

## Guidelines for Developing Surveys- RPG-06

### Guideline

#### **Purpose**

Surveys are important tools for collecting primary source data in clinical research studies. Surveys are designed to elicit information directly from the subject; either through interview or self-report. Thus, the methodology relies heavily on the language and interpretation of each question. The goal of survey development is to design questions that are reliable and valid in the context of the study hypotheses.

These guidelines address the development of surveys and questionnaires by the Clinical Research Center (CRC) staff and a guide to assist investigators in developing well-designed surveys. They include planning for a survey project, developing survey instruments, pretesting a survey, and evaluating an instrument's reliability and validity.

#### **Definitions**

**Survey:** A data collection instrument designed to gather information about a group of individuals via structured and standardized questions asked directly of the individual that is intended for quantitative statistical analysis.

**Sampling frame:** The population of interest that can be selected for inclusion in the study.

**Validity:** The degree to which survey questions actually elicit information about the concept trying to be measured.

**Reliability:** The degree to which responses are understood and answered in the same way over time or across different methods of gathering data, when there is no actual change or difference in what is being measured.

The following section outlines the procedures to be followed when developing a survey.

#### **Planning Phase:**

The planning phase is a critical component of any research project and represents the foundation of the development of the survey. The following describes the essential questions to be answered during the planning phase of the project.

### **What research questions are you trying to answer?**

It is important to identify/clarify your research questions for your survey research project. These research questions should be affixed in your mind at all times during survey development, as they should govern what items are included in your survey.

### **What specific information do you need to collect to answer the research question(s) and are they in measurable form?**

It is essential to take each of your research questions and identify the specific **measurable** variables that will be analyzed to answer that research question.

### **What information will you eventually want to publish from your research?**

Create templates of data tables or charts that you will want to include in a manuscript or other report of your study findings. Develop an analysis plan for your data at this time describing what variables you will analyze, in what form, and the statistical tests you want to use. Identifying the information that you will publish will help you eliminate unnecessary questions or “nice to know” data from the survey project. Limiting the survey to the essential variables reduces the amount of time necessary for development, data collection, data entry and data analysis, as well as the cost associated with these tasks. In addition, by identifying up front the analysis variables and the statistical methods that you will employ, you will know the types of response scales that you will need to offer in your survey to generate the appropriate response distributions (continuous or categorical response scales). If you are planning to examine change over time by administering your survey at multiple points over time, you will need to identify items that are sensitive to change, i.e., they are able to statistically detect the level of change over time that you hypothesize will occur. The survey items must also be “reliable”, i.e., any change that you measure over time must be due to actual change in that which you are measuring, rather than changes in response that arise from problems with the survey item.

### **Is a survey the best way to get the information you need?**

Survey development and implementation is often a time consuming, costly, and laborious task. Therefore, it is important to determine whether a survey is the best method for meeting your goals or if data could be collected in some other way, such as through you directly observing a behavior, or you directly measuring some indicator such as blood pressure or heart rate. Surveys are most useful for assessing information that only individuals themselves can perceive such as opinions, feelings, and preferences.

**Do you have to create your own survey or are there previously developed surveys, and survey data, that you can use?**

Conducting a thorough literature search may save you the time and effort of having to create your own survey. Look for existing questions or surveys that get at the same thing or contact the authors of published studies to find out what they have used. In addition, there may be existing datasets from previous data collections such as national or state surveys that you can analyze to answer your research question.

**How much money, time, and staff do you have to develop and administer a survey, as well as to computerize and analyze your survey data?**

Plan to take at least 6 months to develop and pre-test a survey, before any data can start to be collected. Developing your own survey is an iterative process requiring many rounds of review, editing, and formatting. Further information on the specific steps involved in developing a survey is provided below. The cost of a survey project can vary considerably depending on the method of administration, the length of the survey, whether survey respondents are offered compensation, how the data entry will be done, etc. Some of the issues to keep in mind are that interview surveys require hiring and maintaining staff to administer the surveys. While self-reported surveys do not require interviews, they may require more effort to achieve higher response rates, such as numerous mailings. It is also important to consider how the data will be entered in a database for analysis. This may require a database programmer as well as data entry staff and data analyst.

**If you do a survey, how will you show that it is measuring what you want it to measure (survey validity) in a reliable way (survey reliability)?**

Good survey instruments are able to provide consistent measurement of items over time as well as being able to demonstrate the items within the survey are measuring what they are intended to measure. It is important to establish a plan for demonstrating the validity and reliability of your survey instrument. For more details on validity and reliability, refer to Section 7.

**What questions or ideas have other researchers/experts in the field identified as important to assess about your research topic?**

Before you start developing any survey items, first check to see whether others have developed similar instruments or items that you can use in your project. From literature reviews, identify researchers who have published papers on your topic to see what items they used to generate information on your topic. You should also contact them to see whether they would be willing to share their instruments or whether they have any advice about designing survey items for your research topic.

### **What do people in your study population think are important questions or ideas to assess about your research topic?**

It is often useful to talk with a group of individuals in your study population to identify key issues, test potential questions, and gather additional information. You can interview individuals or convene a group of individuals to answer your questions. A group meeting is often referred to as a “focus group”. Focus groups allow researchers to ask open-ended questions about behaviors and perceptions that may assist in developing better response options, identifying additional questions to ask, and appropriately phrasing important questions.

### **Who should be surveyed?**

Determination of the appropriate study population is critical and impacts the survey format and data collection process, and the usefulness of data that you collect. A list of participants should be developed that both possess the knowledge and appropriate criteria for inclusion in the study. For some topics, self-reporting may be the only appropriate method for answering your study questions as it relates to the subjective experience of the individual. However, if the nature of the subject matter is less subjective, it is important to identify the individual who is best able to accurately report the information necessary for answering the study question. For example, if the question of interest were about how a particular medication is administered to a patient, it would be best to identify and use the person that is primarily responsible for administering the medication.

### **What is the impact of utilizing a caregiver as the informant versus the child in pediatric research?**

In pediatric research, it may not always be easy, convenient, or reliable to ask survey questions of children. Depending on the age of the child, they may be unable to answer the questions of interest. Therefore, caregivers or parents may be relied upon to answer questions by proxy. However, one should remember that if the child is the respondent of interest, a parent or caregiver does not have the same point of view. If the area of interest involves subjective data about one's feelings or opinions, it may not be appropriate to utilize a proxy. When thinking about using a child as a respondent, special considerations must be made for a child's reading level, developmental level, and ability to understand the questions of interest. If surveying a wide range of ages it may be necessary to create different versions of the survey utilizing language appropriate for young children versus adolescents or young adults.

### **How many respondents are needed?**

Power and sample size calculations are also necessary in survey research. An appropriate statistician or data analyst should be involved in the planning phase of the study. Sample size estimates are tied to the specific research question tested at a time. Usually, estimates involve the specification of alpha levels of significance,

power, and the use of one or two-tailed tests with the most crucial parameter being the effect size that is meaningful enough to identify as being significant. For a brief discussion see Cohen (1992).

### **What method should you use to administer the survey?**

The selection of the method of survey administration requires the researcher to think about the characteristics of their study population, costs associated with each type of administration, available staff, and research topic. There are advantages and disadvantage to each type of approach. The following list describes some of the advantages and disadvantages of common survey administration methods.

- **Self-Administered surveys:**

Self-administered surveys, while requiring less study staff, are dependent upon the reading and writing skills of the study population. The burden is placed on the respondent to complete the survey correctly. Therefore, questions should be self-explanatory not requiring clarification by a third party. For populations in which English is not their first language, or for young children, self-administered surveys may not be ideal.

Traditionally, self-administered survey questionnaires have been distributed as a hard copy by mail. Dillman has described a detailed, systematic method of conducting mail surveys to maximize the response rate called the ‘Total Design Method’ (Dillman, 1978). Another method of delivery that is gaining popularity in the recent years is the electronic web-based survey (Dillman, 2000). Web-based surveys are increasingly used for their ease of administration, low costs, and quick turnaround time. While administering surveys via the internet, researchers have to comply with special regulations that apply to internet-based research. The Office of Clinical Investigation (CCI) provides more information regarding these regulations. See the document, “[Guidelines for Using the Internet to Conduct Research Activities](#)” on the CCI website for details. Researchers should also bear in mind the difference between confidentiality and anonymity. Before promising anonymity of responses to recipients of web-based surveys, researchers should ensure that this is indeed feasible.

Advantages	Disadvantages
Can have lower costs	Question wording requires more careful design
Requires less staff	Good reading and writing skills are required of respondents
Respondents have more time to think about responses	An interviewer is not present to provide clarification or ensure all questions are answered
Visual aids can be provided to assist with answering questions	Can have lower response rates than other methods
Respondents may feel more anonymity	Should not use open-ended questions

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- **Interview-guided surveys:**

Interview-administered surveys are structured much like that of self-administered surveys, but include additional instructions or scripts for an interviewer to follow as they administer a survey to an individual or group. Having scripted instruction ensures that the survey is administered in the same way to every participant. In addition, the interviewer can ensure that all questions are completed, unlike self-administered surveys. Interview-guided surveys are particularly useful when conducting nutrition-related research as it is often difficult for individuals to remember everything that they ate without prompting or clarification.

**Question Development Phase:**

Advantages	Disadvantages
Often can administer longer surveys	Higher cost
Can use more complex questions with skip patterns or lengthy lists of response options	Need to spend time and money training interviewers and developing scripts
Higher response rate than self-administered surveys	Interviewer-bias – bias introduced by the behavior, mannerisms, voice inflections or other administrative errors of the interviewer.
Less missing data	Less anonymity
Interviewer provides higher quality assurance and can provide clarification to respondents	Social desirability bias – bias introduced when participants respond according to the perceived desires of the interviewer or social group.

During the question development phase, a list of the items or variables of interest should be created. The list of variables need not be questions; rather it is a list of items of interest that will be developed into a question or group of questions. The recommended format is a **survey matrix** in which each variable or question group is listed and linked to a study concept or measurement of interest. This type of matrix is useful for ensuring that only

items that pertain to achieving the study objectives are included in the survey instrument as well as ensuring that all study objectives are being met by the proposed questions or variables.

### **Developing a survey matrix:**

A survey matrix is a tool for outlining the proposed contents of the survey, and is used to show how each survey question is linked to study objectives and hypotheses. It demonstrates how a study concept or item of interest is operationalized. The matrix is structured in a table format with the following columns:

- **Column 1: General categories of information needed**

Identify the categories of information to collect, i.e., the “domains” of information that you want to collect. For example, the survey may require patient demographic information, followed by medical history.

- **Column 2: Subtypes of information within each general category that you are specifically interested in assessing**

- Within the domain of patient demographic information, individual items of interest would be specified such as patient gender, patient race, level of education, date of birth and so on. **Column 3: The specific question wording that you will use to assess the item**

For each item specified in Column 2, identify the exact wording of the question that you will use on your survey to obtain that information. This may be an item developed by others in previous studies, or it may be an item that you had to create yourself.

- **Column 4: The response options that will be offered for each item listed in Column 2**

In this column, specify the response options that will accompany each question. Response options must be **comprehensive**, meaning that all responses that are possible to a question must be represented among your response options. One example of commonly used response scales is a Likert-scale. The Likert-scale is an ordinal response scale in which respondents typically provide their level of agreement or disagreement with a statement. Scales of this type may include 4-10 categories depending upon whether you offer a neutral and/or do not know option and how finely gradated you want the response to be. If you prefer that respondents make a clear choice in one direction or the other on your response scale, you would NOT include a neutral response option. The appropriateness of this forced choice will depend on the type of question that you are asking. Similarly, offering a “Don’t Know” response may be appropriate in some cases, and inappropriate in others. When you are asking questions assessing knowledge, offering a “Don’t Know” option is necessary so as to prevent respondents who do not know the information from guessing and reducing the validity of your data. On the other hand, if you were assessing attitudes or feelings, a “don’t know”

option would **not** be as appropriate since respondents can generally answer questions about their feelings or attitudes, and respondents should not be given an easy way to avoid answering the question. Other types of response option scales include yes/no, nominal response scales which have no inherent ordering, and interval or ratio scales which have inherent ordering such as numeric scales or number ranges.

- **Other possible columns to include**

If you draw items from pre-existing surveys, you will want to keep track of this information by including an additional column on your matrix that indicates the source of each question. In manuscripts or reports that you write using the survey data, it is important to give proper acknowledgement of the work of other researchers that contributed to making your data possible. If you have multiple research questions, another useful column to include is one where you indicate for each item which research question that item is necessary for answering. In this way, you limit your survey to those questions absolutely necessary for meeting your study objectives.

### **Tips for Survey Content, Format, and Coding**

The following is a list of some recommended guidelines for developing the content of surveys. This list is by no means exhaustive as there are whole textbooks written on the subject of designing surveys. For more detail and clarification, please refer to some of the survey design texts listed in the reference section (Section 5).

#### **Question wording tips:**

- Use complete sentences when writing questions.
- Avoid using only abbreviations for variables that are not commonly known and do include variable definitions.
- Utilize specific time frames when applicable. For example, use “In the past 30 days, how many times...” instead of “In the past month...” Months have different numbers of days, by specifying the number of days instead of using a general statement of month each respondent will be thinking about the same period of time when answering the question.
- Start questions with a time frame when time is utilized. For example, use “During the past 12 months, how many times have you...” instead of “How many times have you ... in the past 12 months”.

#### **Response Option tips:**

- Avoid the use of free text responses to questions in self-administered surveys. Free text takes longer to enter, is more difficult to read, is more prone to data entry errors, and relies on the reader’s interpretation at the time of data entry. Free text cannot be analyzed without having someone first categorize and code the responses in the database.

- Use closed-ended questions with defined response categories whenever possible.
- Include instructions for how to indicate an answer for **every** question, such as “check all that apply” or “circle only one”.
- Include “other” response options when applicable to account for unanticipated responses to question items.
- Avoid overlapping categories of responses in interval type questions. For example, use 0-5, 6-10, 11-20. Do not use 0-5, 5-10, 10-20; as these responses are not mutually exclusive.

**General formatting tips:**

- Design the form so that the questions and responses flow vertically. The reader’s eyes will automatically “find” the next item that they need to answer and prevent missed questions.
- Use transition statements between sections or topics to provide an introduction to a new topic for the respondent.
- Provide clear skip pattern instructions when questions are not applicable.
- Use adequate font size for readability. The CRC standard shall be 11-point font minimum.
- Use adequate line spacing for readability and minimizing missing data.
- Assign a number to each question to provide a clear reference to every item.
- Assign a numerical code to the response categories of closed-ended questions.
- List all parts of a question on the same page.
- Use consistent and standard numerical codes and formats for responses to all close-ended items across forms. The CRC standard will be to use 0 for “No”, 1 for “Yes”, -9 for “Missing”, -3 for “Not Applicable”, and -8 for “Don’t Know”.
- Document “dates” consistently as MM / DD/ YYYY.
- Use a table format when there is a series of questions that have the same response categories, and organize the responses in columns and questions in rows. Gray-shade every other row so that respondents are more easily able to follow the row all the way across the table. In this way, respondents will be less prone to marking their answer on the wrong line of checkboxes.
- Use subsections to divide the form and organize it by topic. For example, Section A: Demographic Data, Section B: Medical History, etc.
- Include a “Thank you for your help and time” statement at the end of the survey.
- Include standard footers that document the form name, number, version date, and page number. The CRC standard footer shall be as follows: -0.5 inches, 10-point font, solid line separator above the form version date, form name and number, and page number on right under the line.

## Pre-testing (Pilot-testing) Your Survey

A survey **must** be given a trial run before you implement your full data collection. Pre-testing of the survey instrument and all the data collection procedures that you will use in the full study should be done to examine whether the survey questions are clearly worded and easy to follow, whether the response choices to each item are comprehensive (i.e., they account for all possible responses), how long the survey takes to complete, and whether there are any issues with the data collection procedures. You should specifically ask pre-test participants to give you feedback through written comments about whether they found anything unclear or difficult to answer. By pre-testing your instrument and data collection methods on a few people initially, you may be able to catch problems with your survey that could have resulted in unusable data from your full study. Pre-testing should include both knowledgeable colleagues in your field who can give you feedback, as well as a small representative sample of your intended survey respondents. Ideally, you would use a comparable group that is NOT your study group as a pre-test sample so that you do not take away potential subjects from your actual study sample. The number of respondents to include in a pre-test sample depends on your study aims. If one of your study aims is to compare subgroups of respondents, you will need to represent each subgroup adequately in your pre-test sample. For example, if you plan to compare three different age groups, you should include at least 5-10 individuals from each age group in your pre-test sample. Once the pre-test data is collected, the response frequency distributions for each item should be examined to identify whether any “clumping” of responses occurs. Clumping of responses refers to when the responses are all clumped in only one or two response categories in a Likert-type or interval response scale. Clumping indicates that the response options need to be revised to stretch out the response data across more categories, if possible. For example, in a question asking about a relatively infrequent behavior (occurs a few times a month), having the response options of 0, 1-10, 11-20, 21-30 would result in most respondents being clumped in the 0 and 1-10 categories. Better response options for this type of question might be 0, 1-2, 3-5, 6-10, or 11 or more, which would stretch out the response data across more categories.

## Assessing survey reliability and validity

### Reliability

The reliability of responses to survey questions is important to maximize so as to minimize the amount of error in your data that is due to measurement problems. If your data is affected by measurement artifacts, you will be unable to draw valid conclusions about your research questions from the data. The reliability of survey questions is indicated by how **stable** and **reproducible** your response data is over time or across different methods of data collection, **when there is no change or difference in what you are measuring**. There are three main ways to assess the reliability of a measure:

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- **Test-retest reliability**

Test-retest reliability refers to how well the same question yields the same results if you ask it more than once (assuming no actual change occurred). Three days is considered an optimal spacing for a test-retest because it is not so soon that a person will remember exactly what he/she answered previously, and it is not so long that an actual change will cause the responses to differ. If you do not have the ability to administer the survey twice in a few days, an alternative way of assessing test-retest reliability is to ask the same question or very similar questions in different parts of the survey to see whether the responses are the same. The statistical measures most often used to assess test-retest reliability are the intra-class correlation coefficient for continuous variables and kappa statistic for categorical variables. Correlation coefficients or the intraclass correlation coefficient

- **Inter-rater reliability**

Inter-rater reliability is only applicable if you have different people involved in the data collection such as different interviewers, or different raters doing ratings using your measure. Inter-rater reliability refers to the degree to which these different data gatherers obtain the same responses to the same questions from the same (or similar) study subjects. Establishing inter-rater reliability is important so as to show that the variance in your study data is not confounded by differences in how your different interviewers or raters gathered the data (interviewer bias). One way to assess inter-rater reliability is to have two or more raters simultaneously rate the same phenomenon (if the phenomenon is occurring in real time) using the same measure. Since the thing that is being rated is the same between the two raters, any difference that is seen in the results could be attributed to measurement unreliability. A way to assess inter-rater reliability in the case of interviews is to randomly assign your study subjects to different interviewers, and then assess the comparability of the overall distribution of responses using correlation coefficients (for continuous data) or kappa statistic (categorical data). It is presumed that through random assignment, you should have two equivalent groups so that any differences that you see may be attributed to differences in interviewers. It is best to try to work up front to minimize the potential for interviewer /observer bias by thoroughly training your interviewers or raters in standardized interviewing/rating and field procedures, as well as periodically monitoring their performance. Training should involve resolution to issues related to drift (moving away from operational definitions), reactivity (the presence of rater/observer altering the measurement situation) etc.

- **Internal consistency reliability**

The final type of reliability (which is not related to consistency over time) is internal consistency reliability, which refers to the degree of consistency among

responses to different questions intended to measure the same concept. Internal consistency only applies to “scales” (not to be confused with “response scales”) or groups of questions that get at the same theoretical concept. Scales are developed when whatever is trying to be measured is multi-dimensional and requires more than one question to describe it adequately. For example, to assess physical limitations, we would need multiple questions to assess for various kinds of activities such as fine motor, gross motor, activities of daily living like eating, dressing, and so on. Also, an advantage of multi-item scales is that with multiple questions, your data will be less prone to measurement error associated with any single item. When the multiple items of a scale correlate highly with each other, the more likely it is that they are getting at the same theoretical concept, which indicates greater internal consistency reliability. The main statistical indicators for internal consistency reliability are the Cronbach’s alpha and the split-half reliability coefficients, which are summary measures of the inter-item correlations across all the items in the scale. Cronbach’s alphas of .70 or higher are evidence of internal consistency across items. Ideally, a researcher would want to account for the levels of measurement error in the instrument by correcting standard errors of measurement for the presence of unreliability.

### **Validity**

- The validity of survey items refers to the degree to which they are accurately measuring what they are meant to measure. Reliability is critical to validity; you cannot have a valid measure if it is not reliable. However, having a reliable measure does not guarantee validity as you could consistently measure something different from the actual concept that you want to measure. There are three main ways to assess the validity of a measure: Content Validity

One aspect of the validity of a survey is whether the questions chosen most appropriately represent the full meaning of the theoretical concept that you are trying to measure. Referred to as content validity, in order to establish this type of validity, you must have some well-articulated theory about your study topic, which includes the key dimensions that should be assessed. The usual way to enhance content validity is to begin your survey development by doing a thorough literature review to examine prior work on your research topic to see what theoretical models exist and what domains other researchers deemed important to assess. For example, when assessing substance use among adolescents, previous research has shown that alcohol, tobacco, and marijuana are the most commonly used substances by adolescents and therefore should be included in a survey on adolescent substance use. In addition, you should elicit the feedback of an “expert” panel during the development and refinement of your survey items. Experts are defined as those people most knowledgeable about and experienced in your research area. These people should include researchers, people who have participated in the activities that you are assessing, and people who are representative of your survey sample. If, based on your literature review and the feedback of your experts, your survey content is deemed appropriate and comprehensive; your measure is then believed to have content validity.

- **Construct Validity**

Construct validity refers to the extent to which your survey data empirically supports well-developed theories or existing hypotheses about the associations among the variables studied. The more often these hypothetical relationships are borne out by your data, the more construct validity your survey is assumed to have. For example, a measure of the symptoms of physical discomfort should correlate well with other measures of physical health (**convergent** validity). On the other hand, physical health measures should be comparatively LESS correlated with measures of other constructs such as cognitive functioning (**discriminant** validity). When survey measures show convergence and discriminance in the ways that are expected and intended, then construct validity is supported. The statistical measure that is commonly used to assess convergence and discriminance across measures is the correlation coefficient. Factor analytic methods such as principal components analysis or principal axis factor analysis can also be used to explore, or confirm hypothesized, convergent, and divergent relationships across variables. As discussed in Psychometric Theory (Nunnally & Bernstein, 1994), factor analysis can be used to determine 1) groupings or clusterings of variables; 2) which variables belong to which group and how strongly they belong; and 3) how many dimensions are needed to explain the relations among the variables. More detailed information on factor analytic methods is available in Chapters 11-13 of Psychometric Theory (see selected Bibliography in Section 5.1 for complete reference). For an excellent discussion on satisfying convergent and discriminant validation through confirmatory factor analysis see Gorsuch (1983).

Another way to examine construct validity is to conduct a **known-groups validity** study. This type of survey validity is demonstrated when your survey data accurately differentiates subject groups that are **known to differ** in the indicators that you are measuring. For example, if you have a measure of physical discomfort for children, you can administer your survey to a number of different groups of children that you hypothesize should score very differently on your measure, such as children with a chronic illness and children who do not have a chronic illness. In your data analyses, you should see statistically significant differences in physical discomfort levels between these two groups, in the expected direction. That is, children with a chronic illness should have significantly **higher** physical discomfort levels compared to children with no such illness.

- **Criterion Validity**

Criterion validity refers to the extent to which survey data agree with or predict, some “criterion” or “gold standard” which represents a true value of your measure. This type of validity can only be assessed when there is some widely accepted criterion or gold standard for what you are trying to measure. For example, the gold standard for a substance abuse screening tool might be a clinical diagnosis of a substance abuse disorder. Alternatively, the criterion for a

person's self-report of drug use might be a urine test. In many cases, however, you will not have a widely agreed upon gold standard. When there is a gold standard for what you are trying to measure, you can assess two types of criterion validity, depending on what is most appropriate. **Predictive** validity involves looking at how accurately a **future** event can be predicted by your data. **Concurrent** validity is the level of agreement between your measure and a gold standard assessed at essentially the **same point in time**. To assess both types of validity, people often use sensitivity and specificity analyses, as well as correlation coefficients to assess convergence. Sensitivity and specificity are most relevant for screening tools that are intended to identify respondents that have some specific characteristic of interest. **Sensitivity** analysis assesses a measure's ability to identify as screening **positive** the true positives in your sample. **Specificity** analysis assesses a measure's ability to identify as screened **negative** the true negatives in your sample. The sensitivity and specificity of a measure are statistically represented as percentages, with sensitivity indicated by the percent scoring positive on the measure among the true positives, and specificity indicated by the percent scoring negative among the true negatives.

## Related Content

### SURVEY MATRIX EXAMPLE

Domain	Subdomain	Variables	Questions	Response Categories	Source
Socio-demographics	Demographics	Race	What is your race? (Select all that apply)	<ul style="list-style-type: none"> <li>• White/Caucasian</li> <li>• Black/African American</li> <li>• Asian</li> <li>• American Indian /Alaskan Native</li> <li>• Native Hawaiian/Other Pacific Islander</li> <li>• Don't Know</li> </ul>	
	Demographics	Ethnicity	Are you of Hispanic or Latino origin?	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• Don't Know</li> </ul>	
	Demographics	Gender	What is your gender?	<ul style="list-style-type: none"> <li>• Male</li> <li>• Female</li> </ul>	
	Demographics	Marital Status	What is your current marital status?	<ul style="list-style-type: none"> <li>• Single</li> <li>• Married</li> <li>• Living with partner</li> <li>• Divorced</li> <li>• Widowed</li> <li>• Other</li> </ul>	

	Household characteristics	Number of residents in home	How many people currently live in your home at least 3 or more days a week?	<ul style="list-style-type: none"> <li>• 1</li> <li>• 2</li> <li>• 3</li> <li>• 4</li> <li>• 5</li> <li>• 6 or more</li> </ul>	
	Socioeconomic Status	Household Income	For the past year, what was your total combined household income before taxes from all sources? Include income from jobs, social security, retirement income, unemployment payments, public assistance, interest, and dividends.	<ul style="list-style-type: none"> <li>• Below \$20,000</li> <li>• \$20,000 – \$29,999</li> <li>• \$30,000 – \$39,999</li> <li>• \$40,000 – \$49,999</li> <li>• \$50,000 – \$59,999</li> <li>• \$60,000 – \$69,999</li> <li>• \$70,000 – \$79,999</li> <li>• \$80,000 – \$89,999</li> <li>• \$90,000 – \$99,999</li> <li>• Above \$100,000</li> <li>• Don't Know</li> </ul>	
	Socioeconomic	Education level	What is the highest grade or level of school you completed or the highest degree you received?	<ul style="list-style-type: none"> <li>• Never attended/ Kindergarten</li> <li>• 1ST GRADE</li> <li>• 2ND GRADE</li> <li>• 3RD GRADE</li> <li>• 4TH GRADE</li> <li>• 5TH GRADE</li> <li>• 6TH GRADE</li> <li>• 7TH GRADE</li> <li>• 8TH GRADE</li> <li>• 9TH GRADE</li> <li>• 10TH GRADE</li> <li>• 11TH GRADE</li> <li>• 12TH GRADE, NO DIPLOMA</li> <li>• HIGH SCHOOL GRADUATE</li> <li>• GED OR EQUIVALENT</li> <li>• SOME COLLEGE, NO</li> </ul>	NHANES (1999-200)

				DEGREE <ul style="list-style-type: none"> <li>• ASSOCIATE DEGREE: OCCUPATIONAL,</li> <li>• TECHNICAL, OR VOCATIONAL PROGRAM</li> <li>• ASSOCIATE DEGREE: ACADEMIC PROGRAM</li> <li>• BACHELOR'S DEGREE (EXAMPLE: BA, AB, BS, BBA)</li> <li>• MASTER'S DEGREE (EXAMPLE: MA, MS, MEng, MEd, MBA)</li> <li>• PROFESSIONAL SCHOOL DEGREE (EXAMPLE: MD, DDS, DVM, JD)</li> <li>• DOCTORAL DEGREE (EXAMPLE: PhD, EdD)</li> <li>• REFUSED</li> <li>• DON'T KNOW</li> </ul>	
Health	Body Mass Index	Height	How tall are you without your shoes on?	Write in feet and inches	YRBS
		Weight	How much do you weigh without your shoes?	Write in pounds	YRBS

# Self Reported Survey Example

**Section A: Personal Experience:**

A1. What is your role at Children's (check one)

- 1 Attending
- 2 Clinical Fellow
- 3 Resident
- 4 Other → specify: \_\_\_\_\_

A2. In what year did you complete medical school? \_\_\_\_\_

A3. In the past two years, have you evaluated or treated a child for rickets?

- 1 Yes → A3A. If yes, how many cases have you treated in the past two years? \_\_\_\_\_
- 2 No Skip to B1

**Section B: Vitamin D:**

	Check all that Apply	Milk <sub>1</sub>	Yogurt <sub>1</sub>	Cottage Cheese <sub>1</sub>	Steak <sub>1</sub>	Broccoli <sub>1</sub>	Salmon <sub>1</sub>
B1.	Which are foods fortified with <u>vitamin D</u> in the U.S.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B2.	Which are foods with significant natural dietary sources of <u>vitamin D</u> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B3. According to American Academy of Pediatrics current recommendations, infants should receive which of the following: (check one)

- 1 400 IU vitamin D daily
- 2 200 IU vitamin D daily
- 3 100 IU vitamin D daily
- 4 Infants do not require supplementation of vitamin D

B4. The recommended daily allowance (RDA) for vitamin D for a school-age child is: (check one)

- 1 200 IU
- 2 400 IU
- 3 800 IU
- 4 there is no RDA for vitamin D for school-age children

B5. The recommended daily allowance (RDA) for vitamin D for a teenager is: (check one)

- 1 200 IU
- 2 400 IU
- 3 800 IU
- 4 there is no RDA for vitamin D for teens

B6. Is the following statement true or false: (check one)

The American Academy of Pediatrics (AAP) recommends that all exclusively breastfed babies should receive a vitamin D supplement.

- 1 True
- 2 False

B7. Which of the following is the best way to measure the body's store of vitamin D? (check one)

- 1 25 OH D
- 2 1, 25 OHD
- 3 parathyroid hormone
- 4 both 1 and 2

B8. What percent of adolescents in Boston are vitamin D insufficient according to a recent study?

- 1 2%
- 2 12%
- 3 22%
- 4 32%
- 5 42%

**Thank you very much** for your participation in this study, we really appreciate your help. If you have any questions or have any comments for us, please feel free to call ...

# Interview Survey Example

## Section A: Infant Nutrition and History

A1. Date of Interview: \_\_\_ / \_\_\_ / \_\_\_\_\_

I would like to ask you a few questions about your child's eating and drinking habits:

Complete the following for Infants less than 1 year old — If greater than 1 year skip to A3.

A2. At the moment is your baby ..... Read answers

- 1 Breast fed
- 2 Bottle fed
- 3 Both breast-fed and bottle-fed

A2A. For Breast Fed Infants — Do you ever give your baby milk or formula in a bottle, other than breast milk?

- 1 Yes
- 0 No SKIP to A4

A2a1. If YES How many times per day on average do you give your baby a bottle? \_\_\_\_\_ times/day

A2B. For Bottle Fed Infants — Have you ever in the past breast-fed this infant?

- 1 Yes
- 0 No SKIP to A4

A2B1. IF YES How old was your baby when you stopped breast-feeding? \_\_\_\_\_ months old

A2B2. About how much of the time would you say you were breast-feeding at the time?

- Would you say... Read answers
- 1 Less than half of the time
  - 2 Half of the time
  - 3 More than half of the time

A2C. For Breast- and Bottle-fed Infants— How much of the time would you say that you bottle-feed your baby at this time?

- 1 Less than half the time
- 2 Half the time
- 3 More than half the time

GO TO A4.

For Infants greater than 1 year old

A3. In a typical 24-hour period (from one morning to the next morning), which of the following does your child drink? Read each item — If yes, ask how many

	YES	NO	1. If yes, How many cups or bottles does your child drink per day?
A Juice	1	0	_____
B Milk	1	0	_____
C Breast milk	1	0	_____
D Soy milk	1	0	_____
E Soda	1	0	_____
F Water	1	0	_____
G Other, specify	1	0	_____

A4. Do you give your baby any vitamins?

- 1 Yes → If YES — What kind of vitamins? \_\_\_\_\_
- 0 No

1 – Multivitamin
2 – Vit. D
9 – Other

A5. Does your child spend time on a regular basis in a childcare setting such as day care, a center based childcare program, or family childcare home?

- 1 Yes
- 0 No

ASA. If YES — Approximately how many hours in a typical week does your child spend in childcare outside of your home?  
\_\_\_\_\_ hours (whole numbers only)

A6. On a typical day, do you take your baby outside?

- 1 Yes
- 0 No

A6A. If YES — How much time is your baby outside? Would you say...

- 1 Half an hour or less per day
- 2 Between Half an hour and 1 hour per day
- 3 More than 1 hour, but less than 2 hours
- 4 2 or more hours per day

If less than 1 hour per day

A6B. Of the following, what is the reason(s) for spending little time outside?

- 1 Not enough time
- 2 Threat of crime or harm
- 3 No parks or facilities in the area
- 4 Lack of interest
- 9 Other, specify \_\_\_\_\_

Thank you very much for your participation in this study, we really appreciate your help. If you have any questions or have any comments for us, please feel free to call ...

## References

More detail on all of the above-discussed topics can be found in numerous survey design textbooks, some of which are listed in the attached bibliography. One particularly useful reference that provides comprehensive information on both the design and implementation of health surveys is the book “Designing and Conducting Health Surveys” by Lu Ann Aday. The full reference is provided in the bibliography.

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<b>Approved</b>	<u><b>Signature on file</b></u> Stavroula Osganian, MD, ScD, MPH Co-Chief, Clinical Research Center	<u><b>SIGNATURE ON FILE</b></u> Ellis Neufeld, MD, PhD Associate Chief, Division of Hematology/Oncology	

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