The National Association of County & City Health Officials

The Seasonal and Pandemic Influenza Vaccination Assessment Toolkit

San Francisco Bay Area Advanced Practice Center

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Communicable Disease Control & Prevention Section, San Francisco Department of Public Health & Center for Infectious Diseases & Emergency Readiness, University of California, Berkeley School of Public Health
The Seasonal and Pandemic Influenza Vaccination Assessment Toolkit

San Francisco Bay Area Advanced Practice Center, National Association of County & City Health Officials

The San Francisco Bay Area Advanced Practice Center is a partnership between the San Francisco Department of Public Health, Communicable Disease Control and Prevention Section, and the University of California Berkeley School of Public Health, Center for Infectious Diseases & Emergency Readiness.

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Seasonal & Pandemic Influenza Vaccination Assessment Toolkit
Contents

1 Introduction ........................................... 1
  1.1 Purpose............................................. 1
  1.2 Background ....................................... 2
  1.3 How to Use the SPIVA Toolkit ...................... 2
  1.4 Rationale ......................................... 2
  1.5 Key Assumptions ................................. 3
  1.6 Expected Outcomes ............................... 3

2 Community Assessments for Preparedness .......... 5
  2.1 Community Assessments .......................... 5
  2.2 Key Informant Interviews ......................... 5
    2.2.1 Purposes of Key Informant Interviews ...... 7
    2.2.2 Interviewer Skills and Knowledge .......... 11
    2.2.3 Analyzing Data from Key Informant Interviews 12
    2.2.4 Summary .................................. 14
  2.3 Focus Groups ..................................... 14
    2.3.1 Purposes of Focus Groups ...................... 14
    2.3.2 Planning and Conducting Focus Groups ...... 15
  2.4 Surveys ............................................ 22
    2.4.1 Where to conduct vaccination program surveys . 23
    2.4.2 When to conduct vaccination program surveys . 23
  2.5 Identifying and Engaging Target Populations .... 25
  2.6 Putting Community Assessment Data to Use ...... 28

3 Surveys for Improving Vaccinations ................ 31
  3.1 Introduction ...................................... 31
  3.2 The 7 Steps of Highly Effective Surveys ......... 34
    3.2.1 Step 1: Define the survey goals .............. 35
    3.2.2 Step 2: Select a study design ................. 35
    3.2.3 Step 3: Design a sampling plan ............... 37
    3.2.4 Step 4: Design the questionnaire ............ 46
    3.2.5 Step 5: Pretest the survey .................... 61
    3.2.6 Step 6: Conduct the survey ................... 62
3.2.7 Step 7: Communicate findings .................. 63
3.3 Managing Personnel and Resources ............... 65

4 Using Online Tools ...................................... 71
  4.1 Using Community Health and Census Data ......... 71
    4.1.1 Community Health Data Sets .................. 72
    4.1.2 United States Census Data ..................... 72
    4.1.3 Data.gov: “Empowering People” ................ 72
  4.2 Using Online Survey Tools .......................... 73
  4.3 Using Relational Database Software ................. 74
  4.4 Using CDC’s Epi Info Software ..................... 75
  4.5 Using EpiData Open Source Software ............... 75

References .................................................... 77

Appendixes ................................................... 79
Introduction

1.1 Purpose

The purpose of this toolkit is to help local health department (LHD) staff prepare for future influenza A pandemics by practicing their assessment and implementation skills each year during seasonal influenza. A public health infectious disease emergency response, such as a mass vaccination campaign, will be more effective if we understand the changing needs, attitudes, beliefs, and behaviors of our diverse communities. Because these characteristics can differ significantly by age group, gender, ethnicity, income level, or neighborhood, we can use this knowledge to customize our response.

In this toolkit, using epidemiology and management concepts, we review how to improve our influenza vaccination programs by conducting targeted assessments before, during, and after influenza seasons. To promote successful assessments, we emphasize the value of taking one step at a time prior to an emergency situation. This will make emergency preparedness and response assessment less onerous and more manageable by many public health responders.

Each year, seasonal influenza necessitates a strong public health response in order to reduce the morbidity and mortality from circulating influenza A virus subtype variants. The response effort is concentrated on achieving optimal influenza vaccine coverage in the United States. This annual vaccination effort provides public health agencies the opportunity to evaluate and improve not only their seasonal vaccination capabilities, but also their ability to respond to a future pandemic and other public health emergencies.
1.2 Background

As the 2009–2010 novel influenza A (H1N1) reminded us, each pandemic is unique in terms of the infectious spread, risk groups for infection, and the public’s perceptions of risk and willingness to get vaccinated. The focus of this toolkit was shaped by the experiences of local health departments that responded to the H1N1 influenza pandemic during the spring and fall of 2009. The rate and intensity at which LHD staff members were expected to respond to mitigate further spread of the H1N1 virus was unprecedented when compared to day-to-day operations.[1] And, in spite of the low virulence of the H1N1 virus, many unforeseen challenges still arose.

1.3 How to Use the SPIVA Toolkit

The SPIVA toolkit is designed to use in part, or in whole. Each of the appendixes can be used as a stand-alone resource to augment existing plans or assist with ongoing community assessments. Each section of the toolkit provides guidance and examples pertaining to different aspects of community assessment. Taken as a whole, this toolkit provides guidance, examples, and functional resources to assist users with implementing community assessments in their jurisdiction.

In Section 1 we provide the introduction to the toolkit and discuss the rationale for creation of the toolkit, the key assumptions made during its design, and the outcomes that toolkit users can expect as a result of its use.

In Section 2 we cover the following topics: differentiating between data types and data collection methods (key informant interviews, focus groups, and surveys); engaging communities in community assessment; conceptualizing and designing a survey; and putting data to use.

In Section 3 we cover how to conduct and manage a survey by discussing the “7 Steps to Highly Effective Surveys,” a step-by-step guide that takes users from defining their goals all the way to communicating their findings.

Finally, in Section 4 we review software and online tools that can assist users throughout the survey design and management process.

1.4 Rationale

- Each influenza season may differ in terms of infectiousness and virulence of the virus and the populations affected.
- To date, the San Francisco Bay Area Advanced Practice Center has not identified a comprehensive survey and assessment tool focused on influenza vaccination.
1.6 Expected Outcomes

- The skills gained through implementing the activities presented in this toolkit will be applicable beyond influenza vaccination to a wide range of public health interventions.
- Building partnerships with private providers, local clinics, and community-based organizations is essential to effective public health preparedness and response capabilities.
- Seasonal influenza presents an annual opportunity to evaluate and improve public health preparedness and response capabilities.
- By focusing on community assessments, which help to inform planning, marketing, and risk-communication activities, this toolkit seeks to assist with all-hazards preparedness.

1.5 Key Assumptions

- There will be time, perhaps several influenza seasons, before the world faces another pandemic strain of influenza.
- The toolkit will be used to plan for seasonal influenza vaccination, thus proactively preparing for future pandemics by enhancing public health practitioners’ knowledge of the communities they serve.
- During a pandemic, new influenza vaccine production may be delayed resulting in vaccine rationing and prioritization.
- Identifying how best to reach vulnerable populations in advance of an infectious disease emergency will improve our ability to meet their needs.
- In a national emergency, state and federal guidances may supersede local planning assumptions. This toolkit provides a framework for working within a wide range of scenarios without undermining official guidances.

1.6 Expected Outcomes

- Increased number of staff members trained in practical survey and assessment techniques applicable to various public health functions.
- Improved mass vaccination planning and coordination with private providers, community-based organizations, and other key public health partners.
- Effective targeting and marketing to vulnerable populations.
- Integration of community-based organizations into survey implementation to heighten community participation in mass vaccination.
• Increased influenza vaccine uptake, resulting in decreased transmission during influenza season and compliance with the Advisory Committee on Immunization Practice’s (ACIP) recommendations.

• Increased awareness of local health conditions and potential gaps in public health preparedness to inform future preparedness planning.
Community Assessments for Public Health Preparedness

A community assessment is an important tool to improve public health emergency preparedness, surveillance, response, and recovery capabilities. Communities are diverse and constantly changing. Health departments can use community assessments to assess needs and assets; to measure attitudes, beliefs, and behaviors; and to improve and target services. Information collected in multiple ways informs the strategies for developing mass vaccination campaigns and enhancing preparedness.

2.1 Community Assessments

Understanding where our own vaccination assessment activities fit into a larger framework helps ensure that our data collection methods are consistent and that we use information properly (Figure 2.1).

The goal of the assessment, the type of data being collected (quantitative vs. qualitative), and the intended audience for the results guide which method to use. We use community surveys for collecting descriptive data about opinions, attitudes, and feedback. Surveys can be geared towards an internal audience and do not require formal statistical analysis. In contrast, academic research is often focused on testing a specific hypothesis and requires significant statistical knowledge to interpret and present results to an external audience, such as a peer-reviewed journal. In this toolkit we cover three data collection methods (key informant interviews, focus groups, and surveys) with the goal of understanding trends and attitudes and using this information to improve vaccination campaigns and public health preparedness.

2.2 Key Informant Interviews

A key informant interview is an in-depth conversation with an expert on a particular topic. When we focus our key informant in-
Chapter 2. Community Assessments for Preparedness

Fig. 2.1. Community assessments and public health preparedness

Interviews on the topic of vaccination our “experts” can range from public health nurses to local religious and community leaders. The interviews we conduct can inform our decisions about vaccination campaigns by providing background information about past vaccination efforts, opinions from community leaders about how to effectively communicate with community members, and advice from experts in the field of immunization.

Learning Objectives

By the end of this section of the SPIVA Toolkit, you should be able to:

• Discuss key informant interviews as a viable data-collection method in community assessment;
• Identify how key informant interviews may be used in planning for seasonal and pandemic influenza campaigns; and
• Discuss how local health department staff may use key informant interviews for infectious disease emergency preparedness.

Key informant interviews are an efficient method for collecting reliable data that we can use to directly inform our public health programs, as well as improve the design of other data collection methods such as focus groups and surveys. While interviews are generally the simplest of these three data collection methods, a hastily conducted interview will not yield the quality information needed to improve a vaccination program.

A key informant interview is distinctive from another type of interview in that it is semi-structured. The interviewer conducts the interview to satisfy the pursuit of information. The interviewee is someone deemed to have expertise acquired formally or informally. The interviewee is “expert” and “key” in providing information. There is

Seasonal & Pandemic Influenza Vaccination Assessment Toolkit
2.2. Key Informant Interviews

2.2.1 Purposes of Key Informant Interviews

Among the purposes are:

- To gauge the level of familiarity of an issue or topic within a community

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Chapter 2. Community Assessments for Preparedness

- To identify who else among a community ought to be included in an assessment
- To gain insights culled from others’ experience
- To evaluate products or practices prior to general dissemination

One should identify the goals for conducting key informant interviews, develop a protocol that includes their purpose, pertinent questions, and a follow-up procedure.

Steps for Planning Key Informant Interviews

- Schedule the interview at a time that is convenient for the interviewee.
- Determine the duration of the interview after pre-testing the questions and anticipated length of time for interviewee responses.
- Make explicit the purpose of the interview.
- Follow a set policy on confidentiality and data use.
- Be open to making available the interview questions in advance of the scheduled interview to allow the interviewee to research or prepare his or her responses.

We should remember to consider the following questions when planning our key informant interviews:

- Who will we interview and how many interviews will we conduct?
- How will we structure the interview? Will it be formal or informal?
- What questions will we ask in the interview? Questions can be related to experiences, feelings, opinions, or knowledge.
- Will we conduct the interview in-person, over the phone, or via a web-conference?
- How will we analyze the information we collect? Conversations can be reviewed for patterns, key words, recommendations, the tone and intensity of the interviewee, emphasis placed on specific topics or subtopics, and the absence of particular language or expressions.
- How will we use the results? Were new questions raised through the information that was collected and analyzed?

Considering the number of ways that we could answer these questions, it becomes clear that conducting two separate interviews with the same person about the same topic could still yield very different results depending on the structure of the interview and the wording of the questions. When we interview a number of individuals about the same topic we want to standardize our interview format and list of questions to ensure that we are collecting information in the

Seasonal & Pandemic Influenza Vaccination Assessment Toolkit
same manner each time. Therefore, planning to include key informant interviews as a data collection method for community assessment requires a written protocol. This protocol ordinarily describes the eligibility criteria for inclusion of key informants in an assessment. The protocol also lists the open-ended, introductory, general, and probing questions for more in-depth inquiry. In order to ensure the integrity of the information we collect we should consider the following:

- Keep interview formats the same for all interviews in terms of formality, method of communication, and questions asked.
- Pilot-test questions beforehand with co-workers or others with knowledge of the subject matter to ensure that questions are clear and free of bias.
- Always keep in mind the goals and objectives of the interview. Stay focused on the answers being sought from the interviewee.
- Take thorough notes, and if possible, make an audio recording of the interview (with the subject’s permission). It may help to have a second interviewer present to assist with these functions.
- Be courteous, encouraging, and attentive during the interview. Always be sure to express your thanks and appreciation for the person’s contribution to your work.
- Obtain permission to contact the individual with follow-up questions, or to clarify answers to questions asked during the interview.

Typically, key informant interviews are structured to some extent. A means for structuring the interview entails drafting an interview protocol. A sample outline of a protocol for key informant interviews appears below:

1. Introduce yourself as the interviewer.
   
   Example: Hello, my name is ____. I will be interviewing you today.

2. Reconfirm the availability of the interviewee’s uninterrupted time.
   
   Example: Is this still a good time for this interview? I estimate it will take at least a half-hour.

3. Begin the interview with a brief statement of the sponsor and purpose of the interview.
   
   Example: This interview is sponsored by SPONSOR NAME. The purpose of the interview is to better understand the viewpoints of vaccination clinic supervisors, with at least three

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In the sample outline the eligibility criteria for key informants have been subsumed in the example purpose statement.
years of public health experience, about encouraging clinic staff to get vaccinated.

4. Request permission to audio-record the interview or otherwise record responses.

Example: I will be taking notes, but would also like to audio-record this interview to make sure I don’t miss any of your responses. May I have your permission to record this interview?

5. State how the interview findings will be used.

Example: Your responses will not be matched to your name. We will group your answers and comments with those by others who will also be interviewed.

6. Based on prior research and defined goal of the interview, include open-ended questions followed by probing questions.

Examples of open-ended questions followed by probing questions (hypothetically asked of a vaccine clinic supervisor as a key informant):

Q: What do you believe are the three main reasons your staff get vaccinated during the flu season?
   • PQ1: Do you believe it is necessary to encourage clinic staff to get vaccinated?
   • PQ2: Can you think of how best clinic staff might be encouraged to get vaccinated?

Q: In what ways does your local health department encourage staff to get the seasonal flu vaccine?
   • PQ1: Are there specific messages given to staff to encourage them to get vaccinated for seasonal flu?
   • PQ2: Are there any staff concerns about being encouraged to get the seasonal flu vaccine?

Q: What were some of the challenge you faced as a vaccination clinic supervisor last season?
   • PQ1: Do you anticipate facing the same challenge(s) this season?
   • PQ2: What specific challenges do you anticipate you will face this season?

7. Thank the interviewee and ask for additional comments.

Examples: Now that I have finished asking you my set of questions, are there any comments you would like to add to your earlier responses? Do you have any other comments?
2.2. Key Informant Interviews

8. Request an opportunity to follow-up if needed.

Example: How may I contact you if, when I review my notes, I need to get some more detail about your responses?

Advantages of Key Informant Interviews

- Built-in level of accessibility to community provided to the interviewer;
- Information stems from credible community sources; and
- Accumulated information spans the range of perspectives within a particular community group.

Disadvantages of Key Informant Interviews

- Selection of who is “key” requires a relationship broker;
- Interview time competes with key informant’s commitments and priorities; and
- Use of information may be restricted due to confidentiality agreement(s).

2.2.2 Interviewer Skills and Knowledge

Interviewer skills for conducting key informant interviews include: verbal communication skills to match the language of the interviewee; active listening skills and possibly observational skills; ability to follow an interview guide; interpersonal skills to conduct the interview in a respectful and professional manner; and ability to recognize usual manners of speech that will yield usable data. The interviewer has to be able to moderate the ebb and flow of a personal interview (i.e., when to encourage further response, how to request further clarification, how to dissuade off-topic remarks) without introducing personal opinion that could influence the interviewee’s reactions or responses to the questions posed during the interview.

Knowledge about the content area or interview subject is helpful. Having some subject matter experience allows the interviewer to further probe so the interviewee clarifies a response. Or, when an interviewee gets off point, the interviewer’s knowledge on the subject of inquiry provides some background to help discern what is a pertinent response or simply extraneous information.

Although key informant interviews may be done in person, communication technology allows one to interview others by telephone, and increasingly, by using computer-assisted technologies or two-way video cameras mounted on computers. Regardless of technology use,
the interview should have a conversational, non-judgmental tone; interviewees should be made aware of the interview purpose; and flexibility by the interviewer should allow for issues raised that are “out of order” and that may require gently redirecting the interview to the questions at hand.

2.2.3 Analyzing Data from Key Informant Interviews

Earlier we noted it worthwhile to remember to ask about data use before embarking on data collection. Let’s consider some answers to the questions, How will we use the results? Were new questions raised through the information that was collected and analyzed? [2]

After being transcribed, aggregated responses from key interviews will have to be analyzed and coded for common themes and categories. This thematic, qualitative content analysis is highly interpretive. The interviewer and/or data analyst will have to group similar responses by categories. For the example questions in Table 2.1 above, the response categories might be labeled under headers abbreviated as “reasons for vaccination,” “ways of encouragement,” “challenges faced by supervisors” or other headers that are meaningful to the analyst and reflect the interview questions. Responses for each question would be grouped into obvious response categories. When it is not immediately obvious how individual responses “fit” within response categories, it may be necessary to create other categories. When there are new questions raised in a single interview or as a series of interviews progresses, those questions create new headers and responses to those questions may require new response categories.

Here are example response categories for thematic analysis:

- Q1: reasons for vaccination
  - Response category 1a. beliefs in prevention
  - Response category 1b. boost immunity
  - Response category 1c. professional responsibility
- Q2: ways of encouragement
  - Response category 2a. announcements in internal newsletter
  - Response category 2b. web-based reminders
- Q3: challenges faced by supervisors
  - Response category 3a. late vaccine availability
  - Response category 3b. insufficient vaccine
  - Response category 3c. untrained volunteers
  - Response category 4d. lack of coordination with private providers

Note: Response categories should encompass all the individual responses provided by interviewees. One can then quantify responses by noting the number of responses within categories. That allows one to “weigh” the frequency of similar responses and describe trends in...
knowledge, attitudes, beliefs, or circumstances among interviewees selected as key informants.

Exhibit 2.1 Key Informant Uses in Public Health

- Audience testing for development of educational messages among immigrant communities (African American, Hispanic, Vietnamese)—Seattle-King County Advanced Practice Center (Source: Vulnerable Population Segment Audience Research http://www.vulnerablepopulation.com/ knowing/vulnerable_population_segment_audience_research/, Accessed 9/10/10.)

Statement that we can make about this data after grouping it into categories and reviewing the themes that surfaced are applicable to the people from whom the information was collected. Our written reports of data interpretation must qualify it as such. Qualitative data is particular to the group from which it is derived. One cannot make inferences or generalizations to a larger population given the specific recruitment techniques used to identify and recruit the key informants. Furthermore, one must compare the findings derived from key informant interviews with those from other sources of data (e.g., program or agency documents about the community represented by the key informants, other data collection methods such as focus groups or community surveys.) To confirm qualitative findings, one must be willing to check out rival explanations and get concurrence on the input obtained from key informants [2].
2.2.4 Summary

Conducting successful key informant interviews is an acquired skill. Staff members at local health departments can use this method alone or to inform future phases in the design of a community assessment.

At a minimum, we have highlighted some considerations for planning and conducting key informant interviews. Our expectation is that future vaccination campaigns at the local level are data-driven and informed by community member input and participation. Key informant interviews are a tool for that.

2.3 Focus Groups

A focus group is a method for obtaining input from a small group of individuals in an interactive setting. Focus group discussions must be managed by a trained facilitator and require planning. The qualitative information gained from the group’s discussion and participant observation can yield valuable insight about a specified topic.

Learning Objectives

By the end of this section of the SPIVA Toolkit, you should be able to:

- Discuss focus groups as a viable data-collection method in community assessment;
- Identify how focus groups may be used in planning for seasonal and pandemic influenza campaigns; and
- Discuss how local health department staff may use focus groups for infectious disease emergency preparedness.

**Generally Speaking, A Focus Group Will Be . . .**

- A group of people gathered to provide input and reaction to planned activities.
- A moderated discussion group that aims to yield information about the perceptions, knowledge, beliefs, attitudes, and language used by service recipients.

2.3.1 Purposes of Focus Groups

In community assessment, focus groups may serve single or multiple purposes. Among the purposes are:
2.3. **Focus Groups**

- To identify a group’s level of interest in a topic area;
- To identify perceptions of a public health intervention;
- To identify best means of reaching selected audiences; and
- To test promotional and educational messages.

Among the many questions we should consider during our focus group planning are:

- Who will we recruit for our focus group (or groups)?
- Who will moderate and record our focus group(s)?
- How large will our focus group(s) be?
- How long will our focus group(s) last?
- What questions will we ask? How will we ensure that these are the right questions?
- How will we synthesize and analyze the results?
- What will we do with the information we have collected?

### 2.3.2 Planning and Conducting Focus Groups

Planning and conducting a focus group is likely to be a more involved method of data collection than conducting key informant interviews because of the multiple parties that could participate in planning and implementing focus groups. The following briefly describe tasks associated with various roles that may or may be conducted by the same staff member.

**Administrator:** This person coordinates the logistics for the focus group. This entails site location, acquisition of participant incentives, and follow-up assistance as needed. The administrator will often be a member of the study team that determines the purpose and desired composition of focus groups.

**Focus group recruiter:** This person follows the coordinator’s guidance on the eligibility criteria for focus group inclusion. The focus group recruiter will ensure advance distribution of an invitation to participate or provide notice of recruitment. This person may also screen for participant eligibility and make reminder calls to heighten the likelihood that participants show at the right location and time.

**Focus group moderator:** This person will have skills in managing small-group dynamics, conducting purposeful inquiry, and will display flexibility for empathetic and active listening. To help minimize individual and group response bias, the focus group moderator must balance neutrality with a predetermined study purpose.

**Graphic recorder or note taker:** This person actively listens to the focus group members’ responses, comments, and questions while the focus group is conducted. The note taker records such qualitative data for later analysis, synthesis, and interpretation by designated study team member(s).

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Transcribers, translators, or other specialists: These specialists could be needed for the accurate and complete transfer of the audio data that is digitally recorded and requires analysis for report writing.

Often times in a local health department, a staff member plays multiple roles and performs the various tasks required to coordinate and moderate a focus group. Additional to local health department staff may be “relationship brokers.” These relationship brokers may be staff members not directly involved in the study, staff from community-based organizations, or vendors with access to people who would be invited to participate in a focus group.

Other times, specific tasks are contracted to independent vendors with particular expertise (e.g., focus group recruitment services, moderators, transcribers, or qualitative data analysts). When vendors are used, they can be contracted for a menu of services that extend the conduct of focus groups. These contractors’ services, based on established expertise, might include the development of a focus group protocol, focus group facilitation, data analysis, data use for design of educational messages for an influenza campaign, and report writing.

Table 2.1 is abstracted from an independent consultant’s plan document that was prepared for the Alameda County Public Health Department’s Health Worker Immunization (HWI) Project, an informal qualitative assessment of health worker beliefs and attitudes regarding immunization. Appendix A is a focus group discussion guide prepared by the same independent consultant for the HWI Project.

<table>
<thead>
<tr>
<th>Advantages of Focus Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Face-to-face time with future consumers/ recipients of planned services;</td>
</tr>
<tr>
<td>• Provide a link between sponsoring organization and program recipients; and</td>
</tr>
<tr>
<td>• Offer opportunity to test assumptions in real time.</td>
</tr>
</tbody>
</table>


Seasonal & Pandemic Influenza Vaccination Assessment Toolkit
### 2.3. Focus Groups

**Table 2.1. Sample Focus Group Requirements: Parameter and Participant Requirements for Focus Groups in Health Worker Immunization Project.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment:</td>
<td>Male and female health workers will be recruited through the institution database as determined by the director of the institution’s immunization program.</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>30 focus group sessions will be conducted at 15–25 sites with 6–12 participants in each focus group:</td>
</tr>
<tr>
<td>Health Worker Inclusion Criteria</td>
<td>(1) At least 18 years of age; (2) Has worked at the institution for at least 1 year; (3) Able to speak and read English; (4) Willing to confirm their consent prior to study entry; and (5) Represent any level of health worker status including: support, maintenance, volunteer, temporary, etc.</td>
</tr>
<tr>
<td>Health Worker Exclusion Criteria</td>
<td>(1) Having any concurrent medical or psychiatric condition that, in the investigator’s opinion, may preclude participation in this study; or (2) Cognitive or other impairment (e.g., visual) that would interfere with completing a self-administered questionnaire.</td>
</tr>
<tr>
<td>Instruments</td>
<td>(1) Sign-In Questionnaire; (2) Focus group discussion guide; (3) Flip Chart; and (4) Exit Questionnaire.</td>
</tr>
<tr>
<td>Administration of Instruments</td>
<td>Focus group moderator will conduct 30 focus groups at various healthcare sites with health workers who have experience with immunization campaigns. The assessment will be conducted anonymously — first names only. Informed consent will be obtained when participants arrive and fill out the Sign-In Form and confirmed verbally at the start of the focus group session.</td>
</tr>
<tr>
<td>Recording</td>
<td>Focus group sessions will be digital voice recorded for subsequent transcription.</td>
</tr>
<tr>
<td>Compensation</td>
<td>Participants will be compensated for their time upon completion of the focus group session in one of two ways: (1) Small Groups: each participant will receive a $25 gift certificate; or (2) Large Groups: will raffle off 2 iPods</td>
</tr>
<tr>
<td>Analysis:</td>
<td>Qualitative content analysis will be used to evaluate the information gathered during the focus groups. Descriptive statistics will be used to characterize the demographics of the sample population.</td>
</tr>
</tbody>
</table>

**Disadvantages of Focus Groups**

- May yield insufficient information for a comprehensive community assessment;
- Discussion triggers used might not be sufficient to yield data of interest; and
- Require sufficient resources for facilitation, site access, and participant incentives.

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## Exhibit 2.2 From The Field—Choosing a vendor to conduct focus groups

Speaking on the use of vendors to moderate focus groups of child-care workers, one local health department staff member acknowledged the valued use of vendors with a caveat. Local health departments need to have established community ties to help inform their H1N1 vaccination campaign:

> “Choosing a vendor with a proven track record in health communications can assist local health departments develop effective influenza vaccination campaigns. No matter how skilled a vendor may be, however, having the right community partners and stakeholders at the table is critical to getting the message right.”

Kim Cox, M.P.H., Emergency Services Manager, Contra Costa Health Services, Contra Costa County, CA

Conducting focus groups will provide some, but not all information about a particular community’s behavioral trends or its residents’ perceptions, beliefs, knowledge, or attitudes. Depending on participant level of comprehension, literacy, and interest in the topic at hand, discussion triggers—the question or items used to elicit information—may require modifying the protocol to include alternatives to dialogue. Consider visual cues or tangible objects as initial conversation pieces to open up required discussion.
Helpful Tips for Planning Focus Groups

- Approach the pursuit of information as an exchange: Anticipate providing appropriate incentives in exchange for the focus group participants’ time.
- Have a convenient and accessible site location: Prevent late arrival by “lost” participants whose tardiness can interfere with introductions or instructions to the group;
- Create a welcoming and open atmosphere: Appropriate, theme related snacks are symbolic of a shared experience;
- Clarify the purpose: Focus groups are not educational sessions, they require active, two-way communication rather than one-way information;
- Listen for needed follow-up activities: The level of response and type of language used among participants can clue the facilitator about needed educational activities (e.g., myths about vaccine effects)

Consider future educational opportunities:

When focus group participants provide responses that are technically or factually inaccurate (e.g., myths about vaccine risk), explore the possibility of follow-up activities as a prelude to a full-fledged vaccination campaign. Doing so would not interfere with the genuine openness and honesty of focus group participants.

Successful focus groups have an element of exchange: the facilitator (and sponsor) obtains information; the focus group participants are compensated somehow for their time and input. There are associated costs of coordination and scheduling time, hiring a facilitator, use of adequate space, and, increasingly in public health programs, monetary or gift-card incentives.

Facilitation of focus groups is an acquired skill. Training on the conduct of focus groups is generally obtainable through workshops offered by trade organizations whose members are involved in qualitative data collection for various purposes.

A effective focus group facilitator is usually someone with a curiosity in human behavior, an interest in the subject matter, flexibility with group management, good organizational skills, and a sense of humor. The success of a focus group is as much about the facilitator’s ability to intrigue the group about the topic at hand, as it is to be willing to have them inform the direction and flow of the session.

Listening skills are a must! The facilitator has to be prepared to listen for key issues, the central point in someone’s response, and
Exhibit 2.3 Focus Group Uses in Public Health

- The Broome County Health Department, NY used focus groups to inform after action activities and an online community survey on H1N1 (see “Tips from the Field”). (Source: Leigh Ann Scheider, Public Health Emergency Preparedness Program Director, Broome County Health Department (September 2010). Personal communications.)

- The Immigrant, Refugee, and Migrant Health Branch, Centers for Disease Control and Prevention in partnership with the Oak Ridge Institute for Science and Education identified key educational messages regarding H1N1 influenza and translated them into seven languages commonly spoken by resettled refugees (Karen, Somali, Burmese, Amharic, Kirundi, Farsi, and Arabic). Focus groups were conducted among resettled refugees in three states (Minnesota, Texas, and California) to test educational messages and illustrations related to H1N1 influenza. (Source: Willacy, E., Guterbock, M., Tayman, A, and Martin, K., (2010). Educating Refugees During an Outbreak: Lessons Learned from the 2009 H1N1 Influenza Response. Abstract submitted to the American Public Health Association for presentation at the 138th Annual Meeting and Exposition.)


sort through language that may be particular to a group (e.g., slang, colloquialisms, or story-telling style).

As with key informant interviews, there are many variables in the design of a focus group, and each choice can affect the type of information we receive from focus group participants. The following recommendations can help guide us through the process of designing an effective focus group:

- Focus groups can include a range of six to ten participants, plus a moderator and a recorder.
2.3. Focus Groups

Exhibit 2.4 From the Field—13 points for facilitating community focus groups that produced successful results:

1. Have the right people at the table—those with firsthand knowledge.
2. Include a cross section of individuals to help generate dialogue and diverse opinions.
3. Prepare discussion questions ahead of time and, if possible, test in a smaller group setting.
4. If possible, combine focus group/after action with recognition.
5. Always provide refreshments.
6. Create an agenda so that participants can follow along and stay focused. Have an introduction and conclusion.
7. Explain what the goal of the focus group is—validate its importance and explain how information obtained will be used.
8. Create a comfortable welcoming environment for people to share their opinions in an organized manner without bias.
9. Make sure people can hear what is being said.
10. Avoid hierarchy, have a moderator who is familiar with the topic, but is not at the top of the food chain.
11. Involve state directors to audit or participate.
12. Take notes and record the discussion.

Contributed by Leigh Ann Scheider, Public Health Emergency Preparedness Program Director and Diane O’Hora, Supervising Public Health Educator, Broome County Health Department, New York

- Focus group participants must be representative of the target population you seek to study, but must also be compatible with one another in a conversational setting.
- Focus groups should not last longer than two hours. Allow time for participants to arrive and settle in.
- Questions for focus group participants should be simple, clear, and direct. Be sure to pilot-test questions as often as possible before conducting the focus group. Questions can also be “pre-tested” in a mock focus group with participants similar to those being recruited.
- Open-ended questions will yield more information from participants than simple yes-or-no questions.
- Develop a plan for recruiting participants. Invite more people than you will need and consider the use of incentives to encourage participation.
- Analyze notes and recordings for common key words, themes, and intensity of conversation. It is best for those analyzing information.
from the focus group to do so independently prior to comparing results.

By following these recommendations we can increase the possibility of obtaining a clearer picture of how individual participants and the focus group as a whole think and feel about our chosen subject.

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**Exhibit 2.5 From the Field—More on Tip No. 9 from the Broome County Health Department:**

“Establish ‘ground rules’ and objectives ahead of time; explain how speakers can obtain the floor to offer feedback and contribute to the dialogue; and clearly state appreciation for participatory dialogue... Allotting a specific amount of time to each discussion topic helps to avoid participants from feeling like they were ignored if they were not given a chance to speak due to time constraints.

“Having our Regional Emergency Preparedness State Representative helped to validate the need for feedback and to assist in explaining objectives. Community members recognized the state authority and were at ease providing their opinion through a more formal After Action review.”

Leigh Ann Scheider, Public Health Emergency Preparedness Program Director, Broome County Health Department, New York

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### 2.4 Surveys

Surveys provide a systematic method for collecting important data at a population level. From a population of interest, we collect data on a representative sample to develop quantitative measurements. In public health we work to improve population-level health indicators, and surveys are an important tool we can leverage to achieve our population health goals.

*Learning Objectives*

By the end of this section of the SPIVA Toolkit, you should be able to:

- Describe where to conduct vaccination surveys;
- Describe when to conduct vaccination surveys;
- Describe how to identify and engage target populations; and
- Describe how to use community assessments to improve vaccination programs.
2.4. Surveys

2.4.1 Where to conduct vaccination program surveys

Within the context of this toolkit we divide surveys in two types:

- Location-based surveys: Surveys that are administered to the population of interest at a certain site, such as a vaccination clinic, where desired respondents will already be present.
- Community-sampling surveys: Surveys requiring surveyors to seek out and engage a desired population in a particular setting.

Location-based surveys are already employed by many health departments and health care providers to gain valuable input from the communities they serve. This type of survey can assist planners in understanding the public’s attitudes regarding vaccination (e.g., a person’s motivation for receiving a vaccine) as well as gathering practical data (e.g., how far people must travel to attend a vaccine clinic). We can use a location-based survey to gather input at a location such as a vaccine clinic from individuals participating in a vaccination campaign. We can administer location-based surveys in paper form or electronically. Users of this toolkit will find a question bank in English and Spanish in Appendix B.

Community-sampling surveys can take many forms. Your health department may already be engaged in some form of community sampling to help inform decisions about your vaccination campaigns. Often, the availability of resources (personnel, time, money, etc.) will determine if conducting a community-sampling survey is feasible, and, if so, what approach will be most effective. Potential approaches to community-sampling include, but are not limited to:

- Surveying subsets of schoolchildren enrolled in public schools;
- Performing door-to-door interviews in targeted areas of a community (such as neighborhoods with historically low vaccination rates);
- Targeting electronic surveys or telephone interviews towards certain communities (perhaps through a partnership with a community-based organization who may keep contact information on file);
- Conducting surveys at or near polling places on election day;
- Targeting individuals at community events such as festivals, fairs, and other public gatherings; and
- Partnering with a range of community-based and religious organizations to engage their constituents or congregations.

2.4.2 When to conduct vaccination program surveys

When to collect new data for planning a vaccination campaign depends largely on LHD priorities, a community’s needs, available resources, and vaccination schedules. We can consider three approaches
that may be used individually, or in conjunction, to design an effective vaccination survey. These include:

*Pre-vaccination community sampling*

A pre-vaccination community survey gives us baseline information about the community that we are targeting. Understanding beliefs and attitudes towards vaccines is crucial to crafting successful public health messages and risk communications.

*Location-based surveys during vaccination*

Vaccine recipient surveys are perhaps the easiest type of information-gathering tool we can implement. The target population is generally restricted to those persons choosing to receive the vaccine and can therefore inform us about the characteristics and motivations of individuals choosing vaccination. They can help us improve clinics and vaccination programs based on participant feedback.

*Post-vaccination community sampling*

Findings from a post-vaccination survey allow us to identify who was not vaccinated during the campaign and why. This can reveal important information regarding the effectiveness of clinic locations, timing, and communication methods that can inform our planning for subsequent years.

While some survey approaches are restricted to certain time periods as outlined above, other approaches can be utilized at any point during the year. For example, we could administer a survey to vaccine recipients at a doctor’s office during influenza season, but we could expand this effort to surveying patients at any point during the year. This allows us to reach a wider audience and assess attitudes regarding vaccination and other matters of interest throughout the year.

We recommend using these approaches in the context of focusing on specific communities and demographic groups. It is unlikely that

*Seasonal & Pandemic Influenza Vaccination Assessment Toolkit*
2.5 Identifying and Engaging Target Populations

a LHD will have the time and resources to conduct a comprehensive survey representative of their entire jurisdiction each year. Rather, we should focus on one group at a time, with vulnerable populations or those with low uptake rates being obvious candidates. Users of this toolkit can build upon their community data by examining one or more subpopulations each influenza season (Figure 2.2).

Exhibit 2.6 Community Sampling: 2009 California Kindergarten Survey

This is an example of conducting a sampling assessment to gain information about vaccination coverage rates.

Methods and Participants: This year’s Kindergarten Retrospective Survey was conducted in a sample of approximately 3% of California’s kindergartens in concurrence with selective review. Local health departments visited 256 schools with kindergartens and collected copies of every sixth student immunization record (blue card). Demographic information and immunization history were extracted from each record. Data were analyzed using birth dates and immunization dates to retrospectively estimate immunization coverage at various age checkpoints. Age checkpoints are defined according to whether or not children are up-to-date for DTaP, Polio, MMR, Hep B, and Varicella vaccines at 3, 5, 7, 13, 19 and 24 months. To read the full report and learn more about the sample design, visit the following Web site:


2.5 Identifying and Engaging Target Populations

To determine why (or why not) a particular group has good participation in a vaccination campaign, public health practitioners have to keep in mind that there may be many communities in a given population. Key questions to ask before conducting a survey may include:

- What is a minimum acceptable level of vaccination in community?
- Are there levels of vaccination among certain communities which are deemed unacceptable by LHD standards?
- Which of those communities is of most interest to the LHD in order to raise uptake rates?

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Specific sub-populations that may require a special focus may include:

- The elderly (65 years and older)
- Pregnant women
- College students
- Minority groups as defined by ethnicity, race, gender, socio-economic status, physical disability, etc.
- Parents of young children
- Neighborhoods with particularly low (or high) uptake rates

Sub-populations that may be regarded as “hard to reach,” “vulnerable,” or at particularly higher risk of infection, but seemingly not engaged in customary public health approaches, can be invited to participate. Cultural sensitivity and creativity will be required to engage, establish trust, and maintain participation levels. Actively involving community representatives in advance survey notification, training, and on-site clinic participation demonstrates a long-term commitment to integrate community members into public health efforts.

Government intervention can have positive or negative connotations to community residents in light of personal experiences with their own or the U.S. government. Keep in mind the barriers and inconveniences that typically turn away participation in data collection approaches. Public health practitioners are oriented to data collection as a basis for informed decision-making. But our need for data from community residents needs to be balanced with the feasibility of actually using the data collected. Follow the principle of parsimony: collect only what you will use.

Consider cultural aspects of vaccination implementation in determining what data you will collect. Cultural sensitivity goes beyond collecting data in a common language, it is about recognizing the leadership and communication dynamics that underpin community life.

Listed below are several strategies that may contribute to increased community participation in surveys and assessments. Note that some require the involvement of community leaders to act as liaisons between health department staff and the target population.

**Negotiations with key community leaders**

An advance discussion about procedures, the intent of mass vaccination and related surveys, and follow-up activities possibly requiring community member involvement serve to inform community residents about their role in public health efforts. People regarded as community “gate keepers,” or who are particularly knowledgeable about access to community residents, play a facilitative role to
2.5. Identifying and Engaging Target Populations

help integrate LHD staff into community activities. One may identify key community leaders through community-based organizations, city council member recommendations, or places of worship. Word-of-mouth may help identify the community member(s) in a leadership role. Such leadership roles could be due to a personal or professional stance in the community, longevity in it, or through active civic participation.

Identification of sites for vaccine clinics where residents congregate and that are convenient to community members

Some of these sites include community centers, businesses that are amenable to onsite vaccination clinics and with whom matters of liability have been pre-negotiated with LHD officials, and school auditoriums or multipurpose rooms familiar to community residents. These data collection opportunity sites are likely locations for vaccine PODs (Points of Dispensing) and concurrent survey implementation.

Linguistic expertise

Identify individuals to translate clinic forms in advance and/or to function as clinic interpreters. This also applies to forms of communication by community residents with visual or hearing impairments that might require specialized equipment. Some of those specialized resources may be document text magnification devices, Braille readers, or clinic personnel with sign language capabilities.

Crowd management and direction

In just about any community, there will be people with training, experience, or a natural ability to handle crowds in a controlled, orderly, and tactful manner. Provide those individuals with a role in crowd control to either maintain the clinic flow or to identify potential bottlenecks in processing clinic visitors.

Data collection

With some training on the use of forms and data collection, community residents who are gregarious can adhere to rules of confidentiality, be consistent when asking questions on data collection forms, and function as helpful resources to collect information. Make certain that data collection monitors understand the basis for each survey item. This minimizes the potential for inconsistent data obtained in response to improvised on-the-spot explanations or major deviations from the wording of each item.
Table 2.2. Putting data to use when vaccine uptake is low

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Potential Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of trust in public health?</td>
<td>Develop relationships with faith-based and community-based organizations.</td>
</tr>
<tr>
<td>Lack of interest in receiving vaccine?</td>
<td>Develop better messaging regarding benefits of vaccination.</td>
</tr>
<tr>
<td>Poor communication with intended population?</td>
<td>Shift communication to appropriate channels. Conduct messaging through trusted community entities.</td>
</tr>
<tr>
<td>Vaccine inaccessible due to time, location, or cost?</td>
<td>Further surveying to assess convenient time and locations for free vaccine clinics.</td>
</tr>
<tr>
<td>Is uptake high in similar populations elsewhere?</td>
<td>Research best practices for reaching intended population in other areas.</td>
</tr>
<tr>
<td>Are ambivalent or negative attitudes towards vaccination possible to change in this demographic?</td>
<td>Consider that some populations may necessitate an impractical level of intervention to increase uptake rates. Scarce resources should be targeted towards those populations most apt to be influenced towards receiving vaccine.</td>
</tr>
<tr>
<td>Are uptake rates consistently low despite attempts at intervention?</td>
<td></td>
</tr>
</tbody>
</table>

Health promotion and education

Some community residents have basic and possibly advanced familiarity and knowledge about mass vaccination based on their personal or professional backgrounds. Make the time to identify community residents willing to combine their expertise with the promotional and educational messages the LHD advocates and endorses. These persons may be willing to create mini-educational campaigns in advance of the data-collection phase of a community assessment to further extend the reach into neighborhoods that have been unresponsive in prior vaccination campaigns.

2.6 Putting Community Assessment Data to Use

Once data from an interview, focus group, or survey is analyzed, it begs the question, “what do we do now?” Of course, any steps taken depend entirely on the results and validity of the data collected. The table below outlines some very basic considerations and potential actions after data analysis and interpretation. Keep in mind that every community will have its unique characteristics and that improving vaccine uptake in any jurisdiction will require community-oriented, specific approaches.
2.6. Putting Community Assessment Data to Use

Table 2.3. Putting data to use when vaccine uptake is acceptable

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Potential Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What influenced those who received vaccine?</td>
<td>Highlight these factors in future communications to this population.</td>
</tr>
<tr>
<td>What are some best practices for reaching this population?</td>
<td>Apply best practices to populations with lower uptake rates, if applicable.</td>
</tr>
<tr>
<td>Is improving uptake rate further a realistic goal in this population?</td>
<td>Only focus additional resources on this population if cost-benefit is reasonable.</td>
</tr>
</tbody>
</table>

Table 2.4. Putting data to use when vaccine uptake is high

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Potential Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What influenced those who received vaccine?</td>
<td>Highlight these factors in future communications to this population.</td>
</tr>
<tr>
<td>What are some best practices for reaching this population?</td>
<td>Apply best practices to populations with lower uptake rates, if applicable.</td>
</tr>
<tr>
<td>Is vaccine uptake in this population high in other areas?</td>
<td>Make methods and best practices available to other public health entities with lower uptake rates.</td>
</tr>
<tr>
<td>Would shifting resources focused on this population to populations with lower uptake rates reduce uptake in this population?</td>
<td>Shift resources to improve rates in other populations if good uptake rates can be maintained in this population.</td>
</tr>
</tbody>
</table>
3

Surveys for Improving Vaccinations

3.1 Introduction

Learning Objectives

By the end of this section of the SPIVA Toolkit, you should be able to:

- Describe the purpose of community-based surveys;
- Outline “The 7 Steps of Highly Effective Surveys”;
- Discuss at least two sampling approaches;
- Describe the relationship between sample size and measurement precision;
- Distinguish three types of measurement data; and
- Describe at least two biases from each: design of questions, questionnaires, and administration.

A survey is a systematic method for gathering information from a population or from a subset of that population (called a sample) for the purpose of developing quantitative descriptions of that population [3]. This quantitative description is called a statistic. For example, among clients vaccinated in our clinic, useful statistics might include the mean age of female clients and the proportion of children with monolingual, Spanish-speaking parents. These are examples of descriptive statistics. In contrast, analytic statistics assess the relationship between two or more variables. In this toolkit, we focus on descriptive statistics.

Community surveys are used for collecting descriptive data about opinions and attitudes. The feedback and survey findings are often used by those conducting the survey. In this toolkit, we focus primarily on community surveys, where the goal is understanding trends and attitudes and using this information to improve vaccination campaigns and public health preparedness. We will use a case study approach to present the information.
On April 14, 2010, Broome County Health Department News Release invited community residents to take the online “H1N1 Response - Citizen Satisfaction Survey” (see Exhibit 3.1). The Web-based survey collected information on age, sex, ethnicity, occupation, income level, vaccination history, perceptions of and satisfaction with the public health H1N1 response, and much more. This timely, comprehensive, and relevant survey illustrates the value, opportunities, challenges, and limitations of conducting a community-based survey.

In addition to collecting data on H1N1 vaccine uptake, vaccine type, vaccination site accessibility, vaccine cost, and satisfaction with services, Broome County Health Department surveyors also included questions to assess satisfaction with, perceptions of, and confidence in public health services:

Q: Please indicate whether you Agree or Disagree with the following general statements regarding Broome County’s response to the H1N1 Pandemic:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Disagree</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Organized a sufficient number of H1N1 vaccination clinics</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b) Kept the public informed through the media (press conferences, interviews, etc.)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c) Hosted a sufficient number of public information (town hall) sessions</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d) Educated the public about how to protect themselves and others from illness</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e) Worked with local schools and school districts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f) Facilitated local H1N1 response efforts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

The following questions were asked about local, state, and national public health agencies:

Q: After observing the response to the 2009 Influenza Pandemic my perception of the following organizations’ ability to respond to an emergency is:

- ☐ Weakened
- ☐ Remained the Same
- ☐ Strengthened

*Seasonal & Pandemic Influenza Vaccination Assessment Toolkit*
Exhibit 3.1 Broome County Health Department, Binghamton, New York, conducts online “H1N1 Response - Community Satisfaction Survey”

The Broome County Health Department (BCHD) News Release on April, 14, 2010, included the following: “The Broome County Health Department would like feedback from the community on the local response to the H1N1 flu pandemic. A short community survey has been created and posted on the Broome County Health Department webpage. The public is encouraged to visit http://www.gobroomecounty.com/hd/flu to provide feedback on the Health Department’s efforts to protect the community from illness during the H1N1 pandemic. Information provided will be evaluated and used to improve local emergency response plans and mass dispensing activities.”

The BCHP survey covered the following content areas:

- Gender
- Sex
- Children under 18
- Medical insurance
- Income level
- Education level
- Ethnicity
- Health care occupation
- Broome County community risk communication
- H1N1 vaccine uptake
- H1N1 vaccine type
- Seasonal vaccine uptake
- Frequency of annual influenza vaccine uptake
- Vaccine clinic location
- Broome County vaccine clinic services
- H1N1 vaccine cost
- Information sources
- Use of BCHD H1N1 pandemic Web site
- Perception of BCHD and other agencies’ response
- Confidence in BCHD and other agencies’ response
- Value of drop-in clinic and
- Interest in serving on a BCHD H1N1 focus group

The online survey used by BCHD can be found in Appendix C.
Q: After observing the response to the 2009 Influenza Pandemic how confident are you in the following organization’s ability to respond to an emergency?

- Very Confident
- Confident
- Indifferent
- Not Confident
- Not at All Confident

From these questions above we can appreciate the valuable information that can be collected from community members about the public health H1N1 response, risk communication, vaccination program, and other services. We will use the Broome County Health Department survey as a starting point to review survey design concepts. Here are some additional survey design questions to consider:

- What were the primary goals of the survey? If the goals included reporting summary statistics, then the next question applies.
- Were the self-selected respondents to the online survey representative of Broome County residents? Some factors that might influence who responded to the survey include:
  - Access to survey invitation;
  - Computer Internet access;
  - English language literacy; and
  - Level of education.
- The survey findings applied to which target population(s) in Broome County?
- Do they have enough respondents from ethnic minorities that may represent a small fraction of the population, yet for which they might want an accurate picture to address possible health disparities?
- Were the questions designed and ordered to increase data accuracy and respondent completion?
- Who is the primary audience for the survey results?
- How will the survey findings be used?

We believe that the Broome County Health Department approach (key informant interviews, focus groups, and surveys) is the type of model practice we are promoting with the SPIVA Toolkit. To improve our public health surveys we review a 7-step approach that can be used by non-epidemiologists.

### 3.2 The 7 Steps of Highly Effective Surveys

In an effective survey the data collected accurately measures key characteristics of interest from the target population. To achieve this we need the following:

*Seasonal & Pandemic Influenza Vaccination Assessment Toolkit*
3.2. The 7 Steps of Highly Effective Surveys

- Representative and sufficient sample of subjects, and
- Accurate and precise measurements from each subject.

In short, we strive to minimize systematic error (bias) and random error (chance) in both sampling (subject selection) and measurement (questionnaire administration).

To promote the design and conduct of effective vaccination surveys we are adapting a systematic, practical approach called “The 7 Steps of Highly Effective Surveys”:¹

1. Define the survey goals;
2. Select a study design;
3. Design a sampling plan;
4. Design the questionnaire;
5. Pretest the survey;
6. Conduct the survey; and
7. Communicate findings.

3.2.1 Step 1: Define the survey goals

To be effective, survey studies must have clear, understood, and agreed-upon goals. Before embarking on a survey, we should answer the following questions:

- What questions do we need/want answered?
- Why are these questions important? (significance)
- Will we report survey summary statistics? (sampling design and sample size)
- From whom do we propose to collect the information (sample population)
- To whom will the survey findings apply? (target population)
- Were the right stakeholders included in the survey design?
- Who is the primary audience for the survey findings?
- How will the survey findings be used?

3.2.2 Step 2: Select a study design

A survey is a systematic method for gathering information from a population (or from a sample) for the purpose of developing quantitative descriptions of that population. Epidemiology² is a foundational science of public health. Epidemiologists commonly use survey

¹ From Tomás Aragón & Arthur Reingold, Essential Field Epidemiology, UC Berkeley Center for Infectious Diseases & Emergency Readiness
² The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems [4].

NACCHO San Francisco Bay Area Advanced Practice Center
Chapter 3. Surveys for Improving Vaccinations

methods to sample and collect primary data from subjects for epidemiologic studies. It may be useful to us to view a survey as part of an epidemiologic study. Epidemiologic studies can be descriptive, analytic, or both. A descriptive study measures the magnitude, extent, and variety of a problem or issue. An analytic study assesses the relationship between two or more variables. The hallmark of an analytic study is the use of comparison groups to test hypotheses.

In public health we conduct three types of epidemiology studies that can be used for descriptive or analytic purposes:

- Cross-sectional study;
- Cohort study; and
- Case-control.

In a cross-sectional study we collect data from the study subjects only once “at a point in time.” For example, before vaccinated clients exit our influenza mass vaccination clinic, we approach them to conduct a satisfaction survey. In non-research settings, cross-sectional studies are more common because of lower costs, ease of administration (no follow up), or simpler design. For the SPIVA Toolkit we focus on cross-sectional surveys.\(^3\)

In a cohort study we collect data from the study subjects more than once: (a) at baseline (possibly as part of a cross-sectional study); and (b) at a later time to assess a change in status compared to baseline. For example, among our clinic enrollees, we might compare the proportion of vaccinated clients that developed influenza-like illness (ILI) compared to the proportion unvaccinated clients that developed ILI. Cohort studies are designed to answer analytic questions. These data can be used to calculate field vaccine effectiveness. We would use a survey to collect ILI symptoms for case classification.

In a case-control study we compare “cases” to “controls” (non-cases) to assess differences in exposure to putative causal factors. For example, in a school-based outbreak of chickenpox, we might compare the proportion of cases that were vaccinated against chickenpox to the proportion of controls that were vaccinated. Case-control studies are designed to answer analytic questions. These data can be used to calculate field vaccine effectiveness. We would use a survey to collect influenza vaccination history.

In summary, a survey is one method used by investigators to collect primary data from subjects to answer the key questions of a study. Survey data can be used to classify outcome status (case vs. noncase), and to measure other variables (e.g., demographics, behaviors, attitudes, exposures). It is useful for us to recognize that surveys—a data collection method—can be viewed through the lenses

\(^3\) A cross-sectional survey is just a cross-sectional study that uses a survey for primary data collection.
3.2. The 7 Steps of Highly Effective Surveys

Fig. 3.1. Relationship of target population, sample population, and respondents. The frame population (not shown) is a listing of target population that will be used for selecting the sample population.

of an epidemiology study. Then we can appreciate that surveys can be used to collect data for different types of epidemiology studies (cross-sectional, cohort, and case-control).

3.2.3 Step 3: Design a sampling plan

If one of our survey goals includes using or reporting survey statistics then we need to design a sampling plan that will ensure that the survey findings accurately represents the characteristics and experiences of the population of interest. To ensure representativeness we use probability sampling methods. A sampling plan will consist of two parts:

1. Sampling design and sample size (design component);
2. Selection and recruitment protocol (implementation component).

The sampling design is the description of our methods to ensure that we have enough survey respondents that are representative of the population of interest. The selection and recruitment protocol are the operational instructions for implementing the sampling design.

We start by reviewing survey sampling terminology. The subjects that complete our questionnaires are called respondents. The respondents are the subset of the sample population that completed our survey. The sample population (also called the “sample”) is a representative subset of the target population that was selected to complete the survey. Therefore, assuming no significant selection errors, the survey findings (from respondents) will apply to the target population. In other words, the target population is the inferential “target” of our survey findings. Figure 3.1 summarizes these relationships.

Our first task in designing a sampling plan is to clearly specify the survey target population. For an influenza vaccination survey we will generally deal with the following target populations:

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Chapter 3. Surveys for Improving Vaccinations

Fig. 3.2. Relationship of potential target populations for a vaccination survey

- Health plan enrollees (administrative membership);
- Vaccination clinic clients (location-based); and
- Community members (geographic or cultural connection).

These possible target populations overlap in membership and surveying them presents special challenges (see Figure 3.2). Once we have selected our target population, we need a list that enumerates this population.

Operationally, this list of the target population is called a sampling frame (or frame population). For example, for the health plan, the membership roster will serve as the sampling frame. Undercoverage occurs when current health plan members are not in the sampling frame. This can occur if the membership roster is outdated. Conversely, persons that have left the health plan but are still on the roster are actually ineligible. In acquiring or constructing a sampling frame, we want to minimize both undercoverage and ineligibility. While ineligible persons can always be removed from the survey study, undercoverage cannot easily be corrected after the study.

The sampling frame becomes our operational representation of the target population. In general, we do not have the staff and resources to survey everyone in the sampling frame, therefore, we must sample a representative subset (sample population). We have the following sampling approaches:

1. Simple random sampling;
2. Systematic sampling;
3. Cluster sampling; and
4. Stratified sampling.

**Simple random sampling**

We use simple random sampling (SRS) when we can (a) list everyone in the target population; and (a) randomly select a sample from that list. Figure 5 is a graphical depiction of simple random sampling.
Fig. 3.3. Relationship of target population and sampling frame (frame population): undercoverage and ineligible units.

**Example 3.1. Simple random sampling:** Consider a pre-influenza season cross-sectional survey of our health plan enrollees (target population of 100,000) to learn who does and does not intend to receive the seasonal influenza vaccine and why. The survey findings will guide our influenza vaccination outreach and promotion. We select a 20% simple random sample (sample population of 20,000) from our enrollee list. We send the survey to this sample of 20,000 enrollees, but only 40% respond (8000 respondents). Assuming no significant sampling errors, the survey findings from our 8000 respondents will apply to our target population of 100,000 (health plan enrollees).

**Systematic sampling**

We use systematic sampling when (a) the target population is becoming eligible in real time; (b) we have access to the target population as they become eligible; and (c) we must administer the survey immediately because we only have temporary access to them. Yes, we will eventually have a complete list for simple random sampling, but by the time we have a sample it will be too late, too expensive, or infeasible to survey them at a later time. Systematic sampling can be used in venues where non-member clients are dropping in to receive one-time services and follow-up is unlikely (e.g., pandemic influenza mass vaccination clinics).

**Example 3.2. Systematic sampling:** Consider a pandemic influenza mass vaccination clinic cross-sectional survey to assess client satisfaction. We estimate that we will vaccinate at least 16,000 clients (estimated target population). We would like to have 1000 respondents, but will invite 2000 clients (sample population) assuming 50% refusal. Therefore, we will invite every 8th vaccinated client before
they exit the clinic. To minimize bias, at the beginning of every hour we will randomly select a number between 1 and 8, and our first selection each hour will be based on that number.

**Cluster sampling**

We use *cluster sampling* when (a) we cannot list the target population; or if we could list them, it would be too expensive to survey a random sample (e.g., face-to-face interviews in a large geographic area); and (a) we can list identifiable “clusters” that can be sampled (e.g., clinics, schools, neighborhoods, census tracts). Because these constraints occur often, cluster sampling is common. Figure 3.5 is a graphical depiction of cluster sampling.

We have a few caveats with cluster sampling. First, because clusters sizes can differ dramatically, we want to ensure the larger clusters have a higher chance of being sampled. To do this we need to know approximate cluster sizes. Second, because people within clusters tend to be more alike, these correlated data will need to be taken into account when calculating summary statistics. And third, once clusters have been selected, we can list the cluster members and then take a simple random sample within clusters.

Because cluster sampling can be complex, we recommend a statistical or epidemiological consultation. If a consultation is not available, takes good notes at each step (e.g., cluster sizes) and the statistical corrections can be made later.

**Example 3.3. Cluster sampling:** Consider a post-pandemic influenza winter wave, community-based, cross-sectional survey to assess influenza vaccination among children attending elementary schools (K5) in our county. We want to learn why parents did not vaccinate their children.

---

4 Within cluster correlation affects the variance of our summary statistics, but not the point estimates. Without corrections the confidence intervals will be narrower than they should be.
their children, including beliefs about the vaccine, sources of information, and barriers to vaccination. The schools cannot provide us with a student list, but we do have the list of 200 elementary schools in our county, including the numbers of students in each school. We have 21,660 students (target populations) enrolled in 68 schools (average cluster size is 320 students). We propose a multi-stage sampling plan: (a) randomly choose 30 elementary schools (clusters); (c) within each cluster, use simple random sampling to select 20 students per grade (K–5), giving us a sample population of 3600 students. We estimate that 50% of student families will respond to the survey, leaving us with about 1800 respondents (30 students per grade). Although we do not have a statistical consultant, we will document our sampling carefully so that a collaborator with statistical knowledge can make the statistical corrections later.

**Stratified sampling**

We use stratified sampling when (a) a sub-population of interest is small but we need reliable statistics (simple random sampling will select too few to give reliable data); and (b) we are able to list and classify the target population so that we can oversample this sub-population. This list can be of individuals or of clusters. For individuals, we will conduct stratified random sampling; i.e., simple random sampling of individuals within strata. For clusters, we will conduct stratified cluster sampling; i.e., simple random sampling of clusters within strata. This will become clear with examples.

The necessity for stratified sampling occurs commonly with ethnic minorities that often comprise a small percentage of the total population. If we were to rely on simple random sampling we would not sample a sufficient number of that sub-population, and our summary statistics of that group would be unreliable. To close ethnic health disparities, reliable data is important, so we use stratified sampling to oversample from these groups.

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Stratified random sampling: For the “ethnicity” field, we select a 20% random sample from the whites, latinos, and Asians strata; however, from the African Americans stratum we select a 50% random sample (“oversample”).

![Fig. 3.6. Stratified random sampling: For the “ethnicity” field, we select a 20% random sample from the whites, latinos, and Asians strata; however, from the African Americans stratum we select a 50% random sample (“oversample”).](image)

Stratified sampling can be applied to any level (e.g., African American) of a categorical field (e.g., race/ethnicity). Because this issue occurs commonly, stratified sampling is common. Here is an example involving enrollees of our health plan.

**Example 3.4. Stratified random sampling (of individuals):** Consider a pre-influenza season cross-sectional survey of our health plan enrollees (target population of 100,000) to learn who does and does not intend to receive the seasonal influenza vaccine and why. The survey findings will guide our influenza vaccination outreach and promotion. Because of the health disparities among ethnic groups in our county, we want to make sure we get reliable data for each group, however, African American make up only 7% of our enrollees. Therefore, we decide to use stratified sampling to oversample African Americans enrollees. Here’s how we do it:

1. We take our total 100,000 enrollees (target population) and divide them into four mutually exclusive ethnic groups: white (31,000), African American (7000), Latino (31,000), and Asian (31,000).
2. For each ethnic group except African Americans, we select a 15% simple random sample (4650 per group).
3. For the African American group we select a 66.5% simple random sample (4655 per group). This oversample ensures that we have about the same number in each group.
4. The sum of these subgroup samples makes up our sample population (18,605) that we invite to complete the survey.
5. We send the survey to this sample of 18,605 enrollees, but only 40% respond (7442 respondents). Assuming no significant sampling errors, the survey findings from our 7442 respondents will apply to our target population of 100,000 (health plan enrollees).
6. Because we have oversampled African Americans, we need to adjust our combined, overall summary statistics to take into account...
Fig. 3.7. Stratified cluster sampling of elementary schools in a community. Neighborhoods A and B are separated by railroad tracks. Neighborhood A is home to predominantly low-income ethnic minority residents. Neighborhood B is much larger and affluent. To address the ethnic disparity in pediatric vaccine uptake we oversample the schools in Neighborhood A (66%) compared to Neighborhood B (33%).

African Americans are “over-represented” in the data. We keep detailed documentation of our methods so that a collaborator with statistical knowledge can make the statistical corrections later.

Now, here is an example involving clusters in a community.

**Example 3.5. Stratified cluster sampling (of clusters):** Consider a post-pandemic influenza winter wave, community-based, cross-sectional survey to assess influenza vaccination among children attending elementary schools (K5) in our community. We want to learn why parents did not vaccinate their children, including beliefs about the vaccine, sources of information, and barriers to vaccination. Our community is divided by railroad tracks. On one side, Neighborhood A is home to predominantly low-income ethnic minorities; in contrast, Neighborhood B is much larger and affluent. If we did standard cluster sampling, we would get too few Neighborhood A schools in our sample (and unreliable data). Therefore, we decide to sample 33% of schools from Neighborhood B and 66% from Neighborhood A (oversample). In effect, we stratified by neighborhood and then cluster sampled within strata. Although we do not have a statistical consultant, we will document our sampling carefully so that a collaborator

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5 If the findings are broken down (stratified) by ethnic group, then a statistical adjustment is not necessary; it is only necessary if we present combined, overall statistics.
with statistical knowledge can make the statistical corrections later for the combined summary statistics.

In summary, designing a sampling plan may seem complex, but most of the steps are straightforward and can be done with a calculator or spreadsheet. While it is preferable to have a consultant, this may not be feasible. It’s better to forge ahead and keep good notes of the methods so that statistical adjustments or corrections can be implemented later. The sampling approaches we covered and the reasons we need them are very common. In fact, cluster, simple random, and stratified sampling are often used together under the term “multi-stage” sampling. Do not be discouraged or intimidated by the jargon!

**Sample size determination**

In order to improve the precision of our measurements we must have a sufficient number of respondents (sample size). The number of respondents is equal to the sample population we invite minus those that do not enroll in our survey. Therefore, in order to get enough respondents we must invite a larger sample population. Here are the necessary steps for achieving a sufficient sample size:

1. How many respondents do we need? (sample size estimate)
2. What sample population size do we attempt to recruit in order to get enough respondents?

We handle these questions in order.

**Sample size estimation for a single proportion**

For our purposes, we will be most interested in measuring what proportion (fraction) of a population has a characteristic of interest. For example, what proportion of a population got vaccinated? To get the sample size for a proportion we follow these steps:

1. What is the expected proportion? (e.g., 0.20)
2. What is the desired confidence level? (usually 95%)
3. What is the desired width (precision) of the confidence interval? (e.g., 0.10; i.e., 0.05 below and 0.05 above expected proportion)
4. Look up the sample size in a sample size table (see Table 3.1).

For example, for an expected proportion of 0.20 and a 95% confidence interval of width 0.10, the sample size is 246 subjects.

If the expected proportion is greater than 0.50, just use the complement. For example, if the expected proportion is 0.80, then just use $1 - 0.80$ or 0.20.
Table 3.1. Sample Size for a Descriptive Study using Proportions

<table>
<thead>
<tr>
<th>Expected Proportion</th>
<th>Confidence Level (%)</th>
<th>Total width of confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.10</td>
<td>0.15</td>
</tr>
<tr>
<td>0.10</td>
<td>90</td>
<td>98</td>
</tr>
<tr>
<td>0.15</td>
<td>90</td>
<td>139</td>
</tr>
<tr>
<td>0.20</td>
<td>90</td>
<td>174</td>
</tr>
<tr>
<td>0.25</td>
<td>90</td>
<td>204</td>
</tr>
<tr>
<td>0.30</td>
<td>90</td>
<td>229</td>
</tr>
<tr>
<td>0.40</td>
<td>90</td>
<td>261</td>
</tr>
<tr>
<td>0.50</td>
<td>90</td>
<td>272</td>
</tr>
</tbody>
</table>

Source: [5]

Sample population size estimation

The sample is the population we will recruit for the survey. The size of the sample must take into account the proportion that will not participate (non-respondents).

\[
\text{Sample} = \text{Respondents} + \text{Non-respondents}
\]

The number of necessary respondents was based on the sample size.

\[
\text{Sample} = \text{Sample Size} + \text{Non-respondents}
\]

Therefore, once we have estimated the sample size \((SS)\), we must inflate the number to account for non-respondents \((NR)\). To calculate the sample population \((SP)\) we use this simple equation:

\[
SP = \frac{SS}{1 - NR}
\]

From our previous example (expected proportion of 0.20, 95% C.I., confidence interval width of 0.10, and sample size of 246), suppose we estimate that we will have 25% non-responders, then here is the calculation:

\[
SP = \frac{246}{1 - 0.25}
\]

That is, our sample population will need to be 328 in order to get a sufficient number of respondents (sample size of 246).

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Recruitment protocol

The recruitment protocol contains the operational instructions for recruiting the sample population. The details of this protocol will depend on several factors including:

- How will the survey be administered? If interviewer-administered, will it be face-to-face, or over the phone? If self-administered, will it be paper-based, web-based, or other (e.g., text message-based)?
- How and how often will the sample population be contacted and invited to participate? For example, if the invitation to participate will be done by phone, how many calls will be made during day vs. evening hours, weekdays vs. weekends, etc?
- Will incentives be offered to potential respondents? If yes, how will that be handled?

Finally, the recruitment protocol will be used to train the recruiting staff, which often times are also the interviewers.

3.2.4 Step 4: Design the questionnaire

A survey is one method to collect data for a study. Developing and administering a survey instrument involves three steps:

- Design the questions;
- Design the questionnaire; and
- Design the questionnaire administration.

There are two types of questions: open-ended questions and closed-ended questions. Focus groups and key informant interviews almost exclusively use open-ended questions. In contrast, survey questionnaires will use primarily closed-ended questions. In this section we focus on closed-ended questions.

Design the questions

To design survey questions we need to review and understand the following:

- Types of measurements;
- Types of survey questions;
- Question formats;
- Response scales; and
- Modes.

---

6 In outbreak investigations, open-ended questions are used early in an investigation to generate research hypotheses. However, we used closed-ended questions to collect data to test hypotheses.
3.2. The 7 Steps of Highly Effective Surveys

Types of measurements

To design survey questions we must first answer these questions:

- What are we trying to measure? (construct)
- How will we measure it? (measurement)
- How will we minimize biases?

What we are trying to measure (knowledge, attitude, belief, behavior, etc.) is called a construct. Operationally, we collect survey data to build a measurement of that construct. In surveys, we have three types of measurement data:

- Quantitative;
- Qualitative; and
- Psychometric (attitudes, beliefs, intentions, etc.).

These measurements and examples are summarized in Tables 3.2 and 3.3.

Quantitative measures are either continuous numbers (e.g., height, weight) or discrete numbers (e.g., 1, 2, 3, . . .). Qualitative measures are either unordered categories (e.g., male, female) or ordered categories (e.g., rarely, sometimes, often). Psychometric scales measure levels of personal beliefs, attitudes, opinions, agreement, etc. The Likert Scale is an ordered and symmetric psychometric scale about a neutral choice. For example, this Likert Scale measures level of agreement with a personal statement:

Q: How strongly do you disagree or agree with each statement? (circle one):

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I do not get the flu vaccine because I rarely get sick.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) I do not get the flu vaccine because it can give you the flu.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

In analysis, these psychometric questionnaire items can be treated as discrete numbers (1 to 5) or as ordinal categorical levels.

The Broome County Health Department “H1N1 Response—Citizen Satisfaction Survey” used many of these measurement types. Here are examples adapted from the Broome County Health Department Survey.

Quantitative measurements: Age is continuous, but it is usually collected as a discrete integer.

Q: Please enter your age [   ]
Chapter 3. Surveys for Improving Vaccinations

Qualitative measurements: Here are examples of nominal categorical measurements:

Q: Please select gender (choose one):
   ○ Male
   ○ Female

Q: What type of insurance do you have, if any? (choose one)
   ○ None
   ○ Private
   ○ Medicaid
   ○ Medicare

Here is an example of ordinal categorical measurement:

Table 3.2. Types of quantitative and qualitative measurements used in surveys

<table>
<thead>
<tr>
<th>Measure</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variable</td>
</tr>
<tr>
<td>Quantitative</td>
<td></td>
</tr>
<tr>
<td>Continuous</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Height</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
</tr>
<tr>
<td>Discrete numbers</td>
<td></td>
</tr>
<tr>
<td>Integers</td>
<td>Weight change (± lbs)</td>
</tr>
<tr>
<td>(..., -1, 0, 1, ...)</td>
<td></td>
</tr>
<tr>
<td>Counting numbers</td>
<td>Age</td>
</tr>
<tr>
<td>(0, 1, 2, ...)</td>
<td></td>
</tr>
<tr>
<td>Qualitative</td>
<td></td>
</tr>
<tr>
<td>Categorical, nominal</td>
<td>Case status</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Categorical, ordinal</td>
<td>Annual household income</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.2. The 7 Steps of Highly Effective Surveys

#### Table 3.3. Types of psychometric measurements used in surveys

<table>
<thead>
<tr>
<th>Measure</th>
<th>Variable</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement with statement (Likert item)</td>
<td>Statement #1 (e.g., “Influenza vaccines are not effective in preventing flu.”)</td>
<td>1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree</td>
</tr>
<tr>
<td>Level of belief, feeling, etc. Level of confidence (e.g., “After observing the response to the 2009 Influenza Pandemic how confident are you in your local health department’s ability to respond to an emergency?”)</td>
<td>1 = Not at all Confident, 2 = Not Confident, 3 = Indifferent, 4 = Confident, 5 = Very Confident</td>
<td></td>
</tr>
<tr>
<td>Change in belief, feeling, etc. Change in perception (e.g., “After observing the response to the 2009 Influenza Pandemic my perception of my local health department’s ability to respond to an emergency is . . .”)</td>
<td>1 = Very Weakened, 2 = Weakened, 3 = Remained the Same, 4 = Strengthened, 5 = Very Strengthened</td>
<td></td>
</tr>
<tr>
<td>Opinion</td>
<td>Rate the quality of . . .</td>
<td>1 = Very Poor, 2 = Poor, 3 = Okay, 4 = Good, 5 = Very Good</td>
</tr>
</tbody>
</table>

Q: Please indicate the range of your total household income (choose one).
- $0 to $25,000
- $25,001 to $45,000
- $45,001 to $65,000
- $65,001 to $85,000
- $85,001 to $105,000
- > $105,000

There are two ways to collect 2-level responses. We can use a list with “check all that apply” or individually with a “yes” vs. “no” choice. For example, this question:

Q: Have you ever taken any of these influenza antiviral medications? (check all that apply)
- Oseltamivir
- Zanamivir
- Amantadine

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is equivalent to these questions:

Q: Have you ever taken Oseltamivir?
   ○ Yes
   ○ No

Q: Have you ever taken Zanamivir?
   ○ Yes
   ○ No

Q: Have you ever taken Amantadine?
   ○ Yes
   ○ No

_Psychometric measurements:_ Essentially, we have knowledge about facts, attitudes, intentions to act, and behaviors. The first three cannot be observed—we must query the respondent to measure these types of constructs. Attitudes and intentions are the domain of psychometric measurements. We generally will ask about one of the following:

- Belief
- Concern
- Agreement
- Awareness
- Intentions
- Confidence
- Desirability
- Satisfaction
- Acceptability
- Perception of quality

When we question a respondent, we can use an open-ended question format:

Q: What are your beliefs about vaccines causing autism?

An alternative approach is to use a closed question format with a rating scale such as the Likert questionnaire item where respondents specify their level of agreement to a statement about this belief:

Q: How strongly do you disagree or agree with this statement: Vaccines cause autism (choose one):
   ○ Strongly disagree
   ○ Disagree
   ○ Neither agree nor disagree
   ○ Agree
   ○ Strongly agree

Here is an example of Likert items applied to influenza vaccination services. Each Likert items can be analyzed as either ordinal categorical data or as discrete numerical data (1, 2, 3, 4, 5).
Q: How strongly do you disagree or agree with each statement regarding your local health department response to the H1N1 Pandemic? (choose one: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree)

____ Organized a sufficient number of H1N1 vaccination clinics.
____ Kept the public informed through the media (press conferences, interviews, etc.).
____ Hosted a sufficient number of public information (town hall) sessions.
____ Educated the public about how to protect themselves and others from illness.
____ Worked with local schools and school districts.
____ Facilitated local H1N1 response efforts.

Each one of these Likert items will get a score of 1 to 5. We can create a Likert Scale by combining the results of these Likert items. This Likert Scale can range from 5 to 30.

Types of survey questions

In contrast to types of measurements, we now review types of survey questions:

• Factual;
• Socio-demographic;
• Behavioral;
• Attitudinal; and
• Intention;

Factual questions ask about things for which there is a correct answer. In theory, such information could be obtained by independent means of observation. Factual questions can be about a variety of things, such as figure-based facts (date, age, weight), events (pregnancy, marriage), and behaviors (getting vaccinated). A factual question may use quantitative or qualitative measurement types, but not psychometric.

Socio-demographic questions ask about respondent characteristics such as age, marital status, income, employment status, education, and ethnicity. A socio-demographic question may use quantitative or qualitative measurement types, but not psychometric.

Behavioral questions are used to ask respondents to report on activities they do, or have done. For example: Did you receive the “swine flu” (H1N1) vaccine last season? A behavioral question may use quantitative or qualitative measurement types, but not psychometric.

Attitudinal questions ask about respondents’ opinions, judgments, emotions, and perceptions. These cannot be measured by other means; we are dependent on respondents’ answers. Attitudinal questions are about psychometric constructs.
Chapter 3. Surveys for Improving Vaccinations

Intention questions ask respondents to indicate their intention regarding some behavior. They share features with attitudinal questions. Intention questions are about psychometric constructs; when action occurs it becomes a behavior.

Question formats

Closed question format is a survey question that provides a limited set of predefined answer categories from which respondents choose.

Q: Has a health care provider recommended that you receive a seasonal flu vaccine this year? (select one answer only)
   ○ Yes
   ○ No

Open question format is a survey question requires respondents to answer questions in their own words.

Q: What are your beliefs about vaccines causing autism?

Response scales

For a closed question, a response scale is a predefined set of possible answers. Respondents are asked to select a response from a list. Common response scale formats are rating, ranking, or frequency scale formats.

Rating response format is a response format which requires the respondent to select from an ordered list. The Likert item is a common example of a rating response format.

Ranking response format is a response format where respondents express their preferences by rank ordering a list of items.

Q: Listed below are possible venues to receive your flu vaccine. Based on convenience to you, please enter the number 1, 2, 3, or 4 alongside each possible venue to indicate your rank ordering. 1 stands for the most convenience, 4 for the least convenience.
   __ Health department mass vaccination site
   __ Community clinic
   __ Local pharmacy
   __ Personal physician

Frequency scale response format is a scaled response format where respondents indicate how often they engage in a behavior. Here is one example:
3.2. The 7 Steps of Highly Effective Surveys

Q: When I cough or sneeze I cover my mouth and nose (choose one):

- Never
- Occasionally
- Sometimes
- Often
- Always

Design the questionnaire

Now that we have the questions, we must select a questionnaire mode, determine the ordering of the questions, and compose and test the questionnaire.

Select questionnaire mode

Traditionally, surveys have been of three types: mail, telephone, or face-to-face. The mailed paper survey is a self-administered questionnaire (SAQ), and the telephone and face-to-face surveys are interviewer-administered questionnaire (IAQ). Therefore, to design the questionnaire we need to answer the following questions:

- Will it be a self-administered questionnaire?
  - Questionnaire sent to respondent (e.g., mail, email)
  - Respondent sent to questionnaire (e.g., online survey)
- Will it be an interviewer-administered questionnaire?
  - Telephone (audio) interview
  - Face-to-face interview
- Will we use technological assistance?
  - Computer-assisted personal interviewing (CAPI)
  - Audio computer-assisted self-interviewing (ACASI)
  - Computer-assisted telephone interviewing (CATI)
  - Online Web surveys

We ensure that our selection is appropriate for our survey goals, target audience, and budget.

Order questions (including skip patterns)

Questions should be ordered to improve clarity, completion, and validity (minimize bias). We should use skip patterns so respondents can skip questions that are not relevant to them. However, we must ensure that the question order retains a logical flow.
Design the questionnaire administration

Up to now, we have designed the questions and questionnaire. Next, we design the operational details of how the questionnaire will be administered. Consider an interviewer-administered questionnaire:

- How will the interviewers interact with respondents?
- What are the guidelines for interviewer probing?
- What will be the degree of privacy?
- Will the interviewer use show cards?\(^7\)
- Will the interviewer use visual aids to enhance recall?

Biases in questionnaires

Biases in survey questionnaires threaten the validity of survey findings, therefore we take great care to minimize these biases. Biases can creep into the design and implementation of the survey:

- Questions;
- Questionnaire; and
- Questionnaire administration.

In this section we focus on how to minimize bias when designing questions, questionnaires, and administration. Summarized in Tables 3.4–3.6 are the biases that can result from the design of these survey components [6, 7]. We cover selected examples here (see Exhibit 3.2 for more resources).

**Biases from question design**

The design of questions can be a source of bias. Summarized in Table 3.4 is a comprehensive list of biases. Selected examples are covered here.

*Problems with wording:* The *double-barrelled* question unintentionally contains two (or more) questions in one question. Here is an example:

Q: Will anyone in your family receive the H1N1 or the seasonal flu vaccination?

○ Yes
○ No

A “yes” response has three meanings: it could mean intending to receive seasonal vaccine only, H1N1 only, or both vaccines. This question could be split into two questions, or changed to provide all possible mutually exclusive options:

\(^7\) Listing of response alternatives

*(Seasonal & Pandemic Influenza Vaccination Assessment Toolkit)*
### Exhibit 3.2 A Catalog of Biases in Questionnaires

by Bernard C.K. Choi, Ph.D. and Anita W.P. Pak, Ph.D.:

“Bias in questionnaires is an important issue in public health research. To collect the most accurate data from respondents, investigators must understand and be able to prevent or at least minimize bias in the design of their questionnaires. This paper identifies and categorizes 48 types of bias in questionnaires based on a review of the literature and offers an example of each type. The types are categorized according to three main sources of bias: the way a question is designed, the way the questionnaire as a whole is designed, and how the questionnaire is administered. This paper is intended to help investigators in public health understand the mechanism and dynamics of problems in questionnaire design and to provide a checklist for identifying potential bias in a questionnaire before it is administered.” This open access article is freely available from [http://www.cdc.gov/pcd/issues/2005/jan/04_0050.htm](http://www.cdc.gov/pcd/issues/2005/jan/04_0050.htm)

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**Q:** Will anyone in your family receive the H1N1 or the seasonal flu vaccination?

- [ ] Both vaccines
- [ ] Neither vaccine
- [ ] Seasonal only
- [ ] H1N1 only
- [ ] Not Sure

Sometimes a question contains *technical jargon* that is unnecessary. For example,

**Q:** Within 5 days of receiving the flu vaccine did you develop any of the following (check all that apply):

- [ ] pyrexia
- [ ] myalgias
- [ ] arthralgias
- [ ] erythema at the injection site
- [ ] edema at the infection site

should be changed to:

**Q:** Within 5 days of receiving the flu vaccine did you develop any of the following (check all that apply):

- [ ] fever
- [ ] muscle aches
- [ ] joint aches
- [ ] redness at the injection site
- [ ] swelling at the infection site

---

**NACCHO San Francisco Bay Area Advanced Practice Center**
### Table 3.4. Sources of Questionnaire Bias—Question Design

<table>
<thead>
<tr>
<th>Source</th>
<th>Bias</th>
</tr>
</thead>
</table>
| Problems with wording | ambiguous question  
| | complex question  
| | double-barrelled question (two questions in one)  
| | short question  
| | technical jargon  
| | uncommon word  
| | vague word |
| Missing or inadequate data for intended purpose | belief vs behavior  
| | starting time  
| | data degradation  
| | insensitive measure |
| Faulty scale | forced choice (insufficient category)  
| | missing interval  
| | overlapping interval  
| | scale format |
| Leading questions | framing  
| | leading question  
| | mind-set |
| Intrusiveness | reporting (self-report response)  
| | sensitive question |
| Inconsistency | case definition  
| | change of scale  
| | change of wording  
| | diagnostic vogue |

Source: [6]

**Missing or inadequate data for intended purpose:** The belief vs behavior bias can arise when think we are measuring one but we are actually measuring the other. This can happen when we are measuring psychometric constructs (beliefs, intent, agreement, etc.) and we mistakenly interpret that were are measuring behavior.

The starting time bias can occur when our question uses a time frame that we define imprecisely. For example, for a survey that is conducted during influenza season (which spans months), a question that starts with “In the past two months . . . ” will actually be measuring different time periods. This can be significant because the risk of influenza infection changes over time. If relevant, provide specific calendar time periods. Use a calendar as a visual and reference cue.

The data degradation bias occurs when we collect data based on broad categories when more precise can be collected with the same effort. For example, instead of collecting age as a categorical variable (e.g., Age 15 to 24), if we have the date of birth we can easily calculate age. Precisely collected data can always be categorized as needed; however, the reverse is not possible—we cannot retrieve the precise data from categorical data.

The exception to the preference of collecting more precise data is when we are collecting sensitive information that is better collected
in broad categories. For example, measurements of financial income are collected as categorical data.

The *in insensitive measure* bias occurs when too few categories are provided as possible responses when more categories provides better discriminatory power. Consider the following question:

Q: How important is it to be vaccinated against the flu?

Option A: (Unimportant) 1—2—3 (Important)

Option B: (Unimportant) 1—2—3—4—5 (Important)

Option B provides more discriminatory power and is a more sensitive measure.

*Faulty scale:* The *forced choice* bias occurs when a reasonably comprehensive list of options are not provided for selection so that the respondent is “forced” to choose from a limited list. In this question from a RAND influenza vaccination survey [8], investigators include a “Don’t know” option to avoid the “forced choice” bias.

Q: Each year, the federal government recommends seasonal flu vaccine for high priority groups. Are you a member of a high priority group recommended for seasonal flu vaccine? (select one answer only)

- Yes
- No
- Don’t know

The *neutral scale format* includes a neutral option that can be selected. Some investigators prefer to “force” respondents to “take sides”: this is accomplished by removing the neutral option. This is an intentional application of “forced choice.” In this question from the RAND influenza vaccination survey [8], investigators included a neutral choice:

Please indicate how much you agree or disagree with the following statement:

Q: Being vaccinated against seasonal flu is safe. (select one answer only)

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Removing the “Neutral” option would have forced the respondent to select “agree” or “disagree” even though they may truly be neutral. There is no consensus on which approach is better, although this author (TJA) prefers avoiding a “forced choice” question.
Leading questions: A framing bias occurs when how the question is framed influences the respondent’s answer. Consider these equivalent statements:

A  Influenza vaccine has a 10% failure rate (1 out of 10 vaccinated persons still become sick with the flu).
B  Influenza vaccine has a 90% success rate (9 out of 10 vaccinated persons do not become sick with the flu).

Even though these questions are numerically equivalent, respondents may have a preference for questions that contain “success” or an aversion for questions that contain “failure.”

A leading question bias leads or guides a respondent to an answer.

A  Did you protect your loved ones (children) by vaccinating them against the flu?
B  Were your children vaccinated against the flu?

Question A clearly “leads” a respondent to a “Yes” answer. Question B is more neutral and appropriate.

Intrusiveness: A self report bias arises when respondents selectively suppress information for questions they may perceive an intrusive. This can be reduced by loading the question. For example, in the RAND influenza vaccination survey [8], investigators loaded the question about why respondents do not intend to get vaccinated against influenza.

There are many reasons why people don’t get a seasonal flu vaccine. What is the main reason you do not intend to get a seasonal flu vaccine this season? (select one answer only)

- Don’t know enough about seasonal flu
- Don’t need it
- Others need it more than I do
- Might get sick or experience side effects
- Dislike needles
- Don’t know where to get the vaccine
- There was no vaccine available when I tried to get it
- I got/will get an H1N1/Swine flu vaccine instead
- Flu vaccines cost too much
- It takes too much time to get the vaccine
- Don’t believe in flu vaccines
- Other, please specify

Loading the question informed respondents that others share the same reasons for not getting vaccinated. Also, notice that these responses could have been elicited in focus groups of stakeholders. Focus groups can provide possible responses that are representative of and relevant to stakeholders.
3.2. The 7 Steps of Highly Effective Surveys

Sensitive questions are questions that ask about areas that are generally considered to be sensitive such as age, income, sexual orientation, marital status, etc. If asked early in the questionnaire, these questions may cause the respondent unease and affect the responses to the remaining questions, or cause the respondent to quit early before the primary questions are answered. The general approach is to put sensitive questions at the end of the questionnaire. If one must come early, consider loading the question.

Inconsistency: If our survey will assess influenza or influenza-like illness, then we should use an existing case definition. However, case definitions change over time, even during an investigation. The CDC case definition for influenza-like illness is fever ($T > 100°F$) AND cough and/or sore throat (in the absence of a known cause other than influenza). To have flexibility in changing the case definition, and to reduce possible inconsistencies, ask about each component separately.

Q: Did the patient have a fever? ($T > 100°F$)
   ○ Yes
   ○ No

Q: Did the patient have a cough?
   ○ Yes
   ○ No

Q: Did the patient have a sore throat?
   ○ Yes
   ○ No

Q: Did the patient a diagnosis other than influenza to explain the respiratory illness?
   ○ Yes
   ○ No

The diagnostic vogue bias arises when a diagnostic label for an illness changes over time, differs by geographic region, or differs by culture. When the novel influenza A (H1N1) virus was discovered to be the cause of a new influenza pandemic, its diagnostic label changed several times: "swine" flu, swine-origin influenza A (H1N1) virus, novel influenza A (H1N1) virus, etc. A diagnostic name that may be up-to-date and technically accurate may not be widely accepted by the general public.

Biases from questionnaire design

The design of questionnaires can be a source of bias. Summarized in Table 3.5 is a list of biases. Selected examples are covered here.

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Table 3.5. Sources of Questionnaire Bias—Questionnaire Design

<table>
<thead>
<tr>
<th>Source</th>
<th>Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering of questions</td>
<td>unblind interviewer;</td>
</tr>
<tr>
<td></td>
<td>affect recall</td>
</tr>
<tr>
<td>Formatting problem</td>
<td>horizontal response format</td>
</tr>
<tr>
<td></td>
<td>juxtaposed scale (questionnaire format)</td>
</tr>
<tr>
<td></td>
<td>left alignment and right alignment</td>
</tr>
<tr>
<td>Questionnaire too long</td>
<td>no-saying and yes-saying</td>
</tr>
<tr>
<td></td>
<td>open question (open-ended question)</td>
</tr>
<tr>
<td></td>
<td>response fatigue</td>
</tr>
<tr>
<td>Flawed questionnaire structure</td>
<td>skipping question</td>
</tr>
</tbody>
</table>

Source: Adapted from [6]

Ordering of questions: How questions are ordered can bias the interviewer or the interviewee. For example, in outbreak investigation surveys, questions about possible causal exposures come before any questions about illness. The illness questions are used to determine case status and we want the interviewer to be “blind” to the case status of the interviewee. Likewise, we do not want the interviewee to be dwelling on their case status when they answer the exposure questions. In other words, preceding questions can set up a context or state of mind that can, consciously or unconsciously, bias the interviewer or interviewee.

Formatting problem: As a general rule, for a single question with a selection list, avoid the horizontal response format, instead use vertical response formatting like this RAND influenza vaccination Likert item [8]:

Please indicate how much you agree or disagree with the following statements:
Q: Being vaccinated against seasonal flu is worth the time and expense (select one answer only).

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

In self-administered questionnaires, the check boxes should be aligned to the left of the response (as above). However, in an interviewer-administered questionnaire, the check boxes should be aligned to the right:
3.2. The 7 Steps of Highly Effective Surveys

IAQ: Have you ever been diagnosed with any of the following health problems? (select all answers that apply)

- a. Diabetes
- b. Heart disease
- c. Chronic lung disease (e.g., emphysema)
- d. Asthma
- e. Immune system problems (e.g., chemotherapy, HIV)
- f. Kidney disease
- g. Sickle cell disease or hemophilia
- h. None of the above

Questionnaire too long: Response fatigue among respondents can occur when a questionnaire is, or perceived to be, too long or too burdensome. Personal interviews can last 50 to 90 minutes; telephone interviews, 30 to 60 minutes; and self-administered questionnaires, 10 to 20 minutes. If a questionnaire is too long, respondents lose interest or stop concentrating. They may start to give invalid responses (all yes’s or all no’s) or they may refuse to answer any remaining questions.

Biases from questionnaire administration

Sources of bias from the administration of questionnaire are listed in Table 3.6. In general, we think about the types of biases that can occur, consciously or unconsciously, because of interviewers’ or respondents’ pre-existing biases, or how they perceive or react to each other, the setting, the questions, or the responses. For interviewers, they must be trained to set aside their personal biases and to conduct all interviews without bias. For respondents, we must consider how the administration can be designed to minimize responder bias. Focus groups can be a good source of ideas or to test different approaches.

3.2.5 Step 5: Pretest the survey

Usually we think of pretesting as applying only to the questionnaire. However, there are several “moving parts” to a survey study of which the questionnaire is one component. The Comparative Survey Design and Implementation (CSDI) Guidelines Initiative based at University of Michigan has published an online, freely available Guidelines for Best Practice in Cross-Cultural Surveys [9]. Summarized in Table 3.7 are the methods for pretesting survey components. Essentially, we need to pretest field procedures and cognitive processes.

If the survey will use recruiters and interviewers, then these staff need to be trained and evaluated. Pretesting can be an additional opportunity to evaluate the effectiveness of staff training.
Table 3.6. Sources of Questionnaire Bias—Administration of Questionnaire

<table>
<thead>
<tr>
<th>Source</th>
<th>Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewer not objective</td>
<td>interviewer nonblinding</td>
</tr>
<tr>
<td>Respondent’s subconscious reaction</td>
<td>end aversion (central tendency)</td>
</tr>
<tr>
<td></td>
<td>positive satisfaction (positive skew)</td>
</tr>
<tr>
<td>Respondent’s conscious reaction</td>
<td>faking bad (hello-goodbye effect)</td>
</tr>
<tr>
<td></td>
<td>faking good (social desirability)</td>
</tr>
<tr>
<td></td>
<td>unacceptable disease or exposure</td>
</tr>
<tr>
<td></td>
<td>unacceptable</td>
</tr>
<tr>
<td></td>
<td>underlying cause (rumination)</td>
</tr>
<tr>
<td>Respondent’s learning</td>
<td>learning</td>
</tr>
<tr>
<td>Respondent’s inaccurate recall</td>
<td>hypothesis guessing</td>
</tr>
<tr>
<td></td>
<td>primacy and recency</td>
</tr>
<tr>
<td></td>
<td>proxy respondent (surrogate data)</td>
</tr>
<tr>
<td></td>
<td>recall</td>
</tr>
<tr>
<td></td>
<td>telescope</td>
</tr>
<tr>
<td>Cultural differences</td>
<td>cultural</td>
</tr>
</tbody>
</table>

Source: [6]

3.2.6 Step 6: Conduct the survey

We are now ready to conduct our survey. This involves the following steps:

- recruit and enroll subjects;
- collect data;
- process and enter data;
- analyze data; and
- interpret results

The recruitment and enrollment of subjects is a critical step because we want to minimize non-respondent bias. We want all recruiters or interviewers to use the same procedures in recruitment and enrollment. Standardization is the general rule in conducting a good survey. We want data collection to be consistent across interviewers and for all subjects.

If data has been collected on paper forms, then these need to be checked for completion, logical errors, and entered into a computer system for analysis. CDC’s DOS-based Epi Info 6 gained popularity because of its simplicity and effectiveness in linking questionnaire design, data collection, data entry, and data analysis. Although the CDC stopped supporting Epi Info 6, public health programmers in Denmark have developed a similar program called EpiData Entry and EpiData Analysis.\(^8\)

In the analysis and interpretation of data, we must remained focused on our original study goals and objectives. We can be tempted

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\(^8\) Available from [www.epidata.dk](http://www.epidata.dk).
3.2. The 7 Steps of Highly Effective Surveys

Table 3.7. Methods for Pretesting Survey Components

<table>
<thead>
<tr>
<th>Pretesting Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Methods</strong></td>
<td></td>
</tr>
<tr>
<td>Field pilot study</td>
<td>A miniature version of the main data collection</td>
</tr>
<tr>
<td>Interviewer debriefings</td>
<td>Small group discussion with interviewers to talk about their experiences</td>
</tr>
<tr>
<td>Respondent debriefings</td>
<td>Respondents’ comments on specific questions or the survey as a whole (usually collected during a field pilot study)</td>
</tr>
<tr>
<td>Behavior coding</td>
<td>Systematic coding of the interviewer-respondent interaction in order to identify problems that arise during the question-answer process [3]</td>
</tr>
<tr>
<td>Focus groups</td>
<td>Small group of people brought together to discuss specific topics in a relatively unstructured manner, led by a moderator who ensures the flow of the conversation is in the intended direction</td>
</tr>
<tr>
<td><strong>Cognitive Methods</strong></td>
<td></td>
</tr>
<tr>
<td>Vignettes</td>
<td>Brief scenarios describing hypothetical situations to which respondents are asked to react in order to explore contextual influences on respondent’s response formation processes</td>
</tr>
<tr>
<td>Concurrent think-aloud</td>
<td>Respondents’ report of the thoughts they are having while answering a survey question</td>
</tr>
<tr>
<td>Retrospective think-aloud</td>
<td>Interview with respondents after they have completed a survey about how they came up with answers to specific questions</td>
</tr>
<tr>
<td>Expert review</td>
<td>Review of draft materials by experienced methodologists, analysts, or translators</td>
</tr>
<tr>
<td><strong>Miscellaneous Methods</strong></td>
<td></td>
</tr>
<tr>
<td>Question Appraisal System</td>
<td>A systematic appraisal of survey questions that allows the user to identify potential problems in the wording or structure of the questions that may lead to difficulties in question administration, miscommunication, or other failings.</td>
</tr>
<tr>
<td>Usability Testing</td>
<td>Testing of the functionalities of CAPI, CATI, sample management systems or printed materials such as respondent and interviewer booklet, show cards, etc.</td>
</tr>
</tbody>
</table>

Source: [9]

to pursue new and interesting questions at the expense of the original goals. This will delay disseminating or publishing our findings and may reduce the effectiveness of our study findings.

3.2.7 Step 7: Communicate findings

Once the survey data analysis is completed and the results have been interpreted and discussed internally, it is useful to present the findings to a live audience to get immediate feedback and questions. This feedback can be incorporated into written forms of communication.

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Exhibit 3.3 Organization of a scientific publication

- **Introduction**
  - What is the problem and why is it important?
  - What is known and unknown about this problem? (previous findings and research)
  - What are the problems with the previous research?
  - How did we fix these problems and what is the purpose of this study?

- **Methods**
  - Study and survey design (cross-sectional, cohort, case-control)
  - Subject selection
    - Sampling design (target, sample, respondents)
    - Recruitment and retention plans
  - Measurements
    - Constructs
    - Key questions
  - Statistical issues (e.g., sample size)

- **Results**: Concise description of key findings that correspond to order of tables and figures

- **Discussion**
  - Key findings: What did the study find?
  - Interpretation: What do the results mean and how strongly do you believe the results?
  - Prior agreements/disagreements: How do the results compare with prior knowledge?
  - Strengths: What were the strengths of the study?
  - Limitations: What were the limitations of the study?
  - Implications: What are the scientific/clinical implications of the study?
  - Next steps: What are the next steps?
  - Conclusions

In choosing the medium to communicate finding we ask these questions:

- Who is the audience?
- What are the goals for this audience?
- What are the overall survey goals?

The audience will come from the list of stakeholders that have already been identified. What goals do we have with a particular audience. Is it part of a disease control campaign? How does this

*Seasonal & Pandemic Influenza Vaccination Assessment Toolkit*
3.3. Managing Personnel and Resources

audience like to receive information? Do we need to include or involve community opinion leaders (e.g., religious leaders)? What stake do the stakeholders have in the results, and do you need to manage expectations?

To communicate findings, we usually use one of the following media:

- News release
- Newsletter or Bulletin
- Web page
- Interim or final report
- Manuscript for peer-reviewed article

Regardless of medium, results should be accurate, focused, timely, relevant, and concise. We avoid technical jargon and use plain language that is easy to understand.

One common error is to attempt to include too many results in one publication. This can delay your publication and also confuse your message by having too many findings. We believe it is more effective to break up your findings and to prepare several publications.

While only a minority of survey study findings will go on to be submitted for peer-review publication, we find it useful to review how findings would be organized and presented to a scientific audience. Exhibit 3.3 summarizes key questions and sections for a scientific publication. Even if we are not publishing an article, we can use this outline to improve our communication effectiveness.

3.3 Managing Personnel and Resources

Most local health departments have few resources to spare in terms of time, money, and personnel. Many rely on a range of volunteers and private entities to administer their seasonal flu campaigns. It is understandable why health departments are wary of attempting to conduct additional activities such as surveys and assessments.

Health department staff should keep in mind that there are a range of organizations that support the everyday public health infrastructure and provide surge capacity during emergencies. Relationships with those entities should be developed to combine public health workforce and community members’ efforts to increase overall public health preparedness. Appendix D is a generic Job Action Sheet for a clinic survey worker.

This toolkit highlights five types of external partner organizations that can assist in conducting surveys or assessments, as well as support the functional implementation of vaccination programs.

1. Community Emergency Response Teams (CERT)

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2. Medical Reserve Corps (MRC)
3. Student Volunteers (public health, nursing, or medical school)
4. Community-Based Organizations (faith-based organizations, neighborhood groups, advocacy groups, cultural organizations)
5. Community outreach workers / promotores

**Community Emergency Response Teams (CERT)**

Originally developed in 1985 by the Los Angeles City Fire Department, the concept of training civilian volunteers to help respond to disasters has taken hold in 28 states. Developing and training CERT teams has been supported nationally by the Federal Emergency Management Agency (FEMA) and the Emergency Management Institute (EMI) since 1993. Most CERT teams operate in conjunction with their state and/or local emergency management agencies and can provide a range of trained and eager volunteers to help support public health functions. More information about how to contact a CERT team in your area, as well as resources to help start a team can be found at [http://www.citizencorps.gov/cert/](http://www.citizencorps.gov/cert/). (See Exhibit 3.4)

**Medical Reserve Corps (MRC)**

The MRC was established in 2002 with the mission “to improve the health and safety of communities across the country by organizing and utilizing public health, medical and other volunteers.” MRC is made up of medical and public health professionals and is composed of community-based organizations that function to coordinate these volunteers. The program is run nationally through the Office of the Surgeon General. More information about how to contact an MRC in your area, as well as resources to help start a unit can be found at the following Web site: [http://www.medicalreservecorps.gov/](http://www.medicalreservecorps.gov/) (See Exhibit 3.5)

**Student Volunteers**

Many cities and towns across the United States are home to medical schools, nursing schools, and schools of public health. These educational institutions can provide a steady stream of well-trained volunteers with a variety of specialties ranging from clinical to behavioral health to epidemiology expertise.

**Community-Based Organizations (CBO)**

There exists a plethora of community and faith-based organizations in most communities. Some may be chapters of a national organization (such as the Red Cross) and others may be unique to their specific community. Engaging these groups in public health initiatives...
3.3. Managing Personnel and Resources

**Exhibit 3.4 Public Health Community Emergency Response Training Modules**

The Center for Infectious Diseases & Emergency Readiness at the UC Berkeley School of Public Health has developed a series of in-depth CERT training modules that can be found here: [http://cert.idready.org/](http://cert.idready.org/) (Username: cidercert, Password: Community). The Public Health Community Emergency Response Training (PH-CERT) Curriculum is designed for emergency response teams such as CERTs, MRCs and ARC volunteers who may be a critical resource in a variety of responses to public health related events. These groups may employ community mitigation strategies such as basic home care for infectious individuals, use of personal protective equipment, and appropriate actions to deal with infectious disease and environmental threats before, during, and after emergencies and disasters that have public health implication. The PH-CERT Curriculum is a critical tool that bridges the gap between currently available trainings. It can be used as a just-in-time training tool or as standard training for community level volunteers with some preparedness and response training.

Also, the NACCHO Advanced Practice Center toolkit “CERT - Pandemic H1N1 Influenza—Train-the-Trainer” developed by the Santa Clara Public Health Department can be found at the following Web site: [http://www.naccho.org/toolbox/tool.cfm?id=1779](http://www.naccho.org/toolbox/tool.cfm?id=1779)

Can often increase community participation and buy-in, particularly if public health practitioners make an effort to reach underserved or at-risk populations through these types of organizations. By engaging trusted community leaders in the planning process one can expect to improve participation in a range of public health interventions.

**Community Outreach Workers / Promotores**

Community outreach workers (promotores, in Spanish) are increasingly being incorporated into LHD educational and outreach teams. Their particular job functions and topical expertise vary depending on the LHD program to which they are assigned. However, their professional experience with specific pockets of communities and neighborhoods, their personal experiences and familiarity with lifestyles and cultural aspects of ethnic communities, and their practical orientation to accessing and engaging community residents make positive and time-saving contributions to community assessments and surveys. There are statewide and local networks of outreach workers. By contacting local community-based organizations and involving LHD
In August 2009, the Rhode Island State Health Department requested RI MRC involvement in the planning of their fall vaccination campaign. The RI MRC was tasked with developing and implementing an H1N1 training and competency course for their volunteers; recruiting and managing the volunteer staff and logistics for each clinic; providing medical control at each clinic with the use of a site supervisor (a licensed medical professional); and operating within the state health department’s Emergency Operations Center (EOC) during each clinic. As a result of this effort... 275 RI MRC volunteers vaccinated 122,000 students for an approximate 73% uptake rate... The school vaccination clinics proved to be a strong indicator of the successful partnership between the RI MRC unit, DMAT, and the Rhode Island State Health Department. With pre-established roles, responsibilities, and structure—the clinics ran smoothly and successfully.


MRC’s efforts were an integral part of Rhode Island achieving the highest overall H1N1 vaccination rate, 38.8%, in the country. In addition, Rhode Island led the country in vaccinating children and high-risk individuals. Nearly 85% (84.7%) of children were vaccinated compared to the national average of 36.8%. Almost 58% (57.5%) of people in high-risk groups were vaccinated compared to the national average of 33.2%. (Rhode Island Department of Health, 2010)


staff assigned to outreach work that can facilitate the participation of outreach workers/promotores in a LHD-sponsored community assessment, one is likely to tap into this community-oriented resource.
3.3. Managing Personnel and Resources

Exhibit 3.6 Student Volunteers: Applied Practice Example

The North Carolina Center for Public Health Preparedness, housed within the University of North Carolina Gillings School of Global Public Health has developed an excellent example of how public health graduate students can be utilized for a variety of functions through their “Team Epi-Aid” program. Through this program students have provided assistance to local and state public health entities in the areas of epidemiology, disease outbreak investigations, surveillance, rapid needs assessments following emergencies, and community health assessments and surveys. More information about Team Epi-Aid can be found here: http://nccphp.sph.unc.edu/teamepiaid/index.htm
Using Online Tools

Learning Objectives

By the end of this section of the SPIVA Toolkit, you should be able to:

• Identify at least two publicly available online data sources to effectively design community-based surveys;
• Describe at least four features to consider when choosing to use or purchase an online survey tool; and
• Discuss the purpose of a relational database management system and its use in managing and analyzing data.

There is an array of tools available online to assist us with data collection and analysis. A brief synopsis of some useful tools appears in the following section. Each of these tools corresponds to a certain stage in the survey design, data-collection, and data analysis process (Figure 4.1).

4.1 Using Community Health and Census Data

Having access to timely, accurate, and properly formatted data sets can be valuable to public health practitioners. The following tools are useful resources that can provide us with the background information necessary for effective survey design:
Chapter 4. Using Online Tools

- Community Health Data Sets
- United States Census Data
- Data.gov

4.1.1 Community Health Data Sets

On June 2, 2010, the Department of Health and Human Services (HHS) launched their Community Health Data initiative, with the goal of releasing more health data in formats that are accessible and easy to use. HHS is seeking to promote the creation of software applications that will make use of the data to produce more effective health outcomes. While this initiative is in its early stages at the time of this writing, it has the potential to become a useful resource to an array of public health practitioners. The HHS Community Health Data website can be found at: http://www.hhs.gov/open/datasets/communityhealthdata.html.

4.1.2 United States Census Data

The U.S. Census Bureau has information from a number of surveys, most notably the decennial census, available through its website, which can be found at: http://factfinder.census.gov/home/saff/main.html. Information from Census 2000 is searchable down to the city-block level by accessing the “Geography” section of the “Download Center.” Data from Census 2010 will be available beginning in April 2011. This tool can help users to access local population data to help inform preparedness and planning activities. It can be found online at: http://factfinder.census.gov/servlet/DCGeoSelectServlet?ds_name=DEC_2000_SF1_U

4.1.3 Data.gov: “Empowering People”

In May 2009, the Federal Chief Information Officer of the United States launched Data.gov “to increase public access to high value, machine readable data sets generated by the Executive Branch of the Federal Government.” Data.gov is the central repository for data sets being made available to the public as part of the Open Government Initiative. The website publishes data from a variety of federal agencies and promotes the development of software that takes advantage of these data. The website breaks data into three “catalogs”: the “Raw Data Catalog” provides users with access to information in machine-readable files such as .xml, .csv, and .kml formats that can be instantly viewed through different applications; the “Tools Catalog” provides users with a listing of data sets with links to tools...
4.2 Using Online Survey Tools

Commercial online survey tools such as SurveyMonkey, Zoomerang, and SurveyGizmo provide an easy way to implement electronic surveys. This type of survey may be used at a site with computers available for the public to use. It is also an increasingly convenient avenue by which to reach certain communities in their own homes at relatively low-cost.

There are several important features to consider when using an online survey tool, with cost being among the most important. The three online survey services listed above provide some functionality through their free versions. However, in order to access all of the features and not be limited in survey length or the number of responses,
one would have to purchase their services. The following is a list of other features to consider when choosing an online survey tool.[10]

- **Customization of Survey Appearance**: The ability to choose different templates and color patterns and incorporate your own fonts, images, and even videos.
- **Skip Logic**: The mechanism by which survey respondents are given the option to skip certain sections of a survey based on their responses.
- **Piping**: Piping refers to the ability for survey software to incorporate an answer from one question into questions that follow later in the survey.
- **Randomization**: Some survey tools will allow for the random ordering of survey questions in order to decrease the bias on the part of respondents due to question order.
- **Website Integration**: Certain survey tools will allow surveys and polls to be integrated directly into a user’s website.
- **Data Reports & Analysis**: Most services can produce simple reports summarizing survey responses and will allow for the exportation of data into other programs for further analysis. More advanced (i.e. expensive) services will provide more rigorous tools for analyzing and interpreting data.

Regardless of which software you choose to use, no service can replace the need for properly crafted questions and a well-thought-out survey design. Without the right questions aimed at appropriate respondents, the most expensive and elaborate services will be of very little use.

### 4.3 Using Relational Database Software

A relational database management system (RDBMS), or simply a “relational database” is a collection of data tables that are related to a unique list (usually individuals). A single table within a relational database resembles a simple spreadsheet, such as those created in Microsoft Excel. What a relational database does that a spreadsheet (or “flat file”) cannot, is link data from multiple tables so that users can understand relationships between the varying pieces of information that they have collected. When your data have complex relationships, a flat file may not be sufficient to easily add, delete, and summarize information from a data set. Instead, it is more desirable to use an RDBMS such as Microsoft Access or MySQL.

Creating a relational database to store your data can seem like a complex process, but it will ultimately save time and energy. Most relational database management systems make it easy to export your
4.5 Using EpiData Open Source Software

EpiData is a freely available, open source software program based on the old CDC Epi Info 6 (DOS version). EpiData is used to develop survey questionnaires for printing and rapid field deployment. The computer screen version of the questionnaire is automatically converted into a computer data entry form. Logic checks are easily added to improve accurate data entry. Finally, the accompanying EpiAnalysis package conducts basic analyses on the entered data. The EpiData module will simplify and operationalize the process from survey design, data collection, data entry, and analysis for non-epidemiologists.
More information about EpiData can be found at: http://www.epidata.dk/
References


Appendixes

A  Alameda County HWI Focus Group Guide
B  Survey Question Bank (English and Spanish)
C  Broome County, New York H1N1 Survey
D  Vaccine Clinic Survey Job Action Sheet