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Workshop synthesis: Survey methods for hard-to-reach groups and modes

Elizabeth Ampt\textsuperscript{a*}, Mark Hickman\textsuperscript{b}

\textsuperscript{a*} Concepts of Change, Hahndorf, South Australia  
\textsuperscript{b} University of Queensland, Brisbane, Queensland

Abstract

Transport decision-making requires data from all travellers. This is usually obtained from sample surveys – using rigorous sample selection, survey design and analysis. However people are often systematically excluded because they cannot respond to the chosen survey instrument and/or they represent rare behaviours not easily captured by traditional sampling techniques. These “hard-to-reach” groups are the subject of this paper.

This workshop identified current hard-to-reach groups in different cultural and geographical settings, providing case studies from three countries. It also identified research designs to address these challenges and suggested ways to identify hard-to-reach respondents whose absence in the data will affect results.

1. Purpose and introduction

Decision-making in transport relies on input from the full universe of travellers, in order to consider the welfare of the full population when making decisions. This input is often obtained by measuring or soliciting people’s travel patterns and needs – usually done by conducting a sample survey of some type – using well documented processes of sample selection, survey design and analysis. However, in specific cases people are systematically excluded from...
reporting in these surveys through one of two main reasons. (1) they cannot respond to the chosen survey instrument; and/or, (2) they represent rare behaviours not easily picked up by traditional random or stratified sampling techniques. These so-called “hard-to-reach” groups are the subject of this paper.

There are five specific reasons that people or sampling units (e.g. households, modes) might be hard-to-reach. First, travel surveys, like most surveys other than Censuses, are based on selecting a sample of people or trips. In order to select a sample, a sampling frame is required, i.e. a base list or reference which properly identifies every sampling unit in the survey population. This listing of all sampling units, or enumeration, relies on data that is often unknown (e.g. a list of all people who ride bicycles, or all people that have difficulty using public transport, or people using a car-sharing scheme). When enumeration is difficult, populations become hard-to-reach because it becomes difficult to draw a representative sample. Second, even when it is possible to enumerate all target sampling units, it is sometimes not easy to select a sample that can be interviewed. For example, it might be possible to obtain the number of people owning hydrogen powered cars, but it might not be possible to sample them due to constraints on availability of personal data of car owners. Third, even though it might be possible to enumerate and to choose a sample, it might not be possible to access that person or unit. This could include people without access to the selected survey technology (e.g. without a phone or internet connection), or people not in the chosen survey location at the survey time (e.g. night workers). A fourth reason that the target population becomes hard-to-reach is lack of ability to communicate with them. This could include a lack of understanding of survey questions (through language or lack of testing) or cultural barriers. Finally, potential respondents can be hard-to-reach because they do not want to participate in surveys. This category might include people with lack of time, who do not trust the survey designers, or who feel it is a burden in some way. This paper details papers and workshop discussions that addressed each of these issues.

The remainder of this paper is set out as follows. The second section of this paper summarises the process of the workshop. Section 3 presents some of the key methods for overcoming the barriers of hard-to-reach. The current state of research, open questions, challenges and opportunities are discussed in Section 4. A concluding section focuses on the outlook for future research on the improvement of methods to collect data from hard-to-reach populations.

2. The workshop process

The workshop discussions were initiated by three paper presentations. Stark et al. (2014) provided insights into the methodology that had been used in Austria to reach another hard-to-reach group – young students’ travel patterns. Travel patterns by this group are often recorded by proxy (through their parents) or suffer from a high level of under-reporting either through lack of understanding of the questions or lack of interest in the process. The researchers used the young students to assist in designing and testing the survey instrument (a travel diary) and achieved both a high response rate (95%) though this was achieved with a high level of supervision and checking in the classroom situation. Porter et al. (2014) presented another innovative approach to recording the mobility of older people in rural sub-Saharan Africa. In this case they trained older people in participatory research methods – and these people became the research team members. The research showed that ‘co-investigation’ in this manner is one of a number of qualitative approaches with great potential for wider application in research into transport- and mobility-related social exclusion. Finally, Heilig et al. (2014) presented a case study testing an innovative way of reaching small populations. They identified customers of a carsharing scheme on the company Facebook site of Car2Go in Berlin and conducted a web-based survey. Their paper evaluated the advantages and disadvantages, noting that it was possible to recruit almost three times more participants than by simply posting a link to the survey.

After the presentations, a lively discussion led to the listing of an extensive range of likely hard-to-reach groups – most of them based on the experiences of workshop participants. They could be divided into several categories, based on the reasons for their being hard to reach (Table 1). Note that, as discussed in Section 3, some groups have multiple attributes that make them difficult to reach.
Table 1. Groupings of Hard-to-reach Targets

<table>
<thead>
<tr>
<th>Key hard-to-reach attribute</th>
<th>Characteristics</th>
<th>Specific examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult to enumerate</td>
<td>Lists of all people in a given category are not readily available</td>
<td>Tourists (international and domestic) Refuges/transients/foreigners to a country Homeless/squatters Specific disabilities Illiterate Unemployed in some countries People who are busy</td>
</tr>
<tr>
<td>Choosing a sample</td>
<td>Even though there is a list of people in a given category, it is hard to select a sub-sample for survey – e.g. no address or phone number</td>
<td>Gated communities</td>
</tr>
<tr>
<td>Reaching the target person</td>
<td>Person not able to be reached due to the chosen survey method/technology Need a person within an organisation to give permission Very few people in a target stratum</td>
<td>Non-phone or smart-phone owners Illiterate Organisation-based travel surveys Users of public transport users/new transport modes</td>
</tr>
<tr>
<td>Hard to communicate</td>
<td>Cultural or language barriers Use of technologies that are not familiar to the whole target population</td>
<td>Foreign languages Cultural mores on who can answer Older people or those who find reading difficult</td>
</tr>
<tr>
<td>Lack of willingness to participate</td>
<td>Inherent biases against data collection Perception of irrelevance or response burden</td>
<td>People who are busy Some cultural groups (e.g. with privacy concerns)</td>
</tr>
</tbody>
</table>

3. Methods for overcoming the ‘hard-to-reach’ barrier

Each of the three papers had presented specific examples of overcoming the barriers of hard-to-reach groups. In addition, the workshop discussion came up with other constructive solutions.

3.1. Collaboration with survey participants

There were two examples where collaboration with survey participants – both in the design and implementation of the survey – led to a significant improvement in uptake and response for traditionally hard-to-reach groups. The Austrian researchers collaborated with children to create trip diaries that could be readily completed by 12-15 year olds. Based on previous experience (Strange et al., 2003, Barker, 2008) the team used a control and intervention group, first trialling a traditional trip diary. The next stage was a workshop with the children, culminating in getting the students to assist in a redesign they would find easy and interesting to complete. For example, modes that children found important (scooter, wave board, rollerblades) are traditionally rolled into an ‘other’ category. When separated out, the response was much better as children perceived it as more inclusive.

In the sub-Saharan Africa example, understanding the mobility constraints of women was done by training older women in techniques of interviewing. They were also taught associated visual mobility mapping techniques so that they could record spatial data and encourage the reporting of details such as snakes, fallen trees and pot holes as impediments to travel. Another successful interview technique for the older women interviewing other older women was the use of seasonal calendars and timelines to aid understanding of changes in accessibility and associated
health journeys over a year. The research found that the participation of older people as researchers in the initial stages of the transport study were vital in achieving valuable results.

These two examples could be used in most other situations shown in Table 1. Preliminary focus groups and pilot surveys are relatively common, but the concept of getting the involvement of the participants in the design and implementation is likely to be a key to better understanding the attributes of ‘hard-to-reach’ and hence addressing the associated response issues.

3.2. Using alternative ways to recruit

While the use of Facebook as a survey technique could readily be criticised as not giving representative results, planners and decision makers sometimes need to trade-off the condition of no information with that of gaining some insights into a given situation or issue (Brickman-Bhutta, 2012). The use of the Facebook gave the insight that, amongst those users of a new mode of transport – free-floating carsharing – there was a significantly higher response rate than would have been the case without using a personal message to attract responses. The use of pre-testing of the method with a small group of people might have increased the response rate even further.

While not specifically advocating Facebook surveys, the workshop group recognised the need to explore alternative approaches for those who are important data sources, but are difficult to reach.

3.3. Specific approaches

Table 2 describes some specific methods that participants had experienced or seen documented.

<table>
<thead>
<tr>
<th>Group</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal settlements, homeless, squatters</td>
<td>Important for respondents to understand purpose of survey; use of advertising, drama. Face to face surveys likely to get best response.</td>
</tr>
<tr>
<td>Transients, foreigners, refugees</td>
<td>Testing is particularly important – language, wording, cultural interpretation. On-line difficult. Face to face likely to get best response</td>
</tr>
<tr>
<td>Gated communities</td>
<td>Use of community leaders/respondents to recruit, access via community leaders. Purpose of survey needs to be clear. Privacy will almost always be an issue.</td>
</tr>
<tr>
<td>Children</td>
<td>Use of collaborative techniques, good design, involvement of technology often important.</td>
</tr>
<tr>
<td>People with a disability</td>
<td>Usually an over-surveyed group, need to stress benefit. Important to understand differences between disability types and not group all into one set.</td>
</tr>
<tr>
<td>Older people</td>
<td>Generally easier than other groups. Test design when using new communication technologies.</td>
</tr>
<tr>
<td>People who are busy</td>
<td>Often easier to design the survey for completion during busy times rather than in ‘precious’ free time.</td>
</tr>
<tr>
<td>Illiterate</td>
<td>Face to face approach usually overcomes their response barrier.</td>
</tr>
<tr>
<td>Company employees</td>
<td>Describe the purpose of the survey to management and employees. Collaborative approach useful.</td>
</tr>
</tbody>
</table>

4. Future research issues

This section discusses the research issues and challenges that the participants felt were high priorities for future research.
4.1. Consideration of evolution of ‘hard-to-reach’ groups over time

The group discussed the following issues which are likely to contribute to the change in nature of ‘hard-to-reach’ groups over time.

- Changes in communication channels over time are likely to affect those people who are difficult to reach. For example an ever-changing platform of technology (and hence technology-literacy) is likely to have an effect.
- There are likely to be changing attitudes to privacy over time – which might increase or change the levels and demographics of those people who self-select as hard-to-reach.
- The proportion of the population that has a mobility disability is likely to grow over time. Depending on changing policies this might make it easier or more difficult to find this group of people.
- The continuing trend for having a greater number of older people and changes in health of these people in the community is likely to mean they will be more active, more mobile, more technology-savvy people which may reduce the level of difficulty in reaching some of these people.
- The growing number of refugees, migrants, and new citizens is likely to create a growing group of people that are hard to enumerate, hard to sample, and more difficult to communicate with through language, cultural and other reasons.

4.2. The household as the standard unit of measurement for travel surveys

The household has typically been the sampling unit in area-wide day-to-day travel surveys (Stopher, 2012). Part of the discussion in this workshop focusing on hard-to-get participants noted that there is already a trend towards different types of household structure – blended/patchwork households, those without adults, those missing generations. Each of these might well have an impact on interview structure and content, but more importantly in this context, on ease of reaching different household members. Research that continues to recognise this issue will contribute to the ease of reaching these households.

4.3. Research questions

Finally, the key research questions that need to be answered in this context – before ongoing research is conducted – are:

1. Who and where are the groups (people or modes) that are likely to be excluded from the survey you are conducting?
2. Do these groups behave differently from other groups who are key to your survey questions?
3. Do these groups have different needs from other (traditional) groups in terms of modes of transport and modes of survey?
4. What happens if these groups or travel modes are not included in the survey process?

5. Conclusion

This paper has reviewed an area of travel surveys that is often overlooked – the omission of hard-to-reach participants, either deliberately or inadvertently. It provides a list of those generic areas where the problem can occur and then groups known hard-to-reach people into these groups. Finally it provides direction for research areas in the future which is designed to remind researchers of aspects for consideration in the design of studies to avoid the exclusion of hard-to-reach participants.

Acknowledgements

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Appendix A. Papers presented during the workshop

Recruiting participants for user-behavior surveys of free-floating Car Sharing using Facebook – a case-study. Authors: Michael Heilig, Martin Kagerbauer and Peter Vortisch.

Qualitative methods for investigating transport and mobility issues among commonly socially excluded populations: a case study of co-investigation with older people in rural Tanzania. Authors: Gina Porter, Amleset Tewodros and Flavian Bifandimu.

Examining mobility behavior among youth - a progress report. Authors: Juliane Stark, Ilil Bartana, Wiebke Unbehaun, Wolfgang J. Berger, Ulrike Raich and Reinhard Hössinger.

Appendix B. Posters associated with the workshop

Travel behaviour of under 5 year olds – implications for survey data. Authors: Elizabeth Ampt and Michael Keall.

Regional Freight Demand Estimation Using A Commodity Flow Survey In Korea. Authors: Minchoul Park and Jinseok Hahn.


Refining a Smartphone-based Travel Survey System: Sampling Strategies Learned by Several Implementations. Authors: Takuya Maruyama.


References


Brickman-Bhutta, C. 2012 Not by the Book: Facebook as Sampling Frame, *Sociological Methods and Research*, S. 1-32

Heilig, M., Kagerbauer, M., Allier, C., Vortisch, P. 2014 Recruiting participants for user-behaviour surveys of free-floating carsharing using Facebook – a case-study. 10th International Conference on Transport Survey Methods, Leura, Australia, paper 60.

Porter, G., Tewodros, A., Bifandimu, F., Heslop, A. 2014 Qualitative methods for investigating transport and mobility issues among commonly socially excluded populations: A case study of co-investigation with older people in rural Tanzania. 10th International Conference on Transport Survey Methods, Leura, Australia, paper 104.

