****%** | **Other****%** |
| Homes | Total TV | 190 | 51 | 34 | 0 | 0 | 15 |
| Homes | **BBC2** | 108 | 82 | 10 | 0 | 0 | 8 |
| Indivs | Total TV | 33 | 67 | 7 | 1 | 21 | 5 |

It can be seen that nil viewing queries yield high levels of genuine behaviour. To minimise unnecessary contact genuine behaviour is classified under two categories - ‘one-off behaviour and ‘normal’ behaviour. Someone who is contacted for nil viewing to BBC2 who claims that they never watch BBC2 is not contacted for that query for at least six months, whereas someone who claims that they didn’t watch BBC2 but generally do will be contacted again as soon as the problem recurs.

**Extreme Viewing**

The long session viewing checks generally expose panel members’ laziness. For the most part though the inaccuracy resulting from this laziness is small with panel members only omitting to register short absences, which might account for 1-2% of the viewing registered. Unsurprisingly, the longer the viewing session, the less chance of it being genuine, as is shown in the table below.

**Long Session Viewing (6 months to Aug 93)**

|  |  |  |
| --- | --- | --- |
|  |  | **Outcomes** |
| **Session Length** | **Queries** | **Genuine Behaviour****%** | **Suspected Meter Fault %** | **Re- education****%** | **Demog Change****%** | **Other****%** |
| **Any 4+ hrs** | 2587 | 11 | **0** | 89 | **0** | **0** |
| **4-6 hrs** | 1019 | 17 | **0** | 83 | **0** | **0** |
| **6-10 hrs** | 984 | 9 | **0** | 91 | **0** | **0** |
| **10+ hrs** | 584 | 5 | **0** | 95 | **0** | **0** |

**Uncovered Set Viewing**

This check is useful in identifying panel members who are confused about what is required of them, as the high level of re-education shows. This check can also identify panel members who have lost interest and have ceased to press their buttons to record their viewing. There is also a high level of genuine behaviour which can occur, for example, when people leave the television on as a security device when they go out, or when very small children are left in front of the TV alone while adults are elsewhere in the home (children under 2 years old do not have handset buttons allocated to them).

**Uncovered Set Viewing (6 months to Aug 93)**

|  |  |  |
| --- | --- | --- |
|  |  | **Outcomes** |
| **Parameter** | **Queries** | **Genuine Behaviour****%** | **Suspected Meter Fault %** | **Re­ education****%** | **I)emog Change****%** | **Other****%** |
| **Over 20 mins and 6.5% of viewing** | 847 | 42 | 9 | 41 | **0** | 9 |

**Unallocated Button Pushing**

This check is useful in identifying panel member confusion, particularly with regard to the procedure required for registering guest viewers on the peoplemeter handsets and also for identifying demographic changes. When new household members join, existing members often unofficially allocate a handset number to the new member which is then picked up by this check.

**Unallocated Button Pushing**

|  |  |  |
| --- | --- | --- |
|  |  | **Outcomes** |
|  | **Queries** | **Genuine Behaviour****%** | **Suspected Meter****Fault %** | **Re­ education****%** | **Demog Change****%** | **Other****%** |
| **1 hour or more per week** | 138 | 0 | 1 | 74 | 20 | 4 |

**The Overall Effect of Input Checks on Viewing Levels**

The qualitative nature of panel member’s responses to queries makes it difficult to gauge accurately the extent to which viewing is incorrectly measured by the peoplemeter system. However, it is possible to make an estimate based on the frequency of problems occurring and the probable effect on viewing that each problem has. The table below attempts to do this, using the following assumptions about the different query types:

**Nil Viewing.** This is the greatest source of potential viewing inaccuracy. Individuals in an average home account between them for around 60 hours of television viewing a week, all of which could potentially be lost if a problem occurs.

**Extreme Viewing.** Typically a long session of 8 hours continuous viewing is a much more accurate reflection of viewing than might originally be thought, since often only a small number of short absences have failed to be registered. Viewing is therefore over-estimated slightly.

**Uncovered Set Viewing.** This is second in importance to nil viewing as a cause of inaccuracy in the data. From the levels of uncovered set viewing which occur and prove to be problems, the average problem probably accounts for 4 hours of viewing per individual per week.

**Unallocated Button Pushing.** The low levels of occurrence and the small number of hours of unallocated button pushing which occur suggest that inaccuracy due to this problem is small.

**Overall Effects on Viewing**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Average queries per week** | **Non genuine behaviour as outcome** | **Estimated hours of viewing per individual lost/gained from non- genuine behaviour** | **Total hours lost/ gained** | **%of total viewing** |
| **Nil Viewing Extreme Viewing****Uncovered Set Viewing Unallocated Button Pushing Combined Effect on Total Viewing** | 1401804020380 | 701602415269 | -8+0.5-4.0-2.0-2.2 | -560+80-96-30-605 | -0.2+0.03-0.03-0.01-0.2 |

The net effect on viewing is very small. It suggests that the viewing recorded by panel members is 99.8% of the true figure in an average week, which is remarkably good. However it does reinforce the need to conduct these quality control checks on the panel, since although small in itself, the cumulative effect of a 0.2% differential could become 10% over a year if left unattended. RSMB believe that the extensive quality control procedures carried out on the BARB panel are of fundamental importance in maintaining the accuracy of the final viewing data.

**PART 4 - CONCLUSION**

In constructing this paper the authors have attempted to give a brief review of a number of factors which influence the representativeness of panel results.

The obvious point has been made that the accuracy of results is determined by the rigorous administration of all aspects of the sampling and operational procedures. Perhaps less obvious and potentially controversial is the view, expressed in this paper, that continuous monitoring of individual panel records combined with a programme of checking by direct contact with panel members can assist in ensuring the long term representativeness of the panel. Certainly in the UK experience on the BARB panel continues to support the maintenance of ‘input quality control procedures’ provided that their operation is part of an overall programme of panel contact.