KEY POINTS

for Successful Foodborne Outbreak Detection and Investigation

PRODUCT TRACING IN EPIDEMIOLOGIC INVESTIGATIONS OF OUTBREAKS DUE TO COMMERCIALLY DISTRIBUTED FOODS

PART 1: WHEN AND HOW TO INITIATE

Product tracing has emerged as an increasingly important part of the epidemiologic process for the identification of the vehicle in outbreaks due to commercially distributed foods; tracebacks conducted in this context are commonly referred to as "epi" or "informational" traces. A white paper was written to help standardize approaches used to conduct product tracing in this context, and to stimulate an increase in its use. This document (Part 1 of 2), targeted primarily at epidemiologists, provides a brief synopsis of when to use this tool and how to initiate the process.

1. A number of conditions that, when they all occur, indicate that product tracing might be useful:

- There is a molecular (e.g., PFGE, WGS) subtype cluster of cases that likely represents a common source outbreak;
- Cases occur in multiple locations or jurisdictions (particularly if they occur in multiple states);
- Interviews of case-patients reveal no obvious common exposure that can explain the outbreak, suggesting that the outbreak vehicle is a commercially distributed food item; and,
- A vehicle cannot be clearly implicated with traditional investigation methods alone.

2. It is critical to focus epidemiologic investigations as narrowly as possible, to recognize when product tracing might be appropriate.

- Case demographics and temporal and geographic case distribution can be useful, but the most critical component of obtaining actionable information is case exposure interviews.
- Interview as many cluster cases as possible, as soon as possible (to minimize recall loss), **in detail**, until compelling patterns emerge. The more specific the exposure information (i.e., purchase or consumption location, brand/variety of foods), the more quickly strong hypotheses will emerge.

3. Product tracing is almost always warranted as part of an epi investigation when:

- Case sub-clusters are associated with multiple restaurants or institutions (Key Points: Investigating Establishment Sub-Clusters);
- A statistical association with a food item is identified, but uncertainty exists due to concerns about combined consumption with other food items, the possible involvement of stealth vehicles, or other factors about the outbreak presentation that do not align with the statistically implicated vehicle;
- There are statistical associations with >1 food, and the analysis cannot clearly implicate 1; or,
- A borderline statistical association relating to the primary hypothesis of interest is identified.

- Product tracing also can be applied effectively when the proportion of case-patients report eating one or more particular types of food is appreciably higher than expected. The plausibility of these associations can be quickly assessed with a binomial probability model and real or estimated background exposure frequencies.

4. The lead epidemiologist investigator initiates this type of product trace by identifying regulatory agency collaborators, establishing clear lines of communication, providing an outbreak summary, and requesting the product trace

- The decision on whether a product trace might be useful is based on an assessment of the cumulative available data by the lead epidemiologist investigator(s). For multi-state outbreaks, this often involves collaborative data evaluation by multiple health departments and CDC. It also typically includes consulting regulatory and industry collaborators.

5. The lead epidemiologist investigators should present to regulatory partners a prioritized list of case exposures. Exposures should be prioritized based on:

- The likelihood that the exposure is truly the exposure of interest for a case-patient;
- The availability of clear, documented details on the exposure (e.g., receipts, shopper card information, bank statements);
- Whether or not other case-patients share specific commonalities (e.g., ate at the same restaurant, shopped at the same grocery store, report the same brand or variety of the suspect food item);
- Geographic and/or temporal dispersion of case exposures;
- The likelihood that a case exposure (single case or sub-clusters) represents a different "leg" in the supply chain that might provide convergence upstream; and
- The likely quality of product tracing information available at the exposure location.

6. When a food exposure is identified for tracing, these details should be provided to the correct regulatory agency (some variables specific to grocery store items, restaurants, or institutions):

- Establishment name, address, phone number;
- Type of food (as specific as possible) or menu item that contains the food;
- Recipe/ingredient list for menu item;
- Brand and variety names;
- UPC or PLU numbers;
- Other product information on packaging (e.g., lot code, "best by" or "use by" dates);
- Purchase/consumption date (try to verify with receipt or other records);
- If the store has membership or shopper cards, get the card number (and get permission to share it with the appropriate regulatory agency);
- Menu for the week before illness (for institutions); and,
- If there is any product left from the same package as was eaten prior to illness, or if packages that were purchased at the same time are available (this is a good time to ask if the product or packaging can be obtained).

Additional Resources:

Product Tracing in Epidemiologic Investigations of Outbreaks due to Commercially Distributed Food Items – Utility, Application, and Considerations (http://mnfoodsafetycoe.umn.edu/wp-content/uploads/2015/10/Product-Tracing-in-Epidemiologic-Investigations.pdf)

Tracebacks (http://mnfoodsafetycoe.umn.edu/food-product-tracing/)

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