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Designing & Using Consumer Broadband Surveys

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KEY TAKEAWAYS

- Surveys are a popular method for gathering broadband data and can be an effective part of broadband-related analysis.
- Careful survey design, administration, and interpretation is necessary to obtain meaningful, actionable results.

What Roles Can Broadband Surveys Play?

Surveys have long been a popular method for gathering data directly from consumers about broadband. Some of the most robust broadband-related data is gathered via survey, such as the Census Bureau's American Community Survey. Surveys are also one of several "crowdsourcing" data collection method.

Surveys can be utilized at the state and local levels when publicly available sources of broadband data may not be sufficiently granular or otherwise do not provide the necessary details to guide policymaking. However, despite their popularity and widespread use, surveys involve several core methodological considerations and must be carefully designed, administered, and interpreted to yield actionable conclusions.

The following presents an overview of key considerations of a proper survey process. This discussion is not intended as an all-encompassing guide to survey design. Ultimately, policymakers should engage and closely collaborate with independent and objective experts on any formal survey efforts. Instead, this document is intended to provide a "101"-style overview so that policymakers can make educated decisions about whether and how to use surveys in support of their broadband efforts.

Sample Size and Representativeness

At their core, surveys involve collecting answers to questions from a subset of a larger population with the intent of drawing conclusions regarding the sentiments, choices, etc. of that population. As such, a key aspect of accurate surveying is ensuring that this subset, or sample, accurately reflects the population as a whole. Generally speaking, this involves two primary considerations:

- **Sample Size.** A sample needs to be adequately large to provide a comfortable level of certainty regarding how well it reflects the population. In the case of surveys, sample size is the number of responses received. The minimum sample size to provide a desired level of statistical confidence can be computed mathematically.[1]
- **Representativeness.** Along with being adequately large, a survey must also be representative, meaning that it accurately reflects the population from which it was obtained.[2] This can be reframed as making sure that the survey responses are not affected by biases that skew which groups are represented in the pool of responses.

Survey administrators can measure the representativeness of a sample by collecting demographic information from respondents and comparing the composition of the sample to known quantities from robust data sources like the Census Bureau. For example, if respondents to a county broadband survey report a median household income of $150,000, but the American Community Survey indicates median household incomes of $80,000, it may suggest that the survey is not representative of the population being analyzed.

(Non-)Response Bias

One of the main factors that can negatively impact a survey sample's representativeness is response bias. Non-response bias is the tendency of certain factors about respondents that make them more (or less) likely to respond. In the case of broadband surveys, many factors might influence households' motivations to respond. For example, households satisfied with their current internet service may be less likely to respond to a broadband survey than those who are unserved or unsatisfied. Households that are more civically engaged and trusting of their local governments may be more likely to fill out a survey asking for their address and complete an associated broadband speed test.

The effects of response bias can be significant and can heavily skew the results of survey efforts. Survey administrators can check for potential response bias issues by collecting demographic information about respondents and comparing them to known population metrics from reliable sources like the U.S. Census Bureau.

Question Wording and Design

The way survey questions are written and presented can influence the thought processes of respondents and affect their choice of response. As such, survey questions should be as straightforward and basic as possible while clearly communicating what they are asking. Some common pitfalls of question design include:

- **Leading Questions.** These are questions that, intentionally or unintentionally, support one response more than the other. For example, compare "Does your current internet service provide adequate speeds for your needs?" with "Are you negatively affected by slow internet service that is woefully inadequate for your needs?" The former's phrasing is preferred because it is straightforward; the latter exemplifies, in an exaggerated manner, how a leading question might be phrased.
- **Loaded Questions.** These questions presuppose certain sentiments or qualities about respondents. For example, asking respondents "Do you support government subsidies to fund improvements to our town's slow, inadequate broadband speeds?" presupposes respondents feel that current speeds are too slow, and a Yes/No answer set does not provide adequate detail to capture that sentiment.
- **Overly Technical language.** Broadband survey questions should be worded in such a way that they are comprehensible to as many respondents as possible. This is especially important for a topic like broadband, which is replete with jargon. For

example, compare "How often do you experience packet loss, excessive jitter, buffering, and other short-term upstream/downstream service interruptions?" with "How often to do you experience short-term (under 5 minutes) problems with your internet connection (for example stuttering/freezing videos, websites not loading, etc.)?" The former question is laden with jargon that few people would understand; the latter question is preferred because it captures the same sentiment in a much more plainspoken manner.

- **Too Many Choices.** Survey designers may be tempted to provide questions with many possible responses to collect detailed data. This can be overwhelming for respondents, and just like the questions themselves, the list of potential answers should be succinct and easy for respondents to parse. A question with many potential answers may be better off split into multiple, simpler questions.
- **Mandatory Questions.** Survey designers may also be tempted to set many or all survey questions to mandatory-response, such that they cannot be left blank. Mandatory questions can skew responses by forcing respondents to select an answer even if they are unsure or do not have a strong sentiment. Whenever possible, questions should be optional and should include responses like "I'm not sure," "Don't know," or other similar non-answer response.
- **Compound Questions.**[3] Compound questions, sometimes referred to as "double-barreled" questions, roll two or more questions together in a way that could result in inaccurate or incomplete information. For example, asking respondents "Are you satisfied with the speed and reliability of your internet service?" would be better designed as two separate questions, one asking about "speed" and the other about "reliability."

Ordering Effects

Along with how questions are worded, the order of the questions and the menu of answers can influence the choices made by respondents.[4] For example, if a broadband survey begins with several detailed questions regarding the prevalence of speed and reliability issues, and then asks about satisfaction with current internet service, this will likely lead to lower satisfaction scores than if the order were reversed.

There are two main approaches to dealing with ordering effects. The first is to lay questions out in an order that takes respondents through a logical thought process regarding the issue(s) being explored. The other approach is to randomize questions and/or their answers between respondents.

Survey Fatigue

Survey respondents are typically not compensated for their responses and are asked to voluntarily fill out surveys or stay on phone calls to walk through all questions and answers with the surveyor. As such, surveys should be designed with the goal of collecting the desired information in as few, simple, straightforward questions as possible. Surveys that take a

long time to complete may cause respondents not to respond or to rush through their responses. Certain types of questions, like open-ended written-answer questions, can be especially fatiguing and should be optional and used as sparingly as possible.

What Are Some Best Practices for States and Localities Performing Surveys

The following best practices are offered to state and local policymakers as they utilize surveys to collect broadband data.

- **Engage Independent Experts.** Although free and low-cost platforms exist for the rapid deployment of online surveys, obtaining accurate data requires careful design and administration to ensure that results are not biased. In addition, proper interpretation of results requires an understanding of the statistical reliability of a survey's findings. Policymakers should collaborate with independent expert entities that are experienced in market surveys and should be skeptical of surveys performed by non-experts or vested parties (*e.g.*, consultants that design and administer their own surveys).
- **Obtain Good Samples**. Survey administrators should ensure that their samples are of adequate size and representativeness. Necessary sample size can be computed mathematically, and demographic information should be collected and compared to known population values to ensure the survey sample is representative.
- **Combat Non-Response Bias.** As part of their effort to obtain a good sample, survey administrators should consider potential reasons for non-response bias and attempt to minimize its effects. This could include efforts like providing both online and paper surveys and advertising the survey via a diverse set of avenues. When bias is present, results should be properly weighted to adjust for its effects.[5]
- **Properly Word Questions.** Survey questions should be written in simple, neutral, straightforward language that avoids jargon. Whenever possible, question responses should not be mandatory and should include an "I'm not sure," "don't know," or other similar non-answer response.
- **Consider Ordering Effects.** When designing surveys, authors should be cognizant of the potential effects of question order and utilize either a logical question ordering or randomized order to account for them.
- **Prevent Survey Fatigue.** Surveys should be designed with the goal of collecting key information in as few questions as possible.

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[1] For a discussion of sample size computation, *see* Del Siegle, *Sample Size – Educational Research Basics*, University of Connecticut, https://researchbasics.education.uconn.edu/sample-size/.

[2] For an in-depth discussion of sample representativeness, *see Sample Representativeness and Nonresponse Bias: Frequently Asked Questions*, Education Development Center, https://preventionsolutions.edc.org/sites/default/files/attachments/Sample_Representativeness_Nonresponse_Bias_FAQs_0_0.pdf.

[3] *See, e.g., Double-barreled questions*, PickFu, https://www.pickfu.com/blog/double-barreled-questions/.

[4] For additional discussion of ordering effects, *see Writing Survey Questions*, Pew Research Center, https://www.pewresearch.org/our-methods/u-s-surveys/writing-survey-questions/.

[5] For a discussion of weighting, *see How Different Weighting Methods Work*, Pew Research Center, https://www.pewresearch.org/methods/2018/01/26/how-different-weighting-methods-work/.