



National Centre for Research Methods Report

Web surveys for the general population: How, why and when?

Gerry Nicolaas, NatCen Social Research

Lisa Calderwood, Centre for Longitudinal Studies, IoE

Peter Lynn, ISER, University of Essex

Caroline Roberts, Université de Lausanne

Web Surveys for the General Population:

How, why and when?



Authors: Gerry Nicolaas (NatCen), Lisa Calderwood (CLS), Peter Lynn (ISER), and Caroline Roberts (UNIL)
Date: 28/02/2014
Prepared for: National Centre for Research Methods

Acknowledgements

The network “Web Surveys for the General Population: Why, How and When?” was supported with funding from the ESRC National Centre for Research Methods under the initiative Networks for Methodological Innovation 2012. We are also grateful to the Institute of Education and the University of Essex for hosting the two main events of the network.

We would like to thank all of the presenters at the events as well as the participants for their contribution. Particular thanks are due to the UK Core Group for their time, advice and support:

Bill Blyth, TNS Global
Mario Callegaro, Google UK
Ed Dunn & Laura Wilson, ONS
Rory Fitzgerald, City University London
Joanna Lake, ESRC
Carli Lessof & Joel Williams, TNS BMRB
Nick Moon, GfK NOP
Patten Smith, Ipsos MORI
Professor Patrick Sturgis, NCRM
Joe Twyman & Michael Wagstaff, YouGov UK

Finally, we would like to acknowledge the networking support from COST Action IS1004 which will allow the network to continue as a Task Force of WEBDATANET (www.webdatanet.eu).

1 Introduction

Cultural and technological change has made the web a possible and even desirable mode for complex social surveys, but the financial challenges faced by the Research Councils and the UK Government has accelerated this shift, creating an urgent need to explore both its potential and hazards for a range of studies. While some progress in carrying out large-scale complex social surveys on the web has been made, there is still no consensus about how this can best be achieved while maintaining population representativeness and preserving data quality.

To address this problem, the NCRM funded a network of methodological innovation “Web Surveys for the General Population: How, Why and When?” (also known by its acronym GenPopWeb). A key objective of the network’s activities was to review and synthesise existing knowledge about the use of web-based data collection for general population samples and to identify areas where new research is needed.

The network hosted two events in 2013. The first event was a two-day conference held at the Institute of Education in February 2013. The aim was to pinpoint what we know, debate key issues and identify questions to be answered through the network. The organisers presented synthesis papers summarising current knowledge and knowledge gaps relating to three aspects of the challenges involved in switching large-scale surveys to the web: (1) sampling and coverage; (2) engagement and participation; and (3) measurement issues. The issues raised were then taken up in discussions by the Core Group, which culminated in a list of research problems requiring further investigation (presented in the Report of the Opening Conference, GenPopWeb 2013). A key distinction was made at this event between cross-sectional and longitudinal surveys of the general population because the challenges involved in using web-based data collection, and as a result, the research needs identified, vary greatly between types of surveys. This conference was followed by a two-day workshop held at the University of Essex in June 2013. At the workshop, the focus was on the practical advantages and disadvantages of web-based data collection in cross-sectional surveys, and the current demand in the UK for an online panel based on a probability sample.

The network has been able to draw on a wide range of institutions and experts from across the national and international survey research community, including representatives from academia as well as organisations with serious social survey delivery capabilities from government, the private and not-for-profit sectors. One way in which we were able to widely publicise the network’s activities was by exploiting social networking media. For example, we have promoted the network, its events and outputs through Twitter using the Twitter name @GenPopWeb and the hashtag #GenPopWeb. All network outputs have been made available to the wider social research community and can be found on the GenPopWeb website at <http://www.natcenweb.co.uk/genpopweb/>. These outputs include synthesis papers, blogs, presentations and reports of the events, and a NCRM podcast on this topic. We also organised three sessions on the topic of using web for general population surveys

at the 2013 Conference of the European Survey Research Association. Furthermore, the network has now been integrated within the wider European network WebDataNet and will continue as a WebDataNet task force after the NCRM grant has come to an end.

In this report, the authors provide a summary of the main issues identified by the network (chapter 2), present the key barriers to using web for surveys of the general population (chapter 3), propose a research agenda for the social science community (chapter 4), argue the case for a UK probability-based web panel (chapter 5), and conclude with recommendations for an infrastructure for enabling a transition to web platforms (chapter 6).

2 Current state of knowledge and survey practice

This chapter summarises the key findings from the network in relation to existing knowledge about: (1) sampling and coverage; (2) engagement and participation; and (3) measurement issues.

2.1 Sampling and coverage

The limited options for sampling frames and sampling methods in the UK severely constrain the use of web in probability-based general population surveys. At present, good population coverage can only be achieved through use of the Postcode Address File. However, contact at sampled addresses can only be made using either postal methods, which may result in selection bias or in-person visits which will negate most of the cost benefit of using web for one-off surveys. Consequently, web data collection is mainly considered for longitudinal surveys, in which participant names are known and email addresses can be collected at previous waves. The prospects for web data collection from the general population would change dramatically if a population register were to become available and especially if this were to include email addresses. However, this seems highly unlikely, at least in the foreseeable future. For these reasons, less costly non-probability methods are likely to remain attractive to many for some time to come.¹

Twenty per cent of UK households do not have access to the internet at home and people living in these households are more likely to belong to older age groups and the lowest social grades (Ofcom, 2013; Callegaro, 2013a). Although this level of population non-coverage would be an issue for most social surveys of the general population, it is not an insurmountable barrier to using web. These groups can be offered alternative methods for taking part in surveys (e.g. postal questionnaires) or they can be provided with a computer device and internet connection². Furthermore, the proportion of the

¹ See Rivers (2013) for a review of sample matching and Lagorio (2013) for an overview of web Omnibus surveys in the UK.

² A growing number of probability-based web panels provide devices and internet connections. See for example, the LISS panel in the Netherlands (<http://www.centerdata.nl/en/survey-research/mess-liss->

population with internet access is rapidly increasing and will soon reach a level of almost universal coverage.

Further details about sampling and coverage for web surveys of the UK general population:

- Synthesis paper on this topic by Peter Lynn (University of Essex) at <http://www.natcenweb.co.uk/genpopweb/documents/Theme-1-Coverage-and-sampling.pdf>)
- Presentations on this topic by Peter Lynn (University of Essex), Mario Callegaro (Google UK) and Doug Rivers (Stanford University & YouGov USA) at <http://www.natcenweb.co.uk/genpopweb/outputs.htm>

2.2 Participation and engagement

High population coverage does not imply that everyone with internet access is capable or willing to take part in web surveys. Ability to complete a web questionnaire depends not only on functional and cognitive abilities but also familiarity with this type of web task. Willingness to complete a web questionnaire will depend on a range of different motivational factors including general propensity to respond to surveys, interest in the survey topic, incentives and time.

Response rates to web surveys are lower than comparable surveys using other modes (Manfreda et al, 2008; Shih & Fan, 2008), and this is particularly evident when comparing web response rates with those for face-to-face surveys (still the dominant mode for high quality government and academic surveys in the UK). For example, the UK component of the European Social Survey achieved a face-to-face response rate of 55% in 2012 compared to only 21% for the equivalent web survey (Villar, 2013). Similarly, an experiment comparing web and face-to-face methods for the 2012-2013 Community Life Survey achieved a face-to-face response rate of 60% compared to web response rate of 19% (TNS BMRB, 2013). Many government and academic survey funders will be reluctant to opt for a web survey with low response rates without knowing more about the impact that this will have on non-response bias.

Not everyone with internet access is equally inclined to complete a web questionnaire. For example, contrary to the often-held belief that web surveys may help to attract younger participants who are hardest to reach in other modes, there appears to be emerging evidence that participation rates in web mode are higher among older rather than younger adults (as in surveys conducted in other modes; see for example Durrant & Steele, 2009).

A number of factors were identified that could explain the lower response rates for web compared to other modes, such as the necessity to use a different mode than web/email for making first contact, the additional burden of going online and accessing

panel), the GIP panel in Germany (http://reforms.uni-mannheim.de/internet_panel/home/), the ELIPSS panel in France (<http://www.elipss.fr/elipss/recruitment/>), and the Knowledge Panel in the USA (<http://www.knowledgenetworks.com/knpanel/>).

the questionnaire, concerns about data privacy, lack of familiarity or experience of using the internet, and the greater likelihood of break-offs.

An optimal strategy for increasing web response rates and ensuring a broad participation across different sample subgroups is to use a variety of methods that address the underlying causes of web non-response with particular attention paid to those groups most at risk of underrepresentation. Such methods might include the use of multiple and varied contact attempts, different types of incentive to attract different types of person, and following up web non-participants with another mode of data collection.³ Furthermore, break-off rates can be reduced by making web questionnaires easier to complete and more enjoyable; e.g. allowing participants to complete the questionnaire on mobile devices (Couper, 2013), and designing questionnaires to be more attractive and interesting (Puleston, 2013).

Despite extra efforts to increase participation, response rates will remain considerably lower for probability-based web surveys than for equivalent surveys carried out face-to-face. Concerns about low response rates have led some to consider whether web panels using non-probability samples might be an acceptable alternative. Indeed pre-election online polls using non-probability samples have been found to perform as well as and sometimes better than those using probability samples (Twyman, 2008; YouGov, 2011). Nonetheless, these appear to be the exception with evidence lacking for other survey topics (Callegaro et al, 2014a).

Further details about participation and engagement in web surveys of the general population:

- Synthesis paper on this topic by Caroline Roberts (University of Lausanne) at <http://www.natcenweb.co.uk/genpopweb/documents/Theme-2-Participation-and-engagement.pdf>
- Presentations on this topic by Caroline Roberts (University of Lausanne), Annette Scherpenzeel (CentERdata), Annemieke Luiten and Barry Schouten, (Statistics Netherlands), Jon Puleston (Innovation, UK) at <http://www.natcenweb.co.uk/genpopweb/outputs.htm>

2.3 Measurement issues

Although there are differences in measurement between web and other data collection modes, this is not considered to be a major obstacle to using web data collection on new surveys (though there is much to learn about how measurement quality may vary depending on the device used to access the internet). We already know a lot about the causes for measurement differences between modes and how to reduce the risk of these (Campanelli et al 2011; Dillman et al, 2009). New research shows some promise in helping us to detect and adjust for remaining differences (Lugtig, 2013), particularly when face-to-face data collection can be used for a random sub-sample alongside web

³ It should be noted that recent studies suggest response rates will still be lower when following up web non-respondents with another mode than using the other mode on its own (Jäckle, Lynn & Burton, 2013; Messer & Dillman, 2011; Millar & Dillman, 2011; Villar, 2013).

data collection (Vannieuwenhuyze & Loosveldt, 2013). Despite some of the drawbacks of administering questionnaires on the web, the network recognised many possibilities the web offers for improving survey measurement, such as removing negative interviewer effects and the possibility of replicating positive interviewer effects (e.g. motivating respondents) by making use of interactive features of web design. Nonetheless, switching to web (either as a stand-alone mode or within a mixed mode design) will be tricky for existing surveys, particularly those surveys that contribute data to important time series. The decades-long dominance of face-to-face interviewing in the UK has resulted in survey design customs that are unsuitable for web surveys, such as long and dull questionnaires and complex questions requiring regular face-to-face interviewer support. Adapting these questions for web, rather than purposely designing new measures better suited to web administration, may compromise data comparability.

The rapid uptake of mobile web is another challenge to UK survey design customs. It is envisaged that an increasing proportion of people will try to complete web questionnaires on their smartphones (Callegaro, 2013b). The way forward is to optimise questionnaires for mobile web; e.g. use shorter question text and fewer response options, avoid grids and long horizontal scales, and limit the requirement for text entry.

Various experiments and trials with web data collection are being carried out on large academic surveys such as the UK birth cohort studies, the European Social Survey and the Innovation Panel of Understanding Society. Similar efforts are being made for official statistics with ONS testing new methodologies for using web data collection on the Labour Force Survey and the Cabinet Office exploring the feasibility of using web as a stand-alone mode for the Community Life Survey. Although all these efforts contribute to a better understanding of how and when to use web data collection they are also constrained by the requirement to replicate rather than improve measurement on these surveys.

For further details about measurement in web surveys of the general population:

- Synthesis paper on this topic by Lisa Calderwood (Institute of Education) at <http://www.natcenweb.co.uk/genpopweb/documents/Theme-3-Measurement-challenges.pdf>
- Presentations on this topic by Lisa Calderwood (Institute of Education), Tina Glasner (Vrije Universiteit Amsterdam), Peter Lugtig (Utrecht University & University of Essex) and Mick Couper (University of Michigan) at: <http://www.natcenweb.co.uk/genpopweb/outputs.htm>

3 Barriers to greater use of the web for social science research

In this section we discuss some of the barriers to greater use of the web for social science research in the UK. As the challenges of web-based data collection depend on the survey design, we discuss cross-sectional and longitudinal surveys separately, before considering some more general barriers.

3.1 Barriers to greater use of the web in cross-sectional surveys

For a cross-sectional web survey of the general population in the UK, the main challenges to be overcome are those of sampling and participation outlined in section 2. Issues of measurement may be important if the survey is part of an ongoing, repeated cross-sectional survey series, or if the survey has the explicit objective of comparison with one or more other surveys that were carried out in a different mode, but is not a particular concern for other one-time cross-sectional web-only surveys.

Enabling the inclusion of people who are not (regular) internet users is rapidly becoming a small problem in terms of overall magnitude. The proportion of people who do not use the internet is small and is decreasing each year. Providing a paper self-completion alternative for people who are unable or unwilling to complete a web survey would seem to be an adequate – though not cost-free – solution at present, though there is little evidence of UK surveys using this approach currently. Even this may be unnecessary in just a few years time.

The absence of a good-quality sampling frame of named individuals is arguably a bigger problem. This presents a barrier to those intending to carry out a web survey of the general population, as an extra stage of the survey process is necessitated, in which some procedure is implemented for randomly selecting one or more persons at each sampled address. Evidence from both the *Community Life Survey* and the UK component of the *European Social Survey* suggests that in a sizeable proportion of households that contain at least two adults, the person completing the web questionnaire is not the person who should have been selected had the procedures been followed correctly (Villar, 2013; TNS BMRB 2013). It is unclear to what extent the incorrect selections are made deliberately rather than accidentally and how they affect the survey data, but it is clear that the selections are no longer random and it seems that this skews the distribution of some socio-demographic variables. This problem seems to arise whether a “roster” procedure or a “last birthday” procedure is implemented (Villar, 2013). A possible solution – not yet tested in the field – would be to ask all eligible adults in the household to complete the questionnaire, rather than attempting to impose a random selection. Another approach, that could avoid the need to rely on samples of address, is to collect personal email addresses on a large random survey and then use that sample as a sampling frame for one or more web surveys. That may be feasible in some specific situations (e.g. a web survey carried out by ONS

where the emails are collected on one of the large ONS surveys such as the Annual Population Survey) but is unlikely to provide a general solution for a wide range of surveys. A third approach is currently being developed by the *UK Labour Force Survey*, involving a two-stage mixed-mode design where people are first invited to register online (Lound, 2013). At the second stage, a sample of those who did not register will be approached to take part face-to-face, while two samples of those who registered will be selected, one to take part face-to-face (in order to be able to control for mode effects on measurement) and one to take part online. An obvious limitation of this approach is that survey costs will be considerably higher than for a single-mode web survey due to the continued reliance on sizeable samples of face-to-face interviews.

A number of surveys have now tried implementing a web survey based on a PAF sample of addresses in the UK. Response rates have all been in the range 20% to 25%. While this is large enough to suggest that continued attempts to develop the method are worthwhile, it is not large enough to satisfy the quality needs of many social surveys. As outlined in section 3 of this report, experimentation with a range of means of increasing web response rates is essential. In particular, increasing numbers of people will only be willing to take part if they can do so from a tablet or other mobile device. The diversity and rapid development of such devices suggests that considerable investment will be needed to enable participation via mobile devices in ways that are comparable to participation via a PC.

For the foreseeable future single-mode web surveys do not seem to be a viable solution for good quality cross-sectional surveys of the general population. However, mixed-mode approaches in which web is followed up by postal or other modes could significantly reduce the coverage and participation problems.

3.2 Barriers to greater use of the web in longitudinal surveys

The context of longitudinal surveys is somewhat different. Some of these differences make web data collection easier or more attractive, while others make it more challenging.

A longitudinal design in which the first wave of data collection is carried out in an interviewer-administered mode and subsequent waves switch to web can overcome some of the difficulties experienced by cross-sectional surveys, outlined in the previous section. First, there is no need to identify or select sample members at the web data collection stage, as this has already been done at wave one. Second, email addresses can be collected from sample members at the first wave. Third, sample members may be more motivated to participate in a web survey if they have first been recruited by an interviewer. For these reasons both *Understanding Society* and the *National Child Development Study* have recently experimented with web data collection with considerable, though not unqualified, success. These studies have found that it is possible to achieve web response rates in excess of 50% amongst people who have previously participated face-to-face. However, these rates are still significantly lower than would be achieved with interviewer-administered data collection and mixed-mode

approaches are needed in order to maintain overall participation rates. Even then, there is evidence from *Understanding Society* that approaching sample members first for a web survey may depress overall response rates (Jäckle, Lynn & Burton, 2013).

A disadvantage of the design outlined above is that modes are necessarily mixed, both between and within respondents. This introduces considerable concerns about measurement error, the effects of which could be particularly complex. In particular, the effect on measures of change resulting from respondents changing modes between waves is a great concern and, as yet, not well understood.

3.3 Other general barriers

Survey customs in the UK: As mentioned before, the primary data collection mode for high quality surveys in the UK is face-to-face interviewing. Consequently our question design conventions tend to be optimal for face-to-face administration, such as the heavy reliance on interviewer instructions. This has also allowed us to produce questionnaires that are relatively long and complex because face-to-face interviewers are able to motivate and assist respondents in making the required effort to produce complete and accurate answers. Such customs do not always lend themselves for web surveys. However, abandoning these customs and designing questions that are either optimal for web or at least portable across modes can be tricky when there is a need to produce equivalent data for time series and other comparisons.

Our survey design customs are being stretched even further to their limit by ongoing changes in web technology. The rapid uptake of mobile web is an example of such a change which should force us to rethink how we design and conduct surveys; e.g. offering multiple bite-sized data collections rather than a single long questionnaire, exploiting new techniques for engaging mobile respondents to compensate for the absence of an interviewer, writing shorter and simpler questions that can more easily be displayed on small screens.

Web technology also provides us with new opportunities for collecting other types of data that do not rely on the conventional process of asking and answering questions (e.g. passive measurement). If we are to make significant progress in this field, we will have to step back from existing survey designs and be willing to rethink the way we collect survey data from scratch.

Over-reliance on the response rate as an indicator of survey quality: The response rate remains the main indicator of the quality of surveys conducted in the UK. Relying on the response rate as the main indicator of survey quality, however, has meant that web surveys are frequently evaluated as a poor alternative to face-to-face surveys, which typically obtain higher participation rates thanks to the motivating role played by interviewers. Yet, there is growing evidence that response rates can be poor indicators of non-response bias and that increasing levels of non-response do not necessarily translate into more bias (see for example, Groves & Peytcheva 2006, Kohut et al, 2012). This means that web surveys may be being unfairly evaluated, when the true extent of bias resulting from non-response is unknown. In fact, in the specific case of

online panels, Yeager et al (2011) and Krosnick et al (2013) have shown that results from a probability-based online panel with a cumulative response rate in single digits are as accurate as RDD telephone surveys and more accurate than non-probability online panels results.

Furthermore, appropriate efforts can be made to minimise and adjust for non-response bias in web surveys. For example, incentives and personal contact can be targeted at under-represented sub-groups in order to improve the balance of the responding panel. And information attached to the sampling frame or collected at the time of recruitment can be used to correct for non-response bias. Moreover, supplementary measures of quality are being developed which may be more suitable than the response rate for assessing the risk of non-response bias. For example, the R-indicator provides a measure of how representative the respondents are compared to the sample or population from which they were drawn (Schlomo et al, 2011). Though such measures rely on the availability of auxiliary data about non-respondents not typically available for UK surveys, growing interest in them where such data are available highlights a more general shift towards evaluating survey quality on the basis of the total survey error affecting estimate accuracy, rather than simply focusing on single sources of error as the basis for survey quality evaluation. Such a paradigm shift would enable a more systematic assessment of the quality of surveys conducted in different modes.

Speed of technological and societal changes: It is widely documented that technology and society are changing at an exponentially increasing rate. In comparison, social survey research has been relatively slow to respond to these changes. For example, we have already highlighted the emergence of mobile web as the preferred tool of communication and how unprepared the (social) survey industry is to apply and integrate this new technology.

To keep up to speed and reap the benefits of new technology, new evidence should be shared quickly and widely across the public, private and third sectors. Dissemination should take a variety of different forms that will appeal to survey practitioners as well as academic researchers, and not be restricted to the more traditional academic publications. Further collaboration across sectors should be encouraged; e.g. through suitable funding streams.

4 A research agenda

This chapter sets out an agenda for future research, which would help facilitate more widespread transition in UK social science research to web-based surveying. We focus this discussion on the three themes addressed by the network.

4.1 Sampling and coverage

Availability of suitable sampling frames: As discussed, reliance on the Postcode Address File (PAF) for drawing random probability samples of the general population poses a number of challenges for moving existing face-to-face surveys to the web

because of the need to use postal or face-to-face methods for contacting sampled households to invite them to take part in online surveys, and the additional complication of having to select a target individual from the sampled household. The network discussed alternatives to the PAF, including enhancing existing individual-based frames, and the longer-term possibility of a UK population register, both of which warrant further exploration. If the latter were to eventually be possible, research would likely be needed into public perceptions of the use of such a resource for survey sampling purposes. In the meantime, research reporting on possibilities for enhancing existing lists of individuals (e.g. the Electoral register, GP registers, and commercial databases such as ACORN) would represent a significant step forward. If alternative solutions to the PAF remain unlikely, then research aimed at establishing best practice guidelines regarding contact procedures and within-in household selection procedures in the UK context should be undertaken.

Under-coverage due to households without Internet: Under-coverage in web surveys has traditionally been measured in terms of who has access to the Internet. Yet Internet access on its own – however defined - is unlikely to adequately capture a person's ability to participate in a web survey, which may mean that the true extent of under-coverage (i.e. the possibility of being included in a web survey) is frequently underestimated. The possibility of participating in an online survey depends not only on the availability of an Internet connection, but also knowledge and experience of how to use the Internet. Given the array of devices from which Internet access is now possible, there is a need to clarify definitions of coverage linked to Internet access and usage. This would permit more accurate monitoring of potentially under-covered groups in online surveys of the general population.

4.2 Participation and engagement

Optimal recruitment protocols: Maximising participation and engagement in web surveys requires knowledge regarding the most effective methods for delivering survey requests and incentivising sample members to participate. More research conducted in the UK context would make it possible to customise for British surveys current knowledge about best practice elsewhere to minimise the potential loss of participants. The size and mode of delivery of incentives, in particular, warrants further research, including the advantages and disadvantages of offering large monetary incentives (for example, Villar 2013 found that a larger incentive value had little impact on the web response rate).

Engaging and motivating respondents: Break-offs are a significant reason for non-response in web surveys, with the vast majority occurring near the start of the survey. More research is needed to understand the reasons for early break-offs, and to help prevent them. The network discussed current practice in the market research sector designed to promote respondent engagement, including the 'gamification' of surveys, and future research into incentivising response (as well as improving the respondent experience more generally) could usefully explore the value of such techniques alongside more traditional methods used in social research. Questionnaire length, and its impact on the decision to participate or continue participating in a web survey also

requires careful study, an issue which is particularly pertinent when looking at how to adapt existing face-to-face surveys (which typically have long questionnaire and interview times) for web administration (particularly mobile web).

Minimising nonresponse bias: Concerns about switching to web-based data collection in general population surveys have, in the past, often centred on the problem of low response rates. Yet there has been comparatively little research to date, in the UK context at least, into the actual extent and nature of non-response bias in web surveys. Better knowledge is needed about sub-groups of the population known to be under-represented in web surveys, about the reasons for this, and about how this problem can best be countered.

4.3 Measurement issues

Developing guidance about how to handle mode effects: Discussions about measurement challenges involved in web-based data collection, particularly for existing surveys in other modes, centred around the problem of having to mix web with other modes and the risk of confounded mode effects on measurement in multi-mode surveys. At present, there is still a lack of clarity about the extent to which research commissioners and data users should be concerned about differential measurement error in data collected via multiple modes, and the implications this has for data comparability and usability. The potential impact of mode effects needs to be assessed in relation to other sources of error in the survey, survey costs, and the intended purpose and type of analysis. Further research (if only to synthesise existing research findings) is needed to inform guidance about how to judge the severity of mode effects, and about whether and how data users should handle them in their analysis (e.g. using correction techniques). This concerns not only how to archive mixed mode data and how to analyse it, but also the decision to combine web with other modes to begin with.

Capitalising on technological advances: Technological advances in devices used for accessing the Internet, as well as in interactive media design more generally, offer exciting new opportunities for online survey research. Yet the tools currently used for programming online surveys, and the skills of those responsible for doing so, may sometimes restrict what is possible in social surveys fielded online. Research is needed to improve awareness of the full capabilities of web survey technology, and the issues involved in programming surveys for multiple platforms. Alongside this, methodological research should investigate which technical features are beneficial (e.g. in terms of their impact on respondent engagement or the quality of measurement) and which are redundant (for the same reasons). Web surveys must now be suitable for handheld devices (smartphones and tablets), as well as for standard browsers, so alongside research activities, capacity building in web survey programming represents an important part of the work needed to facilitate the move to web-based data collection in general population surveys.

5 A probability-based web panel for the UK?

Over recent years we have witnessed massive growth in web surveys in the UK, predominantly opt-in panels that are widely used for market research and opinion polling, but also for social research⁴, because they offer the advantages of low-cost data collection, large samples, and short fieldwork periods. Opt-in panels do not use probability sampling methods but recruit panel members using banners, pop-ups, advertising, recruitment websites, etc. Weighting and quota sampling are then commonly used to match population totals for key demographic categories. Although there is no theoretical basis for claiming that these opt-in samples are representative of the general population, there are some studies showing that they can accurately predict election outcomes (Taylor et al, 2001; Twyman, 2008; Vavreck and Rivers, 2008; Callegaro et al., 2014a). Similarly, model-based and sample matching methods commonly used in other disciplines show some promise for survey research (AAPOR, 2010; Rivers, 2013).

Nonetheless, opt-in web panels tend not to be used for high quality surveys that produce population estimates. This reluctance stems from concerns about the accuracy of the survey data, reinforced by findings from a number of research studies (Erens et al, 2013; Malhotra & Krosnick, 2007; Pasek & Krosnick, 2010; Vonk et al, 2006; Yeager et al., 2011) recently critically summarised by Callegaro et al (2014a). In a nutshell, these studies have found that opt-in online surveys tend to be less accurate and sometimes strikingly inaccurate compared to probability sample surveys done face-to-face, by telephone or online. Furthermore, Yeager et al (2011) also found that best practice weighting of the opt-in samples sometimes improved their accuracy and sometimes reduced their accuracy but never made them as accurate as the probability sample surveys done by telephone and online.

Yet, as we have seen, using web to collect data from a probability sample of the general population is problematic, particularly for cross-sectional surveys because we have not yet found a cost-effective method for selecting, contacting and persuading people to go online and complete a questionnaire without sacrificing data quality. Postal contact at sampled PAF addresses will result in selection bias and low response rates. More control of selection and higher response rates can be achieved with face-to-face contact but at a cost that will negate most of the cost-saving of using web data collection. Piggy-backing on existing surveys can reduce these costs but with some loss in response. Coverage and response rates can be improved by following-up web non-respondents with a more traditional data collection mode but this will also increase data collection costs.

There is more opportunity for using web in longitudinal surveys after names and email addresses have been collected at an earlier wave of data collection. A growing number of ESRC-funded longitudinal studies in the UK are testing and using web within mixed mode designs, for example the Innovation Panel of Understanding Society, the UK

⁴ See Lagorio (2013) for an overview of opt-in panels from selected market research companies.

Birth Cohorts and the Longitudinal Study of Young People. However, as noted before, the scope for using web in these surveys is constrained by the requirement to replicate rather than improve measurement on these surveys in order to maintain data comparability over time. Future cohort studies can, in theory, avoid these constraints by designing the survey to be suitable for web administration.

Yet the cost-saving and timeliness advantages of online panels have stimulated a number of countries (the Netherlands, France, Sweden, the USA and Germany) to set up web panels based on probability samples offering researchers a more attractive alternative to online panels based on volunteer samples. These studies have been able to achieve high population coverage and considerably reduce the risk of selection bias (Callegaro et al, 2014b). Conventional sampling frames and methods are used to select a probability sample of the general population, substantial effort is then invested in recruiting panel members using traditional modes of contact and incentives, and offline households are included by either providing them with internet access or allowing them to take part using a different mode. The costs associated with this level of recruitment and coverage are then recouped through multiple data collections using web rather than expensive traditional modes. This model is proving to be very attractive and is now being considered in Norway and Southern Europe, and for the collection of official statistics in Germany and the Netherlands.

Such a probability-based web panel would be a hugely valuable resource for social researchers (and survey methodologists) in the UK, allowing them to collect survey data at lower cost and to develop and test a wide range of web data collection innovations. However, this will require upfront investment and ongoing panel maintenance costs. Feedback from the commercial survey agencies at the GenPopWeb workshop in June 2013 suggests that they are unlikely to take the lead on this. Consequently the initiative and initial funding is likely to have to come from the ESRC, charitable foundations and/or Government.

6 Recommendations for enabling a transition to web data collection

It is clear that web data collection has considerable potential, but that substantial further development and testing is required before it can become the primary data collection mode for high quality surveys in the UK. It is the conclusion of the GenPopWeb network that significant ESRC investment is needed to fund the necessary research and development to facilitate a transition to web in existing repeated cross-sectional and longitudinal surveys, and a large-scale research infrastructure that would provide academics and researchers with access to a high-quality probability-based web data collection platform.

A national expert centre or network for research and development: The UK Core Group highlighted the need for scientific leadership and strategic direction regarding the use of web for high quality general population surveys. We believe that this can be

achieved by creating an expert centre or a network that will be the national focal point for research and development in this area. The activities of the centre/network would include:

- Encouraging and supporting experimentation with web and mixed mode (including web) on existing survey data resources;
- Supporting innovations/changes in survey design, methods and practice that are more suitable for (mobile) web data collection;
- Providing grant funding that encourages collaboration between academic researchers, survey organisations and government departments, including ONS (e.g. collaborative work on improving PAF or developing & providing access to new sampling frames);
- Carrying out methodological research and testing. This may include desk research, secondary analysis, qualitative development and testing, and quantitative methods testing involving either new data collection vehicles or experiments mounted on existing surveys;
- Providing a knowledge sharing system that is open, fast, and online (traditional methods are too slow and do not attract publications from non-academic survey practitioners);

A probability-based web panel for the UK: There is considerable interest in the UK for a probability-based web panel. As a preliminary step, whether there is a business case for such a panel or not should be verified. If so, further developmental work may be required.

An initial review by Carlos Lagorio (2013), presented at the workshop event looked at the current provision of web panels and omnibus surveys. This work could be extended to find out more about the potential demand for such a panel in the academic community and government, looking in particular at the ad hoc and repeated cross-sectional surveys, which could potentially be transitioned to such platform. This then could feed into the sample design for such a panel to ensure that specific groups of interest are adequately represented. Careful investigation would also be advisable to estimate the likely costs of the project, how these compare with other surveys, and overall investment in surveys, to allow a systematic estimation of the likely cost savings of providing a web-based alternative for existing studies conducted in other modes. These are critical components of building the potential business case for a probability-based web panel in the UK.

Further preparatory work for a UK probability-based web panel could include conducting an extensive review of the current state of the art in other countries (Callegaro et al, 2014c), and the positive and negative experiences of existing web-based panels relating to how to optimise the methodological procedures involved in setting up and maintaining an Internet panel, such as those relating to recruitment, incentivising participation, treatment of households without Internet access, choice of device for accessing the surveys, timing and frequency of survey requests, length of

surveys, maintaining respondent commitment to the panel, and so on (Callegaro et al, 2014b).

If the preparatory work for a UK probability-based web panel determines the feasibility of the methodology, then the expert centre/network (as described above) could be given the responsibility for setting up the panel as a research resource for the benefit of the UK research community. The panel should be both a resource for collecting substantive data and a vehicle for developing and testing new methods and practices. Activities of the centre would be:

- Implementing the methodology to set up the online panel. This will involve creating the hardware and software architecture, and recruiting and managing the sample (see Macer, 2014);
- Developing, implementing and promoting a process to grant access to the online panel for data collection;
- Ongoing survey management and implementation, including data collection, panel maintenance, and data management;
- Provision of high-quality, well-documented data sets, with timely deposit to the ESDS;
- Monitoring and documenting use of the panel, through a system of performance indicators and milestones.

The centre should of course work in collaboration with other relevant organisations, including UK research centres such as the Cohort and Longitudinal Studies Enhancement Resources (CLOSER) programme. It should also connect with similar web panels in other countries (for example, LISS, GIP, ELIPSS, Gesis Panel, Knowledge Panel). It could either be a stand-alone ESRC centre, or could be set up under the auspices of the NCRM. An Advisory Group should be included in the specification of the centre.

References

- Baker, R., Blumberg, S., Brick, J.M., Couper, M.P., Courtright, M., Dennis, M., Dillman, D., Frankel, M.R., Garland, P., Groves, R.M., Kennedy, C., Krosnick, J., Lee, S., Lavrakas, P., Link, M., Piekarski, L., Rao, K., Rivers, D., Thomas, R.K., Zahs, D. (2010). AAPOR Report on Online Panels. Last accessed on 05/05/2014 at http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.aapor.org%2FAM%2FTemplate.cfm%3FSection%3DAAPOR_Committee_and_Task_Force_Reports%26Template%3D%2FCM%2FCContentDisplay.cfm%26ContentID%3D2223&ei=KAxoU7DqM8TBPMu3gaAC&usq=AFQjCNEjgeT9tG-T3Ns6PoDCI2T0hPr4RQ&bvm=bv.65788261,d.ZWU
- Callegaro, M. (2013a). Web coverage in the UK and its potential impact on general population web surveys. Presented at the Web surveys for the general population: How, why and when?, London. Retrieved from <http://www.natcenweb.co.uk/genpopweb/documents/Mario-Callegaro.pdf>
- Callegaro, M. (2013b). From mixed-mode to multiple devices. Web surveys, smartphone surveys and apps: has the respondent gone ahead of us in answering surveys? *International Journal of Market Research*, 55(2), 317–320.
- Callegaro, M., Villar, A., Yeager, D. S., & Krosnick, J. A. (2014a). A critical review of studies investigating the quality of data obtained with online panels. In M. Callegaro, R. P. Baker, J. Bethlehem, A. S. Göritz, J. A. Krosnick, & P. J. Lavrakas (Eds.), *Online panel research: A data quality perspective* (pp. 23–53). Chichester, UK: Wiley.
- Callegaro, M., Baker, R. P., Bethlehem, J., Göritz, A. S., Krosnick, J. A., & Lavrakas, P. J. (2014b). Online panel research: History, concepts, applications and a look at the future. In M. Callegaro, R. P. Baker, J. Bethlehem, A. S. Göritz, J. A. Krosnick, & P. J. Lavrakas (Eds.), *Online panel research: A data quality perspective* (pp. 1–22). Chichester, UK: Wiley.
- Callegaro, M., Baker, R. P., Bethlehem, J., Göritz, A. S., Krosnick, J. A., & Lavrakas, P. J. (Eds.). (2014c). *Online panel research: A data quality perspective*. Chichester: Wiley.
- Campanelli, P., Nicolaas, G., Jäckle, A., Lynn, P., Hope, S., Blake, M., & Gray M. (2011) A Classification of Question Characteristics Relevant to Measurement Error and Consequently Important for Mixed Mode Questionnaire Design. Presented 11 October 2011 at the Royal Statistical Society, London, UK. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/other-resources/RSS-Oct-2011-Handout-Recommendations.pdf>
- Couper, M.P. (2013) Surveys on Mobile Devices: Opportunities and Challenges. A presentation given at the GenPopWeb opening conference in London, 25 February 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/Mick-Couper.pdf>

Dillman, D.A. & Christian, L.M. (2005) Survey Mode as a Source of Instability in Responses across Surveys. *Field Methods*, 17(1): 30-52.

Durrant, G.B. & Steele, F. (2009). Multilevel modelling of refusal and non-contact in household surveys: evidence from six UK government surveys. *Journal of the Royal Statistical Society, Series A*, 172(2): 1-21.

Erens, B., Burkill, S., Copas, A., & Couper, M. (2013). How well do volunteer web panels measure sensitive behaviours in the general population, and can they be improved? A comparison with the third British National Survey of Sexual Attitudes & Lifestyles (Natsal3). Presentation given at the Conference of the European Survey Research Association, Ljubljana, Slovenia.

GenPopWeb. (2013). Web surveys for the general population: How, why and when? Report of the Opening Conference. 25-26 February 2013. Institute of Education, London. Last accessed on 05/05/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/GenPopWeb-1st-conference-report.pdf>

Groves, R.M. & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias: a meta-analysis. *Public Opinion Quarterly*, 72(2): 167-189

Hall, J., Brown, V., Nicolaas, G. & Lynn, P. (2011). Extended field efforts to reduce the risk of non-response bias: do they pay off? ISER Working Paper Series: 2011-24.

Jäckle, A., Lynn, P. & Burton, J. (2013). Going Online with a Face-to-Face Household Panel: Initial Results from an Experiment on the Understanding Society Innovation Panel. *Understanding Society Working Paper Series*, No. 2013-03.

Keeter, S., Miller, C., Kohut, A., Groves, R.M., & Presser, S. (2000). Consequences of Reducing Nonresponse in a National Telephone Survey. *Public Opinion Quarterly*, 64: 125-148.

Kohut, A., Keeter, S., Doherty, C., Dimock, M., & Christian, L. (2012). Assessing the representativeness of public opinion surveys. Pew Research Center. . Last accessed on 24/02/2014 at <http://www.people-press.org/files/legacy-pdf/Assessing%20the%20Representativeness%20of%20Public%20Opinion%20Surveys.pdf>

Krosnick, J. A., MacInnis, B., Suh, A., & Yeager, D. S. (2013). The accuracy of survey data collected by various american on-line survey firms: A 2012 comparison. In *MESS Workshop*. Scheveningen, Netherlands: CenterData.

Lagorio, C. (2013) Current UK provision of web panels and Omnibus. Paper presented at the GenPopWeb workshop, University of Essex, 5-6 June 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/Current-UK-provision-of-web-panels-and-Omnibus-Lagorio.docx>

Lound, C. (2013). ONS Plans for Web Data Collection in LFS. Presentation given at the GenPopWeb workshop, University of Essex, 5-6 June 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/outputs.htm>

Lynn, P., Noah Uhrig, S.C., & Burton, J. (2010). Lessons from a Randomised Experiment with Mixed-Mode Designs for a Household Panel Survey. Understanding Society Working Paper Series, No. 2010–03.

Lynn, P. (2012). Mode-switch protocols: How a seemingly small design difference can affect attrition rates and attrition bias. Understanding Society Working Paper Series, No. 2012–07.

Lynn, P. (2013). Mixing modes on household panel surveys: Opportunities, constraints and challenges. Keynote presentation given at the 7th International Conference of Panel Data Users in Switzerland, Lausanne, 14-15 February 2013.

Lugtig, P. (2013) Measurement effects in mixed - mode panel surveys. A presentation given at the GenPopWeb opening conference in London, 25 February 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/Peter-Lugtig.pdf>

Macer, T. (2014). Online panel software. In M. Callegaro, R. P. Baker, J. Bethlehem, A. S. Göritz, P. J. Lavrakas, & J. A. Krosnick (Eds.), Online panel research. A data quality perspective (pp. 413–440). Chichester: Wiley.

Malhotra, N., & Krosnick, J. A. (2007). The effect of survey mode and sampling on inferences about political attitudes and behavior: Comparing the 2000 and 2004 ANES to Internet surveys with nonprobability samples. *Political Analysis*, 15(3), 286–323.

Manfreda, K.L., Bosnjak, M., Berzelak, J., Haas, I., and Vehovar, V. (2008). Web surveys versus other survey modes: A meta-analysis comparing response rates. *International Journal of Market Research*, 50:79–104.

Messer, B.L., and Dillman, D.A. (2011). Surveying the general public over the Internet using address-based sampling and mail contact procedures. *Public Opinion Quarterly*, 75(3):429-457.

Millar, M.M., and Dillman, D.A. (2011). Improving response to web and mixed-mode surveys. *Public Opinion Quarterly*, 75(2):249–69.

Pasek, J., & Krosnick, J. (2010). Measuring intent to participate and participation in the 2010 census and their correlates and trends: Comparisons of RDD telephone and non-probability sample internet survey data. Washington, D.C.: U.S. Census Bureau Statistical Research Division. Last accessed on 24/02/2014 at <http://www.census.gov/srd/papers/pdf/ssm2010-15.pdf>

Puleston, J. (2013) Online Research, Game On! A presentation given at the GenPopWeb opening conference in London, 25 February 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/Jon-Puleston.pdf>

Rivers, D. (2013) Using Web Survey Panels to Estimate Population Characteristics: A Comparison of Alternative Approaches. A presentation given at the GenPopWeb opening conference in London, 25 February 2013. Last accessed on 24/02/2014 at <http://www.natcenweb.co.uk/genpopweb/documents/Doug-Rivers.pdf>

Shih, TH. & Fan, X. (2008). Comparing Response Rates from Web and Mail Surveys: A Meta-Analysis. *Field Methods*, 20: 249.

Shlomo, N., Skinner, C. & Schouten, B., (2011), Estimation of an indicator of the Representativeness of Survey Response. *Journal of Statistical Planning and Inference* 142, pp. 201-211.

Taylor, H., Bremer, J., Overmeyer, C., Siegel, J.W., & Terhanian, G. (2001). The Record of Internet-based Opinion Polls in Predicting the Results of 72 Races in the November 2000 U.S. Elections. *International Journal of Market Research* 43:127-136.

TNS BMRB. (2013). Community Life Survey: Summary of web experiment findings. Last accessed on 21/02/2014 at <http://communitylife.cabinetoffice.gov.uk/assets/user-engagement/Annex%20B%20-%20Summary%20of%20web%20experiment%20findings%202012-13.pdf>

Twyman, J. (2008). Getting it right: YouGov and online survey research in Britain. *Journal of Elections, Public Opinion, and Parties* 18: 343-354.

Vannieuwenhuyze, J.T.A. & Loosveldt, G. (2013) Evaluating relative mode effects in mixed - mode surveys: three methods to disentangle selection and measurement effects. *Sociological Methods and Research* 42(1), pp 82 - 104

Vavreck, L., and Rivers, D. (2008). The 2006 Cooperative Congressional Election Study. *Journal of Elections, Public Opinion, and Parties* 18: 355-366.

Villar, A. (2013). Feasibility of Using Web to Survey at a Sample of Addresses: a UK ESS experiment. Last accessed on 21/02/2014 at <http://www.natcenweb.co.uk/genpopweb/outputs.htm>

Vonk, T.W.E., Ossenbruggen, R and Willems, P. (2006). The effects of panel recruitment and management on research results. *ESOMAR Panel Research* 2006.

Yeager, D., Krosnick, J., Chang, L.C., Javitz, H.S., Levendusky, M.S., Simpser, A., & Wang, R. (2011). Comparing the accuracy of RDD telephone surveys and internet surveys conducted with probability and non-probability samples. *Public Opinion Quarterly*, 75, 709-747.

YouGov. (2011). YouGov's Record. Public Polling Results compared to other pollsters and actual outcomes. Last accessed on 01/05/2014 at http://cdn.yougov.com/today_uk_import/yg-archives-pol-trackers-record2011.pdf

NatCen Social Research
35 Northampton Square
London EC1V 0AX
T 020 7250 1866
www.natcen.ac.uk

A company Limited by Guarantee
Registered in England No.4392418
A Charity registered in England and Wales (1091768) and Scotland (SC038454)