

## **Appendix B: Knowledge Networks Methodology and Panel Recruitment**

Knowledge Networks has recruited the first online research panel that is representative of the entire U.S. population. Panel members are randomly recruited by probability-based sampling, and households are provided with access to the Internet and hardware if needed.

Knowledge Networks selects households using random digit dialing (RDD) and address-based sampling methods. Once a person is recruited to the panel, they can be contacted by email (instead of by phone or mail). This permits surveys to be fielded very quickly and economically. In addition, this approach reduces the burden placed on respondents, since email notification is less obtrusive than telephone calls, and most respondents find answering Web questionnaires to be more interesting and engaging than being questioned by a telephone interviewer.

Beginning recruitment in 1999, Knowledge Networks established the first online research panel (now called Knowledge-Panel®) based on probability sampling that covers both the online and offline populations in the United States. The panel members are randomly recruited by telephone and by

self-administered mail and Web surveys. Households are provided with access to the Internet and hardware if needed. Unlike other Internet research that covers only individuals with Internet access who volunteer for research, Knowledge Networks surveys are based on a dual sampling frame that includes both listed and unlisted phone numbers, telephone and non-telephone households, and cell-phone-only households. The panel is not limited to current Web users or computer owners. All potential panelists are randomly selected to join the KnowledgePanel; unselected volunteers are not able to join.

### **Random-Digit-Dialing Sample Frame**

Knowledge Networks initially selects households using random-digit-dialing (RDD) sampling and address-based sampling (ABS) methodology. In this section, we will describe the RDD-based methodology, while the ABS methodology is described in a separate section below.

KnowledgePanel recruitment methodology uses the quality standards established by selected RDD surveys conducted for the federal government (such as the Centers for Disease Control-sponsored National Immunization Survey).

Knowledge Networks utilizes list-assisted RDD sampling techniques based on a sample frame of the U. S. residential landline telephone universe. For efficiency purposes, Knowledge Networks excludes only those banks of telephone numbers (a bank consists of 100 numbers) that have fewer than two directory-listings. Additionally, an oversample is conducted among a stratum of telephone exchanges that have high concentrations of

African American and Hispanic households based on census data. Note that recruitment sampling is done without replacement, thus numbers already fielded do not get fielded again.

A telephone number for which a valid postal address can be matched occurs in about 70 percent of the sample. These address-matched cases are all mailed an advance letter informing them that they have been selected to participate in KnowledgePanel. For efficiency purposes, the unmatched numbers are under-sampled at a current rate of 0.75 relative to the matched numbers. Both the over-sampling mentioned above and this under-sampling of non-address households are adjusted appropriately in the panel's weighting procedures.

Following the mailings, the telephone recruitment begins for all sampled phone numbers using trained interviewer/recruiters. Cases sent to telephone interviewers are dialed for up to 90 days, with at least 14 dial attempts on cases where no one answers the phone, and on numbers known to be associated with households. Extensive refusal conversion is also performed. The recruitment interview, about 10 minutes long, begins with informing the household member that they have been selected to join KnowledgePanel. If the household does not have a computer and access to the Internet, they are told that in return for completing a short survey weekly, they will be provided with a laptop computer (previously a WebTV device was provided) and free monthly Internet access. All members in a household are then enumerated, and some initial demographic and background information on prior computer and Internet use are collected.

Households that inform interviewers that they have a home computer and Internet access are asked to take their surveys using their own equipment and Internet connection. Per survey incentive points, redeemable for cash, are given to these "PC" respondents for completing their surveys. Panel members who were provided with either a WebTV or a laptop computer (both with free Internet access) do not participate in this per survey points incentive program. However all panel members do receive special incentive points for select surveys to improve response rates and for all longer surveys as a modest compensation of burden.

For those panel members receiving a laptop computer (as with the former WebTV), prior to shipment, each unit is custom configured with individual email accounts, so that it is ready for immediate use by the household. Most households are able to install the hardware without additional assistance, though Knowledge Networks maintains a telephone technical support line. The Knowledge Networks Call Center also contacts household members who do not respond to email and attempts to restore contact and cooperation. PC panel members provide their own email addresses, and weekly surveys are sent to that email account.

All new panel members receive an initial survey to both welcome them as new panel members and familiarize them with how online survey questionnaires work. They also complete a separate profile survey that collects essential demographic information such as gender, age, race, income, and education to create a personal member profile. This information can be used to determine eligibility for specific studies, is used for weighting

purposes, and operationally need not be gathered with each and every survey. (This information is updated annually with each panel member.) Once new members are “profiled,” they are designated as “active” and ready to be sampled for client studies. (*Note:* Parental or legal guardian consent is also collected for conducting surveys with teenage panel members, age 13–17.)

Once a household is contacted by phone—and additional household members recruited via their email address—panel members are sent surveys linked through a personalized email invitation (instead of by phone or mail). This permits surveys to be fielded quickly and economically, and also facilitates longitudinal research. In addition, this approach reduces the burden placed on respondents, since email notification is less obtrusive than telephone calls, and allows research subjects to participate in research when it is convenient for them.

### **Address-Based Sampling (ABS) Methodology**

When Knowledge Networks started KnowledgePanel® panel recruitment in 1999, the state of the art in the industry was that probability-based sampling could be cost effectively carried out using a national random-digit-dial (RDD) sample frame. RDD at the time allowed access to 96 percent of the U.S. population. This is no longer the case. They introduced the ABS sample frame to rise to the well-chronicled changes in society and telephony in recent years that have reduced the long-term scientific viability of the RDD sampling methodology: declining respondent cooperation to telephone surveys; do not call lists; call screening, caller-ID devices, and answering machines,

dilution of the RDD sample frames as measured by the working telephone number rate; and finally, the emergence of households that no longer can be sampled by RDD—the cell-phone-only households (CPOHH).

According to the Centers for Disease Control, approximately 21 percent of U.S. households cannot be contacted through RDD sampling: 18 percent as a result of CPOHH status and 3 percent because they have no phone service whatsoever. Among some segments of society, the sample non-coverage is substantial: almost one-third of young adults age 18–24 reside in CPOHHs. After conducting an extensive pilot project in 2008, Knowledge Networks made the decision to add an address-based sample (ABS) frame in response to the growing number of cell-phone-only households that are outside of the RDD frame. Before conducting the ABS pilot, they also experimented with supplementing their RDD samples with cell-phone samples. However, this approach was not cost effective and raised a number of other operational, data quality, and liability issues (e.g., calling people’s cell phones while they were driving, for example).

The key advantage of the ABS sample frame is that it allows sampling of almost all U.S. households—an estimated 99 percent of U.S. households are “covered” in sampling nomenclature. Regardless of households’ telephone status, they can be reached and contacted. Second, the ABS pilot project revealed some other advantages beyond the expected improvement in recruiting adults from CPOHHs as well:

- Improved sample representativeness for minority racial and ethnic groups.

- Improved inclusion of lower educated and low income households.
- Exclusive inclusion of CPOHHs that have neither a landline telephone nor Internet access (approximately 4 percent to 6 percent of U.S. households).

ABS involves probability-based sampling of addresses from the U.S. Postal Service's Delivery Sequence File. Randomly sampled addresses are invited to join KnowledgePanel through a series of mailings and in some cases telephone follow-up calls to non-responders when a telephone number can be matched to the sampled address. Invited households can join the panel by one of several means:

- Completing and mailing back a paper form in a postage-paid envelope.
- Calling a toll-free hotline maintained by Knowledge Networks.
- Going to a designated Knowledge Networks Web site and completing the recruitment form.

As mentioned earlier, after initially accepting the invitation to join the panel, respondents are then profiled online by answering demographic questions and maintained on the panel using the same procedures established for the RDD-recruited research subjects. Respondents not having an Internet connection are provided a laptop computer and free Internet service. Respondents sampled from the RDD and ABS frames are provided the same privacy terms and confidentiality protections that Knowledge Networks has developed over the years and have been reviewed by dozens of institutional review boards.

Because Knowledge Networks has recruited panelists from two different sample frames—RDD and ABS—they take several technical steps to merge samples sourced from these frames. This approach preserves the representative structure of the overall panel for the selection of individual client study samples. An advantage of mixing ABS frame panel members in any KnowledgePanel sample is a reduction in the variance of the weights. An ABS-sourced sample tends to align more true to the overall population demographic distributions, and thus the associated adjustment weights are somewhat more uniform and less varied. This variance reduction efficaciously attenuates the sample's design effect and confirms a real advantage for study samples drawn from KnowledgePanel with its dual frame construction.