▶ **PRESIDENT'S MESSAGE**

Environmental Health Data—Can We Make More Powerful Decisions?

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While we serve our communities, we work in a more and more connected environment where sharing information and data are required. Doing this sharing in a consistent way, with limited data manipulation, supports better decision making. Environmental public health systems have historically collected a variety of community-, program-, and project-related information and data. These important and potentially useful data have often been placed in spreadsheets, custom databases, or enterprise software systems designed around workflow, workload management, and ensuring regulatory compliance. The information is sometimes publicly available but often kept behind one or more layers of "protection."

There are changes that have occurred with some information that the public and consumers actively sought to access. Retail food inspections are a great example of how demand from the for-profit world has made these data more available and widely used. Initially, big data players (e.g., Yelp and others) worked to gather these data to add to the information that they provided to their customers and system users who were consumers. Now, many (maybe even most) retail food inspections are available on a state or county website, or even shared via social media in near real time. We still have a wide range of data modifiers that are added (e.g., color codes, category descriptors, scoring systems) that often require significant explanations and caveats.

Community members should be encouraged to check and understand the narratives or scores of their favorite eateries and patron-

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ize those establishments with higher ratings. When data reveal recurring issues in certain establishments, does it prompt targeted interventions or increase consumer interest? I have certainly seen these instances occur. Food safety inspections are not only a formality but also a tool for continuous improvement.

Another element of retail food safety data that is of particular interest and importance is the growing reference to one set of standards. It is a program where a national model exists (i.e., the Food and Drug Administration model *Food Code*). Data can become more powerful if they are uniform. By consistently applying one set of standards, a step toward data standardization is possible. Various versions of the *Food Code* from 1995 to 2022 have been adopted in most states (Food and Drug Administration, 2023). These data sources are, however, still fraught with a wide range of implementation models (i.e., varying adoption of the *Food Code* or state and local variances from the *Food Code* for local, regional, or governance reasons). As such, there is room for improvement.

There are many local, state, and national efforts to use program information and data to improve food safety, assure safe practices are adopted, and document regulatory compliance. These data are also used on a much more limited basis for academic research, which I suspect is in part due to the wide range of ways the data are collected and the limits around data access. When artificial intelligence (AI) use grows and taps into this information and data, how—for better or worse—will environmental health programs, consumers, the private sector, and even academia be impacted?

- Data analysis and decision support: AI algorithms can process large volumes of data quickly and accurately, helping professionals analyze regulatory requirements, identify patterns, and make informed decisions based on the data. It could help with workload analysis and program funding.
- Compliance monitoring and risk assessment: AI can assist in monitoring and ensuring compliance with regulations by analyzing data from various sources and identifying any anomalies or noncompliance activities. It can flag potential issues for further investigation, which can reduce the burden of manual monitoring and increase the effectiveness of regulatory oversight. This process could also assist with workload analysis, fee-for-service justification, or early outbreak risk factor identification that could be addressed with targeted educational outreach.

Next, let us consider air quality information and data. As we work to address air quality impacts from national or international sources, transportation, and point sources

in our communities, there is a range of historical data and a set of predictive (i.e., leading indicators) that are being used to reduce exposure or impacts. Detailed data on air quality measurements, emissions from industries, and traffic patterns can be collected from state and local regulatory agencies and the sources themselves for analysis. Some communities use asthma hospital admissions to document historical impacts.

These granular data might allow experts to identify hotspots of pollution and the industries responsible. Provided with this information, communities can work to have these industries adopt cleaner technologies, increase monitoring, and implement warning systems. Inspections of industrial facilities become more stringent and compliance with emission standards can be monitored more closely, which could result in a noticeable drop in air pollution levels.

There are many good examples of tools that provide near real-time data available to guide community or individual behaviors.

On a national level, the Smoke Forecasting System from the National Oceanic and Atmospheric Administration integrates information on wildfire locations with National Weather Service inputs from the North American Mesoscale model into smoke dispersion simulations to produce a daily 48-hr prediction of smoke transport and concentration. The model also incorporates U.S. Forest Service estimates for wildfire smoke emissions based on vegetation cover. This system is intended as guidance to air quality forecast-

ers and the public for fine particulate matter emitted from large wildfires and agricultural burning that can elevate particulate concentrations to unhealthful levels. The system is a great near real-time resource for decision making within environmental public health (https://digital.mdl.nws.noaa.gov/airquality).

On a local level, data on community water quality for cyanobacteria (also known as blue-green algae) in Vermont is collected by regulatory agencies and citizen scientists on an ongoing basis. These online reports are continually updated and are then displayed on the Cyanobacteria (Blue-Green Algae) Tracker (www.healthvermont.gov/environ ment/tracking/cyanobacteria-blue-green- algae-tracker). This resource can be used by individuals as well as water resource managers and health officials.

This local example is just one of many data sources available via the National Environmental Public Health Tracking Network (www.cdc.gov/nceh/tracking/index.html). At local, state, and national levels, the Tracking Network uses groups of people and information systems to deliver a core set of health, exposure, and hazards data; information summaries; and tools to enable analysis, visualization, and reporting of insights drawn from data. As discussed above, gathering the data from a wide range of sources and systems, and getting it into a usable form, is a large part of the effort to make these data available and useful.

The effective collection and use of data are crucial for both public health and envi-

ronmental health initiatives. Environmental public health can benefit immensely from data-driven decision making. By implementing these practical strategies, local community needs, and national initiatives, we can better understand the unique challenges and work toward creating healthier and more sustainable environments. Data alone will not be enough to inform community members or elected officials about these challenges and needs. Relatable stories must accompany the data to create and support the case for change or program improvement.

On a final note, the Building Capacity column in the September 2023 *Journal of Environmental Health* provided a nicely written and thought-provoking discussion about generative AI considerations (www.neha.org/ Images/resources/JEH9.23-Column-Build ing-Capacity.pdf). You can also find a new Building Capacity column in this issue that explores programmatic AI adoption. ❧

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Reference

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