QUESTIONNAIRE USER'S GUIDE

OUTBREAK INVESTIGATION

Arthur L. Reingold's article "Outbreak Investigations--A Perspective" [1] provides an excellent synopsis of the procedures, challenges, and unique attributes of epidemiologic investigations of acute illness outbreaks. He characterizes the essential components of such investigations as "1) establish case definition(s); 2) confirm that cases are "real"; 3) establish the background rate of disease; 4) find cases, decide if there is an outbreak, define scope of the outbreak; 5) examine descriptive epidemiologic features of the cases; 6) generate hypotheses; 7) test hypotheses; 8) collect and test environmental samples; 9) implement control measures; and 10) interact with the press, inform the public."

The questionnaire developed by the Chicago Department of Public Health is intended for use in carrying out component 7 above. It is assumed that prior to using the questionnaire to collect quantitative dose-response data, local health department investigators will have conducted several fact-finding and/or hypothesis generating interviews. In other words, prior to conducting interviews with the questionnaire, investigators should verify that the circumstances in which the illnesses occurred meet the definition of an outbreak, determine what exposures the ill persons have in common, and define the population at risk. The questionnaire is intended for use in carrying out retrospective cohort studies of suspected foodborne disease outbreaks (i.e. the population at risk is well defined). In the scenario of a point-source outbreak linked to a single event, for example, investigators should obtain a list of exposed persons (e.g. attendees at a conference, invitees at a wedding, etc.) and also detailed information about activities held and foods served at the event. This information will be incorporated into the questions on the questionnaire. In essence, each food item (or activity considered to be a possible source of illness transmission) is a hypothesis to be tested using the questionnaire.

1. Reingold AL. Outbreak investigations – a perspective. *Emerg Infect Dis*. 1998;4(1):21-7.

QUESTIONNAIRE OVERVIEW

The questionnaire has been posted on this website in order to allow viewing and to stimulate dialog. Additionally, local health department officials may choose to download the questionnaire and revise it according to the attributes of a particular outbreak they are investigating.

The questionnaire is divided into five aspects: 1) Cover page; 2) Section A: Introduction and screening for illness; 3) Section B: Illness; 4) Section C: Food history; and 5) Section D: Demographics.

The questionnaire is formatted to make it easy to follow (e.g. fonts may appear larger than in other questionnaires), and to place as many related questions on a single page as possible (this helps avoid excessive page-turning). To save space, the wording of some questions is located at the tops of columns (see first page of Section B and first page of Section C).

Phrases highlighted or shaded in gray represent instructions or notes for the interviewer. This is a way of reminding and orienting the interviewer as he/she goes through the questions.

The questions are formatted so that an interviewer starts in the left-hand column, going in order by question number, then "follows" the arrows based on the response to the first question in the row. For example, see Section B, question 3. If the interviewee responds "yes" to having diarrhea or loose stools, the interviewer would follow the arrow that appears next to yes on the page, and proceed to ask questions 3a, 3b, 3c, and 3d. If, conversely, the response to question 3 were "no", the interviewer would skip down to question 4. (see questionnaire tips)

In Sections A- D, words and phrases that inherently need to be revised for use in an outbreak investigation are in Times New Roman font. In Section C, the entire food list (questions 1-24) must be revised based on the food item information obtained for a particular outbreak. However, for viewing purposes, these questions have been kept in Arial font.

The ordering of sections A-D was done purposefully. After verifying that the person being interviewed is part of the cohort of interest, the illness section is carried out first. This is because if an interviewer asks demographic or exposure questions initially, a respondent who has been ill may feel that the interviewer is not interested in his/her discomfort or difficulties. Some respondents may feel more inclined to comply with the rest of the interview, once they have had a chance to "tell their story".

Likewise, the demographics section appears last in the questionnaire because questions are asked about potentially sensitive topics (age, race, medications, underlying illness). A respondent may feel more comfortable about sharing personal information after he/she has had the benefit of hearing the extent of the entire interview, and knowing that the data are meant for addressing public health needs, rather than for marketing or other pursuits.

COVER PAGE

The cover page is for administrative information only. It does not contain any questions. The "ID" box at the top is where a questionnaire number or interviewee number can be written. (In outbreak investigations, it is advisable to assign each exposed person an identification number, so their questionnaire and data can be tracked and analyzed anonymously.) Writing the ID number on each page of the questionnaire ensures that the pages can be put back together in case a staple comes loose.

Interviewers should record the outcome of each attempt that is made to contact a respondent. This information is particularly important when it is necessary to re-assign questionnaires, and the new interviewer needs to know if previous calls have been made.

Prior to turning in questionnaires for review and analysis, interviewers are asked to report the status of the interview, and if the questionnaire was completed, the date of completion.

Contact information is found at the bottom of the cover page. A local health department may choose to detach this identifying information from the questionnaire when the investigation is complete.

SECTION A: INTRODUCTION AND SCREENING FOR ILLNESS

The questionnaire begins with an interviewer identifying him/herself, describing the intent of the call, the type of information sought, the use of the information, and the confidentiality of the information.

Interviewers should be trained to schedule a time to conduct the interview if the respondent is not currently available for the necessary amount of time, and to record this information on the cover page.

Because the lists obtained from event organizers often contain errors, question 1 is asked to verify that the respondent actually is among the individuals exposed in the incident under investigation. (If the response to question 1 is "no", an interviewer should verify that this person also did not consume any foods or drinks from the event. If the response to question 1a is "no", the interviewer should attempt to find out how this person's name came to appear on the list [e.g. invited but did not attend], confirm that no one else in the household attended the event, and then terminate the interview. If foods or drinks from the event were consumed, as leftovers, for example, the interviewer may proceed to question 3.)

A respondent's answer to question 2 often provides information that can be cross-referenced with a pre-obtained list. For example, a list of wedding invitees may only include the information "John Doe and guest." By asking question 2, interviewers will help put together a more complete, accurate list.

Question 3 is asked in order to screen those respondents who did not become ill. If the response is "yes", interviewers should proceed to the illness section. If it is "no", interviewers may skip to the food history section.

SECTION B: ILLNESS

The first page of Section B deals specifically with symptoms, including description, onset, duration, and severity. The second page is used to collect information about medical care sought, specimens submitted, medications prescribed, limitation of activities, and lost work. Illness data are of great importance in the early phases of interviewing because the etiologic agent may still not be known, and onset times and acute symptom severity and duration may be used to guide decisions about specimens to collect and which laboratory tests to pursue. Additionally, these data may subsequently be used in a variety of ways to define the severity of illness in a dose-response assessment.

When collecting symptom data, interviewers need to be versatile and attentive listeners. A respondent may feel more comfortable describing the intensity of her fever before talking about the frequency of her loose stools. For that reason, questions 1-10 are formatted to fit a single page, and the questions are ordered in such a way that an interviewer may guide the responses in a way that makes sense chronologically.

To facilitate interviewers helping respondents to report dates as correctly as possible, a calendar of the month(s) involved may be pasted (manually, prior to

photocopying questionnaires) into the blank space located to the right of questions 6a-8a.

The information in question 18 is obtained for the purpose of identifying 1) secondary cases such as household contacts who developed illness as a result of person-to-person rather than foodborne transmission; and 2) household contacts who work in sensitive occupations (e.g. food preparation) from whom further information or clearance specimens may be required.

SECTION C: FOOD HISTORY

This section allows investigators to collect data for testing hypotheses about the vehicle of transmission in the outbreak, as well as to obtain the data on the quantity of each food consumed or "dose", for subsequent use in assessing dose-response relationships.

Prior to asking about specific food exposures, the time of arrival and time of eating should be established (questions A, B, and B1). This information sometimes helps explain different attack rates for a single food at different points in time.

In the food listing, the first column has questions about whether or not the respondent ate or tasted any of a particular food. A respondent who answers "yes" to any food should be asked to estimate the amount that he/she ate.

The most important aspect of preparing Section C for a specific event is for investigators to ascertain the contents of the menu as exactly as possible during fact-finding and/or hypothesis generating interviews. Identifying the manner in which each item was served is also of great importance because it facilitates accurate recall of quantities consumed. So, if French bread is an item that was served, the questionnaire might have interviewers ask about the number of slices; likewise if a dish such as pasta salad was served, quantity might be

characterized as the number of bites. In general, it is preferable to specify a range of amounts that an interviewer can read. For example, a respondent may not be able to remember the number of celery stalks he ate; he may more easily recall that it was more than one but less than five stalks. By creating categories for quantity responses (rather than leaving these data fields "open-ended"), the data may be more easily analyzed, and recall bias may be reduced.

The large number of different kinds of drinks served at an event sometimes precludes standardized data collection for each of these items. One way of collecting this information in a less-standardized way is shown by question 25.

It is always possible that investigators have failed to identify all the foods served at an event by the time the questionnaire begins to be implemented. For that reason, question 26 asks for any other foods that the respondent remembers eating. If necessary, these items can be integrated immediately into the questionnaire, and the interviews may be reassigned with the revised questionnaire in order to capture these data.

Because leftover foods sometimes harbor the "smoking gun", or causative pathogen, in foodborne disease outbreaks, respondents should be asked if they have any leftovers. The intent of this question (question 27) is to identify and subsequently obtain leftover foods for microbiologic testing.

Question 28 is asked for the purpose of identifying a person who ate foods from the event, but did not attend. Most often, this scenario occurs when an attendee takes leftover foods home to a family member. Again, this information contributes to the list of the exposed cohort being complete and accurate.

SECTION D: DEMOGRAPHICS

In addition to questions on demographics, such as age, sex, occupation, and race, this section also calls for the collection of data on food allergies,

medications and treatments, and underlying illnesses. This information may be used to determine how susceptible an exposed person is to illness, or to particularly severe outcomes.