

The National Environmental Health Association (NEHA) represents more than 7,000 governmental, private, academic, and uniformed services sector environmental health professionals in the U.S., its territories, and internationally. This workforce represents the second largest constituent of the existing public health workforce, second only to nursing. We are the profession's strongest advocate for excellence in the practice of environmental health as we deliver on our mission to build, sustain, and empower an effective environmental health workforce.

Policy Statement on the Need for Data Modernization and Informatics in Environmental Health Programs

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Harnessing the power of environmental health data is a valuable tool to improve and protect public health. NEHA believes that applying the Data Modernization Initiative from the Centers for Disease Control and Prevention (CDC, 2023a) to environmental health practices and adopting the use of informatics using reliable data as a central pillar to decisions is essential to achieve that end. We recognize that wide jurisdictional variability exists in the adoption and implementation of data collection, analysis, and visualization (DAV) systems, as well as the absence of standards for these systems. Modernization of electronic records in place of paper records, databases, software as a service (SaaS), business intelligence and statistical analysis software, and DAV systems for geographic information systems (GIS) is warranted. Additionally, there is an urgent need for informatics training—including data compilation, modeling, and analysis—in the environmental health workforce that will increase capacity and modernize practices to best meet the needs of communities served by environmental health agencies.

We support investments, regulations, and requirements as appropriate for standardization of data structures, data dictionaries, data sharing laws and policies, and messaging systems. Standardized system structures will support cross-jurisdictional data sharing, DAV systems, and research that aid decision support systems for policy and practice implementation. We also advocate for advanced training of the environmental health workforce in informatics and DAV systems. Workforce training and sustainable investment in data infrastructures will strengthen decision support systems by building capacity to address health risk factors and disaster events affecting the communities this workforce serves.

We recognize the positive impact that data systems provide to address health equity challenges. DAV systems provide a method to link social determinants of health to environmental risk factors and to identify and address these disparities within the communities served by environmental health personnel. These data are invaluable to effectively illustrate how residents from underserved communities are disproportionately impacted by environmental hazards.

Additionally, reliable, timely, and interoperable data are integral for jurisdictions to use to improve and inform decisions about health equity and address environmental justice issues in their communities.

NEHA recommends the planning and implementation of DAV systems that will be sustained as a standard cost of operations and that will provide a data-driven foundation to inform environmental health policy, process, and planning decisions. In addition to implementing comprehensive DAV systems and informatics in environmental health, NEHA recommends the following for federal, state, local, tribal, and territorial governmental agencies:

- Engage with environmental health jurisdictions to support and participate in the Data Modernization Initiative from CDC.
- Ensure that jurisdictions have the appropriate funding, resources, and guidance needed to invest and maintain resources (e.g., equipment, software, personnel, training) to support DAV systems for environmental health, and support infrastructure to sustain the use of informatics systems.
- Integrate environmental health systems and advance data sharing and informatics use across offices and jurisdictions to create a shared, common infrastructure for the delivery of high-quality, real-time information for environmental health decisions.
- Cooperate to establish data standards for each subspecialty of operations within environmental health, including data dictionaries, data messaging, and metadata elements.
- Ensure that environmental health jurisdictions at all levels of government, including territorial government agencies and tribal jurisdictions, are engaged in decision-making conversations around the adoption and implementation of the most current data standards and data sharing recommendations.
- Focus on an environmental health data-driven approach to inform and improve practice, policies, research, training, public outreach, advocacy, and health outcomes.
- Encourage the use of established data standards across all jurisdictions in the U.S. and its territories.
- Institute promising and model practices for data security and privacy protection within environmental health data systems and data sharing agreements that support improved health outcomes.

Analysis

The lack of common data structures, informatics training, and a patchwork of data sharing protection laws impairs the ability of environmental health agencies to collaborate across jurisdictions to assess and respond to risk factors affecting public health, including emerging illness threats (Conway & Patel, 2021; Gerding et al., 2020; National Academies of Sciences, Engineering, and Medicine, 2016). This deficit prevents the evaluation of policies and practices to identify effective health outcome results from routine regulatory and preventive work by environmental health professionals. The lack of foundational DAV system support structures,



personnel, and policies also limits reliable assessment of the capacity to respond to local or national disasters.

Minimum requirements for environmental health personnel currently do not include education or knowledge of informatics systems or use of DAV systems to drive decisions on policy, processes, or planning. This lack of knowledge results in less effective management and leadership to address emerging health threats or environmental risk factors to human health when first identified. As a result, outbreaks and injuries affecting both local and multijurisdictional populations are not mitigated or prevented in a timely manner. This deficiency detrimentally impacts the health, welfare, and economy where DAV systems are not fully used. These impacts apply to multijurisdictional threats to public health, such as foodborne illness from a manufacturing source, disaster response and recovery efforts to prevent waterborne illness, or animal bite and rabies case management.

Data that are appropriately and expediently shared across jurisdictions—such as between cities and counties, or between states and federal agencies—provide opportunities to identify emerging environmental health issues earlier and elicit a scaled relay of information and response when necessary. For example, the Georgia Childhood Lead Poisoning Prevention Program combined data from past blood lead surveillance, the American Housing Survey, and Medicaid to develop a risk model of ZIP Codes with higher risk of childhood lead exposure and incorporated this risk assignment into the statewide immunization registry system to alert medical professionals of the need to test children for lead exposure (Callahan & Kuriatnyk, 2021). This work resulted in a significant increase in children who are typically not tested to be identified for case management due to elevated blood lead levels.

Justification

Valuable environmental health data are already being collected. Local agencies supported by DAV systems are currently providing data-informed benefits to the communities they serve. These agencies use systems that include permitting, inspection, and complaint data related to food safety, aquatic recreation facilities, tourist accommodations, onsite wastewater systems, water supplies, chemical storage, solid waste, air quality, and housing safety and sanitation. Examples of these DAV systems include inspection violation data and public posting of inspection results for food establishments, as well as GIS for well water quality, radon hazards, pollution sources, disease vectors, and climate factors that affect health. The collected data, however, are independently structured despite having common core utility. Location, person, demographics, exposures, risk factors, testing and sample results, and investigational notes are determined by local staff with no established standards for structure or governance. Each agency structures data without common guidance or general conceptual design, which results in data sets that are incompatible for sharing or compilation across locales.

Jurisdictions are demonstrating the feasibility and benefits of standardized DAV systems and increased environmental health workforce competence in using these systems:



- The Washington Tracking Network worked with the Division of Emergency Preparedness and Response to add drought information to its Smoke & Air map (Washington State Department of Health, 2022). This information was used to identify areas at risk from fireworks and to deploy additional resources to those areas. It also added a map layer showing locations of cooling stations to identify areas of need.
- The Arizona Environmental Public Health Tracking website includes a mapping site to help parents decide if their child needs to be screened for elevated blood lead levels based on home address (Arizona Department of Health Services, 2022).
- The Georgia Department of Public Health implemented a program for two cohorts per year to train county, district, and state environmental health staff in advanced use of Microsoft Excel and Power BI Desktop for data analysis, visualizations, informatics, and data-centered storytelling (Callahan, 2022). This program uses data from environmental health services in 156 counties, as well as other available resources, to track the environmental health risk factors in regulated operations and to track the performance of staff. It serves as a surveillance system for emerging issues such as repeat violations, increased onsite wastewater system failures, and workforce capacity gaps.

Furthermore, data used by researchers that are not based on GIS can help to guide environmental health practices. A Colgate University economics researcher used restaurant inspection data to analyze the effect of inspection anticipation during multiple, same-day inspections at the same facility (Makofske, 2021). The University of Minnesota, as part of the Minnesota Integrated Food Safety Center of Excellence, has conducted numerous studies assessing the public health impact of restaurant grading and inspection result disclosure (Firestone et al., 2020; Firestone & Hedberg, 2018; Kim et al., 2021, 2022; Li et al., 2011). Health departments around the country have also analyzed environmental health data to inform their grading and disclosure practices (Wong et al., 2015).

Finally, CDC (2023a) has set data-driven decision making and data sharing as a national priority for public health with its Data Modernization Initiative. This initiative creates sustainable infrastructure with cloud-based data storage and analytics, a trained workforce, and technical support and funding for state, tribal, local, and territorial agencies. As part of the Data Modernization Initiative, CDC (2023b) established the Center for Forecasting and Outbreak Analytics in 2021 to advance these capabilities to address COVID-19 variants. Improvement provided by the Center for Forecasting and Outbreak Analytics could be realized in environmental health policies and practices, including early warning by outbreak scenario modeling, risk characterization, severity assessment, policy decision advisement, and collaboration due to strengthening relationships across jurisdictions and agencies.

Training and Continuing Education

Trained and experienced environmental health professionals are instrumental in developing and maintaining successful DAV-based decision support systems. Having informaticians who are well



versed in environmental health operations, policies, and practices within environmental health agencies has many benefits that stem from the primary collection of data, such as relevance of a risk factor violation to prevent outbreaks or sample result relationships to water supplies. Furthermore, the presence of informaticians supports the ability of environmental health agencies to interpret data and communicate analysis results.

Environmental health specialists with additional education in DAV systems—including continuing education on new systems, data collection protocols, analysis, and communication and dissemination techniques—are essential to the use of any DAV system, as well as to the realization of the return on investment to implement and maintain such systems. The immense value of data will only produce the benefits expected when environmental health staff are trained to practice informatics to understand environmental health issues and effectively communicate findings and recommendations through data-centered storytelling.

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