

# Community Assessment for Public Health Emergency Response (CASPER) Toolkit



**Centers for Disease Control and Prevention**

**National Center for Environmental Health**

**Division of Environmental Hazards and Health Effects**

**Health Studies Branch**



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For additional information, please contact:

Centers for Disease Control and Prevention

Division of Environmental Hazards and Health Effects

Health Studies Branch

4770 Buford Highway, MS F-57

Chamblee, GA 30341

Phone: + 1 770-488-3410

Fax: + 1 770-488-3450

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### **Primary Authors**

Tesfaye Bayleyegn, MD, Amy Wolkin, MSPH, Sara Vagi, PhD, Leslie Hausman, MPH, and Carlos Sanchez, MD.

### **Contributors**

Dahna Batts, MD, Walter Daley, DVM, Josephine Malilay, PhD, David Olson, PhD, Tanesha Goldwire, MS, and Lisa Bastin, MA.

### **Critical reviewers**

Will Service, David Zane, Eric Brenner, Karen Levin, Kim Shoaf, Wayne Enanoria, Miguel Cruz, Nicole Bradshaw-Jackson, Jianwu Chen, Mark Barnes, Nancy Mock, Richard Hopkins, Patrick Gardner, Danielle Stanek, Michael Drennon, Mark Smith, Shelby Bedwell, Tracy Haywood, Charles Woernle, Teresa Porter, and Marley "Bart" Crabtree.

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### **Disclaimer**

"The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention."

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## **1. Executive Summary**

Following any type of disaster, public health and emergency management professionals must be prepared to respond to and meet the needs of the affected public. The Community Assessment for Public Health Emergency Response (CASPER), also referred to as Rapid Need Assessment (RNA), Rapid Epidemiologic Assessment (REA), and Rapid Health Assessment (RHA), will assist public health practitioners and emergency management officials in determining the health status and basic needs of the affected community. Gathering information about health and basic need data by using valid statistical methods allows public health and emergency managers to prioritize their responses and to rationalize the distribution of resources.

Without accurate information or uniform guidelines, public health officials may make decisions based on impressions or opinions, which may not accurately reflect the needs of the entire community. This toolkit was developed as a guideline for field staff in conducting CASPER. It provides quantitative post-disaster assessment procedures that can identify the health status and basic needs such as food, water, and shelter of the affected population.

Personnel from any local, regional, state, or federal public health department, emergency management officials, academicians, or other disaster responders who need to assess household-level public health needs following a disaster may use this toolkit.

## 2. Background

Disasters are either naturally occurring or manmade, with destructive forces that can overwhelm a given region or community. They often require assistance and coordination of services from outside the affected community to address the myriad of effects and public health needs that disasters create (1). Disasters can cause significant infrastructure damage and devastating financial loss; they can pose a variety of health risks, including physical injuries, illnesses, potential disease outbreaks, and short- and long-term psychological effects. The destruction of homes, the damage to local infrastructure such as the water supply, electricity, and health facilities, and the interruption of services such as garbage pickup and social support will affect the well-being of a community (2).

In the early 1970s, field personnel pioneered the adaptation of traditional epidemiological techniques to simplified sampling techniques and disease surveillance methods (3). The Rapid Need Assessments (RNA) dates back to this era. Scientists in the World Health Organization's (WHO) Expanded Program on Immunization (EPI) and Smallpox Eradication Program experienced constraints (time and monetary costs) while using traditional epidemiological tools in the field in developing countries to assess the immunization status of communities and to identify needs (4). In the 1980s in the United States, the National Academy of Sciences' Advisory Committee on Health, Biomedical Research, and Development (ACHBRD) identified the sampling techniques and surveillance methods used in EPI to help provide reliable health information more quickly and at less cost than was possible by using traditional epidemiological methods (5). The literature of RNA expanded dramatically in the early 1990s after WHO published the nine protocols for best practices in rapid need assessments. In 1999, WHO revised and reissued its own RNA protocols for emergencies to address the absence of a common, standardized technical tool for needs assessment

following a disaster (6). In recent years, the RNA has been frequently used by emergency officials and public health responders for gathering information about the status of an affected population, particularly during emergency response (7). This assessment, which requires a scientific knowledge base, represents the first line of epidemiological response to most types of disasters and is a relatively inexpensive and practical tool in public health intelligence services (8).

The Division of Environmental Hazards and Health Effects, Health Studies Branch (DEHHE/HSB) at the Centers for Disease Control and Prevention (CDC) has been involved in national and international disaster response and need assessment programs since 1992. One of the main goals of DEHHE/HSB is to design and implement epidemiologic investigation to assess the health status and basic needs of a population affected by natural or manmade disasters. To meet these goals and to standardize the assessment procedures focusing on domestic (U.S.) disaster response, the DEHHE/HSB developed the CASPER toolkit. This effort is the first of its kind to fill the gap and to address the lessons learned from hurricane-related assessments in the United States and its territories.

To avoid confusion with other RNA such as “Environmental RNA” and the “Federal Emergency Management Agency’s RNA”, which focuses on the environment and infrastructures assessment following a disaster, we used the name “*Community Assessment for Public Health Emergency Response (CASPER)*” to describe the household-based need assessment. The CASPER toolkit provides guidelines on data collection tool development, methodology, sample selection, training, data collection, analysis, and report writing.

## **2.1. Objectives**

The main objective of the CASPER is to rapidly assess the present and potential health effects and basic needs for a population affected by a disaster. In addition, the information from the CASPER survey can improve response efforts, and aid planning for future disasters. To accomplish these goals, a solid definition of the geographic area of the affected population, careful survey design, and a timely conducted assessment are necessary.

## **2.2. When to conduct the CASPER**

Following a disaster, the local, state, regional emergency managers and health department officers may decide to initiate the CASPER when they deal with at least one of the following conditions:

- The effect of the disaster on the population is unknown;
- The health status and basics needs of the affected population are unknown;
- General concerns about specific groups or individuals (e.g., older adults, children, pregnant women) are present; or
- When response and recovery efforts need to be evaluated.

Once the decision to conduct the CASPER has been made, it should be initiated as soon as possible, with rapid completion, ideally in 72 hours or less. Assessments may be conducted in the first hours, days, weeks, or months after a disaster hits.

## **2.3. Conditions to consider before conducting the CASPER**

Before conducting the CASPER, public health officials should consider the following conditions and obtain detailed information about the assessment and planned activities:

1. Contact or meet local authorities to find out:

- Who requested the CASPER?
- How is the CASPER information going to be used?
- What is the goal of conducting the CASPER?
- Who needs to be involved at the local, state, and federal agencies?
- How will the CASPER fit into the Incident Management System structure?
- Are there any media or public concerns that need to be addressed?
- Are there any safety issues that would put the interviewers at risk in the field?
- Are there any other planned or recently conducted health assessments?
- How quickly are the results needed?
- When should the assessment be conducted?

2. Obtain information about the disaster type and affected geographic area:

- Acquire maps of the affected area.
- Acquire weather information (e.g., hurricane swaths, flooded areas).
- Obtain information from local responders or FEMA related to other assessments conducted (e.g., fly overs, area assessments).
- Obtain and assess recent census information to identify the demographic

characteristics of the affected population (e.g., number of people, housing units affected).

### 3. Assess the resources:

- What resources are needed?
  - How many interview teams are needed?
  - What types of expertise are required?
  - How much and what type of equipment is necessary?
- What are the available local resources?
  - Personnel
  - Transportation
  - Communication devices
  - GPS devices
  - Computer and internet access

### **3. Methodology**

This toolkit provides a general guideline for collecting information by using a standardized assessment of housing units in the area and the population affected by a disaster. On the basis of available resources and the timeline, the organization should decide whether using the CASPER is an appropriate sampling methodology. To simplify the assessment procedures and to provide the information more rapidly at less cost, the designers of the toolkit suggest using the following steps and sampling method to conduct the CASPER:

#### **3.1. Preparation**

- 3.1.1 Define the geographic area
- 3.1.2 Determine what type of sampling method to use in order to select:
  - 3.1.2.1. Clusters
  - 3.1.2.2. Households within each cluster
  - 3.1.2.3. One household member to respond for each household
- 3.1.3 Develop the data collection instrument
- 3.1.4 Develop the assessment tracking and referral form
- 3.1.5 Organize an assessment team
- 3.1.6. Provide training
- 3.1.7. Prepare supplies and assessment materials

### 3.1.1. Define the geographic area

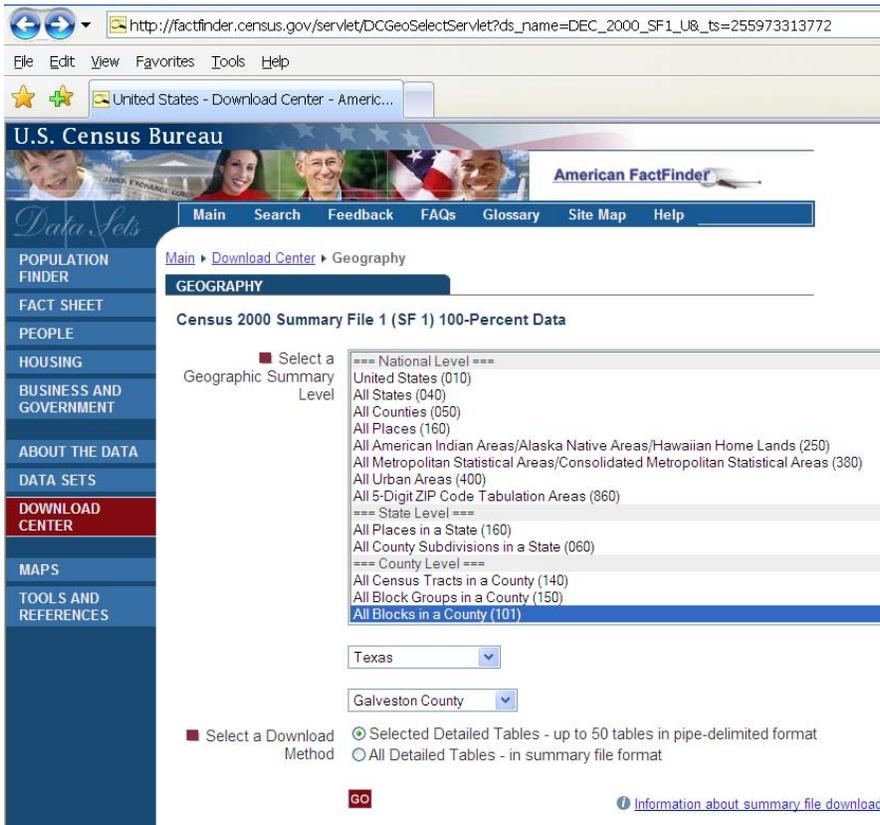
The geographic boundaries of the area affected by the disaster should be well defined before the CASPER can begin. This is usually done by the local official who requested the CASPER. The area of interest can be defined by political boundaries (e.g., a county, a district, a city), by geographic boundaries (e.g., houses in a specific direction from a landmark, such as a road or a river), or by use of a subpopulation of the affected area (e.g., only the most affected areas or those without local health services). One of the key assumptions of the CASPER methodology is that housing units in disaster areas are similarly affected, so you should try to limit rather than extend your sampling frame. If multiple areas with varying levels of damage are to be assessed, you should design separate assessments for each area.

Once you have a population of concern (sampling frame), you can divide into non-overlapping subpopulations (called *clusters*). Typically, the street block is used as the cluster that allows for the total number of units in each cluster to be counted by use of census data.

In the United States, once the geographic boundaries are determined, we can find detailed information of the area by using U.S. Census Bureau data (Figure 1); this tool contains Census 2000 information at the block level and is available for free at:

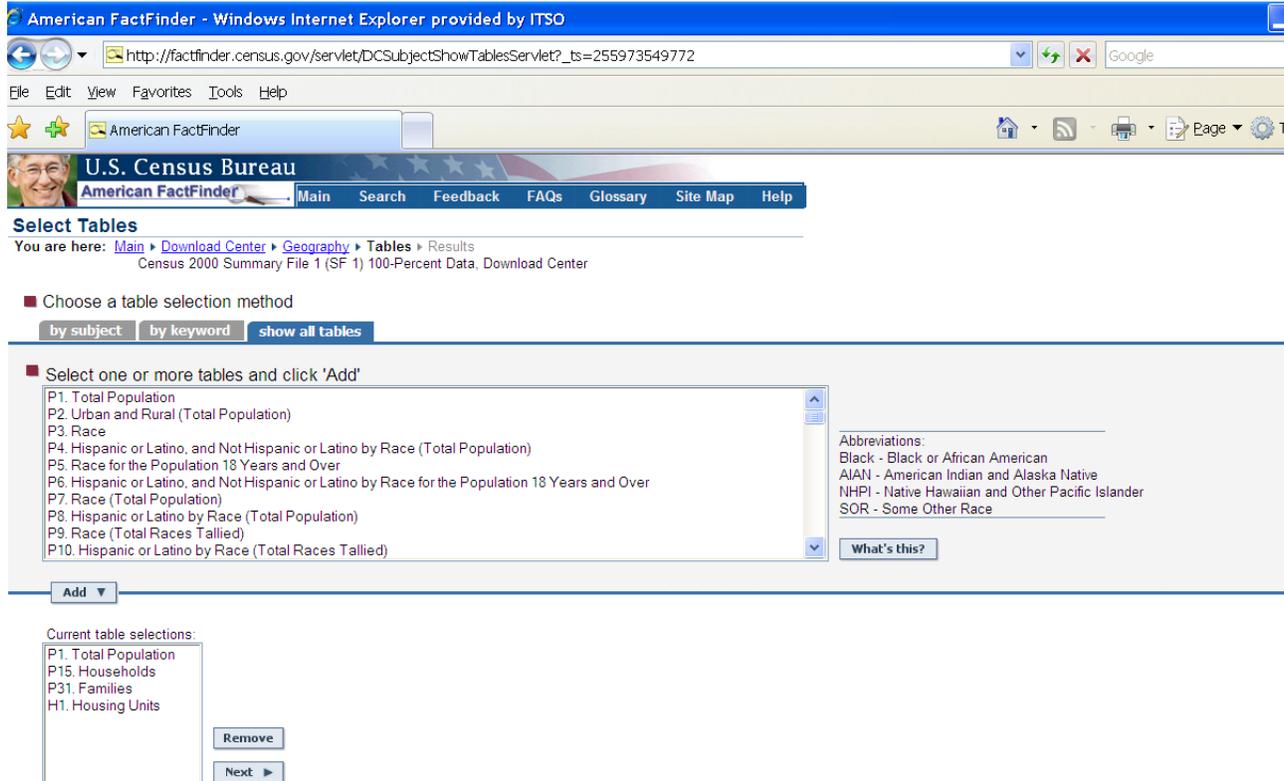
[http://factfinder.census.gov/servlet/DCGeoSelectServlet?ds\\_name=DEC\\_2000\\_SF1\\_U&ts=255973313772](http://factfinder.census.gov/servlet/DCGeoSelectServlet?ds_name=DEC_2000_SF1_U&ts=255973313772).

**Figure 1. U.S. Census Bureau—Census 2000 Summary File Web Page**



From this Web page, obtain the census block-level information (“All blocks in a County”) on the number of occupied housing units in the affected area (e.g., Texas, Galveston County) and click on the “GO” button. From the following page (Figure 2), determine the variable names and the location of the fields necessary to conduct the sampling (e.g., total population, households, and housing units), click “next,” and download the data files.

**Figure 2. Selected Geographic Locations and Variables—Galveston County, Texas (sample)**



### 3.1.2. Determine the proper sampling method

Conducting a census or completing a household unit assessment where information is collected from every household in a geographic area is rarely used to gather detailed information from large populations—it is extremely expensive, labor-intensive, and time-consuming. However, this method is useful for small target population. If the circumstances permit and assessing every housing unit is feasible, no sampling is necessary (9).

When conducting a complete census is not feasible, information from a sample of households is used to represent all the households in a geographic area. Using proper sampling methods is relatively quicker than a census and should include a representative sample of the eligible houses in

the affected area from which reasonable estimates can be made. The following conditions will determine when sampling is necessary:

- a. The affected disaster area is large.
- b. The total number of houses is large or dispersed.
- c. The number of interview teams and the resources are limited.
- d. Results are needed quickly, despite time constraints.

The CASPER sampling method is a multistage cluster design. Other sampling methods, such as simple random sampling, systematic sampling, and stratified sampling, can also be used in CASPER (10). However, these other methods require a list of every housing unit in the affected area and sample size calculations that may not be feasible in disaster situations; therefore, they are not suggested.

### **3.1.2.1. Cluster Sampling**

The cluster sampling methodology for the CASPER involves a two-stage sampling procedure. The first stage includes a sample of 30 clusters (census blocks) selected, with probability proportional to the estimated number of housing units. In the second stage, seven occupied housing units are randomly selected in each of the 30 clusters (census blocks) for conducting interviews (7–12). The CASPER sampling requires a list of all eligible units (in this case housing units) in the area to be assessed, and each unit must have the same probability of being selected. From the list of housing units (e.g., Table 1), you should randomly select 30, using a random number generator (<http://www.random.org/integers/>), or you can calculate a sampling interval by dividing the total housing unit by the number of clusters. Housing units should be randomly selected through their cumulative size by census block. In the following example, the variable HU\_CUM (in yellow) is

equal to the cumulative sum of housing units (variable “Occupied HOUSEING\_UNITS”) in each block. If housing unit #23 was selected randomly, census block #2055 will be selected, because it contains the three housing units from #22 to #24. Repeat the procedure until you have selected all 30 census blocks in your sample.

**Table 1. Selecting Clusters Using Occupied Housing Units Contained in Census Blocks**

(sample)

Geography (Block number, Block Group, Census Tract, County, and State)	Population	Families	Households	Occupied housing units	HU_Cum	Random numbers
Block 4015, Block Group 4, Census Tract 7012, Liberty County, Texas	9	2	2	3	3	
Block 4026, Block Group 4, Census Tract 7012, Liberty County, Texas	6	2	2	3	6	
Block 1005, Block Group 1, Census Tract 7013, Liberty County, Texas	5	2	3	3	9	
Block 1006, Block Group 1, Census Tract 7013, Liberty County, Texas	12	3	3	3	12	
Block 1010, Block Group 1, Census Tract 7013, Liberty County, Texas	11	3	3	3	15	
Block 2012, Block Group 2, Census Tract 7013, Liberty County, Texas	10	3	3	3	18	
Block 2025, Block Group 2, Census Tract 7013, Liberty County, Texas	5	2	2	3	21	
Block 2055, Block Group 2, Census Tract 7013, Liberty County, Texas	6	2	2	3	24	23
Block 3077, Block Group 3, Census Tract 7013, Liberty County, Texas	11	2	3	3	27	
Block 4059, Block Group 4, Census Tract 7013, Liberty County, Texas	3	1	2	3	30	
Block 4062, Block Group 4, Census Tract 7013, Liberty County, Texas	3	0	2	3	33	
Block 4069, Block Group 4, Census Tract 7013, Liberty County, Texas	7	2	3	3	36	
Block 1002, Block Group 1, Census Tract 7014, Liberty County, Texas	4	1	2	3	39	
Block 1007, Block Group 1, Census Tract 7014, Liberty County, Texas	7	2	3	3	42	

After selecting the 30 census blocks, you can map them, along with road names and landmarks.

You can create these maps by using the U.S. Census Bureau Web page. From the Web page

([http://factfinder.census.gov/servlet/CTGeoSearchByListServlet?ds\\_name=DEC\\_2000\\_SF1\\_U&lang=en&ts=246358442398](http://factfinder.census.gov/servlet/CTGeoSearchByListServlet?ds_name=DEC_2000_SF1_U&lang=en&ts=246358442398)), select the geographic information (block, state, county, census tract,

block group, and block number) and click the “Map It” button (see Figure 3). Repeat the procedure

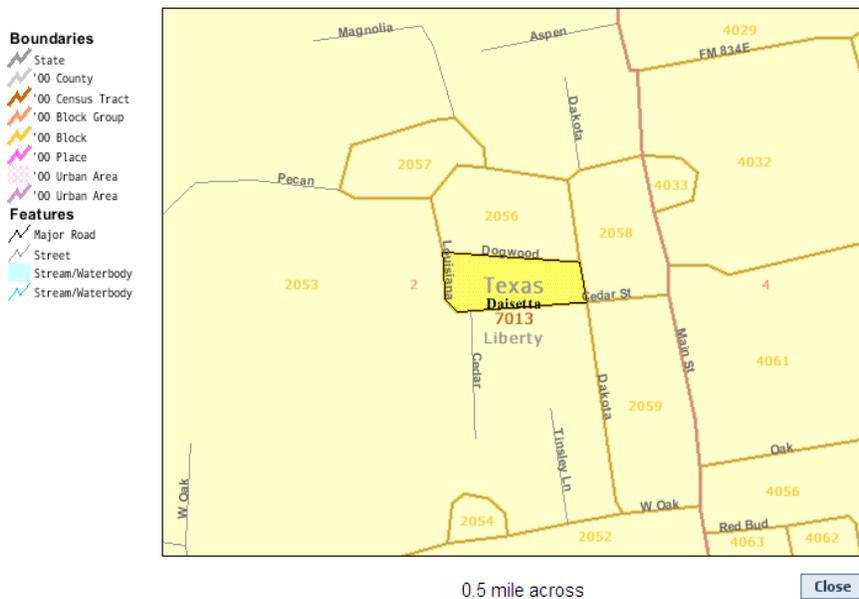
until you have completed the 30 clusters selected. Alternatively, you can use the ESRI's TIGER/Line data, which is available for free at:

[http://arcdata.esri.com/data/tiger2000/tiger\\_download.cfm](http://arcdata.esri.com/data/tiger2000/tiger_download.cfm) to download a shapefile containing the polygons of your area of concern and a map using the Geographic Information System (GIS).

**Figure 3. Mapping Selected Clusters by Using the U.S. Census Bureau Web Page**



Block 2055, Block Group 2, Census Tract 7013, Liberty County, Texas



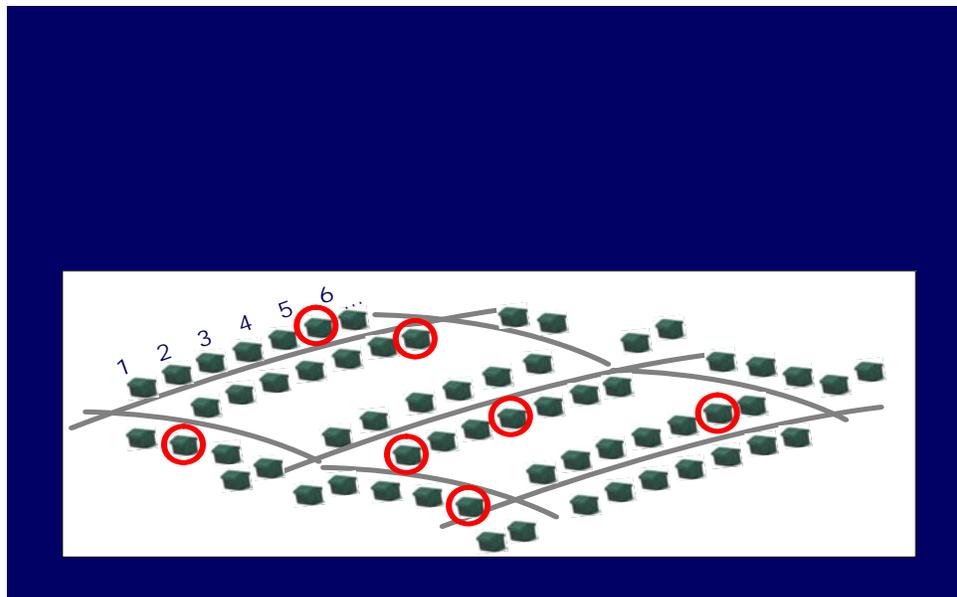
### 3.1.2.2. Housing unit sampling within clusters

The following three methods can be used to select the eligible housing units from sampled clusters. Despite the chosen method, there is no guarantee that the required number of housing units for interviews will be obtained.

First method: Create a complete list of housing units within the cluster and randomly select seven housing units (see Figure 4).

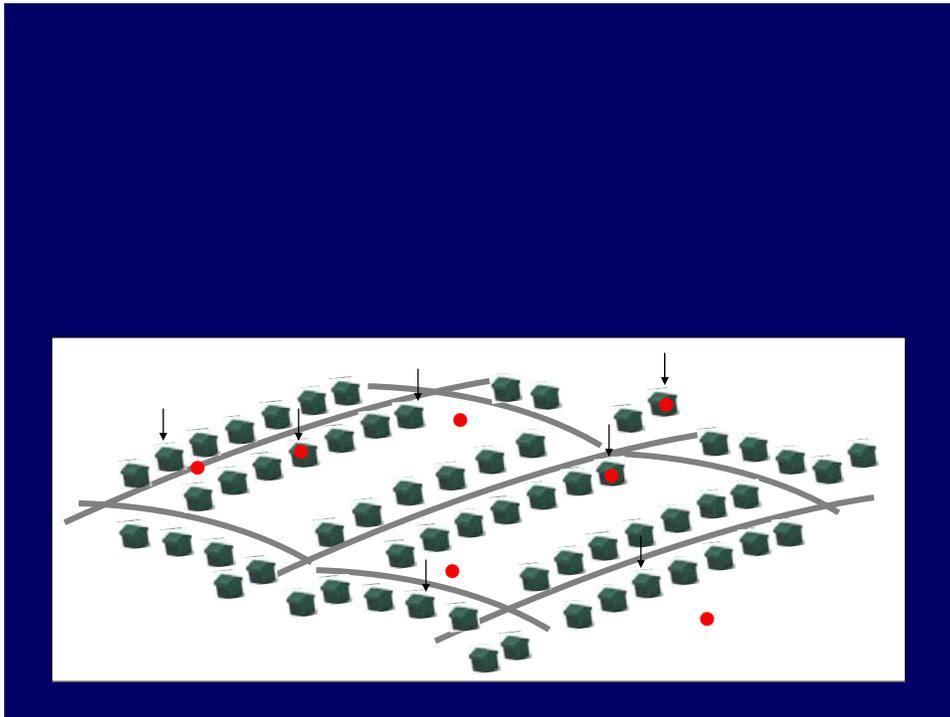
- a. Count all the housing units in the selected clusters.
- b. Number the housing unit from 1 to “N” and randomly select seven numbers.

**Figure 4. Selecting Housing Units for Interview by Using a Simple Random Sampling Method**



Second method: Identify seven random global positioning system (GPS) waypoints generated by using GIS and census data (Figure 5). If no home is located at the waypoint, assess the closest house to the waypoint.

**Figure 5. Random GPS Points Generated to Select the Seven Housing Units**

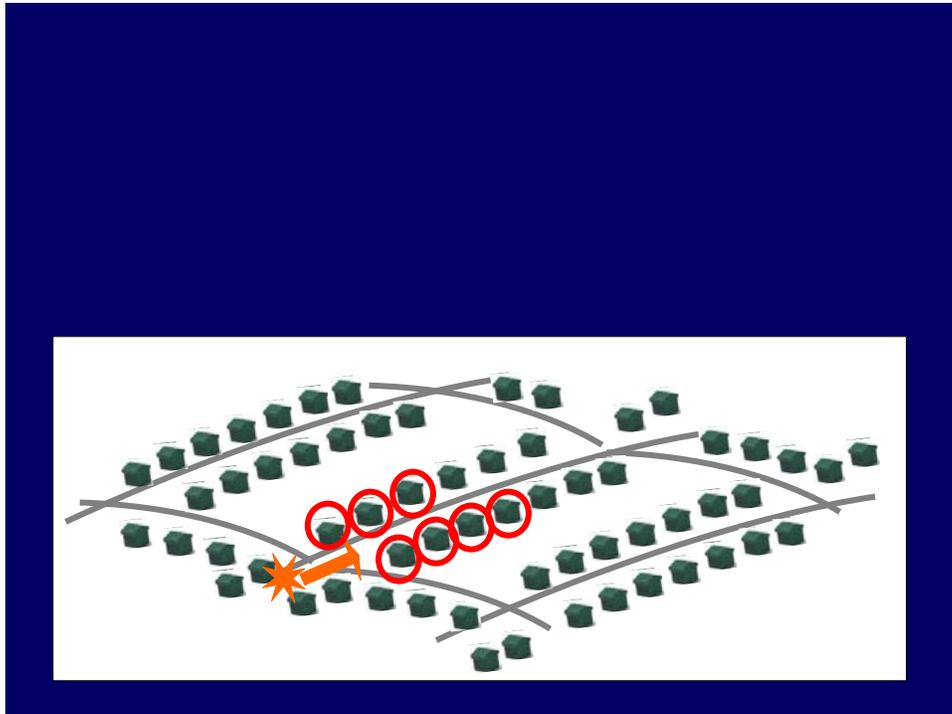


Third method: When the teams arrive at the selected cluster, follow these procedures by using the EPI method:

- 1) Go to the center of the selected cluster (see Figure 6).
- 2) Randomly choose a direction by spinning a bottle, pencil, or pen on the ground and note the direction in which it is pointed when it stops.
- 3) Walk in the direction indicated by the object and select the first house closest to the point where you are standing.

- 4) Continue the assessment by traveling to the home that is closest to the previous house interviewed and proceed in sequential order until seven housing units are selected in each cluster.

**Figure 6. Sequential Selection of Housing Units by Using the EPI Method**



### **3.1.2.3. How to choose eligible persons to interview**

The information obtained through CASPER is based on housing unit level. One eligible household member ( $\geq 18$  years of age) from the family speaks for all house members. There is no magic formula for choosing the eligible individual to interview in selected housing units. The interviewer should use his or her judgment when determining whom to interview. In general, any adult spokesman or spokeswoman, regardless of gender, race, ethnicity, or religion, is eligible to participate in the assessment. If more than one adult is present in the house, either can serve as the

spokesperson, or you can randomly choose between them (e.g., choose the person with the birth date closest to the assessment date). The interviewee should understand that he/she is to report on the entire household—not just on himself or herself.

### **3.1.3. Develop the data collection instrument**

Local authorities, subject matter experts, and other technical assistants should agree on the scope and nature of the key questions that the assessment will seek to answer. At the initial meeting of stakeholders, the team should finalize the key assessment questions and verify that the critical information needs will be met by the data collection instrument. CASPER sample questions and descriptions are provided in the questionnaire bank of this toolkit (see [Appendix A](#)).

In general, the data collection instrument in CASPER should be simple and short; it should avoid open-ended questions and request only information that will satisfy the objectives. The questionnaire should take no more than 10 minutes to complete and should be limited to one page.

The following lists the minimum that should be covered in the questionnaire (see [Appendix B](#) for an example of a questionnaire):

- Interviewer identification (initials)
- Location of the housing unit
- Demographics
- Housing unit type and extent of damage to the dwelling
- Household needs (i.e., first aid, food, water, ice, and medicine)
- Health status of the household members

In the CASPER survey, data are usually collected without personal identification information such as name, social security number, street address, and telephone number. Because confidentiality is a concern, collecting this information is not recommended. However, if this information is needed to address specific emergency issues, it should be provided on a separate form (see [Appendix C](#)) and handled confidentially by local authorities.

### 3.1.4. Develop the assessment tracking form

In addition to the assessment form, the interview teams should carry a tracking form to collect information about each visit to a housing unit (see [Appendix D](#)). For each visit, the interviewer should record the location (county), the cluster number, the interview team identification number, and the date.

The tracking form is used to monitor the outcome of every interview attempt. It is the basis for the assessment response and cooperation rate calculations. Response and cooperation rates can be calculated, respectively, by dividing the completed interviews by all units where contact was attempted and by dividing completed interviews by all housing units where contact was made.

<p><b>Response Rate</b> = <math>\frac{\text{Completed Interviews}}{\text{All housing units where contact was attempted, including non-contacts}}</math></p> <p><b>Cooperation Rate</b> = <math>\frac{\text{Completed Interviews}}{\text{All housing units where contact was made, including completed or partial interviews and refusals}}</math></p>
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Because situations such as evacuated homes can affect the response rate, the cooperation rate provides a more accurate reflection of the willingness of residents to participate in the interview.

### **3.1.5. Organize the assessment team**

For the 30 clusters-by seven-households design, eight to ten interview teams with two to three members each should be assembled, and a team leader for each interview team should be designated. Ideally, the interview team leader should be a public health professional with a similar background to the affected population and should be familiar with the disaster area. However, if a public health expert is unavailable, a team leader with previous experience in conducting community needs assessments and with site-specific skills in interviewing should be selected. The overall CASPER project (assessment team) lead, usually a subject matter expert, should decide the number of interviewers needed, weighing the advantages and disadvantages of a large assessment team versus a small one. The following chart lists some considerations for selecting the size of the assessment team.

## Assessment team size considerations

Small assessment team	Large assessment team
<ul style="list-style-type: none"> <li>• Finding a sufficient number of competent interviewers will be easier;</li> <li>• Fewer people will need to be trained;</li> <li>• Better coordination between interviewers may be achieved; and</li> <li>• Fewer vehicles and equipment will be needed.</li> </ul>	<ul style="list-style-type: none"> <li>• More people will need to be trained in assessment methods;</li> <li>• More people need to obtain field experience;</li> <li>• Can foster broad participation and involvement of more organizations; and</li> <li>• Data collection will be completed in less time.</li> </ul>

During the CASPER, having a variety of experts on each interview team will provide various insights and opinions about issues and questions related to the assessment. Teams can include epidemiologists, local and state health department staff, students from local schools of public health, nursing students, volunteers, and/or other health professionals.

Once the assessment team is assembled, an initial meeting should be held to introduce members to one another so that they can become familiar with each other’s roles and skills and can exchange contact information. Some team members will have little or no prior experience in CASPER, and some will have no knowledge of federal, state, and local health operations during a disaster.

### **3.1.6. Provide training**

Training the interview teams is one of the most important aspects of conducting a quality assessment. Inaccurately collecting or reporting data can jeopardize assessment results and misrepresent the prevalence of disease and the extent of resources in the affected community. Therefore, an interview team must be well-trained in order to conduct accurate and precise assessments. The team members should be briefed on and understand the objectives and principles of the CASPER and the possible interventions that could be implemented as a result of the assessment. Training a CASPER interviewer usually takes 4 to 6 hours. The training can be scheduled one day in advance of the assessment or in the morning hours on the first day of the assessment. At the end of the training, each interviewer should be thoroughly familiar with the data collection instrument and the information being elicited by each question. To achieve this goal, the training should cover the background of the event and an overview, objective, and methodology of the assessment (see [Appendix E](#) for a sample agenda).

### **3.1.7. Prepare supplies and assessment materials**

CASPER data collection can be performed by using a paper form data collection instrument or electronically by using a Personal Digital Assistant (PDA) or tablet personal computer. For data entry and analysis, different statistical software can be used. For example, Epi Info™ is a software package that can be downloaded free of charge at <http://www.cdc.gov/epiinfo/>. As an alternative, a copy of the software on disk can be obtained by sending a letter to the Centers for Disease Control and Prevention, Coordinating Center for Health Information and Service, 1600 Clifton Road, MS E-92, Atlanta, GA 30333.

In general, having the following resources is optimal for conducting the CASPER:

- Qualified personnel;
  - Those who have had field experience in interviewing people are preferred.
- Computers;
  - Laptops that have a minimum of 256 MG of memory, run on Windows 98, 2000, XP, or Vista operating systems, and are loaded with Epi Info™, SAS, or other statistical software.
- Fast and reliable Internet access;
- Standard software for data cleaning;
- PDA and GPS devices;
- Hard copies of the data collection form;
  - Enough copies of the data collection form to complete the work with a minimum of three extra copies per packet per team. If the assessment is planned for two or three districts or counties, printing the forms in different colors will help to identify each assessment and ultimately minimize human errors; and
  - A copy of the assessment tracking form for each team to document non-responses or people who were not at home at the time of the assessment.
- Commercial maps of the area;
- Consent forms;
  - Prepare a written consent form to be read before conducting the actual assessment. The form should include the right to accept or reject some or all of the questions (see [Appendix F](#) for a sample consent form).
- Authorization from the local or state health department;

- Obtain a letter of permission to conduct the assessment from local authorities. The letter should state the objective of the assessment and request the cooperation of the community. Each interview team should carry a copy of this letter.
- Temporary identification badge (e.g., name tag).
- Office supplies (e.g., paper, pens, pencils, clipboards);
- Referral information, fact sheets, and other health information handouts for respondents and other community members;
- Access to a photocopier machine and a printer;
- Transportation;
  - Each interview team should have at least one vehicle; a driver who is familiar with the area and its regulations is preferred.
- Food and water for team members;
- One emergency kit per vehicle; and
- Wireless communication channels and devices (e.g., cell phone, radio).

### **3. 2. Conducting the assessment**

The face-to-face interview is the only feasible method to do the CASPER following any type of disaster. Advantages include a high response rate and direct visual inspection of the disaster-affected area. Face-to-face interviews allow the interview team to distribute fact sheets and the contact information of resource distribution centers and clinics. This method also provides some degree of connection between the affected community and local and/or federal staff who can assist them.

#### **Items to consider when conducting the assessment**

- Is the team trained and ready for the assessment?
- What informational handouts will be distributed?
- What type of public health education materials could be distributed?
- What protocols should interview teams consider when responding to individual issues of affected communities during the assessment?

There are two options for collecting data: paper form or electronic form using advanced technologies (Figures 7 and 8) such as laptops or Personal Digital Assistants (PDAs) devices.

**Figure 7. Assessment Questionnaire in Paper Form** **Figure 8. Assessment Questionnaire in PDA**

Hurricane Ike Community Assessment for Public Health Emergency Response  
Questionnaire—Galveston, County, Texas, September 2008

Date: 09/30/2008	Cluster:	No of HUs in Cluster:	Survey No:	Interviewer initials:
Address:			Key: Y= Yes D/K= Don't Know N= No N/H= Never Had	
1. Type of Structure: <input type="checkbox"/> Single family house <input type="checkbox"/> Multiple unit (e.g., duplex, apartment) <input type="checkbox"/> Mobile home <input type="checkbox"/> Other: _____			10. Since the hurricane, is everybody in this house getting the medication they need? Y N DK If no, why? _____	
2. Since the hurricane, do you feel your home is safe to live in? Y N DK If no, why? _____			11. Is there anyone in the home who need special care (e.g., oxygen supply, dialysis or house health care)? Y N DK If yes, what? _____	
3. Since the hurricane, do you feel secure in your area? Y N DK If no, why? _____			12. Does anyone in the home currently require medical care? Y N DK	
4. How many people lived in this house before the hurricane? _____			13. Do you have running water? Y N DK NH If yes, source: <input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Well <input type="checkbox"/> DK	
5. How many people slept here last night? _____ a) How many are over 18 years of age _____ b) How many are 2 years or younger? _____ c) How many are 65 years or older? _____			14. Do you have safe drinking water? Y N DK NH If yes, source: <input type="checkbox"/> Well <input type="checkbox"/> Public <input type="checkbox"/> Bottled <input type="checkbox"/> No drinking water	
6. Was anyone in this house injured due to or since the hurricane? Y N DK If yes, what was the injury: _____ a) Cuts, abrasion, puncture wounds requiring medical attention? Y N DK b) Strain/sprain _____ c) Broken Bones: Y N DK d) Head injury: Y N DK e) Animal bites : Y N DK f) Other: _____			15. Do you have access to enough food for everyone in the house for the next three days? Y N DK NH	
7. Has everyone adults in the house had a tetanus shot in the last 10 years? Y N DK			16. Do you have a working toilet? Y N DK NH	
8. Since the hurricane, has there been any increase in insect bites/stings from any of the following? a) Mosquitoes Y N DK b) Ants Y N DK c) Bees or wasps Y N DK d) Other: Y N DK			17. Do you currently have electric power from the utility company? Y N DK NH	
9. Have any house members become ill due to/since the hurricane? Y N DK If yes, what did they have? _____ a) Nausea/stomach ache/diarrhea: Y N DK b) Sore throat/cold Y N DK c) Worsened chronic illness: Y N DK d) Other: _____			18. Are you using a generator? Y N DK NH If using a GENERATOR, where and how do you use it? <input type="checkbox"/> Indoors <input type="checkbox"/> Outside, but near an open door/window <input type="checkbox"/> Using open flame as a source of light when fueling <input type="checkbox"/> Other risky behavior: _____	
			19. Are you cooking on a charcoal or gas grill/ camp stove? Y N DK NH If using a GRILL/STOVE, where and how do you use it? <input type="checkbox"/> Indoors <input type="checkbox"/> Outside, but near an open door/window <input type="checkbox"/> Using open flame as a source of light when fueling <input type="checkbox"/> Other risky behavior: _____	
			20. Do you have working telephone? Y N DK NH	
			21. Do you currently have regular garbage pick-up? Y N DK NH	
			22. How did you get warning or other information before the hurricane? <input type="checkbox"/> TV <input type="checkbox"/> Neighbor, word of mouth <input type="checkbox"/> Radio <input type="checkbox"/> Internet <input type="checkbox"/> Newspaper <input type="checkbox"/> Other: _____	
			23. How did you get health advice or information after the hurricane? <input type="checkbox"/> TV <input type="checkbox"/> Neighbor, word of mouth <input type="checkbox"/> Radio <input type="checkbox"/> Internet <input type="checkbox"/> Newspaper <input type="checkbox"/> Other: _____	
			24. Finally, what is your greatest need at this moment? _____	

Data collection and management with paper forms can be a labor-intensive process because it involves an additional data entry step. Recent advances in small, handheld computer hardware and software allow for immediate data entry in the field. Entering data electronically at the same time it is being collected eliminates the need for manually entering written responses later in the assessment process. However, there are also limitations to collecting data by use of electronic forms.

**Table 2. Advantages and Disadvantages of Using Paper Forms Versus Electronic Forms**

	<b>Advantages</b>	<b>Disadvantages</b>
<b>Paper form</b>	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Requires little training</li> <li>• Does not require power source</li> <li>• Easy to fill out in field</li> </ul>	<ul style="list-style-type: none"> <li>• Additional data entry required</li> <li>• Forms not protected (e.g., rain)</li> <li>• Requires additional materials (e.g., clipboard, pen or pencil, copy machine)</li> <li>• Requires additional time, labor, and equipment to generate copies of paper forms</li> <li>• May introduce errors from the manual transfer of the data from the paper form to the database</li> </ul>
<b>Electronic form</b>	<ul style="list-style-type: none"> <li>• Electronic data transfer</li> <li>• No additional data entry required after data collection</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to purchase</li> <li>• Technical training required</li> <li>• Requires a power source</li> <li>• Maintenance and care (charging batteries) required</li> <li>• Units not protected from the elements, which may interfere with functionality or lead to costly damage</li> <li>• Requires more time to fill out</li> <li>• May limit number of field teams to the</li> </ul>

		availability of equipment
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During the assessment, the interview team leader should make the initial contact with the household and introduce the team. Team members should explain the purpose of gathering the information to the household's interviewee.

Despite all pre-field preparation, unexpected problems may arise. For example, the roads may be blocked or the area may be inaccessible due to a storm surge or private security. In other situations, the housing unit may be unoccupied. If so, ask the neighbors about that specific housing unit and document why the house is empty on the tracking form. Depending on the assessment protocol, unoccupied homes should be noted and skipped. If a house is skipped, the team can choose to revisit the home at a later hour or day (replacing a cluster or housing unit is not recommended). Other situations may involve safety threats such as downed power lines, unstable infrastructures, and stray or wild animals. The best way to tackle all of these problems is to:

- Be prepared as much as you can.**
- Be flexible and adjust your plan.**
- Be careful both in assessing the scene and using personal judgment.**

### 3.3. Analyze the data

#### Items to consider:

- How will the electronic format or database and the data entry be handled?
- How will data analysis be conducted?
- How will analyses be adjusted to reflect the complex sampling design?

For the CASPER, data collected by using the paper form should be entered into an electronic database by using software that is familiar, easily accessible, and maintainable. CDC recommends using Epi Info™ software, which is freely distributed and user-friendly. If using this software, provide Epi Info™ training for data entry staff so that they can become familiar with the program and can learn the proper techniques to ensure quality and accuracy when entering data.

For tutorials in setting up the database, entering data, and running the analyses, visit CDC's Web site at [ftp://ftp.cdc.gov/pub/Software/epi\\_info/EIHAT\\_WEB/EIHAT2.0.pdf](ftp://ftp.cdc.gov/pub/Software/epi_info/EIHAT_WEB/EIHAT2.0.pdf) and follow the Community Health Assessment Module.

In the CASPER, there are a few items we need to consider during the analysis. Because of the complex sampling design, data analyses must be adjusted to account for the lack of a simple random sample. Thus, each housing unit from which data was collected must be assigned a weight. After entering all of the data, add a variable called "WEIGHT" to the data set and assign it the following value:

$$\text{WEIGHT} = \frac{\text{(Total number of housing units in sampling frame)}}{\text{(number of housing units interviewed within cluster)} * \text{(number of clusters selected)}}$$

The sampling frame, a population of concern (referred to in the numerator), is defined as the entire geographic area in which CASPER is being conducted. Therefore, the numerator (total number of housing units in sampling frame) will be the same for every housing unit and will total the number of houses in the entire region being assessed by use of CASPER. This number can be found by following the steps outlined in section 3.1.2.1 and summing the column for “housing units.”

If sampling was 100% successful and information was obtained from exactly seven houses in exactly 30 clusters, the denominator will be  $7 * 30 = 210$  for every housing unit. However, obtaining a total of seven houses from each of the 30 clusters may not be possible. In that case, the denominator will be different for each housing unit, depending on the cluster from which the housing unit was selected. Every house in a cluster will have the same weight, but weights will differ between clusters. For example, if only five housing units successfully completed interviews in one of the 30 clusters, the denominator of the weight for each of the five houses in the cluster will be  $30 * 5 = 150$ . Further, if one of the 30 clusters was inaccessible or none of the housing units in that cluster successfully completed an interview, the denominator for all housing units in all the other clusters will be adjusted to  $29 * (\text{number of housing units selected within a cluster})$ .

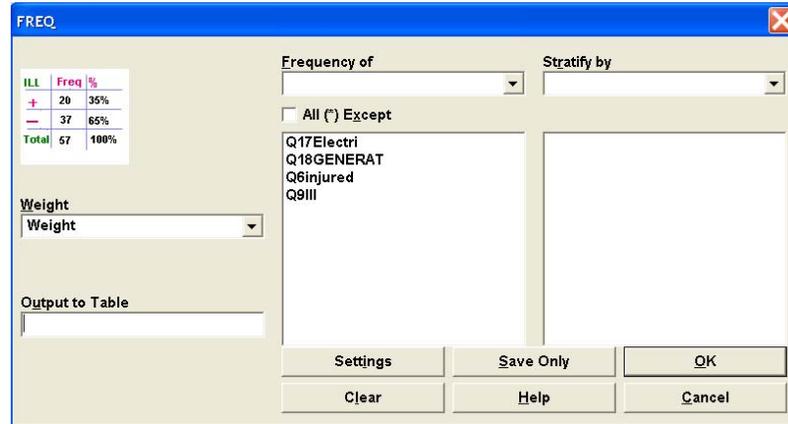
For example, in a CASPER conducted in Galveston County, Texas following Hurricane Ike, 26 clusters were selected, representing 27,701 housing units. The goal was to conduct 210 interviews, but only 146 were completed. Before the analysis, we completed the number of interviews per cluster column in the data set and assigned the “weight” for each house interviewed (see the highlighted areas in Table 3).

**Table 3. Sample Data Set Showing the Number of Interviews per Cluster and the Assigned Weight for Each House Interviewed**

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Date	County	Cluster	Complnterv	Weight	Q1Structur	Q2FeelSafe	Q3FeelSecu	Q4PeopleBe	Q5peoplel	Q5bYanger2	Q5b65OrOld	Q6injured
2	9/30/2008	Galveston	8	3	355.14	Single family	Yes	Yes		1	3	0	1 No
3	9/30/2008	Galveston	8	3	355.14	Single family	Yes	No		1	1	0	0 No
4	9/30/2008	Galveston	8	3	355.14	Single family	Yes	Yes		2	2	0	0 Yes
5	9/30/2008	Galveston	1	3	355.14	Multiple units	Yes	Yes		2	3	0	0 Yes
6	9/30/2008	Galveston	1	3	355.14	Single family	No	No		2	0	0	0 No
7	9/30/2008	Galveston	1	3	355.14	Single family	No	Yes		2	2	0	1 No
8	9/30/2008	Galveston	10	1	1065.42	Multiple units	Yes	Yes		1	1	0	0 No
9	9/30/2008	Galveston	11	4	266.36	Single family	Yes	No		3	1	0	0 No
10	9/30/2008	Galveston	11	4	266.36	Single family	Yes	Yes		1	2	0	0 No
11	9/30/2008	Galveston	11	4	266.36	Single family	Yes	Yes		3	2	0	0 No
12	9/30/2008	Galveston	11	4	266.36	Single family	Yes	Yes		1	1	0	1 No
13	9/30/2008	Galveston	12	2	532.71	Single family	Don't know	Yes		10	2	0	0 No
14	9/30/2008	Galveston	12	2	532.71	Single family	No	No		7	4	0	0 No
15	9/30/2008	Galveston	13	2	532.71	Single family	No	Yes		3	0	0	0 No
16	9/30/2008	Galveston	13	2	532.71	Multiple units	Yes	Yes		1	1	0	0 No
17	9/30/2008	Galveston	14	7	152.20	Single family	Yes	Yes		2	1	0	0 No
18	9/30/2008	Galveston	14	7	152.20	Single family	Yes	Yes		5	6	0	0 No
19	9/30/2008	Galveston	14	7	152.20	Single family	Yes	Yes		2	2	0	0 No
20	9/30/2008	Galveston	14	7	152.20	Single family	Yes	Yes		1	1	0	1 No
21	9/30/2008	Galveston	14	7	152.20	Multiple units	Yes	No		2	1	0	0 No
22	9/30/2008	Galveston	14	7	152.20	Single family	Yes	No		3	3	1	0 Yes
23	9/30/2008	Galveston	14	7	152.20	Single family	No	Yes		4	0	0	0 No

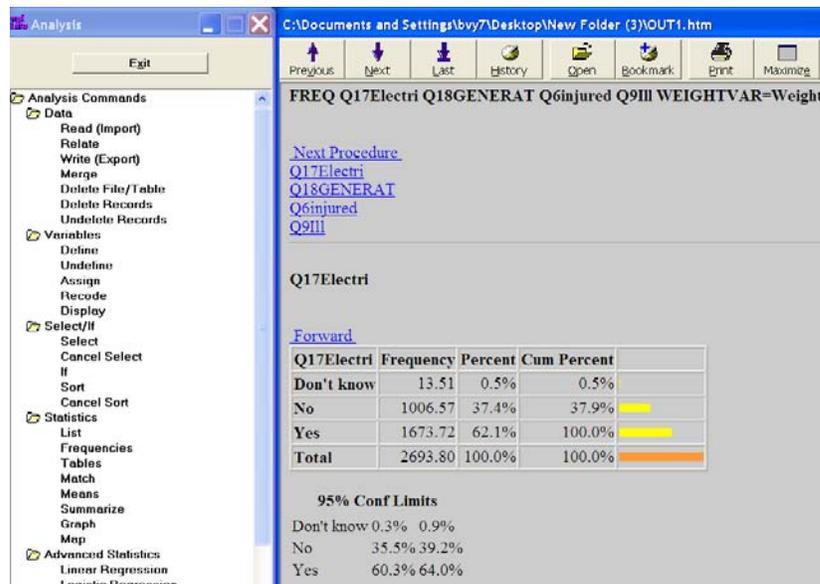
Frequencies can then be run for each of the interview questions. In Epi Info, read (import) the data file with the weight that was just created. Click on “Frequencies” in the “frequency of” box, select each variable for which you would like results, and in the “weight” box select the variable “WEIGHT” that was just created. Finally, click “OK” (see Figure 9) and a report will be generated providing the estimates.

**Figure 9. Epi Info Frequency Analysis Window Showing Four Selected Variables and Weight (sample data set)**



In the Epi Info output window (Figure 10), you can see the selected variables, followed by a table for each selection and the 95% confidence intervals. Save these output tables for preparing the reporting table or to fill the table shell.

**Figure 10. Epi Info Output Window Showing the Weighted Frequency of One of the Selected Variables (sample data)**



Keep in mind that running these frequencies without applying the appropriate weight will result in estimates of ONLY the housing units interviewed. Applying the weights when running analyses

provides estimates that can be generalized to every housing unit in the geographic boundary for which the CASPER is being conducted (Table 4). Both frequencies and percentages yielded from weighted analyses will be the best estimates of household needs of the population. However, the weighted analyses do not account for the changes in the number of households between the time of the census (in this case census 2000) and the time of the assessment. These changes could be due to growth or changes over time or to households that were evacuated or destroyed in the wake of the disaster. Also, remember that the unit of inquiry and analysis is the housing unit; thus, the numbers generated are the number of *housing units*, not *individuals* in the population.

**Table 4. The Weighted and Unweighted Frequencies of Generator Use Following Hurricane Ike, Galveston, Texas (sample data)**

Generator use	Unweighted frequencies		Weighted frequencies	
	Number of housing units interviewed	Percentage	Estimated number of housing units	Percentage
No	134	92	2434	90
Yes	11	8	260	10
Total	145	100	2694	100

### 3.4. Write the report

Consider the following before writing the report:

- Who will draft the written report?
- To whom should the assessment results be submitted?
- What action will be taken based upon the results?
- Who should implement the recommendations?
- How will feedback be generated?

Before writing the report, hold an overall team meeting to thank the assessment team members for their hard work and effort. Conducting a debriefing meeting will give all assessment team members the opportunity to discuss the strengths and weaknesses of the assessment and help to improve future ones (see [Appendix G](#) for sample debriefing agenda). In addition, this meeting will help the assessment team leader gather quantitative data and observational information, anecdotes, or concerns that were not captured in the data collection form. All of this information should be considered and included in the final report.

Written summaries of the results of the assessment require care and attention. Critically review the data and perform the necessary statistical calculations to produce estimates of the affected housing units. If appropriate, plot the results on graphs. This data will help policy makers or emergency personnel better understand the scope and the magnitude of the problem. On the basis of the findings, raising public awareness about specific problems or high-risk areas can lead to positive responses if the results are presented clearly and in a standard format. When conducting the

CASPER, aim to produce results quickly and accurately to prevent any delays in the intervention.

In general, the report should be available within 48 hours of the last day of data collection. To drive the results into action, plan on producing two reports: a preliminary one and a final one.

### **3.4.1. Preliminary report**

The preliminary report is a brief version of the final report. It contains the following information:

- Introduction;
  - Briefly describe the background of the disaster and the affected community.
- Aims and objectives of the assessment;
  - What do you hope to achieve and what are you trying to find out?
- Sample and methodology;
  - This section should describe the sampling scheme, unit of analysis, instruments, field process, number of interviewers, losses, refusals, and so forth. Describe the methodology section in the report in the simplest way so that it does not divert the attention of policy makers and emergency officers from the findings.
- Field work;
  - What questions were asked and how were they asked? You can begin to prepare the preliminary report before data collection commences or while you are still collecting data. Most sections of this brief report can be written as the CASPER progresses. Once the data are analyzed, add the estimates of each indicator.
- Major results;

- Select the main findings and recommendations that everyone should know. If the assessment is well planned and organized smoothly, the preliminary report could be prepared within 24 hours after the field work is complete.
- Include a qualitative report and the assessment team's observational impression of the community's needs and the environment. This report includes referrals that were made, anecdotal data, rumors, and community concerns that may not have been captured on the data collection form.
- Discussion and preliminary recommendations;
  - Summarize the major findings of the assessment. Clearly discuss the greatest needs and health issues following the disaster. Compare these data with pre-disaster data. Indicate what area or group should be targeted. In addition, describe the limitations of the assessment and both the use and interpretation of the data.
- Results presentation.
  - All stakeholders in the assessment who were involved in the planning, implementation, or analysis stages should be invited to a meeting to discuss the main findings, to determine the next steps, and to discuss priority needs. This interaction may heighten interest in the assessment results and lead to further analysis of the data. This meeting provides publicity that can contribute to the effective and widespread use of the assessment results and multiply the benefits of the assessment's efforts. Remember, presenting findings in a chart, graph or on map is more effective than using long tables.

A short summary is another form of an assessment report that may also be useful for reaching certain audiences, such as interviewers or others who provided support. A report could also be produced for community leaders about the services and problems identified, including the most important conclusions of the assessment analysis and a press release summarizing such conclusions. Preparing this press release can also ensure that the findings are reported correctly and that the results are not distorted.

Publishing the preliminary report may stimulate interest among federal, state, and local agencies, as well as among the press and the public, about their current health situation. Highlight where the biggest data gaps existed before the assessment was conducted and how these report results have contributed to more up-to-date information.

### **3.4.2. Final report**

The final report should be based on the preliminary report. Be sure to include the introduction, assessment method, and a discussion about the quality of the data produced (see [Appendix H](#)). Report the number of housing units sampled with incomplete questionnaires, indicating the reasons for non-response. In addition, include the limitations of the assessment, the recommendations for an appropriate action plan, and the acknowledgments for those who helped conduct the assessment and individuals and organizations who provided support.

The final report enables all readers to judge every aspect of the assessment operation and to evaluate for themselves the quality of the data and the results. This report is also the document that

state or local authorities will subsequently share with emergency operation centers, the unified command, and other agencies. Copies of the report should be given to all interested parties.

### **3.4.3. CASPER Example**

This section provides a brief summary of an event in which CASPER was used. The example presented below summarizes different aspects of the assessments conducted after Hurricane Ike in Texas. The experiences and lessons learned from this assessment underscore the adaptability of CASPER for different scenarios and situations.

#### **3.4.3.1. Hurricane in the United States**

##### **Community Assessment for Public Health Emergency Response after Hurricane Ike—Texas, September 25–30, 2008**

On September 13, 2008, Hurricane Ike (Ike), a category 2 storm with sustained winds of 110 mph, made landfall near Galveston, Texas. Ike resulted in an estimated 74 deaths statewide and extensive damage in many areas, including Liberty, Brazoria, and Galveston counties. On the basis of the information from local public health and elected and emergency management officials, The Texas Department of State Health Services (DSHS) identified the cities of Liberty (Liberty County population 8,033), Manvel (Brazoria County population 3,046), and Galveston (Galveston County population 57,247) as being severely affected areas (Figure 1). DSHS staff asked the U.S. Public Health Service Applied Public Health Team (APHT) 3 and CDC for assistance in performing community assessments for public health emergency response (CASPER) to assess the most important public health needs in these cities. Assessment teams

approached nearly 1,000 homes, interviewed almost 500 people, and notified local authorities about specific health needs (e.g., prescription medicines) or urgent needs (e.g., shelter). More than 95% of the households in the Liberty and Manvel communities were receiving utility services, and the residents felt safe. However, in Galveston 16 days after the storm, almost half of households had no power and felt unsafe. General conclusions underscored the need for quickly restoring, trash and debris removal services, housing, vector control, and the potential need for the tetanus vaccine. On the basis of these findings, recommendations were provided to local authorities to assist their disaster response to Ike. This report summarizes the findings from these three community assessments in Texas.

The objective was to provide information about the impact of the hurricane and to identify the most important public health needs of the affected community, as reported by the people currently living in the area. In each city, a multistage cluster sampling methodology was used. With a probability-proportionate-to-size methodology, 30 census blocks (clusters) were selected in each community and seven households were randomly selected from each cluster to interview. The clusters were representative of housing units numbering 2,764 in Liberty, 1,118 in Manvel, and 27,071 in Galveston.

Printed street maps of clusters were provided to 10 two-person teams, each team consisting of one member from TDSHS and one from APHT-3. The first household to be assessed in each cluster was selected by use of a random number generator sheet. Teams moved sequentially and attempted to complete seven interviews per cluster, an overall

goal of 210 interviews.

A one-page data collection instrument that included questions regarding type of housing, safety (e.g., damaged and unsecured house or looting), utilities, generator use, and greatest household need was developed onsite by the state epidemiologist, epidemiology response team members, and local health officials. In addition, information was obtained on hurricane-associated injuries, illnesses, or medical care and tetanus immunization status. CDC personnel trained assessment teams. Interviews were conducted during the day, and non-responding households were not revisited. Epi Info 2003 was used for data entry and for calculation of the weighted and unweighted frequencies. In addition to collecting information on household needs, assessment teams distributed public health and relief agency telephone numbers and educational materials regarding mold, carbon monoxide poisoning, mosquitoes, and other hurricane-related health concerns. When immediate needs pertaining to public health and general assistance (e.g., debris cleanup) were identified, assessment teams completed referral forms that were forwarded to local public health or emergency management officials for further action.

Despite these efforts, there were low response rates in the three counties assessed. The main reason for the lack of response was that there was no one present at the time of the visit (See the preliminary findings, tables, and figures to follow.)

**Liberty (Liberty County).** Assessment teams approached 337 households in Liberty County on September 25, 2008 and completed 157 assessments (response rate 47%).

Most of the housing units visited were single-family. Approximately 83% of households reported their residence was safe to inhabit and 94% felt secure in the area (see Table 5). Roof damage (33%) and mold (14%) were the most common reasons given for not feeling safe. At the time of the assessment, which was conducted 12 days post-landfall, most housing unit occupants had access to food (93%), running (98%) and drinking water (96%), sewage (96%), and electricity (98%). A quarter (25%) of those interviewed reported household members becoming ill since the hurricane; half reported flu-like symptoms such as sore throat, acute sinusitis, and allergies. Only 5% of the households reported an injury since the hurricane. The most common injuries were cuts and abrasions. More than a third (36%) of the households reported an adult not having a tetanus shot within the last 10 years. Approximately 88% of the households reported an increase in mosquito bites since the hurricane.

**Manvel (Brazoria County).** Assessment teams approached 273 households in Manvel County on September 26, 2008 and completed 151 assessments (response rate 55%). Nearly 25% of housing units surveyed were mobile homes, and approximately 91% of all households reported feeling that their residences were safe to inhabit. Roof damage was the main concern for those who did not feel safe in their homes. Despite initial hardship in the disaster's aftermath, most housing unit occupants had access to food (95%), running (97%) and drinking (98%) water, sewage (98%), and electricity (97%). Only 20% of households surveyed reported that members had become ill since the hurricane; one-third reported flu-like symptoms such as sore throat and acute sinusitis and allergies, while another third reported stomach ache. Only 9% of those interviewed reported a

household member being injured due to or since the hurricane. About half of these injuries were cuts and abrasions (i.e., by chainsaw, nail, screwdriver) during clean-up. Approximately 44% of the households reported an adult not having a tetanus shot within the last 10 years. Regarding access to communication, 74% reported receiving warnings and other hurricane-related information from the television before the hurricane, a figure that dropped to 63% after the hurricane.

**Galveston (Galveston County).** On September 30, 2008, assessment teams approached 384 households and completed 146 assessments (response rate 38%). Most of the housing units visited were single family (56.2%). Less than half (47%) of the household occupants reported feeling that their residences were safe to inhabit and approximately 69% felt secure in their area. Mold, roof, structural damage, and no electricity were the main concerns for those who did not feel safe in their homes. Slightly more than half had electricity (54%) or regular garbage collection (52%). More than a quarter (27%) of those interviewed reported household members becoming ill since the hurricane; about 16% of the households reported an injury since the hurricane. More than a quarter (27%) of the households reported an adult not having a tetanus shot within the last 10 years. Regarding access to communications, 81% reported receiving warnings and other hurricane-related information from the television before the hurricane, a figure that dropped to 45% after the hurricane.

***Editorial Note:***

Post-Ike, the CASPERs identified the public health needs in three Texas communities.

Specific reports were prepared for each community, but general conclusions underscored the need for quickly restoring electricity, addressing safety concerns, trash and debris removal services, housing, vector control (mosquito), and the potential need for the tetanus vaccine. In addition, preliminary findings suggested that a combination of TV and radio avenues were needed to disseminate public health advisories and messages.

The findings are subject to at least two limitations. First, residents of evacuated or destroyed homes were unavailable and could not be included in the assessment, a fact that likely resulted in underestimated overall public health needs. Second, homes that might have been occupied but were inaccessible because of safety concerns of assessment teams (e.g., dogs, locked fences) also were not included in the assessment.

Following a disaster, conducting a CASPER is important to identify the critical needs and health concerns of the affected community. Information obtained through community assessment for public health emergency is used by decision-makers to identify where to provide immediate services and how to plan for future post-disaster relief services. A modified cluster sampling method used in CASPER estimates both the percentage of the population and the number of households with a particular need. In addition, the assessments reassure residents that they are not being forgotten, and such assessments elevate the visibility of public health in the community following a disaster. However,

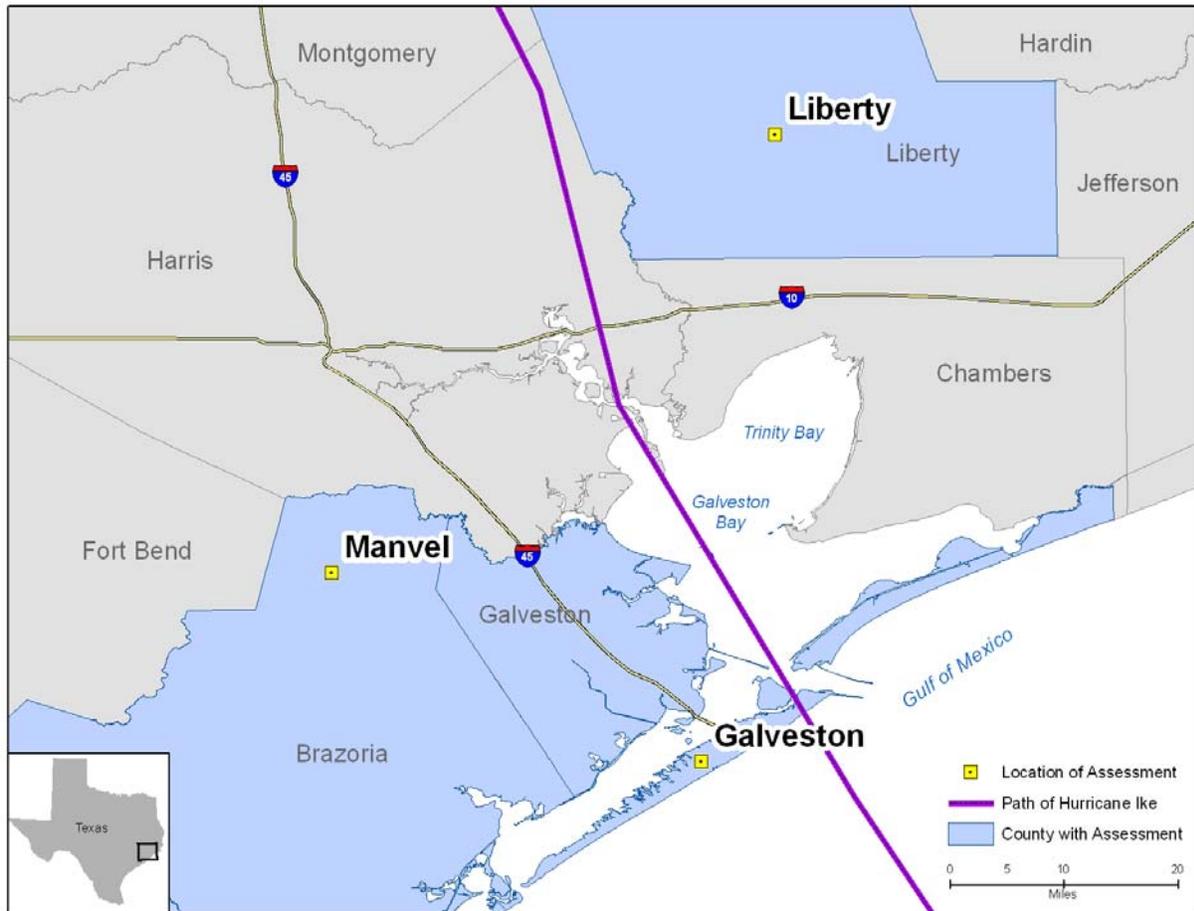
follow-up assessments should be performed to ensure that identified needs have been addressed and to measure efforts to restore services and otherwise respond effectively.

The CASPER conducted following Hurricane Ike provided critical information to local authorities and DSHS about the needs and the health status of the affected communities. DSHS shared the results with local officials, who used them to assist their response to the disaster. For example, as follow-up action to the assessment in Galveston, the Galveston County Health District developed a one-page flyer for the community; 6,000 copies were distributed within a week of the assessment. The flyer consisted of quick reference information (which included contact numbers) such as vaccination sites, boil-water notices, mosquito prevention, the garbage collection schedule, mental health, and utilities. DSHS will use the experience gained during Ike to increase its ability to respond effectively and to build its capacity in Texas to conduct the CASPER in future disasters.

**Table 5. Number and Percentage of Households Reporting Selected Characteristics after Hurricane Ike by Community (County) in Texas, September 25–30, 2008**

Characteristic	Liberty (Liberty County)		Manvel (Brazoria County)		Galveston (Galveston County)	
	% of households (N=157)	No. of households <i>Projected*</i>	% of households (N=151)	No. of households <i>Projected*</i>	% of households (N=146)	No. of households <i>Projected*</i>
<b>Household structure type</b>						
Single-family house	64.5	1602	74.2	829	56.2	15204
Mobile home	15.6	387	24.5	274	0.0	0
Multiple unit	19.1	475	1.3	15	43.8	11867
<b>Perceptions of safety</b>						
Residence is safe to live	83.4	2306	90.7	1014	47.3	12794
Feel secure in the area	94.3	2605	86.1	963	69.9	18913
<b>Household utilities</b>						
Running water	98.1	2694	97.4	1088	92.4	24846
Electricity	98.1	2694	97.4	1088	54.5	14648
Working toilet	96.1	2588	98.7	1088	90.3	24290
Working telephone	89.1	2447	98.0	1096	71.0	19098
Regular garbage collection	89.0	2430	94.7	1059	52.4	14092
<b>Food and water</b>						
Food for 3 days	92.9	2552	95.3	1059	93.8	25217
Safe drinking water	96.2	2641	98.0	1096	91.7	24661
<b>Healthcare</b>						
Ill/household	25.0	687	19.9	222	26.7	7231
Injury/household	5.2	140	8.6	96	15.8	4265
Able to get medication	88.2	2477	96.7	1074	86.3	23363
Able to get medical care	92.3	2536	89.9	992		
No tetanus shot within last 10 years	35.9	986	43.7	489	26.7	7231
<b>Other</b>						
Increase in mosquitoes	88.5	2430	78.0	866	63.7	17244

**Figure 11. Map of the Assessment Area (Liberty, Manvel, and Galveston Counties) and the Hurricane Ike Path.**



*Source: Texas Department of State Health Services and the National Oceanic and Atmospheric Administration, National Hurricane Center, November 2008*

#### **4. CDC support**

The Division of Environmental Hazards and Health Effects, Health Studies Branch at CDC is available by e-mail, telephone, or fax and can provide technical assistance in the following areas:

- expertise in CASPER;
- short-term training on CASPER;
- assistance in sampling method and analysis;
- expertise and logistical support in GPS and PDA use; and
- assistance in data collection during a disaster event.

**To contact the Health Studies Branch/DEHHE, please call, e-mail, or fax:**

Centers for Disease Control and Prevention

National Center for Environmental Health, Division of Environmental Hazards and Health Effects

4770 Buford Highway, NE

MS F-57

Atlanta, Georgia 30341

USA

Voice: 770 + 488-3410

Fax: + 1-770-488-3450

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## Appendix A: Questionnaire Bank

The purpose of the questionnaire bank is to provide possible inquiries for CASPER. Depending on the specifics of the event, you could choose from the following questions or develop event-specific ones by using the following format as a template to develop your own survey.

<b>Identification, physical location, and demographics</b>			
<b>Question</b>	<b>Code Type</b>	<b>Code Choice</b>	<b>Suggested Variable Name</b>
<b>Q1.</b> Date:	Date (MM/DD/YY)	Open answer	Date
<b>Q2.</b> Interviewer base ID:	Text	Open answer	BID
<b>Q3.</b> Team ID:	Text	Open answer	TID
<b>Q4.</b> City:	Text	Open answer	City
<b>Q5.</b> County:	Text	Open answer	County
<b>Q6.</b> Cluster:	Numeric (## )	Open answer	Cluster
<b>Q7.</b> Blocks:	##	Open answer	Blocks
<b>Q8.</b> Latitude:	##	Open answer	LAT
<b>Q9.</b> Longitude:	##	Open answer	LONG
<b>Q10.</b> How many people lived in your household before the event? ( <i>name the event, e.g., “Hurricane Katrina.”</i> )	##	Open answer	PBEFORE
<b>Q11.</b> How many in your household were children less than 2 years old?	##	Open answer	PB_LT2
<b>Q12.</b> <i>If one or more</i> children live in the	Text	1=Yes 2=No 99=DK	KIDSUPPLY

household, do you have access to enough diapers and formula for 3 days (if needed)?			
<b>Q13.</b> How many in your household were children 2–17 years old?	##	Open answer	PB_2TO17
<b>Q14.</b> Were any of the children enrolled in schools in the neighborhood?	##	1=Yes 2=No 99=DK	PB_SCHOOL
<b>Q15.</b> How many in your household were 65 years of age or older?	##	Open answer	PB_65
<b>Q16.</b> Is anyone in your household pregnant? If so, how many are pregnant?	##	Open answer	PB_PREG
<b>Q17.</b> How many people slept here last night?	##	Open answer	SLEPT
<b>Q18.</b> <i>If none</i> , where did you stay?	Text	1=Shelter 2=Special needs shelter 3=Hotel/motel 4=Family/friend’s home 88=Other, specify _____	STAY STAY_TXT
<b>Q19.</b> What are the ages of the people who slept here last night?	## ## ## ## ## ## ## ## (e.g., multiple numeric fields to enter two-digit ages; <1 year=0; 99+ years=99)		AGE1–AGE10
<b>Q20.</b> How many men slept here last night?	##	Open answer	S_MEN
<b>Q21.</b> How many women slept here last night?	##	Open answer	S_WOMEN
<b>Q22.</b> What are the ages and sex of each of	Collected in	AGE	MALE FEMALE MALEL

these people and have they returned to the home?	table. Note: insert an R or N to represent each person: R=Returned person, N=Person who has NOT returned.	<18 years			T18 FEMLT 18
		18–65 years			
		>65 years			MALE1 865 FEM186 5  MALEG T65 FEMGT 65
<b>Q23.</b> Are new people living with you in this home now?	Text	1=Yes 2=No 99=DK		NEWLIVE	
<b>Q24.</b> How many people from other homes were sheltered in this house last night?	##	Open answer		NUMSHELT	
<b>Q25.</b> Do you need childcare for anyone in the household?	Text	1=Yes 2=No 3=No children 99=DK		KIDCARE	
<b>Q26.</b> Does anyone in your household own a pet?	Text	1=Yes 2=No 99=DK		PET	
<b>Q27.</b> Is this the same residence you lived in before the storm?	Text	1=Yes 2=No 99=DK		SAMERES	
<b>Q28.</b> Do you own or rent this home?	Text	1=Own 2=Rent 88=Other, specify___		OWN  OWN_TXT	
<b>Q29.</b> Is this your primary residence?	Text	1=Yes 2=No 99=DK		PRIMRES	
<b>Q30.</b> Are you a year-round resident?	Text	1=Yes 2=No 99=DK		YRNDRES	
<b>Q31.</b> Did you evacuate your home?	Text	1=Yes 2=No 99=DK		EVACUATE	

<b>Q32.</b> <i>If yes</i> , what day did you evacuate your home?	##	MM/DD/YYYY	DAYEVAC
<b>Q33.</b> <i>If yes</i> , what day did you return (spend your first night back in your home)?	##	MM/DD/YYYY; 77/77/7777=Not yet returned	DAYRET
<b>Q34.</b> <i>If yes</i> , since you have returned, have you slept here most nights?	Text	1=Yes 2=No 99=DK	MOSTNITE
<b>Damage</b>			
<b>Q35.</b> What type of structure is this dwelling (as observed by interviewer)?	Text	1=Mobile home 2=Detached single-family house, non-mobile 3=2–5 Family units 4= $\geq$ 6 Family units 5=Migrant camp 88=Other	STRUCT
<b>Q36.</b> <i>If <math>\geq</math>2 family units are living in this dwelling</i> , what are the total numbers of floors in the building?	##	Open answer	TOTFLOOR
<b>Q37.</b> <i>If <math>\geq</math>2 family units are living in this dwelling</i> , what are the floor levels of the interviewed units?	##	Open answer	INTFLOOR
<b>Q38.</b> What is the primary type of construction of this dwelling (majority of exterior as	Text	1=Brick/stone 2=Siding (e.g., wood,	CONSTRUC CONS_TXT

observed by interviewer)?		aluminum, vinyl) 3=Stucco 88=Other, specify _____	
<b>Q39.</b> How many levels are above ground in this dwelling (as observed by interviewer)?	##	1=One 2=Two 3=More than two 88=Other, specify _____	LEVELS LEVL_TXT
<b>Q40.</b> Would you describe the damage to your home as:	Text	1=None or minimal 2=Damaged/habitable 3=Damaged/uninhabitable/ repairable 4=Damaged/uninhabitable/ destroyed	DAMAGE
<b>Q41.</b> <i>If damaged</i> , do you need a tarp?	Text	1=Yes 2=No 99=DK	TARP
<b>Q42.</b> Do you have insurance to cover cleanup?	Text	1=Yes 2=No 99=DK	INS_CLN
<b>Q43.</b> Do you have insurance to cover repair?	Text	1=Yes 2=No 99=DK	INS_REP
<b>Q44.</b> Do you need financial help to clean up your home?	Text	1=Yes 2=No 99=DK	FIN_CLN
<b>Q45.</b> Do you need financial help to repair your home?	Text	1=Yes 2=No 99=DK	FIN_REP
<b>Q46.</b> Do you need physical help to clean up	Text	1=Yes 2=No 99=DK	PHYS_CLN

your home?			
<b>Q47.</b> Do you need physical help to repair your home?	Text	1=Yes 2=No 99=DK	PHYS_REP
<b>Q48.</b> Have you noticed any increase in problems with rodents?	Text	1=Yes 2=No 99=DK	RODENT
<b>Q49.</b> Have you noticed any increase in problems with cockroaches?	Text	1=Yes 2=No 9=D K	ROACH
<b>Q50.</b> Does your family have the means (e.g., financial, physical) to clean up or repair your home?	Text	1=Yes 2=No 3=NA 99=DK	MEANS
<b>Q51.</b> How are you going to pay for cleanup or repair of your home?  <i>(mark all that apply):</i>			
a. FEMA	Text	1=Yes 2=No 99=DK	PAY_FEMA
b. Family/friends	Text	1=Yes 2=No 99=DK	PAY_FAM
c. Self	Text	1=Yes 2=No 99=DK	PAY_SELF
d. Insurance	Text	1=Yes 2=No 99=DK	PAY_INS
e. Loans	Text	1=Yes 2=No 99=DK	PAY_LOAN
f. Don't own it	Text	1=Yes 2=No 99=DK	PAY_DO
g. NA	Text	1=Yes 2=No 99=DK	PAY_NA
h. Other, specify  _____	Text	1=Yes 2=No 99=DK	PAY_OTH
	Text	Open text field	PAY_TXT
i. DK	Text	1=Yes 2=No 99=DK	PAY_DK
<b>Q52.</b> Do you feel the home is safe to live in?	Text	1=Yes 2=No 99=DK	LIVESAFE

<p><b>Q53. If no, why not? (mark all that apply):</b></p> <p>a. Structural hazards</p> <p>b. Surface dust</p> <p>c. Air quality</p> <p>d. Fear of further terrorism</p> <p>e. Other, specify _____</p>	<p>Text</p> <p>Text</p> <p>Text</p> <p>Text</p> <p>Text</p>	<p>1=Yes 2=No 99=DK</p>	<p>NS_STRUC</p> <p>NS_DUST</p> <p>NS_AIR</p> <p>NS_FEAR</p> <p>NS_OTH</p>
<p><b>Q54. If no, when do you expect this home to be safe to live in?</b></p>	<p>Text</p>	<p>1=Less than a month</p> <p>2=2–3 months</p> <p>3=3–6 months</p> <p>4=More than 6 months</p> <p>5=Never</p> <p>99=DK</p>	<p>WHENSAFE</p>
<p><b>Q55. Do you plan to stay in your home?</b></p>	<p>Text</p>	<p>1=Yes 2=No 99=DK</p>	<p>STAY</p>
<p><b>Q56. Where does your family expect to be living in a month?</b></p>	<p>Text</p>	<p>1=In this residence</p> <p>2=With family/friends in this state, but in a different residence</p> <p>3=With family/friends in another state</p> <p>4=Buy/rent different residence in state</p> <p>5=Buy/rent different residence outside state</p>	<p>LIVE1MO</p>

		6=Shelter 88=Other 99=DK	
<b>Utilities-general utilities/services</b>			
Prompt: <i>we would like to ask about the current status of your household utilities and services.</i>			
<b>Q57.</b> Do you currently have running water?	Text	1=Yes 2=No 99=DK	RUNWATER
<b>Q58.</b> Do you have a working indoor toilet?	Text	1=Yes 2=No 3=Never had 99=DK	INTOILET
<b>Q59.</b> <i>If no</i> , do you have access to a functioning toilet?	Text	1=Yes 2=No 99=DK	FXTOILET
<b>Q60.</b> Do you have a working (regular/landline or cell) telephone?	Text	1=Yes 2=No 3=Never had 99=DK	PHONE
<b>Q61.</b> Do you have natural gas service now?	Text	1=Yes 2=No 3=Never had 99=DK	NATGAS
<b>Q62.</b> Do you have regular garbage pickup now?	Text	1=Yes 2=No 99=DK	GARBAGE
<b>Q63.</b> Are you having a problem with mosquitoes?	Text	1=Yes 2=No 99=DK	MOSQUITO
<b>Q64.</b> Are there screens on the windows in this residence?	Text	1=Yes 2=No 99=DK	SCREENS
<b>Q65.</b> Do you currently have the following services in your home?			

a. Telephone (landline)	Text	1=Yes 2=No 3=NA 99=DK	LANPHON1
b. Gas	Text	1=Yes 2=No 3=NA 99=DK	NATGAS1
c. Electricity	Text	1=Yes 2=No 3=NA 99=DK	ELECT1
d. Working elevator	Text	1=Yes 2=No 3=NA 99=DK	ELEVAT1
e. Cell phone	Text	1=Yes 2=No 3=NA 99=DK	CELPHON1
f. Water	Text	1=Yes 2=No 3=NA 99=DK	RUNWAT1
g. Garbage pickup	Text	1=Yes 2=No 3=NA 99=DK	GARBAGE1
<b>Electricity, generator use, and carbon monoxide</b>			
<b>Q66.</b> Do you have electricity from the utility company?	Text	1=Yes 2=No 99=DK	ELECTRIC
<b>Q67.</b> <i>If no</i> , are you using a generator?	Text	1=Yes 2=No 99=DK	GENNOW
<b>Q68.</b> <i>If yes</i> , you are using a generator; where is the generator located?	Text	1=Inside 2=Garage/shed 3=Carport 4=Outside, greater than 25 feet from home 5=Outside, less than 25	GENLOC

		feet from home 88=Other 99=DK	
<b>Q69.</b> Have you used a generator at any time since the event (e.g., hurricane, etc.)?	Text	1=Yes 2=No 99=DK	GENUSE
<b>Q70.</b> <i>If yes</i> , where is or was the generator located?	Text	1=Inside 2=Garage/shed 3=Carport 4=Outside, greater than 25 feet from home 5=Outside, less than 25 feet from home 88=Other 99=DK	GENLOC1
<b>Q71.</b> Are you cooking inside on a charcoal grill or camp stove?	Text	1=Yes 2=No 99=DK	GRILL
<b>Q72.</b> Are you using a pressure washer?	Text	1=Yes 2=No 99=DK	PRESWASH
<b>Q73.</b> <i>If yes</i> , where is the pressure washer used?	Text	1=Inside 2=Outside 99=DK	PWLOC
<b>Q74.</b> Do you have a working carbon monoxide (CO) monitor or detector?	Text	1=Yes 2=No 99=DK	CODETECT
<b>Drinking water</b>			
<b>Q75.</b> Where is the nearest source of drinking	Text	1=Inside the house	DRINKWAT

water?		2=Less than a mile away 3=More than a mile away 99=DK	
<b>Q76.</b> Where are you getting your drinking water? What is your <u>primary</u> source of drinking water?	Text	1=Well 2=Public utility 3=Bottled, supplied by relief agency 4=Bottled, not supplied by relief agency 5=No drinking water 99=DK	WHEREWAT
<b>Q77.</b> <i>If bottled water</i> , do you have enough bottled water for 3 days?	Text	1=Yes 2=No 99=DK	BOTTLED
<b>Q78.</b> Are you treating your drinking water?	Text	1=Yes 2=No 99=DK	TREATWAT
<b>Q79.</b> <i>If yes</i> , how are you treating your drinking water?	Text	1=Boiling 2=Bottled 3=Chemical treatment 4=No treatment 88=Other	HOWTREAT
<b>Access to Transportation</b>			
<b>Q80.</b> Do you have access to transportation?	Text	1=Yes 2=No 99=DK	TRANSPORT
<b>Q81.</b> Do you have access to working motorized transportation (e.g., car, bus,	Text	1=Yes 2=No 99=DK	MOTOTRAN

scooter, bike pedal, golf cart)?			
<b>Q82.</b> What is your current primary type of transportation?	Text	1=Your own car 2=Your family or friend's car 3=Bus/trolley line 4=Taxi 5=Bike 6=No transport 88=Other, specify _____	PRIMTRAN TRAN_TXT
<b>Q83.</b> Do you have access to fuel (e.g., gasoline, propane)?	Text	1=Yes 2=No 99=DK	FUEL
<b>Access to information</b>			
<b>Q84.</b> How did you receive warnings before the event?	Text	1=Flyer 2=Talking to people 3=Telephone 4=Internet 5=Newspaper 6=Radio 7=TV 88=Other, specify _____	WARNING WARN_TXT
<b>Q85.</b> Do you have access to news (e.g., TV, radio, paper, etc.)?	Text	1=Yes 2=No 99=DK	NEWS

<b>Q86.</b> Do you have access to a functional television?	Text	1=Yes 2=No 99=DK	FXTV
<b>Q87.</b> Do you have access to a functional radio?	Text	1=Yes 2=No 99=DK	FXRADIO
<b>Q88.</b> Did you receive any information from any organization about cleaning your home after the event?	Text	1=Yes 2=No 99=DK	INFOCLN
<b>Q89.</b> In the past week, did your family get any information about how to stay safe when cleaning up after the event (e.g., using a chainsaw properly, ladder or roof safety, preventing carbon monoxide poisoning)?	Text	1=Yes 2=No 99=DK	INFOSAFE
<b>Q90.</b> Did your family get any information about how to stay safe when returning to your home after the event (e.g., using a chainsaw properly, ladder or roof safety, preventing carbon monoxide poisoning)?	Text	1=Yes 2=No 99=DK	INFORTN
<b>Q91.</b> <i>If yes</i> , did you get this information through ( <i>mark all that apply</i> ):			
a. Flyer	Text	1=Yes 2=No 99=DK	RTNFLYER
b. Talking to people	Text	1=Yes 2=No 99=DK	RTNTALK

c. Telephone	Text	1=Yes 2=No 99=DK	RTNPHONE
d. Internet	Text	1=Yes 2=No 99=DK	RTNNET
e. Newspaper	Text	1=Yes 2=No 99=DK	RTNPAPER
f. Radio	Text	1=Yes 2=No 99=DK	RTNRADIO
g. TV	Text	1=Yes 2=No 99=DK	RTNTV
h. Other, specify _____	Text	1=Yes 2=No 99=DK  Open text field	RTN_OTH  RTN_TXT
<b>Q92.</b> Was this information helpful?	Text	1=Yes 2=No 99=DK	HELPFUL
<b>Q93.</b> Which source of information was most helpful?	Text	1=Flyer  2=Talking to people  3=Telephone  4=Internet  5=Newspaper  6=Radio  7=TV  88=Other, specify _____	MOSTHELP
<b>Q94.</b> Since the event, have all the floors in your home been cleaned with a wet mop and vacuumed with a HEPA vacuum?	Text	1=Yes 2=No 99=DK	CLNFLOOR
<b>Q95.</b> <i>If yes</i> , who did the cleaning?	Text	1=Occupant  2=Housekeeper  3=Management/super  4=Professional cleaning	WHOCLEAN

		service 88=Other, specify ____	
<b>Q96.</b> Did you get information about cleaning your home after the event (e.g., how to clean up mold)?	Text	1=Yes 2=No 99=DK	INFOCLN1
<b>Q97.</b> <i>If yes, did you get this information through (mark all that apply):</i>	Text	1=Flyer 2=Talking to people 3=Telephone 4=Internet 5=Newspaper 6=Radio 7=TV 88=Other, specify _____	CLNFLYER CLNTALK CLNPHONE CLNNET CLNPAPER CLNRADIO CLNTV CLN_OTH CLN_TXT
<b>Q98.</b> Which source of information was most helpful?	Text	1=Flyer 2=Talking to people 3=Telephone 4=Internet 5=Newspaper 6=Radio 7=TV 88=Other, specify ____	VERYHELP
<b>Q99.</b> Would you like additional information?	Text	1=Yes 2=No 99=DK	MOREINFO

<b>Supplies and relief</b>			
<b>Q100.</b> Do you have access to enough food for everyone in the residence for the next 3 days?	Text	1=Yes 2=No 99=DK	FOOD
<b>Q101.</b> Do you have access to money for immediate daily needs (e.g., groceries, medications)?	Text	1=Yes 2=No 99=DK	MONEY
<b>Q102.</b> Have you received drinking water as part of the relief effort?	Text	1=Yes 2=No 99=DK	WATERAID
<b>Q103.</b> Have you received food as part of the relief effort?	Text	1=Yes 2=No 99=DK	FOODAID
<b>Q104.</b> Have you received shelter as part of the relief effort?	Text	1=Yes 2=No 99=DK	SHELTAID
<b>Q105.</b> Have you received any other type of aid as part of the relief effort?	Text	1=Yes 2=No 99=DK	OTHERAID
<b>Q106.</b> In the past week, did you or your family receive <u>any</u> disaster relief, such as food, water, ice, or shelter?	Text	1=Yes 2=No, none needed 3=No, needed it but could not get it 4=No, did not know it was available 99=DK	RELIEF

<p><b>Q107.</b> <i>If no</i>, if you have not received disaster relief, what are the reasons? (<i>mark all that apply</i>):</p> <ul style="list-style-type: none"> <li>a. No relief needed</li> <li>b. No way to get to relief station</li> <li>c. Did not know it was available</li> <li>d. Other, specify _____</li> <li>e. DK</li> </ul>	<p>Text</p> <p>Text</p> <p>Text</p> <p>Text</p> <p>Text</p>	<p>1=Yes 2=No 99=DK</p> <p>Open text field</p>	<p>NO_NEED</p> <p>NO_TRANS</p> <p>NO_KNOWL</p> <p>NO_OTH</p> <p>NO_TEXT</p> <p>NO_DK</p>
<p><b>Q108.</b> What is your greatest need at the moment?</p>	<p>Text</p>	<p>1=No current needs</p> <p>2=Food</p> <p>3=Electricity</p> <p>4=Water</p> <p>5=Medical care</p> <p>6=Medications</p> <p>7=Transportation</p> <p>8=Physical help with cleanup and repairs</p> <p>9=Financial help with cleanup and repairs</p> <p>88=Other, specify ____</p> <p>99=DK</p>	<p>GREATNEED</p> <p>GREAT_OTH</p>

<b>Illnesses and injury</b>			
<p><b>Q109.</b> Has anyone living in this household ever been told by a doctor, nurse, or other healthcare professional that he or she has the following health problems?</p> <p>a. Asthma</p> <p>b. Emphysema</p> <p>c. Hypertension</p> <p>d. Heart disease</p> <p>e. Diabetes</p> <p>f. Physical disability</p> <p>g. Hearing impairment</p> <p>h. Visual impairment/legally blind</p> <p>i. Gastrointestinal illness</p> <p>j. Renal disease</p> <p>k. Neurological (stroke, seizures, Transient Ischemic Attack (TIA))</p> <p>l. Dementia/Alzheimer's</p> <p>m. Arthritis and joint pain</p> <p>n. Cancer</p> <p>o. Anemia</p> <p>p. Psychiatric disorders</p>	Text	<p>1=Yes 2=No 99=DK</p>	<p>HAD_ASTH</p> <p>HAD_EMPH</p> <p>HAD_HTN</p> <p>HAD_HEAR</p> <p>HAD_DIAB</p> <p>HAD_DISA</p> <p>HAD_HEAR</p> <p>HAD_VISIO</p> <p>HAD_GI</p> <p>HAD_RENA</p> <p>HAD_NEUR</p> <p>HAD_DEME</p> <p>HAD_ARTH</p> <p>HAD_CANC</p> <p>HAD_ANEM</p> <p>HAD_PSYC</p>

q. Skin rash/dermatitis		1=Yes 2=No 99=DK	HAD_SKIN
r. Other (specify)		1=Yes 2=No 99=DK	HAD_OTHE
<b>Q110.</b> If yes, how many people have:	Numeric		
a. Asthma		##	NUM_ASTH
b. Emphysema		##	NUM_EMPH
c. Hypertension		##	NUM_HTN
d. Heart disease		##	NUM_HEAR
e. Diabetes		##	NUM_DIAB
f. Physical disability		##	NUM_DISA
g. Hearing impairment		##	NUM_HEAR
h. Visual impairment/legally blind		##	NUM_VISI
i. Gastrointestinal illness		##	NUM_GI
j. Renal disease		##	NUM_RENA
k. Neurological (stroke, seizures, TIA)		##	NUM_NEUR
l. Dementia/Alzheimer's		##	NUM_DEME
m. Arthritis and joint pain		##	NUM_ARTH
n. Cancer		##	NUM_CANC
o. Anemia		##	NUM_ANEM
p. Psychiatric disorders		##	NUM_PSYC
q. Skin rash/dermatitis		##	NUM_SKIN
r. Other (specify)		##	NUM_OTHE
<b>Q111.</b> Has any household member become ill	Text	1=Yes 2=No 99=DK	HH_ILL

since the event?			
<b>Q112.</b> <i>If yes</i> , how many people have had the following since the event: a) Stomachache/diarrhea b) Dehydration c) Respiratory (cough, flu) d) Hearing impairment e) Physical disability f) Stroke (heat, hypertension, other) g) Heart attack (chest pain) h) Chronic illness that worsened i) Skin condition/rash j) Stress/sleep disturbance k) Inability to perform daily task l) Other (specify)	Numeric	## ## ## ## ## ## ## ## ## ## ## ##	ILL_STOM ILL_DEHY ILL_RES ILL_HEAR ILL_DISA ILL_STRO ILL_HEAR ILL_CHRO ILL_SKIN ILL_STRE ILL_TASK ILL_OTHE
<b>Q113.</b> Has any household member been injured since the event?	Text	1=Yes 2=No 99=DK	HH_INJ
<b>Q114.</b> If yes, how many people have experienced the following since the event: a. Drowned b. Motor vehicle-related injury c. Electrical injury	Numeric	## ## ##	INJ_DROW INJ_VEH INJ_ELEC

d. Burn		##	INJ_BURN
e. CO poisoning		##	INJ_CO
f. Laceration, abrasion		##	INJ_LACE
g. Bruise/contusion		##	INJ_BRUS
h. Impalement/foreign body		##	INJ_FB
i. Brain injury/concussion		##	INJ_BRAI
j. Strain/sprain/dislocation		##	INJ_STRA
k. Fracture		##	INJ_FRA
l. Dog bite		##	INJ_DOBI
m. Insect bite		##	INJ_INBI
n. Snake bite		##	INJ_SNBI
o. Other (specify)		##	INJ_OTHE
<b>Q115.</b> Has any household member died since the event?	Text	1=Yes 2=No 99=DK	HH_DEAD
<b>Q116.</b> <i>If yes</i> , how many?	Numeric	##	NUM_DEAD
<b>Q117.</b> If yes, how did they die?	Text		
a. Brain injury/concussion		1=Yes 2=No 99=DK	D_BRAI
b. Drowned		1=Yes 2=No 99=DK	D_DROW
c. Motor vehicle-related accident		1=Yes 2=No 99=DK	D_VEHI
d. Electrical injury		1=Yes 2=No 99=DK	D_ELEC
e. Burn		1=Yes 2=No 99=DK	D_BURN
f. CO poisoning		1=Yes 2=No 99=DK	D_CO
g. Hypertension		1=Yes 2=No 99=DK	D_HTN

h. Heart disease		1=Yes 2=No 99=DK	D_HEAR
i. Diabetes		1=Yes 2=No 99=DK	D_DIAB
j. Other (specify)_____		1=Yes 2=No 99=DK	D_OTHE
<b>Medical care/prescriptions</b>			
<b>Q118.</b> Since the disaster, has anyone in your household required medical care?	Text	1=Yes 2=No 99=DK	REQUIMD
<b>Q119.</b> Does anyone in your household need medical care now?	Text	1=Yes 2=No 99=DK	MEDNOW
<b>Q120.</b> Will anyone in your household need medical care in the next 3 days to 1 week?	Text	1=Yes 2=No 99=DK	MEDLATER
<b>Q121.</b> Can everyone in your household get the medical care he or she needs?	Text	1=Yes 2=No 99=DK	MEDNEEDS
<b>Q122.</b> How far away is the nearest medical facility?	Text	1=One mile 2=Two miles 3=More than two miles 99=DK	FACILITY
<b>Q123.</b> Does anyone in your household receive home healthcare?	Text	1=Yes 2=No 99=DK	HOMEHLTH
<b>Q124.</b> What type of home healthcare does he or she receive?	Text	Open text field	HHLTHTYP
<b>Q125.</b> Can everyone in your household get the dental care he or she needs?	Text	1=Yes 2=No 99=DK	DENTAL

<p><b>Q126.</b> How many people in your household now need prescription medication?</p>	Text	<p>1=One person 2=Two people 3=More than two people 99=DK</p>	MEDICINE
<p><b>Q127.</b> Do the people in your household who need prescribed medication have enough for the next 3 days to 1 week?</p>	Text	<p>1=Yes 2=No 99=DK</p>	MEDSFILL
<p><b>Q128.</b> How many people in your household are unable to obtain their prescription medications at this time?</p>	Text	<p>1=One person 2=Two people 3=More than two people 99=DK</p>	NOMEDS
<p><b>Q129.</b> <i>If no, why not? (mark all that apply):</i></p> <ul style="list-style-type: none"> <li>a. Clinic or physician’s office closed</li> <li>b. Loss of, or problems with, your private insurance</li> <li>c. No transportation</li> <li>d. Medicare problems</li> <li>e. Medicaid problems</li> </ul>	Text	<p>1=Yes 2=No 3=NA 99=DK</p>	<p>WHYNO WHY_OTH</p>

f. Other (specify)_____		1=Yes 2=No 99=DK	
<b>Q130.</b> Is everyone in your household now able to fill the prescription he or she needs?	Text	1=Yes 2=No 3=NA 99=DK	MEDFILL2
<b>Q131.</b> <i>If no</i> , why not? ( <i>mark all that apply</i> ):	Text		FILLNO
a. Pharmacy closed		1=Yes 2=No 3=NA 99=DK	NO-OTH
b. Loss of, or problems with, your private insurance		1=Yes 2=No 3=NA 99=DK	
c. No transportation		1=Yes 2=No 3=NA 99=DK	
d. Medicare problems		1=Yes 2=No 3=NA 99=DK	
e. Medicaid problems		1=Yes 2=No 3=NA 99=DK	
f. Loss of prescriptions		1=Yes 2=No 3=NA 99=DK	
g. Other (specify)_____		1=Yes 2=No 99=DK	
<b>Q132.</b> Does anyone in your household need supplemental oxygen?	Text	1=Yes 2=No 99=DK	OXYGEN
<b>Psychosocial health</b>			
<b>Q133.</b> Has anyone in your household had any of the following since the event? ( <i>mark ALL that apply</i> ):	Text	1=No symptoms 2=Difficulty concentrating 3=Trouble sleeping 4=Loss of appetite	MN_NORM MN_CONC MN_SLEEP MN_EAT

		<p>5=Racing or pounding heartbeat</p> <p>6=Agitated or frantic behavior</p> <p>7=Violent behavior or threatening violence</p> <p>8=Suicidal thoughts or attempts</p> <p>9=Drug or alcohol intoxication or withdrawal</p> <p>88=Others</p> <p>99=DK</p>	<p>MN_HEART</p> <p>MN_AGITA</p> <p>MN_VIOL</p> <p>MN_SUID</p> <p>MN_DRUG</p> <p>MN_DK</p>
<b>Q134.</b> Has anyone in your household been unable to perform his or her daily tasks since the event?	Text	1=Yes 2=No 99=DK	DAILY
<b>Q135.</b> Has anyone in your household been unreasonably irritable since the event?	Text	1=Yes 2=No 99=DK	IRRITATE
<b>Q136.</b> Is anybody in your household disoriented (to person, place, or time)?	Text	1=Yes 2=No 99=DK	DISORIENT
<b>Q137.</b> Are emotional concerns preventing you or any household members from taking care of yourself/himself or others?	Text	1=Yes 2=No 99=DK	EMOTION
<b>Q138.</b> What is your main concern in general	Text	Open text field	CONCERN1

right now?			
<b>Q139.</b> Are there any other concerns in general that have not been addressed yet?	Text	Open text field	CONCERN2

# Appendix B: Sample Data Collection Form

## Hurricane Ike Community Assessment for Public Health Emergency Response Questionnaire—Galveston, County, Texas, September 2008

Date: 09/30/2008		Cluster:		No of HUs in cluster:		Survey no:		Interviewer initials:	
Address:					Key: Y=Yes D/K=Don't Know N=No N/H=Never Had				
1. Type of Structure: <input type="checkbox"/> Single-family house <input type="checkbox"/> Multiple unit (e.g., duplex, apartment) <input type="checkbox"/> Mobile home <input type="checkbox"/> Other _____					10. Since the hurricane, is everybody in this house getting the medication they need? Y N D/K If no, why? _____				
2. Since the hurricane, do you feel your home is safe to live in? Y N D/K If no, why? _____					11. Is there anyone in the home who needs special care (e.g., oxygen supply, dialysis, or home healthcare)? Y N D/K If yes, what? _____				
3. Since the hurricane, do you feel secure in your area? Y N D/K If no, why? _____					12. Does anyone in the home currently require medical care? Y N D/K				
4. How many people lived in this house before the hurricane? _____					13. Do you have running water? Y N D/K N/H If yes, source: <input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Well <input type="checkbox"/> D/K				
5. How many people slept here last night? _____ a. How many are 2 years of age or younger? _____ b. How many are 3–17 years of age? _____ c. How many are 18–64 years of age? _____ d. How many are 65 years or older? _____					14. Do you have safe drinking water? Y N D/K N/H If yes, source: <input type="checkbox"/> Well <input type="checkbox"/> Public <input type="checkbox"/> Bottled <input type="checkbox"/> No drinking water				
6. Was anyone in this house injured due to or since the hurricane? Y N D/K If yes, what was the injury:					15. Do you have access to enough food for everyone in the house for the next three days? Y N D/K N/H				
a. Cuts, abrasion, puncture wounds requiring medical attention? Y N D/K					16. Do you have a working toilet? Y N D/K N/H				
b. Strain/sprain Y N D/K					17. Do you currently have electric power from the utility company? Y N D/K N/H				
c. Broken bones Y N D/K					18. Are you using a generator? Y N D/K N/H If using a <b>GENERATOR</b> , where and how do you use it? <input type="checkbox"/> Indoors <input type="checkbox"/> Outside, but near an open door/window <input type="checkbox"/> Using open flame as a source of light when fueling <input type="checkbox"/> Other risky behavior: _____				
d. Head injury Y N D/K					19. Are you cooking on a charcoal or gas grill/camp stove? Y N D/K N/H If using a <b>GRILL/STOVE</b> , where and how do you use it? <input type="checkbox"/> Indoors <input type="checkbox"/> Outside, but near an open door/window <input type="checkbox"/> Using open flame as a source of light when fueling <input type="checkbox"/> Other risky behavior: _____				
e. Animal bites Y N D/K					20. Do you have a working telephone? Y N D/K N/H				
f. Other: _____					21. Do you currently have regular garbage pick-up? Y N D/K N/H				
7. Has every adult in the house had a tetanus shot in the last 10 years? Y N D/K					22. How did you get warning or other information before the hurricane? <input type="checkbox"/> TV <input type="checkbox"/> Neighbor, word of mouth <input type="checkbox"/> Radio <input type="checkbox"/> Internet <input type="checkbox"/> Newspaper <input type="checkbox"/> Other: _____				
8. Since the hurricane, has there been any increase in insect bites/stings from any of the following? a. Mosquitoes Y N D/K b. Ants Y N D/K c. Bees or wasps Y N D/K d. Other: _____ Y N D/K					23. How did you get health advice or information after the hurricane? <input type="checkbox"/> TV <input type="checkbox"/> Neighbor, word of mouth <input type="checkbox"/> Radio <input type="checkbox"/> Internet <input type="checkbox"/> Newspaper <input type="checkbox"/> Other: _____				
9. Have any house members become ill due to/since the hurricane? Y N D/K If yes, what did they have?					24. Finally, what is your greatest need at this moment?				
a. Nausea/stomach ache/diarrhea Y N D/K									
b. Sore throat/cold Y N D/K									
c. Worsened chronic illness Y N D/K									
d. Other: _____									

# Appendix C: Confidential Referral Form

## Community Assessment for Public Health Emergency Response

Date: \_\_/\_\_/\_\_\_\_ Time: \_\_:\_\_

Cluster No.: \_\_\_\_\_

Sample Sequence No.: \_\_\_\_\_

Interviewer's Initials: \_\_\_\_\_

GIS Code: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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### Contact Information:

Home telephone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Cell phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

E-mail: \_\_\_\_\_

Assistance Provided:            Yes                No   

Literature Provided: \_\_\_\_\_

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Referral Made:            Yes                No   

Referred to: \_\_\_\_\_

Summary of Need and Assistance Provided: \_\_\_\_\_

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# Appendix D: Community Assessment for Public Health Emergency Response Sample Tracking Form

County: ..... Cluster # (i.e., 1–30): ..... Interviewer: ..... Date of Interview: ..... / ..... / 2009

**Instructions:** Use one tracking form per cluster. Check where appropriate, but try to choose only one best option for each of the five categories. Go as far down the list as possible for each site you visit. Use neighbors to find information if no resident is available.

Order of Visit:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<b>1) NO ACCESS</b>																	
House is Inaccessible	<input type="checkbox"/>																
Front Door is Inaccessible	<input type="checkbox"/>																
<b>2) TYPE OF DWELLING</b>																	
No Housing Structure	<input type="checkbox"/>																
Mobile Home	<input type="checkbox"/>																
Single-Family Home	<input type="checkbox"/>																
Apartment	<input type="checkbox"/>																
<b>3) DAMAGE</b>																	
None or Minimal	<input type="checkbox"/>																
Damaged	<input type="checkbox"/>																
Destroyed	<input type="checkbox"/>																
<b>4) NO ANSWER</b>																	
Previously Vacant	<input type="checkbox"/>																
Evacuated before Disaster	<input type="checkbox"/>																
Abandoned after Disaster	<input type="checkbox"/>																
Nobody Home after 3 <sup>rd</sup> Visit	<input type="checkbox"/>																
<b>5) INTERVIEW</b>																	
Language Barrier	<input type="checkbox"/>																
Refused to Participate	<input type="checkbox"/>																
Interview begun, not finished	<input type="checkbox"/>																
Interview Completed	<input type="checkbox"/>																
Household # (i.e., 1–7) from Completed Questionnaire:																	

NOTES: .....

## **Appendix E: Agenda to Orient Field Teams**

### **Community Assessment for Public Health Emergency Response**

1. Background of the event (disaster)
2. Government's role in emergency management
3. State and local emergency operations center guidelines
4. Purpose of the Community Assessment for Public Health Emergency Response:
  - To quickly gain knowledge of the public health needs of a population affected by the emergency; and
  - To have data for current and future planning to reduce the impact of emergencies.
2. Organization of Teams
  - Number of teams
  - At least two individuals on each team
  - Teams will be assigned specific assessment areas
  - Team leaders
3. Questionnaire and Methods
  - Review Questionnaire
  - How to Conduct Interviews
  - Survey Areas
  - Situations requiring immediate referral
4. Logistics
  - Staging area location
  - Meeting time and place
  - Transportation
  - Food and water
  - Name tags
  - Dress code
  - Safety
  - Contact information/communication
  - Media
5. Debriefing Session Schedule

**THANK YOU FOR YOUR SERVICE TO YOUR COMMUNITY!**

## Appendix F: Consent Form

### Community Assessment for Public Health Emergency Response

Hello, we are \_\_\_\_\_ and \_\_\_\_\_ with the \_\_\_\_\_ State Department of Health.

We are assessing residents in \_\_\_\_\_ county about their needs and health status. This assessment is part of a response activity to help us better understand your needs and respond appropriately. Your house has been chosen scientifically (randomly).

If you choose to participate in the assessment, we will ask you some general questions about your house and the people who live there, and also about certain kinds of environmental hazards. The assessment should take no more than 10 minutes to complete.

There will be no record of you or your address. We will keep your answers private. You can refuse to be part of the assessment or refuse to answer any of the questions. Nothing will happen to you or your household should you choose not to be part of the assessment.

You may have questions about this assessment. If so, you can ask anyone here right now. If you have questions about this later, you can call (Names) at the state health department at (phone number) or (name) at the (phone number) or e-mail @-----. You may keep this information sheet for further reference.

Would you be willing to participate in this assessment? Yes or No

Thank you,

## Appendix G: Debriefing Field Teams

### Community Assessment for Public Health Emergency Response

1.	What was your overall impression of the assessment?
2.	In your opinion, what went well?
3.	In your opinion, what did not go well?
4.	Did you think you were prepared (e.g., training, food, safety, communications, supplies) for your assignment?
5.	If we had to do this assessment again, what should we do to improve it?
6.	Did you learn anything from this experience?
7.	<p>Were there specific situations that you encountered during the assignment that you want to tell us about?</p> <ul style="list-style-type: none"> <li>a. Orientation of field teams</li> <li>b. Food</li> <li>c. Safety</li> <li>d. Communications</li> <li>e. Supplies and equipment</li> <li>f. Questionnaire</li> <li>g. Assessment methods</li> <li>h. Transportation</li> <li>i. Timeliness of the report</li> </ul>
8.	What can be done to prepare you better if we had to do this again?
9.	Would you want to participate on a team in the future?
10.	To what extent do you think this assessment will be useful to your community in responding to this emergency?
11.	Was this debriefing helpful?

**THANK YOU FOR YOUR SERVICE TO YOUR COMMUNITY**

## **APPENDIX H: Report Outline**

### **Community Assessment for Public Health Emergency Response**

#### **Introduction**

- Description of public health emergency (type of emergency, location, communities affected)
- Assessment goals

#### **Methods**

- Sampling methodology
- Questionnaire
- Team composition
- Dates of assessment
- Software used in analyses

#### **Results**

- Number of interviews completed
- Response and cooperation rate
- Assessment results, including percentages and weighted frequencies (use tables, maps, charts)

#### **Discussion**

- Discuss results and limitations of the assessment and recommendations

#### **Acknowledgements**

- List those who provided assistance in the assessment

#### **References**

- List reference articles