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Data-Forward Environmental Health Food Safety Practice

Editor’s Note: The National Environmental Health Association (NEHA) strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, NEHA features this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC’s Water, Food, and Environmental Health Services Branch, as well as guest authors, will share tools, resources, and guidance for environmental health practitioners. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

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Ensuring the safety of food served in restaurants and other licensed food service establishments requires actions that cut across the 10 Essential Environmental Public Health Services (www.cdc.gov/nceh/ehs/10-essential-services/index.html). To provide these services, environmental health agencies collect and maintain a wide variety of data that can inform foodborne illness prevention and surveillance practice.

Environmental Health Data Provide Important Context for Effective Prevention Measures

The most visible manifestation of food safety problems in a restaurant setting is the occurrence of an outbreak of foodborne illness among restaurant patrons. Approxi-

mately 64% of foodborne outbreaks in the U.S. are associated with restaurant settings (Centers for Disease Control and Prevention [CDC], 2019). The primary goal of outbreak investigations is to interrupt the chain of illness transmission from consumption of contaminated food. Mitigation measures are generally focused on preventing contributing factors related to contamination, proliferation, and survival of pathogens in the implicated food item.

Environmental health data generated outside of outbreak investigations, however, provide important context for translating investigation results into effective prevention measures. These environmental health data include restaurant practices, such as the presence of certified food safety managers and the routine documentation of risk factor inspec-

tion violations, and inspection agency practices, such as mandated grading of routine inspections and point-of-service disclosure of inspections results. Using a broad array of environmental health data can foster a more comprehensive understanding of the relationships between restaurant risk factors and foodborne illness.

Environmental Health Data Drive Outbreak Investigations

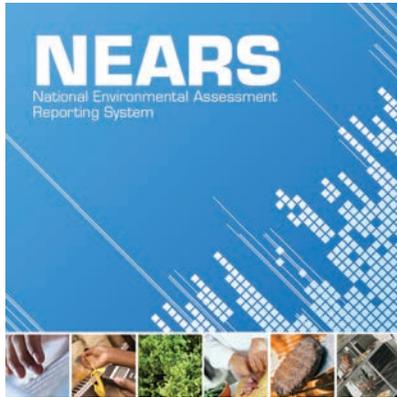
Although outbreaks of foodborne illness can be exceptional events, they provide critical learning opportunities to improve food safety practices. In 2014, the Centers for Disease Control and Prevention/National Center for Environmental Health launched the National Environmental Assessment Reporting System (NEARS) to capture environmental assessments conducted during identified restaurant-associated outbreaks (Figure 1). The NEARS platform provides a framework for the standardization of environmental health outbreak investigative activities to streamline communication of important environmental health findings across jurisdictions and disciplines (CDC, 2022). Lessons learned from NEARS data can be translated into regulatory actions and model practices to guide future investigative practices.

Environmental Health Data Drive Illness Prevention

Outbreaks represent only the tip of the iceberg of foodborne illnesses; therefore, there is significant value in analyzing routine restaurant inspection data. Risk factor violations cited during routine restaurant inspections have been associated with sporadic cases

FIGURE 1

National Environmental Assessment Reporting System (NEARS)



NEARS captures environmental assessment data from foodborne illness outbreak investigations to improve your food safety programs. Learn more at www.cdc.gov/nceh/ehs/nears/index.htm.

Explore These Food Safety Tools and Resources

- **National Environmental Health Association:** www.neha.org/eh-topics/food-safety-0/disclosing-inspection-results-point-service-impact-food-establishment
- **Retail Food Safety Regulatory Association Collaborative:** www.retailfoodsafetycollaborative.org/tools-and-resources/
- **Council to Improve Foodborne Outbreak Response (CIFOR) Guidelines for Foodborne Disease Outbreak Response:** <https://cifor.us/products/guidelines>
- **CIFOR Industry Guidelines:** <https://cifor.us/products/industry>

Learn More

Read these scientific articles and summaries to learn more about how data from the National Environmental Assessment Reporting System are being used. Topics include:

- Root causes of *Clostridium perfringens* outbreaks
- Factors that contribute to outbreaks of foodborne illness
- Norovirus outbreaks and restaurant practices
- Outbreak investigations of restaurants
- Why investigators did or did not do environmental assessments for restaurant outbreaks

Visit www.cdc.gov/nceh/ehs/nears/publications.htm.

(Appling et al., 2018) and outbreaks (Firestone et al., 2020) of *Salmonella*. These findings validate concerns that poor inspection results might indicate failures in restaurant food safety management systems that, if uncorrected, can lead to foodborne illness (Irwin et al., 1989). Because inspections are relatively common events, patterns of inspection results could be useful as food safety hazard surveillance.

Environmental Health Data Drive Inspection Practices

Just as important as the inspections themselves are the underlying drivers that maintain good retail practices at restaurants. These drivers can range from individual food handler and manager factors (Green & Selman, 2005) to consumer perception of food safety factors that drive dining decision making. Many studies have focused on the impact of consumer perception to incentivize food safety practices. These studies found significant associations between disclosure of inspection results at the point-of-service and improved restaurant food safety (Almanza et al., 2002; Choi & Scharff, 2017), fewer *Salmonella* cases (Firestone & Hedberg, 2018), fewer hospitalizations (Simon et al., 2005), and fewer foodborne

outbreaks (Kim et al., 2021, 2022). These public health benefits of disclosure are practical examples of how data can identify effective inspection practices that improve public health in restaurants.

Investment in Information Systems Is Essential for the Progression of Data-Driven Public Health Practice

There is a need to advance public health surveillance systems that include restaurant inspection data (Firestone et al., 2021). Integrating food safety hazards identified through routine inspections into other streams of foodborne illness surveillance can enhance outbreak detection and provide context to guide investigations and implement control measures. Unfortunately, current infrastructure limitations for environmental health restaurant inspection data collection and dissemination inhibit cross-jurisdictional collaboration and limit the use of the data to inform practice. These examples of how environmental health data can inform practice demonstrate the utility of environmental health data as a form of hazard surveillance and a catalyst for improving regulatory policies. Standards of data collection, analysis, and application

What Is the Difference?

Hazard	Risk
A condition that can cause illness.	The likelihood of a hazard to cause illness.

of environmental health data to food safety practice strengthen public health prevention efforts and ultimately reduce the burden of foodborne illness in the U.S. 🇺🇸

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