Name /ID _____

NOROVIRUS OUTBREAK (2012-2391)   Phone _____

Age _____   **Sex** ☐ M   ☐ F   **Interviewee** ☐ self   ☐ parent   ☐ spouse   ☐ _____   Interviewed by _____ on _____

xxxx _____   xxxx _____   xxxx _____   match to _____

xxxx _____   xxxx _____   xxxx _____   xxxx _____   xxxx _____

[1]	Y	?	N	EXAMPLE LEAD-IN QUESTIONS/ DID YOU...	
A	☐	☐	☐	Attend group lunch in the showroom on 5/13 (Sunday)?	
B	☐	☐	☐	Did you eat or taste food at the lunch?	
C	☐	☐	☐	Share food with a co-worker or customer at the lunch?	
D	☐	☐	☐		
E	☐	☐	☐		
F	☐	☐	☐		
G	☐	☐	☐		
H	☐	☐	☐		
I	☐	☐	☐		

```
                    May 2012
          Su Mo Tu We Th Fr Sa
                    1  2  3  4  5
           6  7  8  9 10 11 12
          13 14 15 16 17 18 19
          20 21 22 23 24 25 26
          27 28 29 30 31
          February 2012
```

FOOD EXPOSURES

Let me ask you about the items that were available at the Lunch on Sunday

For each item, give me a "yes" or "no" answer if you remember eating or even tasting it.

DID YOU EAT…..

[2]	Y	?	N	Cold Cut Combo	[3]	Y	?	N	Ham and Cheese	[4]	Y	?	N	Extras
A	☐	☐	☐	How many_____?	A	☐	☐	☐	How many_____?	A	☐	☐	☐	Mayonnaise packet
B	☐	☐	☐	Wheat bread	B	☐	☐	☐	Wheat bread	B	☐	☐	☐	Mustard packet
C	☐	☐	☐	White bread	C	☐	☐	☐	White bread	C	☐	☐	☐	Black olives
D	☐	☐	☐	White American cheese	D	☐	☐	☐	White American cheese	D	☐	☐	☐	Pepperocinis
E	☐	☐	☐	Ham	E	☐	☐	☐	Lettuce	E	☐	☐	☐	Onions
F	☐	☐	☐	Salami	F	☐	☐	☐	Tomatoes	F	☐	☐	☐	Jalapenos
G	☐	☐	☐	Bologna	G	☐	☐	☐	Green peppers	G	☐	☐	☐	BBQ chips
H	☐	☐	☐	Cheese	H	☐	☐	☐	Red onion	H	☐	☐	☐	Plain chips
I	☐	☐	☐	Lettuce	I	☐	☐	☐	Cucumber	I	☐	☐	☐	Drink from vending machine
J	☐	☐	☐	Tomatoes						J	☐	☐	☐	Ice
K	☐	☐	☐	Green peppers						K	☐	☐	☐	Other_____?
L	☐	☐	☐	Red onions										
M	☐	☐	☐	Cucumber										
(*number*) ___				How many drinks with ice?										

[5]	Y	?	N	Food/snacks at the worksite on Fri., Sat., Sun?
A	☐	☐	☐	Pretzels
B	☐	☐	☐	Peanuts
C	☐	☐	☐	Other_____?

[6]	Y	?	N	OTHER QUESTIONS FOR EVERYBODY
A	☐	☐	☐	Are you on any kind of special or restricted diet for medical, weight loss, religious, or any other reasons?
B	☐	☐	☐	Did you bring any food home from the lunch?
C	☐	☐	☐	Did anyone in your household who was not at the lunch later get sick with vomiting or diarrhea? (*If yes*, get details.)
Z	☐	☐	☐	**Have you yourself been sick at all with diarrhea or vomiting since 5/31 (Sunday)?**

if this person has not been sick, STOP HERE. *If they have had symptoms*, CONTINUE *to the last page.*

Name /ID _____

This page is only for people who got sick. Discard or ignore for those who did not become ill.

Let me read you a list of symptoms. For each one, give me a "yes" or "no." Did you have any...

	Y	?	N	SIGNS AND SYMPTOMS		Y	?	N	MORE SIGNS AND SYMPTOMS
H	☐	☐	☐	headache	L	☐	☐	☐	shaking chills
N	☐	☐	☐	nausea	D	☐	☐	☐	any diarrhea or loose stools
V	☐	☐	☐	vomiting	3	☐	☐	☐	*if yes to diarrhea*, did you have 3 or more loose stools within any 24-hour period?
M	☐	☐	☐	myalgia (muscle aches)					
C	☐	☐	☐	abdominal (stomach, belly) cramps	B	☐	☐	☐	any blood in stools
T	☐	☐	☐	unusual fatigue (feeling tired)	Z	☐	☐	☐	other _____
F	☐	☐	☐	fever (*if yes*, ☐ subjective or _____ ˚ (max.))					

ONONSET AND DURATION

```
                                                                    May 2012
                                                          Su Mo Tu We Th Fr Sa
                                                                    1  2  3  4  5
                                                           6  7  8  9 10 11 12
                                                          13 14 15 16 17 18 19
                                                          20 21 22 23 24 25 26
                                                          27 28 29 30 31
```

*Get precise answers for onset times. Without a date **and time**, it's hard to make a decent epi curve. Estimates are OK. Prompt as needed: "What is your best guess of the time?" Don't let them get away with vague stuff like "morning" or "after midnight." Be careful with times such as "midnight" or early morning hours—which day do they mean? By "2 am Friday night," for example, do they really mean Saturday morning? Keep probing until it is unambiguous. Write down what they mean—not what they say. Noon is graphed as 11:59 am; midnight as 11:59 pm.*

On what date did you first feel sick?

☐ Sun, May 13   ☐ Mon, May 14   ☐ Tue, May 15   ☐ Wed, May 16   ☐ Thur, May 17   ☐ m____/d____/y____

At what time did you first feel sick? [*PRESS FOR A SPECIFIC TIME*]

_____ am   ☐ noon   _____ pm   ☐ midnight (very *end* of day)

[If applicable] **On what day did you start having the vomiting or diarrhea (whichever came first)?**
    Note: the point is to capture the onset of their first "hard" symptom, in case they had a "soft" prodrome.

☐ Sun, May 13   ☐ Mon, May 14   ☐ Tue, May 15   ☐ Wed, May 16   ☐ Thur, May 17   ☐ m____/d____/y____

[If applicable] **At what time did the vomiting/diarrhea begin? [*PRESS FOR A SPECIFIC TIME*]**

_____ am   ☐ noon   _____ pm   ☐ midnight (end of day)

[If applicable] **Are you still having any vomiting/diarrhea now?**   ☐ yes   ☐ no

If no, **how long did the vomiting/diarrhea last?**   ___ minutes   ___ hours   ___ days   ☐ never had any

Overall, **how long did you feel sick?***   ___ minutes   ___ hours   ___ days   ☐ still sick

*If symptoms were intermittent, count from beginning to end (e.g., if sick on Monday, Wed, and Friday, but OK on Tuesday and Thursday, mark "5 days", not 3.

Was anyone in your household sick with a similar illness in the week before you got sick?   ☐ yes   ☐ no

MISCELLANY   (*check all that apply; provide details [names, dates, phone numbers, etc.] at right.*)

	Y	?	N	Did you/Are you...	☐ this person died
T	☐	☐	☐	take time off work or school?	*if yes*, how many days? _____
M	☐	☐	☐	see a doctor or other clinician?	*if yes*, whom?
E	☐	☐	☐	visit an ER?	*if yes*, specify
H	☐	☐	☐	get admitted to hospital overnight?	hospital _____ admitted ___/___/___ discharged ___/___/___
S	☐	☐	☐	give a stool specimen?	*if yes*, when/to whom ☐ to PHL ☐ to private lab _____
C	☐	☐	☐	already lab-confirmed?	*if yes*, specify
W	☐	☐	☐	[*if not*] willing to provide specimen?	

If this looks like it is reportable disease (e.g., salmonellosis, O157), make sure you get all the info needed to file a normal case report. [This detail is usually not needed for norovirus outbreaks, *C. perfringens*, etc., in which case this section can be deleted.] Having the usual form at hand is one way to do this, but at the very least, collect the following:

Home Address _____   City _____   Zip _____

DOB m____/d____/y____   Occupation/Grade _____   Worksite/School _____   Race/Ethnicity____

SAMPLE Caller spielS
(You don't have to use a spiel, much less read one word-for-word. Some people like having them; others don't. These are suggestions for those who like to have a written text. Feel free to modify them so that it sounds natural for *you*.)

For cohort controls from groups
Hello, this is _____ from the _____. You may have heard that a number of people became sick after the _____. We are working with the _____ County Health Department to try and find out what caused the outbreak. One of the ways we do that is by comparing the kinds of foods eaten by the people who got sick with those eaten by people who did not get sick. Could I ask you a few questions about your <<*lunch at Joe's Burger Joint*>>?

2012 REFERENCE CALENDARS

Use to help sort out onset dates, etc.; we suggest pasting in on symptom page. Keep them in a monospaced font (e.g., Courier) to keep the columns aligned. Collect 'em all!! Mac users can generate these in the Terminal application; it is an old-fashioned UNIX command, e.g., <user$ cal 9 2012> to get September 2012

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    January 2012          February 2012           March 2012            April 2012              May 2012               June 2012
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7             1  2  3  4                1  2  3    1  2  3  4  5  6  7             1  2  3  4  5                   1  2
 8  9 10 11 12 13 14    5  6  7  8  9 10 11    4  5  6  7  8  9 10    8  9 10 11 12 13 14    6  7  8  9 10 11 12    3  4  5  6  7  8  9
15 16 17 18 19 20 21   12 13 14 15 16 17 18   11 12 13 14 15 16 17   15 16 17 18 19 20 21   13 14 15 16 17 18 19   10 11 12 13 14 15 16
22 23 24 25 26 27 28   19 20 21 22 23 24 25   18 19 20 21 22 23 24   22 23 24 25 26 27 28   20 21 22 23 24 25 26   17 18 19 20 21 22 23
29 30 31               26 27 28 29            25 26 27 28 29 30 31   29 30                  27 28 29 30 31         24 25 26 27 28 29 30

     July 2012             August 2012          September 2012          October 2012           November 2011          December 2012
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7             1  2  3  4                      1       1  2  3  4  5  6             1  2  3  4  5                   1
 8  9 10 11 12 13 14    5  6  7  8  9 10 11    2  3  4  5  6  7  8    7  8  9 10 11 12 13    6  7  8  9 10 11 12    2  3  4  5  6  7  8
15 16 17 18 19 20 21   12 13 14 15 16 17 18    9 10 11 12 13 14 15   14 15 16 17 18 19 20   13 14 15 16 17 18 19    9 10 11 12 13 14 15
22 23 24 25 26 27 28   19 20 21 22 23 24 25   16 17 18 19 20 21 22   21 22 23 24 25 26 27   20 21 22 23 24 25 26   16 17 18 19 20 21 22
29 30 31               26 27 28 29 30 31      23 24 25 26 27 28 29   28 29 30 31            27 28 29 30            23 24 25 26 27 28 29
                                              30                                                                  30 31
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About the Oregon Public Health Division Outbreak Investigation Templates

Oregon epidemiologists have developed a set of templates that we use for many outbreak investigations. These include templates for questionnaire design (this Word file), data entry, and analysis (these latter in FileMaker). This system was designed for "event-centered" GI illness outbreaks (i.e., those with exposure occurring in a circumscribed setting, such as a wedding reception or restaurant meal, with a defined universe of likely exposures), but could be adapted for other investigations. This questionnaire template can be used to make stand-alone paper questionnaires, but it is designed to be part of a system.

The questionnaires are designed to be physically compact. Identifiers and exposure questions come first, with symptom questions usually all on the last page (which therefore can be skipped for persons who weren't ill). For telephone interviews, we assume that users can ad lib the question that frames the item being asked about. For example, if the question is "Did you eat any of the wedding cake?", the questionnaire just says "wedding cake." Our experience is that few if any interviewers read the questions verbatim anyway, and this abbreviated approach makes for a more natural-sounding interview.

STEP 1   Customize the Questionnaire in a Word Processor

The template was created in MS Word, and it helps if you know how to control formatting in that program. There is a lot of carefully embedded formatting in the template (e.g., line spacing, tabs, page breaks, paragraph borders) that helps keep the layout neat and compact, and if you are careless you can end up with a real mess on your hands. The typefaces (fonts) used are Arial and Wingdings (the latter for the boxes). Obviously you can change whatever you want, but try to maintain some aesthetics in your final product.

You'll almost always want to collect certain core variables—name, age, and sex, for example—but there are additional dummy variables that you can use as necessary. If this is a matched analysis; enter the patient's name or (preferably) the case ID number that you are matching to. Examples of variables to consider include school or class name, grade, Scout troop number, etc.

The color coding in the template is just a reminder: stuff in red is almost customized; stuff in blue are just helpful hints that should be read and then deleted. When you're done, just select all (control-A) and choose black text color.

No, we didn't forget to include a space for the person's NAME (or ID). It is tucked away in the page header, so it will print automatically at the top of *every* page—a cheap insurance policy in case pages get separated.

Food and other exposure questions are organized into blocks. Blocks can be used for individual meals, or to split up long menus into logical groups (e.g., desserts, salad items, entrees)—whatever fits and makes sense. You can use up to 25 blocks (!) without modifying the underlying FileMaker code, but few questionnaires need more than 3 or 4 blocks and many need only one. The little letters are keypunch codes; they are critical for data entry. ***Do not delete them!!*** One can use up to 26 items per block (letters *A-Z*). If you keep the blocks relatively even in length across a row, it minimizes wasted space, but don't let aesthetics get in the way of good organization in terms of asking the questions. As a general rule, the fewer blocks, the faster the data entry. Food groups can sprawl across multiple blocks, or you can have multiple exposure groups in one block. The only real rule is that you should never use more than 26 items/block—unless you want to do a bunch of programming yourself. Resist the temptation to extend a block beyond 26 items (*AA*, *BB*, *1*, *2*, *3, etc.*).

Here are some *examples* of how to organize the blocks. They may give you ideas about how to use them, but whatever works for you is fine.

• **Weekend Camp** (church, Girl Scouts, etc.) Typically multiple meals with not a lot of variety at any one meal. Blocks could be: Friday dinner, Saturday breakfast, Saturday lunch, Saturday snacks, etc., or, if there aren't many items at each meal, a block could have subheaders and include all the meals for one day.

• **ALC/jail/institutional outbreak**. Much the same as the weekend camp scenario, really. Ask about enough meals to blanket the likely exposure period.

- **restaurant outbreak**. Follow the menu: Appetizers, Salads, Pasta, Entrees, Desserts, Beverages. Tip: for many big chain restaurants and fast-food places, there may be information on their national web pages about what's on the menu. (Or get someone with a cell phone to stand in the restaurant and read it to you off the board.) Again, you can combine multiple (short) lists into a single block. Use subtitles to separate the subgroups, and insert an extra carriage return in the checkbox column.

- **Potluck party**. Organize by food group, or perhaps by location (the table at the north end of the cafeteria, the one at the south end). A common problem is that there may have been 4 kinds of fruit salad and 3 lasagnes, but no one can remember which was which. Do the best you can (e.g., the lasagne in the red dish), but consider adding an extra variables like "any fruit salad" or "any lasagne" in addition to the specific variables (Marge's fruit salad, the fruit salad that had marshmallows in it, etc.). These variables will be watered down (less statistical power because of misclassification) but may still prove useful—in any event better than nothing (which may be your only alternative).

- **Wedding reception/dinner party/picnic**. Typically 1 meal, which often fits into a single block.

- **Shotgun hypothesis-generating questionnaires.** We use a dedicated questionnaire template (shotgun.doc) and keypunching system; don't use this template for that.

This template kind of looks like a mess when you first open it, but it begins to take shape as you delete the stuff you don't need. The theory is that it is much faster to delete than to create! The template includes examples of exposure grids that are arranged 1, 2, and 3 blocks across. Choose whichever works best for you, or mix and match—but keep in mind that a compact layout is a plus. If you need to add more rows of blocks, put the cursor at the end of the last cell in a table and hit <tab>; you'll get a new row with the same formatting. Don't delete the little block ID numbers (which are Word endnotes), as they help tie into the data entry system. Delete unused items and blocks.

Some programs (e.g., older versions of Excel and some versions of EpiInfo) only allow for 256 fields (data columns); keep this in mind. You may need to split files.

I like to reserve the last page of the questionnaire for use with sick people only. So the ultimate question on the penultimate page is usually "Have you been sick at all since ....?" For those who stayed well, that is the end of the questionnaire.

Individual questions about meal time are obviously unnecessary if everyone ate at the same time.

If you want to have a caller introductory spiel, write it out in a separate document. Don't copy it onto every questionnaire—that just wastes space.

Consider adding little calendars in as needed. Sample calendars are provided. (Keep them in a monospaced font (e.g., Courier) so that the dates align properly.)

Remember that this is a TEMPLATE. You are *supposed* to modify it. Keep in mind, however, that some of the material and much of the formatting is there for a reason. If you strike out on your own without understanding how the data entry and analysis templates work, you may be making your task much harder than you anticipated. If you add questions without keypunch codes, for example, you will make your data entry and analysis chores *much* more difficult. Use your imagination and the information that you have collected to make a questionnaire that serves the purposes you have as efficiently as possible. Don't be in such a rush to make up a questionnaire that you leave out the key questions! If possible, pilot the questionnaire. (Ideally, this should be done with people that will be excluded from the analytical sample.)

If you circulate drafts of the questionnaire (as you should), make sure that they are plainly marked as such. You really don't want people using multiple versions of a questionnaire. A big fat watermark DRAFT across each page should be a clue. (Add/remove them using the Insert/Watermark... command.)

If you distribute the questionnaire by e-mail, it is highly recommended that you do so as a PDF, making sure to "embed all fonts." This improves the chances that the formatting, page breaks, etc., doesn't get screwed up by people who may not have the same fonts and software that you do, and makes it harder for people to modify without your knowledge.

STEP 2   Administer the Questionnaires

Callers should be familiar with the questionnaire before they begin calling. This sounds obvious, but experience suggests it is a worthwhile reminder. If callers have questions or don't understand how to ask a particular question (or what it means), get it straight before they start. All interviewers should have a common understanding of how to interpret answers.

Use dark ink, and preferably nothing fine tipped. You want it to fax well. No pencil.

If asked, it's OK to answer reasonable questions about the outbreak, but avoid details (particularly about possible vehicles) until after you've gone through the questionnaire. "I don't want to influence your responses, so could we go through list of questions first, and then I'll answer that, ok?"

Be sure to emphasize that you want to hear about foods that they just tasted, even if they didn't eat but a bite or two. (For some people, that doesn't constitute "eating.") It's fine to write notes in the margin if you want to; chances are they'll be ignored.

Pay attention to onset dates and times. Estimates (if absolutely necessary) are OK, but try *hard* to worm a specific date and a specific time out of your subject. If you ask "what time did you first start vomiting?" and they say "morning"—don't let it go!! We can't graph "morning" too well. Ask follow up questions as necessary: "About what time was that?" If they say "between 2 and 3 am" write "~2:30" in the AM slot. If they say "midnight," make sure it is unambiguous which day you are talking about. The stroke of midnight after Friday evening is still Friday--but right after the stroke of midnight it is Saturday. Don't write down what they say (necessarily)—write down what they mean—so keep asking until it is unambiguous. Remember that "12 am" or "12 pm" are ambiguous (look it up if you don't believe me), so don't use them.

For bugs with longer incubation periods, you might not care about the exact time of onset. If knowing the date is specific enough, you can delete the questions about time of onset to speed things up.

STEP 3   Data Entry in the FileMaker template file ("*Sleuth*")

If you aren't going to use the FileMaker system, you are on your own to do whatever you like.

Otherwise, enter the data in a copy of the *Sleuth*. Once you get the hang of it, it shouldn't take more than a minute or 2 to keypunch each questionnaire. Modify the data entry layout by deleting unused fields and revising the labels on the layout. Make sure the tab order is correct; this step is often overlooked and really slows down data entry. (Hint: go to Layout mode and choose Tab Order from the menu....) You can change all the names on the screen, but don't change the underlying variable names or you will have some unpleasant surprises.

Most of the questions (exposures, symptoms, etc.) are grouped into data entry "blocks." For yes/no questions, keypunch only "yes" and "?" (don't know) answers; "no" is otherwise assumed. In other words, all answers for a single block are entered as a single variable. If the person ate only items A, C, and H in block 5, for example, type "ACH" in the "block05" field.

The program splits the block values into individual "items", which are coded as yes/don't know/no. Continuing the above example, item05a, item05c, and item05h would get a "Y" value, whereas item05b and so on would be "N". (You can specify Y/N, 1/0, or any other values for positive and negative values.)

Enter "don't know/not sure" answers by following the letter with a question mark. Thus, "ABC?D" means yes for A, B, and D and don't know for C.

The program just looks for the letters and question marks. Punctuation, spaces, and other characters are ignored, as is order and capitalization. It's pretty fast when you get the hang of it.

Data cleaning can be done at any stage: in FileMaker, in Excel, in EpiInfo or SPSS—as you prefer. Some cleaning (e.g., standardization of onset and sx duration times) is done semi-automatically; there are many checks built into the data entry FileMaker file. Manual overrides are available at all steps. Data entry queries (e.g., illegible or inconsistent answers) can be electronically flagged for later review and resolution. Other features are available to the more advanced FileMaker user.

If necessary, more than one person can enter data at the same time. It works best if the file can be parked on the FileMaker server, but it isn't really necessary. Anyone can open the file on their own machine (local hard drive) and others on the same LAN should be able to see it when they choose the Open/Hosts/ option. Yet another way to distribute data entry is for each operator to work independently on a copy of the database. When data entry is complete, merge the various files by exporting and importing. Make sure you "match by variable name" when you do the import. If that doesn't make perfect sense to you, you probably should get help.

STEP 4 Analyzing the Data

Basic data analysis is built into the *Sleuth*. This includes summaries of the clinical profile, case counts, 2x2 table analyses, epi curve creation, basic report writing, and so much more. For many outbreaks you don't need anything else. The FileMaker file is amply documented with mouse-over tooltips and pop-up Help windows; a monkey can understand it.

If necessary, however, data can be easily exported to Excel or DBF files. There are several canned options, and you can always do *ad hoc* exports. We used to recommend EpiInfo 6 (the old DOS version), but it is rarely needed any more, and younger people seem to prefer more expensive software. Knock yourself out.

The EpiInfo 6 program (at least) provides a complete demographic and clinical summary tailored for the outbreak summary report form, data for epi curves, as well as 2x2 tables for all exposure variables.

Note that, under the hood, most of the exposure variable names are generic—e.g., item01a, item01b, …, item22h, …. This makes it easier to write looping routines, and also means that analysis programs can be recycled between outbreaks.

STEP 5 Think About Your Results

2x2 tables alone rarely are the sole solution to an epidemiological mystery. Ask yourself if the data make sense. Consider the effects of bias and confounding, and think about other ways to slice the data.

STEP 7 Getting More Information

For help using this system, contact us by phone (971.673.1111) or e-mail. Not everyone at the Health Division is equally facile with this system; you might want to start with Bill Keene, June Bancroft, Tasha Poissant, Hillary Booth, or Beletshachew Shiferaw.

keene@epilinks.com   *june.e.bancroft@state.or.us*   *beletshachew.shiferaw@state.or.us*

hillary.booth@state.or.us   *tasha.poissant@state.or.us*

UTILITY PAGE: DO NOT DELETE

Footnotes