IFSAC's Strategic Vision & Directions for Future



Interagency Food Safety Analytics Collaboration

Coordinating federal food safety analytics.

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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

Isolates from

o Humans

Animals

Environment

o Food

- 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

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



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- 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

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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



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Results: Estimated Attribution Percentages



Food category

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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
 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



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

Summary & Conclusions continued

- 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



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