IFSAC’s Strategic Vision & Directions for Future

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Recap of the Day with Respect to the IFSAC Vision

- CDC, FDA, and FSIS created IFSAC to address complex analytical issues that require cross-agency cooperation and agreement, with the initial objective to estimate foodborne illness source attribution
- Identified 4 priority pathogens for initial work
- Communicated at public meetings and in other venues
  - January 2012: Public meeting about the 5 year strategic plan
  - Today: Short-term accomplishments and projects for longer-term strategic plan
- Major accomplishment is new methods and estimates for source attribution
Outline

- Overview of strategic plan
- Short-term plan (1-2 years)
- Longer-term plan (3-5 years)
- Summary & conclusions
Overview of Strategic Plan’s 5-Year Vision

- **Ever more accurate attribution estimates**
  - Of the food sources of acute gut illnesses
  - Caused by 4 priority pathogens

- **Using data from a variety of sources, e.g.,**
  - Outbreaks
  - Studies of sporadic cases
  - Travelers
  - Antibiotic resistance

- **Using the most appropriate methods for each pathogen**
  - That may blend data from various sources, and
  - Have uncertainty bounds, and
  - Are updated as needed

- Using isolates from:
  - Humans
  - Food
  - Animals
  - Environment
Along the Way, We Expected

- Exploration and use of various data sources and methods
  - Resulting in differences in attribution percentages for specific food-pathogen pairs, sometimes based only on differences in data sources and methods, not on true changes in sources
- Gradual improvement in the quantity and quality of data
- Requests from public health officials and food safety regulators to provide more analyses, faster
Outline

- Overview of strategic plan
- **Short-term plan (1-2 years)**
- Longer-term plan (3-5 years)
- Summary & conclusions
Short-term Plan (1-2 Years)

- Improve method to assign foods implicated in outbreaks to food categories
- Examine uncertainties associated with outbreak-based source attribution
- Use data from outbreaks to estimate foodborne illness source attribution for 4 priority pathogens
  - With credibility intervals
- Determine gaps and identify solutions
Short-term Plan (1-2 Years)

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Strategic Plan, January 2012

Short-term Plan (1-2 Years)

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Examine Uncertainties Associated with Outbreak-Based Source Attribution

- **Uncertainty:** How sporadic cases differ from cases in outbreaks of the 4 priority pathogens
  - Project: Compared sporadic cases in FoodNet surveillance to outbreak illnesses
  - Result
    - Highly similar by age, sex, illness severity
    - Except children <3 years old underrepresented by *Salmonella* outbreaks
Short-term Plan (1-2 Years)

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Results: Estimated Attribution Percentages

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Salmonella (N=597)</th>
<th>E. coli O157 (N=170)</th>
<th>Campy (N=161)</th>
<th>Lm (N=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td></td>
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<tr>
<td>Pork</td>
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<tr>
<td>Chicken</td>
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<tr>
<td>Turkey</td>
<td></td>
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<tr>
<td>Other meat &amp; poultry</td>
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<tr>
<td>Game</td>
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<tr>
<td>Dairy</td>
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<tr>
<td>Eggs</td>
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<td>Fish</td>
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<tr>
<td>Other seafood</td>
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<tr>
<td>Grains-beans</td>
<td></td>
<td></td>
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<tr>
<td>Oils-sugars</td>
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<tr>
<td>Fruits</td>
<td></td>
<td></td>
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<tr>
<td>Seeded vegetables</td>
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<td></td>
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<tr>
<td>Sprouts</td>
<td></td>
<td></td>
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<tr>
<td>Vegetable row crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other produce</td>
<td></td>
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</tr>
</tbody>
</table>

Model-estimated attribution percentages
Short-term Plan (1-2 Years)

- Improve method to assign foods implicated in outbreaks to food categories
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- Use data from outbreaks to estimate foodborne illness source attribution for 4 priority pathogens
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- Determine gaps and identify solutions
Determine Gaps and Identify Solutions

- **Gap:** Lack attribution analyses based on data other than outbreaks
  - Solution 1: Began work on a model that uses other types of data (modified Hald model)
  - Solution 2: Used a new method to blend information about sources of both sporadic and outbreak-related *Salmonella* serotype Enteritidis infections

- **Gap:** Lack full understanding of reasons for changes in outbreak data over time
  - Solution: Began a project (described later)
Responded to Request from Department of Health and Human Services (HHS)

- Related to an HHS high priority goal to reduce *Salmonella* serotype Enteritidis (SE) infections from eggs
- Estimated the proportion of foodborne SE illnesses due to shell eggs in 2007-2009
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Some Observations from First Two Years that Inform Longer-Term Plan

- **Outbreak-based data**
  - Is the best US data source now
    - But need >1 year of data to make estimates for most pathogens
  - Have major limitations, e.g.,
    - *Campylobacter*: source attribution estimates differ markedly from estimates that do not use outbreak data
    - *Listeria*: few outbreaks, so attribution estimates have wide credibility intervals
    - Other known and unknown biases

- **Food testing data**
  - Very limited other than for meat and poultry
  - Lack of this data limits usefulness of models that include data on food consumption and food testing
    - Used in other countries to measure progress

- **Sporadic case data: exposure information rarely available**
Longer-Term (3-5 years) Strategic Plan

- Improve “best current” source attribution estimates
- Measure changes in source attribution over time
- Determine a way to synthesize results across projects
- Communicate effectively about differences in estimates that are due simply to changes in data sources and methods
Longer-term Plan Includes Two Overarching Goals

First

- Develop foodborne illness source attribution models using a variety of data sources
  - As an alternative and supplement to outbreak-based approaches
    o Include a model that uses consumption data
  - Evaluate discrepancies between various approaches, and their strengths and limitations
  - Determine best approach for each pathogen based on data available
Longer-term Plan Includes Two Overarching Goals

Second

- Determine methods for generating “blended” foodborne illness source attribution estimates
  - Blend data from outbreaks with data from sporadic cases
  - Generate “best current” estimates with uncertainty bounds
    - Revise periodically
    - Recognize that different pathogens may require different methods
Projects *Continuing* in 2015

- **4 priority pathogens**
  - Submit manuscript to peer-reviewed journal describing estimates (presented today) of source attribution based on outbreak data

- **Salmonella**
  - Estimate source attribution from a “product model” (modified Hald model) that uses food testing data and food consumption data
    - Determine whether this model can assess changes in food sources of *Salmonella* infection over time

- **Sporadic vs outbreak illnesses**
  - Compare foods associated with outbreaks to foods eaten by participants in NHANES surveys

NHANES is the National Health and Nutrition Examination Survey
New Projects Already Planned for 2015-2017

- 4 priority pathogens: Create a template for presenting updated foodborne illness source attribution estimates at regular intervals

- *Campylobacter*
  - Evaluate data sources and methods other than outbreak data for making source attribution estimates
  - Re-analyze a FoodNet case-control study conducted in 1998 using a new method
    - Examine differences in attribution percentages between these results and those that use outbreak data
New Projects Already *Planned* for 2015-2017

**continued**

- Examine possible reasons for changes in outbreak data over time
  - e.g., does recognition of a new food vehicle result in more outbreaks being recognized as due to that food?
- Examine how data on contamination at various points in the food chain can inform source attribution
  - Evaluate data that may help estimate the percentage of illnesses that can be attributed to contamination at point of consumption vs earlier points
Projects Being Considered for 2015-2017

- Develop method to incorporate data from outbreaks due to complex foods into attribution estimates

- *Salmonella* serotype Enteritidis
  - Propose a method to estimate recent sources (after 2009) of these illnesses using exposure information from cases in FoodNet
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Summary & Conclusions

- IFSAC was born of the need for
  - A coordinated approach among FDA, FSIS, and CDC
  - To generate estimates of foodborne illness source attribution derived from the best science available
  - To inform food safety policy

- IFSAC has achieved its short-term (1-2 year) strategic plan goals

- Results presented today represent a major step forward in development of robust, harmonized estimates of the percentage of foodborne illnesses that can be attributed to various food categories
  - Combined with other data, they can inform agency priorities
IFSAC is embarking on longer-term (3-5 year) strategic plan to

- Improve “best current” source attribution estimates
- Measure changes in source attribution over time
- Determine a way to synthesize results across projects
- Communicate about differences in estimates that are due simply to differences in data sources and methods

Using feedback from this meeting and other inputs, IFSAC will formulate a strategic plan for years 6-10

IFSAC will continue to communicate with stakeholders in a variety of ways

- To share information
- To obtain feedback
Interagency Food Safety Analytics Collaboration

Coordinating federal food safety analytics.