Interagency Food Safety Analytics Collaboration (IFSAC)

2022–2023 Interim Strategic Plan

Introduction

In 2011, three federal agencies—the Centers for Disease Control and Prevention (CDC), the U.S. Food and Drug Administration (FDA), and the Food Safety and Inspection Service (FSIS)—created the Interagency Food Safety Analytics Collaboration (IFSAC). Its purpose is to improve coordination of federal food safety analytic efforts and address cross-cutting priorities for food safety data collection, analysis, and use. Since its inception, IFSAC's focus has been foodborne illness source attribution: identifying which foods are the most important sources of selected major foodborne illnesses. As part of this effort, IFSAC now produces annual estimates for four priority pathogens: *Salmonella*, *Escherichia coli* O157, *Listeria monocytogenes,* and *Campylobacter.*

Federal agencies and food safety experts rely on these attribution analyses to inform strategic planning and risk-based decision-making; estimate benefits of interventions; and evaluate the impact of interventions, such as new or revised regulations, policies, and performance standards. By bringing together data from a variety of sources, broadly exploring an array of methods and disciplines, and developing sound analytical methods, IFSAC scientists can improve estimates of the sources of foodborne illness.

Purpose

During the five years covered by IFSAC's first strategic plan (2012–2016), IFSAC aimed to improve methods to categorize foods implicated in outbreaks; estimate the percentage of certain foodborne illnesses attributable to each food source; identify data needs; take steps to determine how to better acquire, improve, and organize data available for source attribution; validate current methods and modeling approaches; develop improved methods; and create a plan for communicating results to the public. During the five years covered by IFSAC's second strategic plan (2017–2021), IFSAC continued to work toward accomplishing three goals: 1) improve the use and quality of new and existing data sources to conduct analyses and develop estimates, 2) improve analytic methods and models, and 3) enhance the use of and communications about IFSAC products.

IFSAC activities have been substantially affected by the COVID-19 global pandemic. During 2020 and 2021, many staff from CDC, FDA, and FSIS who lead and participate in IFSAC projects and their oversight have been deployed to COVID-19 response efforts, have had to focus on pandemic-related activities, or have covered agency program activities while others were deployed. IFSAC continues to publish annual estimates of foodborne illness source attribution, but resource limitations have delayed some projects. The ongoing pandemic response will require prioritization of future efforts.

As a result of these resource constraints, IFSAC developed this interim strategic plan, which describes IFSAC's accomplishments during 2017–2021 and identifies key activities for 2022–2023. Near the end of

this interim period, we intend to share information about our direction, goals, and approaches to our future work.

Activities

Major accomplishments during 2017–2021:

- Developed a recency-weighted statistical modeling approach to estimate the sources of foodborne illness caused by specific pathogens and published the method in a peer-reviewed journal.
- Updated IFSAC's scheme for categorizing foods implicated in foodborne disease outbreaks, and described it in a peer-reviewed published article.
- Produced annual estimates of the sources of foodborne illness for *Salmonella*, *Escherichia coli* O157, *Listeria monocytogenes,* and *Campylobacter* for 2015–2019.
- Analyzed outbreak data on *Salmonella* illnesses acquired from consumption of pork products to support draft USDA performance standards for the minimum acceptable *Salmonella* contamination of pork cuts and ground pork products.
- Continued to explore new methods and models for foodborne illness source attribution, including random forest and other machine learning algorithms.
- Hosted a public webinar on our strategic plan and future directions in May 2017.
- Presented progress on several projects at scientific conferences.

Short-term Goals

During the years 2022–2023, we will continue to publish annual reports on foodborne illness source attribution for priority pathogens. We will continue to improve methods for estimating foodborne illness source attribution using outbreak and sporadic (non-outbreak-associated) disease data, pursuing external collaborations as needed to maximize capabilities and access to data sources. Specifically, we intend to prioritize the following activities:

- Analyzing trends in foodborne disease outbreak-associated illnesses over the past 20 years and submitting a manuscript to a peer-reviewed journal describing our methods and results.
- Continuing to develop and refine machine-learning approaches to predict the food sources of human illnesses with unknown sources by using whole-genome sequencing (WGS) to compare *Salmonella* isolates of known source with those from ill persons whose source is unknown.
- Adapting the WGS-based methods developed for *Salmonella* to attribute sporadic *Campylobacter* illnesses to food sources.
- Assessing the frequency of multi-year outbreaks and their impact on source attribution analyses and deciding whether to improve the methods for using them in outbreak-based source attribution models.
- Collaborating with FoodNet staff to estimate population attributable fractions for key food sources of sporadic *Salmonella* Enteritidis and *Campylobacter* illnesses by developing case-

control studies using FoodNet case exposure ascertainment data and FoodNet Population Survey data.

- Continue to develop a method to incorporate into attribution estimates those outbreaks associated with complex foods (i.e., multi-ingredient foods) for which the contaminated ingredient is unknown.

Future Direction

IFSAC's primary focus continues to be improving estimates of the food sources of illness caused by major pathogens. Whereas IFSAC has always focused on estimating the sources of all (not just outbreak-associated) illnesses, the methods have thus far only used data from outbreaks. In recent years, we developed methods to use data from sporadic illnesses to make these estimates.

In this interim period, we will continue to evaluate our approach to attributing *Campylobacter* illnesses to specific food categories. Our recent reports have highlighted the challenges associated with attributing *Campylobacter* illnesses to foods based on outbreak data, due to the outsized influence of outbreaks from foods not widely consumed but with high risk of illness, such as unpasteurized milk and chicken livers.

As we continue our work during this interim period, we will develop IFSAC's strategic vision for the future, including goals, strategic objectives, and projects. We will continue to re-evaluate project priorities as needs arise. For more information, visit the IFSAC website or email IFSAC.