

# Potential for Food and Nutrient Databases and Dietary Survey Data to Aid in Foodborne Illness Outbreak Investigations

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## Outline

- Quick primer on outbreak investigations
- Point out weak links
- Discuss ways in which food and nutrient databases may address weaknesses
- Illustrate way in which dietary survey data may strengthen investigations



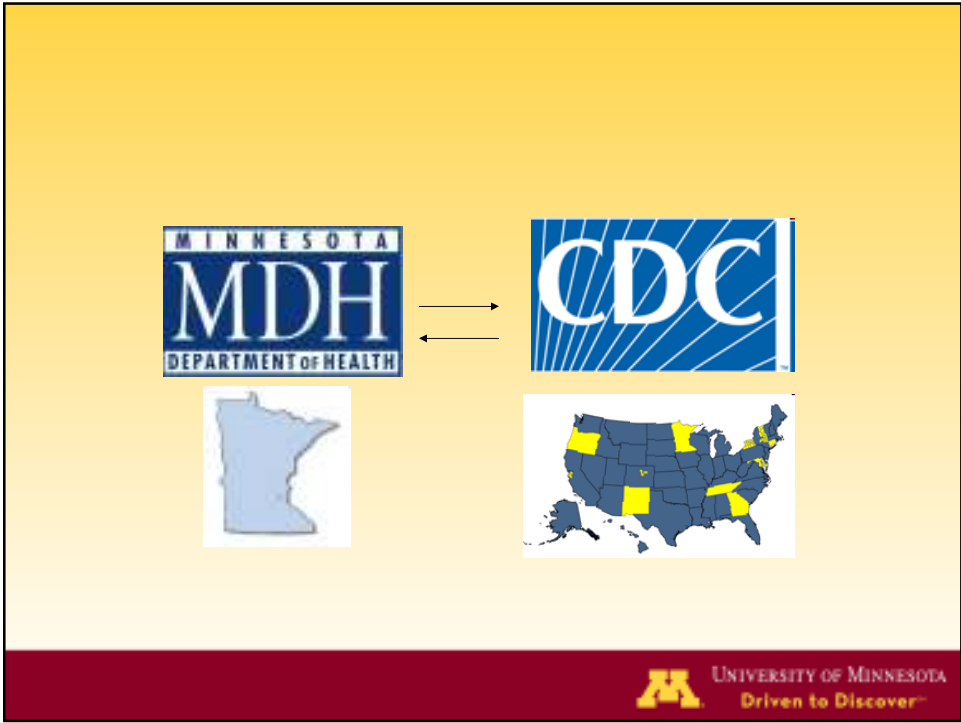
# Outbreak Investigation Primer



June 11, 2008

## Step 1: Detection





## Step 2: Generate hypotheses





## Assessing foods eaten prior to illness: Two approaches

Close ended questions

“Did you drink any unpasteurized milk in the 3 days before you became ill?”



**Oregon method**

Open ended questions

“Tell me about the foods you ate and the beverages you drank in the 3 days before you became ill.”

**Minnesota method**



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“Did you eat any peanut butter in the 3 days before you became ill?”



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Why isn't open ended approach  
routinely used?

- Time consuming to collect
- Take times to make sense of information collected

## Role for food and nutrient databases and dietary analysis software programs

- ✓ Expedite information collection
- ✓ More rapidly make sense of information (data analysis)
- ✓ If database has details about food ingredients, ingredient driven outbreaks may be more efficiently investigated



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CDC Home Search Health Topics A-Z

**MMWR**  
Weekly  
February 6, 2009 / 58(04):85-90

### Multistate Outbreak of *Salmonella* Infections Associated with Peanut Butter and Peanut Butter--Containing Products --- United States, 2008--2009

On January 29, this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).

On November 25, 2008, an epidemiologic assessment began of a growing cluster of *Salmonella* serotype Typhimurium isolates that shared the same pulsed-field gel electrophoresis (PFGE) pattern in PulseNet.\* As of January 28, 2009, 529 persons from 43 states (Figure 1) and one person from Canada had been reported infected with the outbreak strain. This report is an interim summary of results from ongoing epidemiologic studies and recall and control activities by CDC, the Food and Drug Administration (FDA), and state and local public health agencies. Confirmed, reported onset of illness dates have ranged from September 1, 2008, to January 16, 2009. A total of 116 patients were reported hospitalized, and the infection might have contributed to eight deaths. Sequential case-control studies have indicated significant associations between illness and consumption of any peanut butter (matched odds ratio [mOR] = 2.53), and specific brands of prepackaged peanut butter crackers (mOR = 12.25), but no association with national brand jarred peanut butter sold in grocery stores. Epidemiologic and laboratory findings indicate that peanut butter and peanut paste produced at one plant are the source of the outbreak. These products also are ingredients in many foods produced and distributed by other companies. This outbreak highlights the complexities of "ingredient-driven" outbreaks and the importance of rapid outbreak detection and investigation. Consumers are advised to discard and not eat products that have been recalled (Box).

#### Initial Outbreak Investigation

On November 10, 2008, CDC's PulseNet staff noted a small and highly dispersed multistate cluster of 13 *S. Typhimurium* isolates with an

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## 3,913 Peanut- and Peanut Butter-Containing Products Recalled



Photo by Dr. Bill Keene



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## How many of the cases consumed a peanut containing product?



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## Step 3: Test Hypotheses- Case Control Investigations

- **Ideal:** interview cases and matched controls and compare frequency of foods consumed (e.g. were cases more likely to report consuming peanut butter than controls?)
- **Reality:** interview cases and rely on FOODNET population survey data as measure of usual frequency of intake in the population (quicker and less expensive)



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## What is FOODNET data?

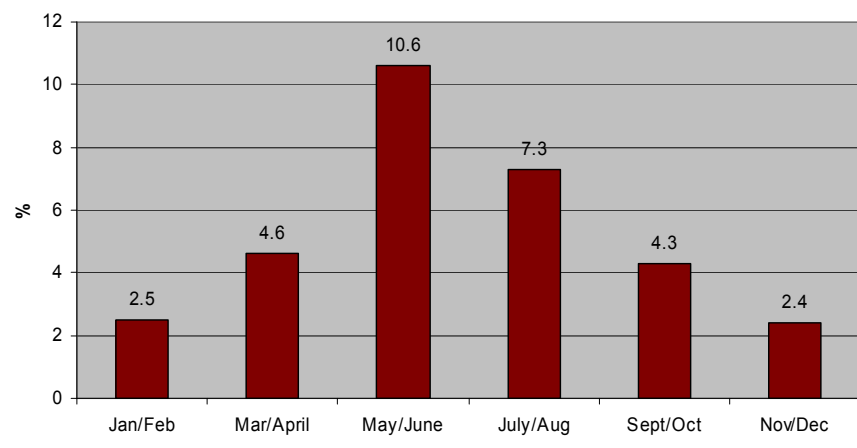
- Gathered through telephone survey in various states (10 states for 2006-2007)
- Participants are asked if they consumed various basic foods (e.g. celery, strawberries, apples, etc.) over the past 7 days
- Downsides- seasonal frequency unknown & frequency of consumption of many processed foods not assessed



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Could data from national (e.g. NHANES) or regional dietary surveys be useful?

Percent of MHS participants reporting consumption of fresh strawberries on recall day by month of year, 2007-2009



## Summary and Conclusions

- Food and nutrient databases, dietary analysis software applications, and dietary surveys such as NHANES have potential to be useful tools to improve foodborne illness investigations
- Dialogue between database and dietary assessment experts and outbreak investigation experts needed to evaluate potential

