CSTE
COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS

Influenza Surveillance Landscape Assessment

Influenza Coordinator Assessment & Key Informant Interview Findings

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Acknowledgments

This resource was authored by the Council of State and Territorial Epidemiologists (CSTE) with the assistance of a consultant, Dr. Meg Schaeffer, Aperio Statistical Consulting. CSTE staff members Amelia Blumberg, MSPH, Jordan Peart, MPH, and Beth Daly, DrPH MPH, contributed to this resource. This project was supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling $40,400 with 100 percent funded by CDC/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government. The use of trade names in this report is solely for identification and does not imply endorsement.

CSTE acknowledges the contributions of the following persons and agencies to this project:

- CSTE Viral Respiratory Diseases Subcommittee Co-chairs who provided critical feedback and review commentary throughout the project and on all deliverables:
    - Lisa McHugh, PhD, MPH, Pennsylvania Department of Health
    - Karen Martin, MPH, Minnesota Department of Health
- CDC Influenza Division for providing oversight and review:
    - Alicia Budd, MPH
- State and territorial influenza coordinators who participated in interviews for this project, providing invaluable insight into their surveillance programs
- Large city, state, and territorial influenza coordinators who participated in the influenza assessment providing invaluable insight into their surveillance programs

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List of Referenced Influenza Surveillance Programs and Acronyms

DCIPHER

DCIPHER is part of the 1CDP platform used to create response systems within CDC and agencies reporting to CDC. Part of DCIPHER is an automated process for incorporating manual data including case reports, laboratory results, outbreak information, and other elements of real-time investigations.[1]

Emerging Infections Program (EIP)

The Emerging Infections Program is a network of 12 US sites working to translate infectious disease research into informed policy and public health practice.[2] Data from each site is obtained through collaboration between state health departments, academic institutions, and other public health partners.

ESSENCE

ESSENCE, the Electronic Surveillance System for the Early Notification of Community-based Epidemics, is an essential data collection and aggregation tool used by public health to extract, analyze, and visualize surveillance data.[3] Public health agencies commonly use ESSENCE as a source of syndromic data received from Emergency Departments (ED). This system also includes NSSP data listed below.

ILINet

Influenza-like illness (ILI) data are collected through the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet).[4] ILINet consists of outpatient healthcare providers in all 50 states, Puerto Rico, the District of Columbia, and the U.S. Virgin Islands who submit data directly to ILINet or the jurisdiction's public health agency.[4]

National Notifiable Disease Surveillance System (NNDSS)

The National Notifiable Diseases Surveillance System collects case surveillance data from across the U.S. to keep people healthy.[5]

National Syndromic Surveillance Program (NSSP)

NSSP is a collection of federal, state and local health departments, academic institutions, and other partners.[3] NSSP supports the submission of near-real-time syndromic surveillance data.

National Wastewater Surveillance Program and National Centers for Excellence (NWSS)

The National Wastewater Surveillance System provides a system for monitoring infectious diseases through wastewater testing at sites across the country.[6] Wastewater surveillance data are collected for COVID-19, influenza A, avian influenza (H5), RSV, and Mpox. There are 1,306 sampling sites covering an estimated 143,000,000 people at the time of this report.

Respiratory Virus Hospitalization Surveillance Network (RESP-NET)

RESP-NET monitors laboratory-confirmed hospitalizations attributed to influenza, COVID-19, and RSV.[7] RESP-NET is comprised of three networks - influenza (FluSurv-NET), COVID-19 (COVID-NET), and RSV (RSV-NET). RESP-NET surveillance is conducted through a network of acute care hospitals in 14 states for influenza, and 13 for COVID-19 and RSV.

Executive Summary

Influenza surveillance programs in U.S. states, cities, and territories are among the most complex, impactful, and well-established public health programs. Over time, these programs have evolved to function as sentinels for multiple respiratory pathogens, and this role has become even more pronounced following the COVID-19 pandemic. The influenza coordinators and teams who lead these programs manage numerous, complex, and often manual data systems to produce near real-time, actionable, and widely used epidemiologic data.

In 2025, CSTE initiated a project to improve the understanding of how influenza surveillance programs were run, what components were used and to what extent, and where major challenges existed. The project consisted of key informant interviews with ten state and one territorial influenza surveillance coordinator ("influenza coordinator"), and a comprehensive assessment from which 57 responses were received, representing 54 unique jurisdictions.

Priority Findings

The following lists the top challenges, opportunities, and gaps identified from the interviews and assessment.

- Influenza coordinators would like to see stronger collaboration among coordinators, better support from internal leadership, and improved data and information sharing within their agencies.
- There is a need for a coordinated and well-supported effort to remove manual data collection and better leverage electronic reporting and automation. Data sources and formats like Health Information Exchanges (HIEs), HL7, and electronic case reporting (eCR) are broadly underutilized.
- All influenza surveillance programs would benefit from increased enrollment and participation in core CDC systems like NSSP/ESSENCE, the National Respiratory and Enteric Virus Surveillance System (NREVSS), and CDC's National Healthcare Safety Network (NHSN). Expansion of wastewater surveillance sites is desired, though guidance is needed to establish baselines and improve data interpretation.
- Funding constraints, including recent reductions and inadequate funding, pose a major challenge. Increased funding is needed to align staffing levels with influenza surveillance program demands, ensure reagent availability each season, and provide consistent financial support for novel influenza activities.

Summary Findings by Influenza Surveillance Category

Syndromic Surveillance

Syndromic surveillance remains a cornerstone of respiratory pathogen detection. Among respondents, 95% reported using syndromic surveillance for influenza, most commonly through ILINet. In addition, 86% reported using NSSP, and 33% reported use of other syndromic surveillance systems. NSSP was identified as the most valuable syndromic surveillance system, followed by ILINet.

Influenza coordinators expressed interest in expanding the use of NSSP. However, many indicated that ILINet remains the primary mechanism for obtaining outpatient clinical data and laboratory specimens.

Laboratory Surveillance

All jurisdictions reported using public health laboratory data for influenza surveillance. Approximately 65% of respondents use NREVSS, hospital laboratory data, outpatient laboratory data, or commercial laboratory data. Perceived value varied by data source, with commercial laboratory data rated as least valuable with 47% indicating value.

There is a clear need for increased automation with laboratory data reporting. Manual data receipt remains common with 32% of respondents receiving state laboratory data manually. Additionally, 47% of respondents indicated receiving laboratory data from hospital and outpatient sources, while 35% of respondents reported receiving data from commercial laboratories. HL7 is used less than 50% of the time across all laboratory sources. Influenza coordinators reported receiving laboratory data through a variety of mechanisms including surveys, portals, REDCap, email, faxes, and, in at least one jurisdiction, testing conducted at local health departments.

Additional challenges include a lack of consistency in laboratory data reporting, and low participation in NREVSS, which influenza coordinators indicated would be more useful with broader participation.

Hospital Surveillance

Hospitalizations are reportable in 42% of the respondent jurisdictions. Among respondents, 25% use FluSurv-NET, 23% participate in the Emerging Infections Program (EIP), 40% use NHSN, and 19% use other data sources. An additional 14% plan to use NHSN in the future. When used, data from these systems were consistently rated as important.

Other hospitalization data sources include weekly surveys to hospitals, hospital capacity system data, collaborations with health systems, ESSENCE, emergency department visits resulting in admission (used as a proxy for hospitalization), and data from hospitals submitted to preparedness teams.

Hospitalization surveillance was described as time intensive, often requiring extensive data cleaning, obtaining data from multiple systems, or manual chart review. Only a small number of states reported using HIEs or eCR to automate hospitalization reporting.

Schools, Long-term Care Facilities, and Wastewater Surveillance

Among respondents, 81% reported using wastewater surveillance as part of their influenza surveillance program, 75% conduct school-based surveillance, 33% use NHSN, and 56% use other methods to capture long-term care facility (LTCF) activity. Additional sources of LTCF data include surveys (most often through REDCap), reportable diseases website, manual reports to local public health, and telephone reporting.

School-based and LTCF data were rated as valuable when used. Wastewater surveillance was considered extremely or moderately important by 74% of respondents. Influenza coordinators note that the utility of wastewater surveillance could be improved through expansion of wastewater sampling sites and the ability to establish baseline measures for better interpretation of results. Challenges were also reported related to funding for testing and personnel, as well as communication between wastewater surveillance and influenza teams.

Mortality Surveillance

Overall, 82% of respondents reported using vital statistics systems to identify influenza-associated deaths. Pediatric influenza deaths are reported in state vital records systems for 91% of respondents, and 25% reported using additional methods for mortality reporting. Across systems, the majority of respondents rated mortality surveillance as extremely or moderately important.

Despite this importance, challenges remain. Among respondents, 70% reported challenges in receiving timely data, 58% believed influenza-associated deaths are underreported, 54% cited issues with the lack of postmortem testing, and 39% reported challenges obtaining laboratory results prior to death. Additionally, 70% of influenza coordinators noted that investigation of pediatric deaths required manual chart review.

Overarching Challenges and Opportunities

Influenza coordinators identified significant financial constraints across surveillance activities. Funding for additional laboratory reagents was cited as critical or important by 81% of respondents, while 80% identified a need for support related to the avian influenza response. Funding to expand electronic data and support surveillance activities was identified as a critical or important need by 87% and 86% of all respondents, respectively.

Influenza coordinators noted that it is difficult to train backups or rotate responsibilities, and recent cuts to federal grants, state layoffs, and hiring freezes have exacerbated this issue. Collaboration and professional support were identified as important opportunities for improvement with 88% wanting to increase collaboration with other influenza coordinators, 72% expressing an interest in mentoring for new influenza coordinators, and 78% supporting the creation of a statistical user group. Coordinators also indicated that a centralized repository documenting influenza surveillance program components across jurisdictions would be beneficial.

Influenza coordinators reported valuing opportunities to benchmark their influenza program against others in terms of adequacy and performance. The annual right-size goals report card was noted as helpful by some respondents, though at least one indicated uncertainty in interpreting their score relative to other states.

Across the categories of software, tools, and training, approximately 60% of respondents, on average, rated proposed improvements, such as improving software, technical assistance, and training, as critical or important. In the past year, 67% of respondents experienced reductions in funding and/or staffing. About 50% reported additional challenges including staff burnout or resignations, reluctance among health care providers to report surveillance data, and insufficient training to conduct analyses.

To develop or expand new surveillance activities, 93% of influenza coordinators indicated a need for additional financial support from CDC's Epidemiology and Laboratory Capacity Program (ELC). If not ELC funds, 88% of respondents indicated that general fund appropriations would be beneficial. Collaboration with other influenza coordinators, stronger internal leadership support, data modernization, and external support were rated as extremely or moderately useful by about 75% of influenza coordinators.

Summary of Recommendations

The following recommendations are based on key findings from each major section of the report. While not comprehensive, the recommendations address commonly cited challenges that could significantly affect influenza surveillance programs and were viewed as both feasible and valuable.

- Establish a repository that summarizes by state, Tribal, local, and territorial jurisdiction, the components of each jurisdiction's influenza surveillance system. The repository should include influenza coordinator contact information and links to externally facing websites where influenza and other respiratory pathogen data are published.
    - Include a breakdown of all known components of influenza and pan-respiratory surveillance and data sources available to influenza coordinators. Include instructions on accessing sources, a data catalog or dictionary, and other relevant details about the data source.
- Create an evolving catalog of best practices including key topics such as:
    - Pan-respiratory surveillance program growth
    - Sentinel provider recruitment and retention
    - Interpretation and integration of wastewater surveillance data
    - Use of health information exchanges for surveillance data
- Provide support for a mentoring program pairing newer influenza coordinators with more experienced influenza coordinators.
- Provide immediate supplemental funding for elevated or emergency response activities such as:
    - Novel influenza epidemiologic and laboratory response
    - Expanded laboratory testing during a severe influenza season
- Establish a working group to develop a roadmap for transitioning influenza surveillance programs into pan-respiratory programs.
    - Include efforts to identify metrics that help distinguish pathogens with similar clinical signals but that have different thresholds and seasonality.
    - Consider adjusting the current ILI case definition to something more specific such as ICD codes.
- Adjust ELC funding for influenza, RSV, and COVID-19 to adequately cover the following:
    - Reagents for seasonal influenza testing
    - Pan-respiratory laboratory testing panel for a subset of seasonal influenza specimens

    - Support for laboratory courier systems especially in more rural states
    - Increases to funding to allow for fully supported positions, not partial FTEs.
- Provide sample language for adding influenza-associated hospitalizations as a reportable condition.
- Develop standardized case definitions for adult influenza-associated mortality and influenza outbreaks. Include specific strategies to simplify identification, capture, and reporting of influenza-associated deaths, especially pediatric influenza deaths.
- Increase recruitment of NSSP, NREVSS, and NHSN sites in currently underrepresented areas to better represent entire jurisdictions. Expand NHSN use for LTCF surveillance. Conduct education sessions with influenza coordinators on each of these systems to promote awareness and increase use.
- Expand wastewater testing and improve guidance on how to interpret results and establish baselines.
- Expand training opportunities for software tools, report publication, and data source utilization.

Methods

Influenza Surveillance Coordinator Assessment

A Qualtrics assessment was distributed to influenza ELC recipients including 50 state, 4 territorial, and 3 city influenza surveillance coordinators ("influenza coordinators"). Responses were solicited for approximately five weeks. A total of 57 responses were received representing 54 jurisdictions, specifically 48 states, 3 territories including Guam, Puerto Rico, and the U.S. Virgin Islands, the District of Columbia, and the cities of New York and Chicago.

Three states had two respondents complete the assessment while all other jurisdictions had one respondent complete the assessment. The two respondents from one state hold different roles, with one managing the wastewater surveillance program and the other overseeing the larger influenza surveillance program. For another state with two respondents, respondents did not specify components of their surveillance program but provided feedback in subsequent sections. For the third state with two respondents, both respondents provided input for the entire assessment.

Report Figures and Table

All figures include either percentage of respondents or count of respondents out of 57. Figures and tables throughout the report are often split into the subcomponents of an influenza surveillance component. For example, syndromic surveillance figures contain responses for the subcomponents of "sentinel providers/ILINet", "NSSP", and other syndromic surveillance data. When "other" is selected, a description of the respondents' notes explaining "other" is located below that object. Not all respondents provided a description of "other" when selected.

There are multiple figures where subcomponents within the graphic may exceed or not equal 100% due to the ability to select multiple responses for that subcomponent. For example, when respondents were asked about data sources for each subcomponent of a surveillance program such as "State reporting system", respondents may have selected ILINet, other, and NSSP/Essence as sources of data for that "State reporting system". Where possible, "No response" was added to total a subcomponent to 100%.

All figures contain the object title, which for most is the actual question asked in the assessment. The caption also contains the title.

The Y axes percentages and counts always refer to the percent or count of respondents. The maximum axis value varies depending on the responses provided and ability to view smaller numeric responses.

Key Informant Interviews

Key informant interviews were conducted with ten state and one territorial influenza coordinators over two months. Several interviews were held with both the influenza coordinator and a small team at their jurisdiction working with multiple respiratory pathogens. The influenza coordinators had varying levels of experience; some had less than one year, and others had over 20 years. States and territories were selected to be intentionally diverse in terms of population served, program structure, and geographic location.

The objectives of these interviews were to capture an overview of influenza surveillance program functions, methods for data collection, communication, and reporting. All fundamental components of influenza surveillance were assessed including syndromic, laboratory, hospital, outbreak, mortality, and wastewater. Interviewees were encouraged to share what worked well, gaps in reporting data or the ability to use or obtain data, and barriers to carrying out influenza surveillance activities. Interviews concluded with general questions about what kinds of support would be helpful and what barriers or gaps impede success or progress.

Notes from interviews were analyzed for overarching themes, and opportunities, gaps, and barriers were categorized under each influenza surveillance component. The following definitions were loosely used to group comments from interviewees.

Opportunities - potential advantages or favorable circumstances that can be expanded to add or create value.

Gaps - deficiencies or missing elements that need to be addressed to achieve better outcomes.

Barriers - obstacles or challenges that hinder progress or achievement of objectives.

It is important to note that the findings from key informant interviews represent a subset of influenza surveillance programs. Findings may not be generalizable across all jurisdictions.

Influenza Coordinator Experience and Program Responsibilities

Influenza coordinators were asked to describe their years of experience (Figure 1). Over half of respondents indicated five or fewer years of experience.

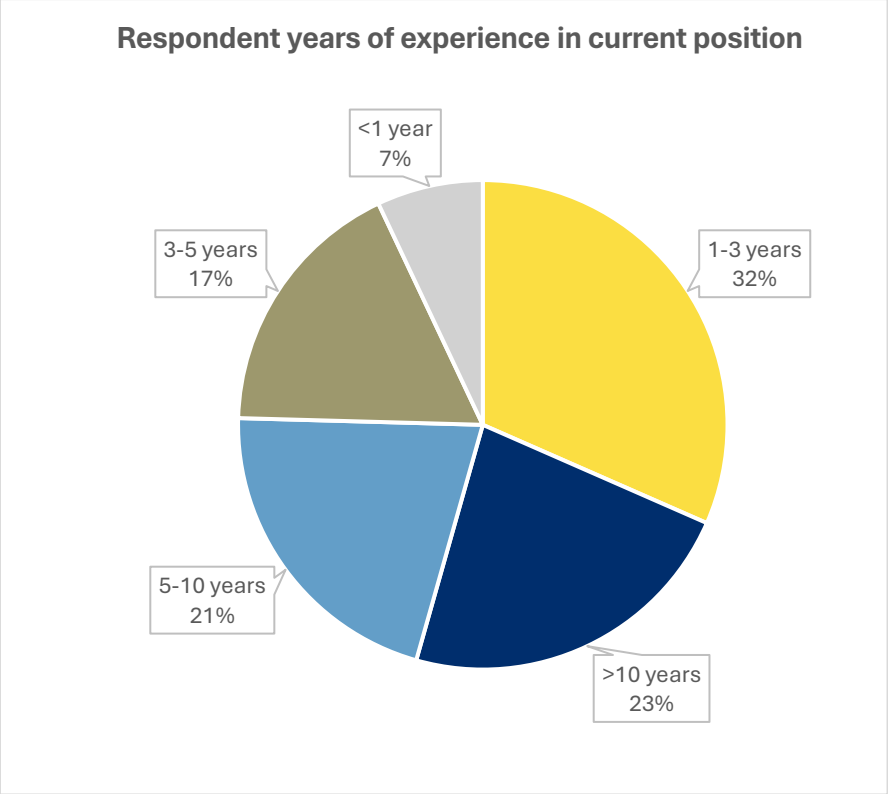

Figure 1. Respondent years of experience in current position

Influenza coordinators oversee a broad range of surveillance activities, with the majority responsible for multiple components. Respondents were asked to identify which components of influenza surveillance were their responsibility (Figure 2). Dashboard or report production and publication (86%), mortality surveillance (84.2%), provider and healthcare facility recruitment/retention (82.5%), and outbreak surveillance (80.7%) were the most reported responsibilities. Wastewater surveillance was the least reported responsibility with only 19.3% of respondents indicating responsibility.

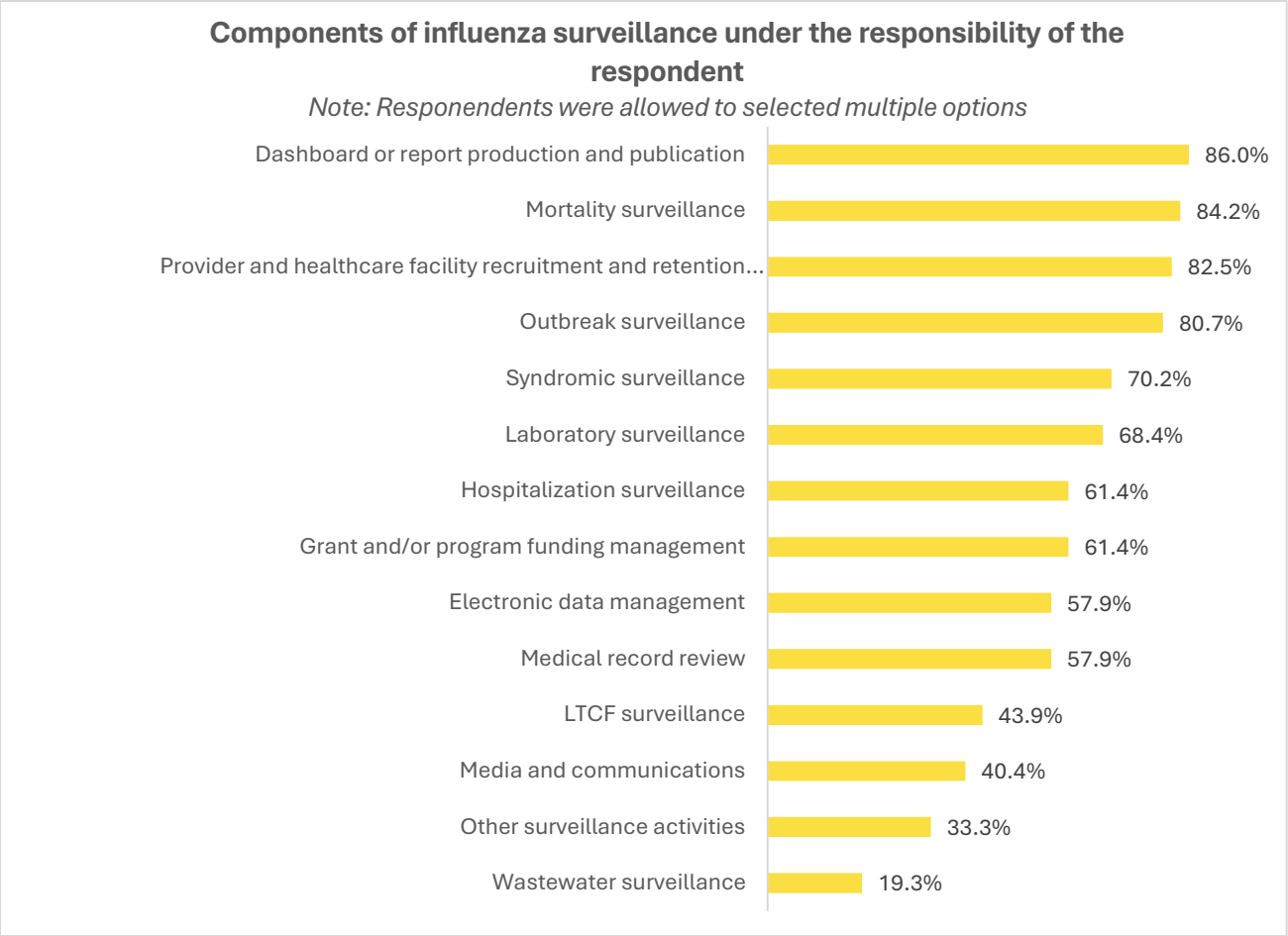

Figure 2. Components of influenza surveillance under the responsibility of the respondent

Syndromic Surveillance

Syndromic surveillance systems and data sources detailed in this section include outpatient and emergency department surveillance. Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

- Of all respondents (n=57), 95% use ILINet data, and 86% use NSSP. Of respondents, 33% utilize other systems for syndromic surveillance too, such as EpiCenter or home-grown databases. Approximately 90% of influenza coordinators indicate that syndromic surveillance data is extremely or moderately important, with a higher percentage designating NSSP as extremely important.
- States using their own syndromic surveillance systems do so because of their ability to increase specificity for influenza apart from other respiratory pathogens, technical issues with NSSP, and use of eCR or an HIE to obtain data.
- ILINet can be labor-intensive as data are still reported via email, web-based surveys, phone, or PDF in many jurisdictions.
- Influenza coordinators noted ILINet syndromic data may not be specific to influenza. One state developed syndromic definitions for influenza, COVID-19, and RSV to improve identification and reporting. Another uses ICD classifiers in their EpiCenter system to differentiate acute respiratory illness. One coordinator extracts data from their state's HIE.
- Several influenza coordinators noted challenges recruiting and maintaining provider sites for ILINet, including clinic capacity, changes in clinic staff, refusal to participate in NSSP and ILINet, difficulty obtaining two specimens from patients, and other issues. Some have found success in recruiting and retention by reporting data back to sentinel providers, supplying free rapid test kits or supplies for laboratory testing, a courier service, and even conducting annual site visits.
- NSSP could potentially replace ILINet if it included outpatient provider data and if there were an option to continue requesting clinical specimens for laboratory testing. eCR could be an option to replace ILINet in the future if expanded to include outpatient facilities.

Assessment Findings

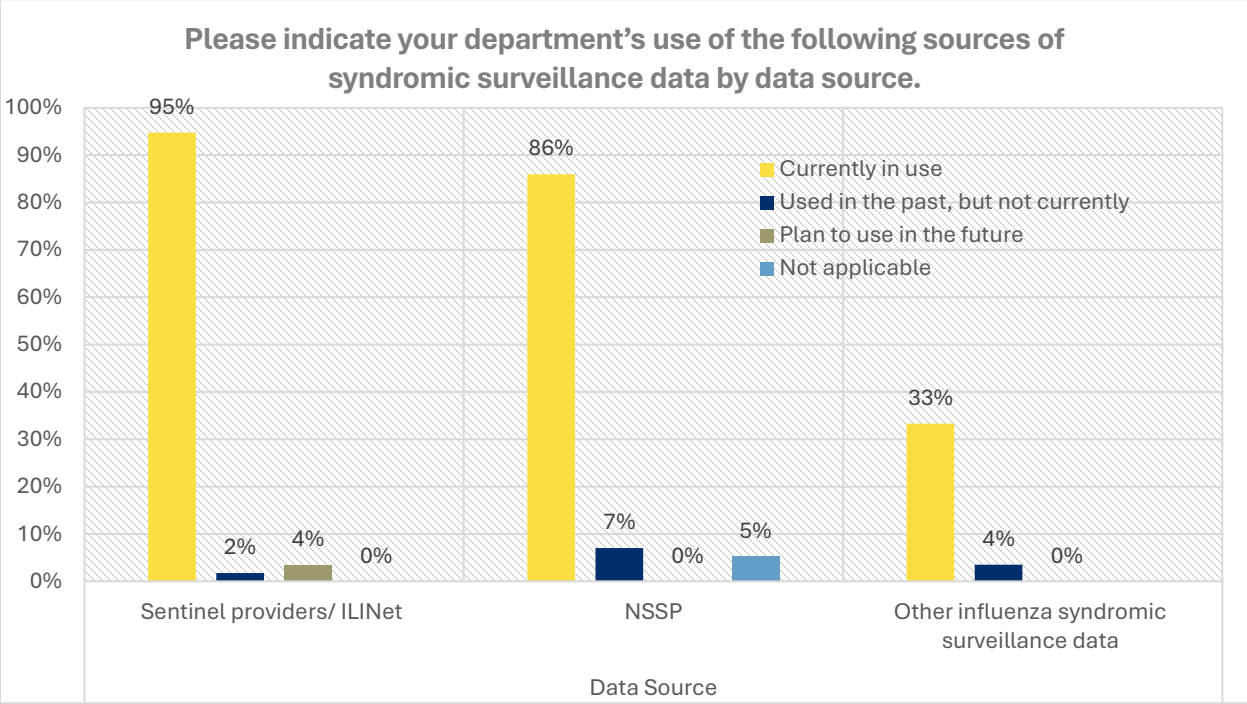

Figure 3. Use of syndromic data
*Other influenza syndromic surveillance data are detailed in *Table 1*.

Table 1. Use of "Other influenza syndromic surveillance data"?

Use of NHSN Respiratory Pathogen Module for early outbreak detection and mitigation efforts
Syndromic surveillance systems (NSSP, ESSENCE, EpiCenter, internally developed platform) using ED and urgent care data
Internally developed syndrome definitions for influenza, COVID-19, RSV and ARI
Internally developed system that collects Chief Complaint data and ICD 10 data from all licensed clinics and hospitals
Reporting via NBS (a national electronic disease surveillance system) to generate and transmit standardized case notifications for NEDSS
Use of ILINet provider data to supplement syndromic surveillance
Vital statistics data and local/regional public health partner reporting
Resident Influenza Tracking Survey (RITS): a system designed to measure influenza-like illness (ILI) based on illness reported directly by residents each week
Home-grown state syndromic surveillance platform
WastewaterScan

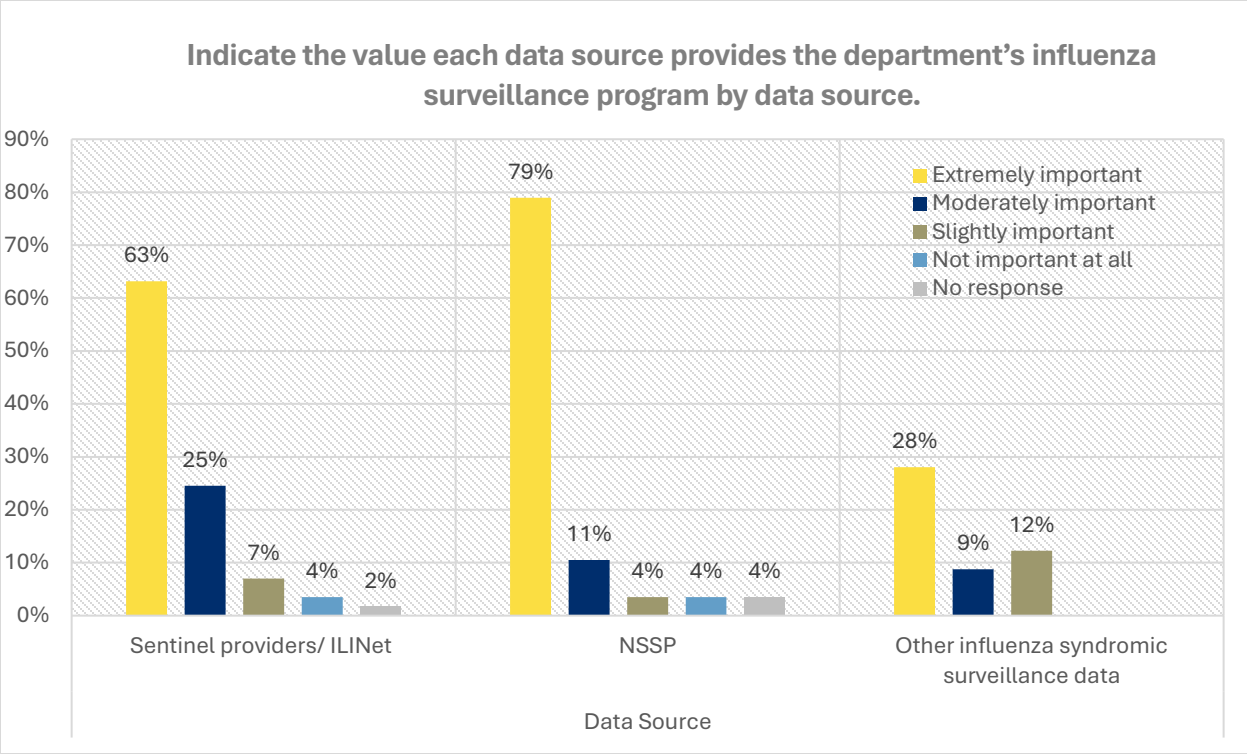

Figure 4. Value of each data source – Syndromic
*Other influenza syndromic surveillance data are detailed in *Table 1*.

Suggested ways to add value to surveillance systems rated "slightly important" or "not important at all"

- Leverage ESSENCE as the primary platform for influenza and respiratory disease surveillance due to its comprehensive and granular data.
- Reduce reliance on ILINet sentinel sites, as specimen submission has been inconsistent and data are increasingly duplicative of syndromic sources.
- Improve mechanisms to facilitate provider reporting and outpatient specimen submission.
- Integrate surveillance findings into influenza newsletters and viral respiratory disease dashboards to enhance data dissemination.
- Retain ILINet for historical comparability and for outpatient specimen collection.
- Broaden NSSP to include more data sources than ED data.
- Incorporate additional syndromic surveillance sources to increase depth of data.
- Increase the number of responses in a surveillance system.
- Expand wastewater surveillance coverage.

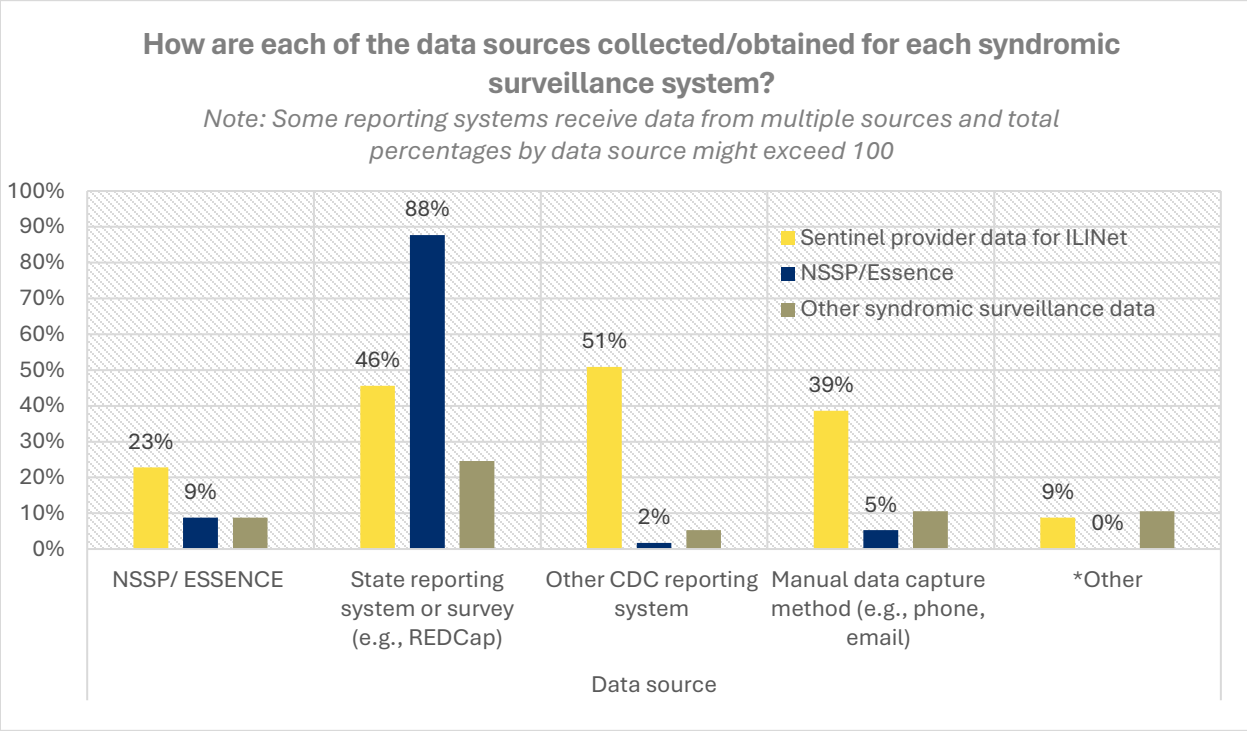

Figure 5. Data collection – Syndromic
*Other influenza syndromic surveillance data are detailed in *Table 1*.

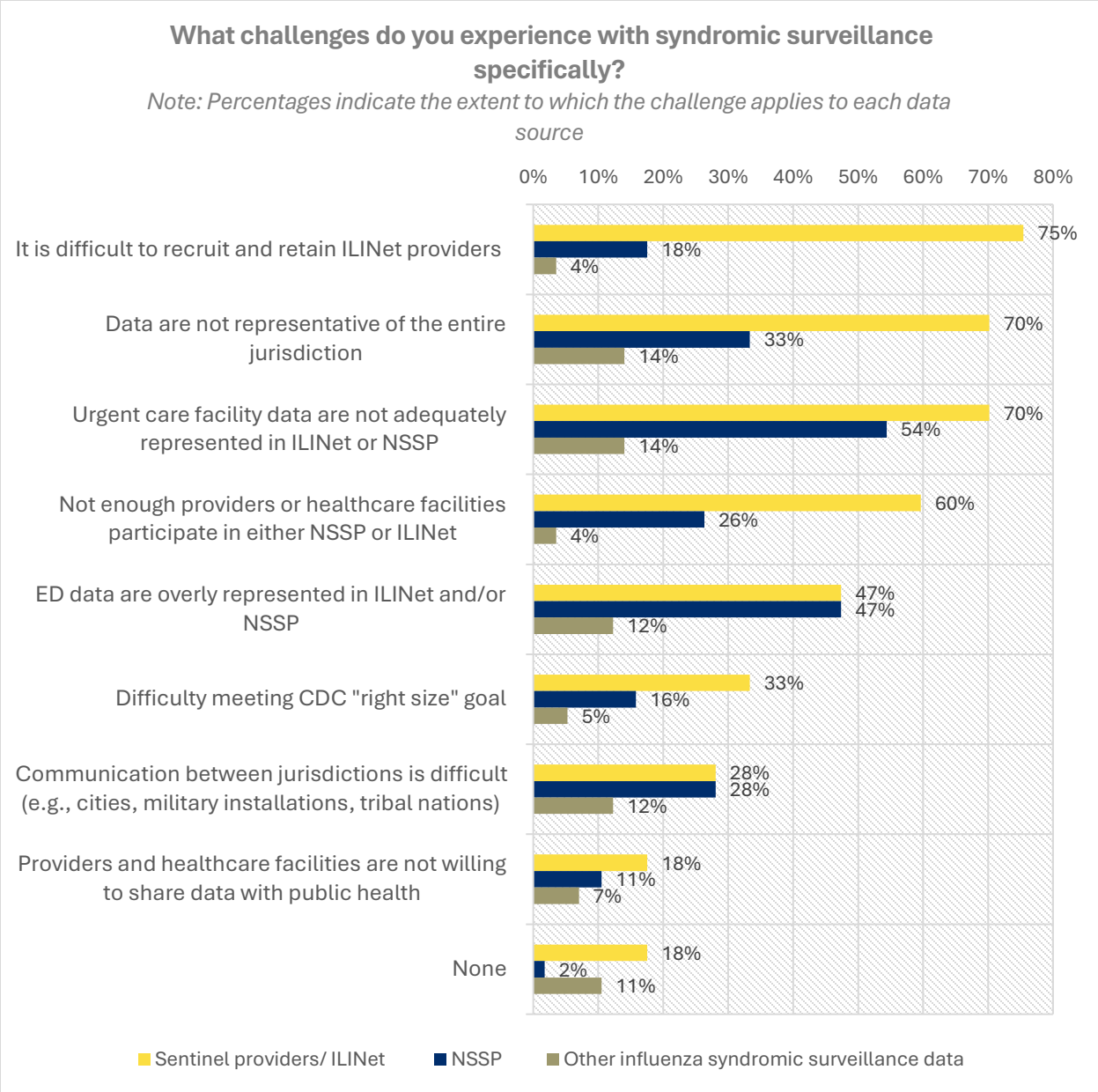

Figure 6. Challenges – Syndromic
*Other influenza syndromic surveillance data are detailed in *Table 1*.

Additional Challenges Associated with Syndromic Surveillance Reported by Respondents Not Captured in Figure Above

- Syndromic Surveillance Coverage
    - Nearly complete ED coverage exists within NSSP but limited other outpatient and inpatient coverage exists.

    - Syndromic surveillance program progress was delayed in one jurisdiction due to extended legal review processes and staffing constraints. Despite advances in electronic laboratory reporting, deprioritization of NSSP onboarding has led to renewed reliance on manual data submission and persistent regional coverage gaps.
    - ILI encounters data by age group are obtained through national NSSP/ESSENCE in one jurisdiction, but there is consideration to switch to state-based ESSENCE to pull ILI data since the system has better historical data for more hospital EDs for previous seasons. Validation would be needed to make this switch.
    - Syndromic data was decentralized until recently in one jurisdiction, which required permissions from local health departments and collaboration with CDC to share ESSENCE data on ILINet. This created temporary coverage gaps.
- Infrastructure and Technical Challenges
    - Technical issues with ESSENCE not working.
    - Setting up classifiers within EpiCenter is resource intensive. This is done since ILI definitions are no longer used in forward facing syndromic surveillance charts, so ICD code classifiers have been set up.
    - Some EHRs do not have the capacity to send their HL7 ADT messages in version 2.5.1, which is the system used at some jurisdictions.
    - Facilities sending ADT data to HIE, which is in development to reroute ADTs to ESSENCE.
    - Constant changes in some hospital systems (replacing software) cause interruption of feed for a long time and require new attesting and onboarding.
- Recruitment and Capacity Challenges
    - It is difficult to recruit and engage sentinel providers.
    - Provider recruitment and retention use a fair number of resources, so the focus is shifted to ESSENCE/NSSP data.
    - Closure of primary care offices has resulted in the loss of sentinel sites for ILINet participation.
    - Staffing shortages in rural clinics limit participation in ILINet, resulting in incomplete county-level representation.
    - Many challenges are interconnected including difficulties recruiting and retaining ILINet providers and underrepresentation of urgent care facilities.

    - Healthcare workers shared concerns about the additional workload associated with surveillance-related data reporting responsibilities.
    - Challenging to recruit and retain providers willing to submit specimens to the public health laboratory.
    - There is a need for standardized guidance on syndromic surveillance protocols and support for recruitment incentives at the jurisdictional level.
- Laboratory Reporting Challenges
    - Although the state laboratory meets right-sizing goals, it relies heavily on clinical specimens forwarded from a major commercial laboratory, which may not be geographically or demographically representative.
    - Reporting limitations due to only influenza laboratory results being reportable.
- Organizational Challenges
    - Silos within the health department regarding syndromic surveillance.

Key Informant Interview Findings

All influenza coordinators interviewed receive syndromic surveillance data from providers or healthcare facilities and submit the data to ILINet, though some also receive standardized syndromic data through automated data feeds. Their various approaches to capturing data are detailed in the following section. Most influenza coordinators manage their sentinel provider networks by recruiting and working to retain participants, though one relies on CDC-recruited providers entirely. All states require regular specimen submission from sentinel surveillance sites; typically, one in five patients.

Opportunities

One jurisdiction has a network of 66 providers with an annual volume of 30,000 patient visits participating in their ILINet program. In one county within the jurisdiction, five clinics test every patient with acute respiratory illness (ARI) for all respiratory pathogens. While this program is extremely valuable in determining the actively circulating viruses, the state is uncertain whether funding for the program will continue. Another jurisdiction also tests all specimens from sentinel providers for all pathogens.

The use of a courier system for sentinel providers is very valuable. Multiple states ensure couriers routinely pick up specimens for influenza or all ARIs. Federal funding

cuts have jeopardized this service for several states which may impact the availability of specimens for testing.

Presenting data back to ILINet providers is an important engagement opportunity. Some influenza coordinators visit their sentinel sites annually and prepare individualized clinic reports to show how a clinic's data contributed to the larger network and how they compare to other clinics' data. In one jurisdiction, the influenza coordinator visits every ILINet provider site annually and gives them a custom report of their activity from the previous year along with flu test kits. A different jurisdiction supports its 23 sentinel provider sites by offering free COVID-19 and influenza combination test kits that can be requested online. Sites can request shipping of specimens to the state laboratory, and if needed, the laboratory will send the supplies needed. The test kit incentives alone seem to motivate and sustain participation in sentinel surveillance. The added effort of meeting with clinics face to face cultivates and strengthens relationships between clinic staff and the influenza coordinator. Influenza coordinators who conduct regular visits report that their clinics contact them more quickly with questions and unusual observations compared with clinics outside of their sentinel network.

Of the influenza coordinators interviewed, only one influenza coordinator's jurisdiction was actively using health information exchange data for syndromic surveillance. Approximately 170 sites participate, representing 97% of this jurisdiction's total healthcare providers reporting to the state's HIE. Epidemiologists in the jurisdiction pull deidentified data from the HIE. The jurisdiction's data team set up a pipeline to feed data into ILINet. Outside of this effort, 23 sentinel sites enter data manually and submit specimens for testing.

All influenza coordinators interviewed except one reported using ESSENCE as their source for emergency department (ED) influenza, RSV, and COVID-19 data. CDC assistance in writing queries to extract the right results from ESSENCE has been helpful. At least one state is pulling pneumonia encounters from ESSENCE data in addition to influenza.

In another jurisdiction, influenza is a reportable condition and case reports directly drive outreach and decisioning. While this is often burdensome for the jurisdiction's epidemiologists, it provides an opportunity for intervention. When influenza activity rises or outbreaks are detected, teams are sent to schools to provide free vaccination.

Gaps

Influenza coordinators have asked if CDC could allow local health departments to directly upload data into ILINet. One jurisdiction noted that CDC identified a way to support this approach, but other decentralized states similar to this jurisdiction may benefit if this capability were expanded.

Most states limit ILINet data tracking to influenza season months (October-April) and incentivize providers to participate in ILINet by focusing on only those months. This seasonal focus might preclude a state from detecting abnormal influenza activity, such as an avian influenza outbreak occurring outside the usual surveillance period.

Influenza coordinators primarily rely on ESSENCE as their main source of ED data.

Widespread availability of at-home rapid tests has significantly decreased the number of specimens submitted by sentinel sites and long-term care facilities. At least one state has a web-based portal for people to submit rapid test results. Other jurisdictions had a web-based portal during the COVID-19 pandemic but no longer use it.

Barriers

A frequent barrier to obtaining specimens is the need for two specimens, one in the clinic/office and a second to send for subtyping. Patients are not always amenable, and clinicians are sometimes hesitant to push for samples.

One jurisdiction has a simplified approach because healthcare in the jurisdiction is dominated by two large healthcare providers. One healthcare provider supplies most of the state's data, which could be problematic if that provider discontinues participation in the future.

Influenza coordinators struggle with antiquated ILINet data reporting methods. Some are using Excel workbooks submitted through email, others have web-based surveys, a phone line, or even PDF documents. A few states are leading the progression of electronic reporting by utilizing their HIE or promoting non-ED provider reporting into ILINet or ESSENCE. Those states have separate data management teams who handle setting up and maintaining integrations with healthcare systems or exchanges. Influenza coordinators are very receptive to learning more about growing electronic data reporting and how to access systems implemented by other states.

A few influenza coordinators have difficulty meeting right-size goals and believe the targets should be adjusted. It takes significant effort to recruit and retain providers, and it is challenging to recruit in underserved areas. Others struggle with regional differences in data, such as too few providers in one area and an excess in another. The differences are sometimes so significant they do not publish regional data publicly. One jurisdiction is trying to shift from using right-size goals to community-based statistical areas. Another jurisdiction's influenza coordinator noted that annual CDC right-size report cards are useful, but they are not sure what the scoring means.

Laboratory Surveillance

Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

- All influenza coordinators use public health laboratory data and believe it is extremely valuable. About 65% of influenza coordinators use NREVSS, hospital or outpatient laboratory, or commercial laboratory data. The value of these specific data sources ranges from 47% to 61%, with NREVSS rated as the most valuable and commercial laboratory data as the least valuable.
- A striking percentage of influenza coordinators receive laboratory data through manual methods, which include survey tools or portals, emails, faxes, and mail. For state laboratory data, 32% is manual, followed by 47% for hospital and outpatient, and 35% for commercial. HL7 transmission is used on average less than 50% of the time across all sources.
- Influenza coordinators almost universally struggle with consistently obtaining enough specimens from representative areas. Some reported huge drops in specimen submission post COVID-19; others see fluctuations in outpatient provider participation, and some do not have enough funding for couriers or reagents.
- NREVSS has the potential to become a much stronger source of laboratory data. About 70% of influenza coordinators use NREVSS, but many stated it would be more useful if additional sites were added to better represent the entire jurisdiction. Participation in NREVSS might improve if laboratories could connect via API. One state said NREVSS was duplicative of their weekly laboratory reporting.
- For influenza coordinators, maintaining a strong relationship through regular communication is essential for a successful laboratory surveillance program.
- The use of courier systems improves specimen submission and timeliness, and is appreciated by submitting providers. COVID-19-related funding cuts have jeopardized this service in a few jurisdictions.
- Transitioning to a pan-respiratory surveillance approach will require funding to support broader testing of ARIs beyond influenza, COVID-19, and RSV. Influenza coordinators would appreciate guidance on expanding their

programs or learning how other influenza coordinators are implementing such approaches.

- Increasing capacity for state public health laboratories to sequence influenza would reduce the time needed to identify H5 and novel influenza strains.
- Influenza coordinators leverage a wide variety of tools to collect additional laboratory data, including surveys, web portals, REDCap, Jotform, fax, and mail.
- Multiple influenza coordinators mentioned having to ration or monitor use of reagents purchased with ELC funds, either by reducing the number of specimens requested from outpatient providers, or in one case, by not testing a subset of specimens. In at least one jurisdiction, supplemental funding from the Association of Public Health Laboratories (APHL) helped address this gap.

Assessment Findings

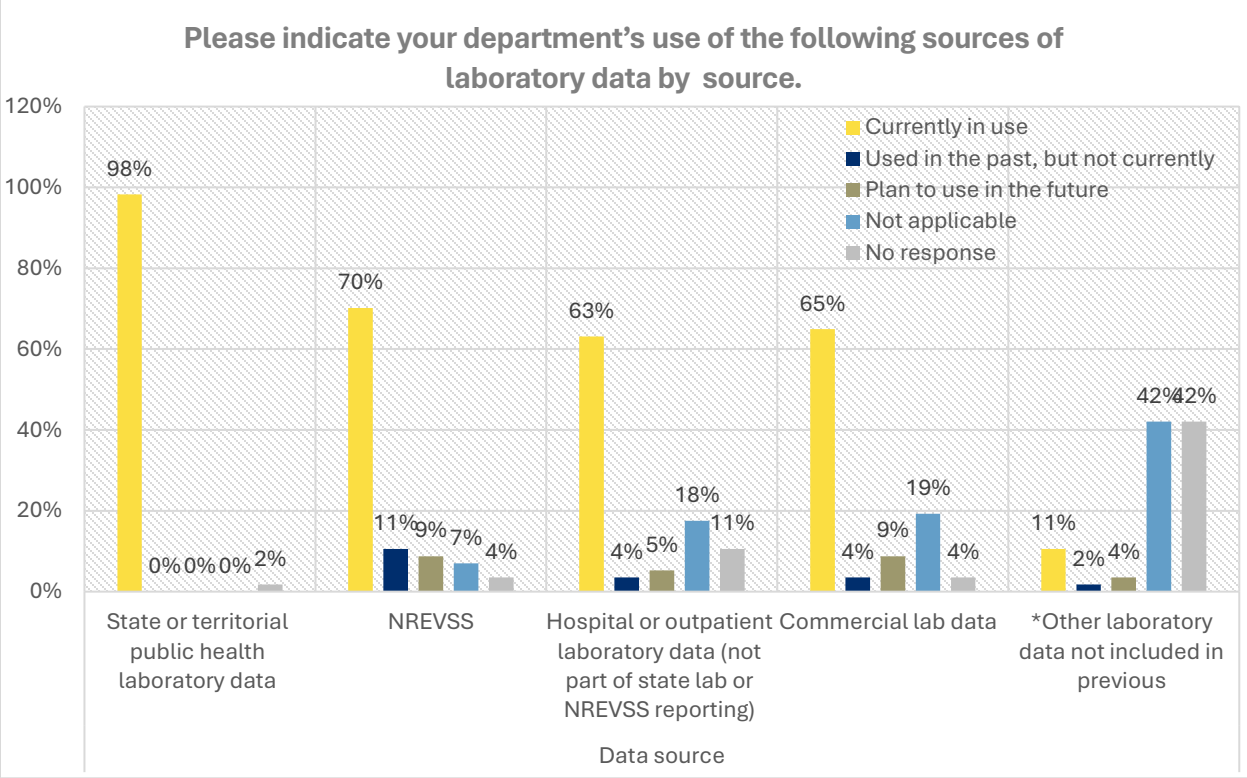

Figure 7. Uses of laboratory data
*Other laboratory data are detailed below.

The following were reported under use of "Other Laboratory Data"

- Weekly Survey: Laboratories not enrolled in ELR in one jurisdiction are surveyed weekly during influenza season to report total influenza and RSV

positive tests and total tests performed. Plans exist to add COVID-19 data to this survey.

- Web-based Laboratory Portal: A web based electronic laboratory portal that captures point of care testing performed by providers and facilities.
- Jotform Reporting: Molecular surveillance partners report influenza and RSV laboratory data via Jotform. Efforts are ongoing with the NREVSS team to implement HL7 uploading. Influenza ELR does not integrate with the state NBS, so efforts are underway to make influenza reportable for facilities with ELR capability to improve understanding of activity and more accurately identify when 10% positivity is reached.
- County Health Department Testing via REDCap: One jurisdiction's county health departments have BD Veritor Machines to run influenza tests, and then report that data to the influenza coordinator via REDCap.

Influenza laboratory results are reportable in 56% of jurisdictions. Among jurisdictions where influenza results are not currently reportable, 10 jurisdictions indicated that they would like sample administrative codes or legal language to support proposals for making reporting mandatory. Jurisdictions also provided additional context regarding influenza reportability. One jurisdiction noted that they have changed statute to specify that influenza results are not reportable except in certain circumstances, such as death or hospitalization. Another jurisdiction indicated they are unsure if influenza will ever be made reportable. In one jurisdiction, influenza is reportable only when testing is done by their public health laboratory. Another jurisdiction noted that novel influenza is reportable, but not seasonal influenza due to funding constraints. Lastly, one jurisdiction said ELR influenza laboratory reporting would require a revision of state law, which is a lengthy process.

Of all jurisdictions, 79% receive influenza laboratory data and 44% receive data through eCR. For jurisdictions using eCR, 19 would be willing to contribute data to a national influenza system if established by CDC, and 24 may be willing to contribute.

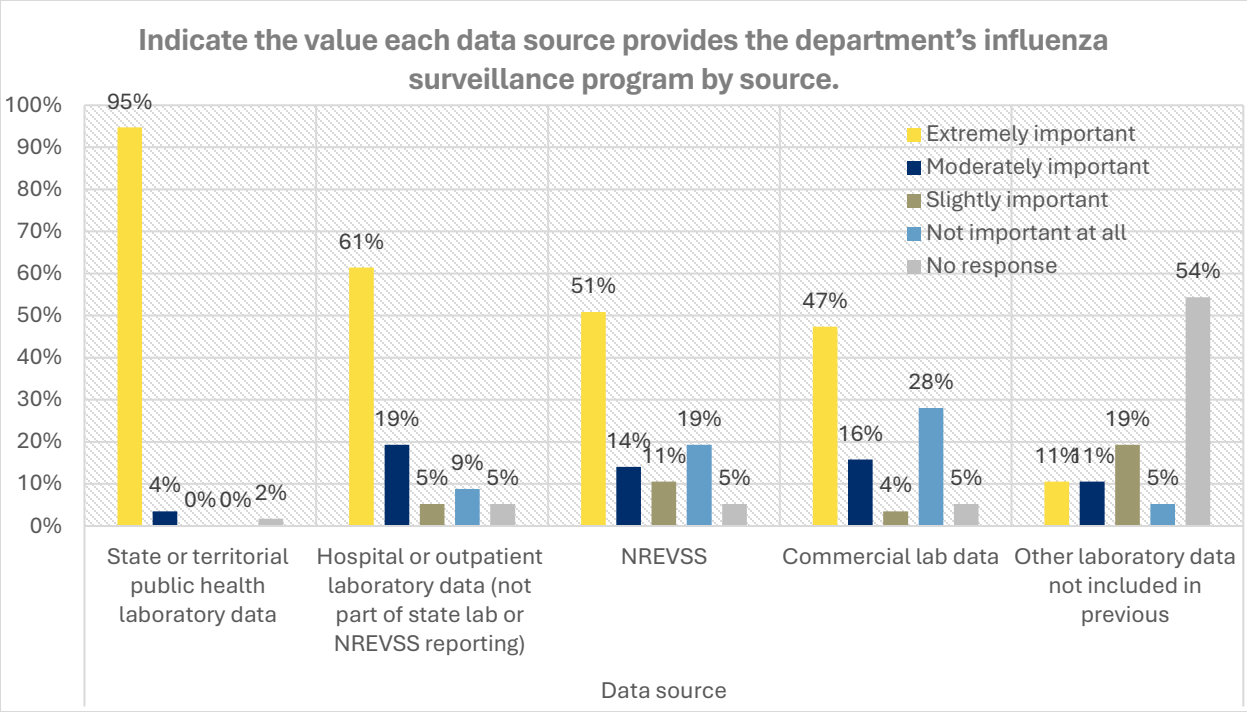

Figure 8. Value of each data source – Laboratory
*Other laboratory data are detailed in a bulleted list above.

Summary of Responses for Ways to Improve Surveillance Systems Indicated as "Slightly Important" or "Not Important at all"

- Low Participation or Coverage
  - NREVVS recruitment has been unsuccessful in some jurisdictions.
  - Limited facilities reporting data into NREVSS, so data is not always representative of a jurisdiction.
  - Increasing the number of reporting facilities (as low as 3-6 in some jurisdictions) would supplement missing data and improve representativeness.
  - Broad participation by hospitals is needed. Data from only a few hospitals is insufficient for meaningful surveillance.
  - More NREVSS sites should be recruited to improve data coverage, while other existing surveillance methods remain in use.
- Data Availability and Consistency
  - Weekly surveys currently provide more laboratory data than NREVSS in one jurisdiction, especially for hospitalized influenza cases.
  - Inconsistent reporting across facilities makes it difficult to assess representativeness or overall influenza activity.

    - Limited ELR from commercial labs creates uncertainty about whether data are missing due to testing gaps or data transmission issues.
- Reporting Limitations
    - The test results are not reportable.
    - Flu is not reportable unless hospitalized or a deceased person. Commercial laboratory data are rarely available, and if they are, likely not representative.
    - Facilities are not required to report influenza, except for novel influenza.
    - If jurisdiction required reporting, then the data sources would have higher value.
- Data Redundancy
    - Much of the NREVSS data overlaps with public health and hospital laboratory data. Unique direct reporters would add more value.
- Resources and Communication
    - Automation and sufficient funding are needed to support additional data streams and sources.
    - Better communication with state laboratories could clarify what is reported to NREVSS.

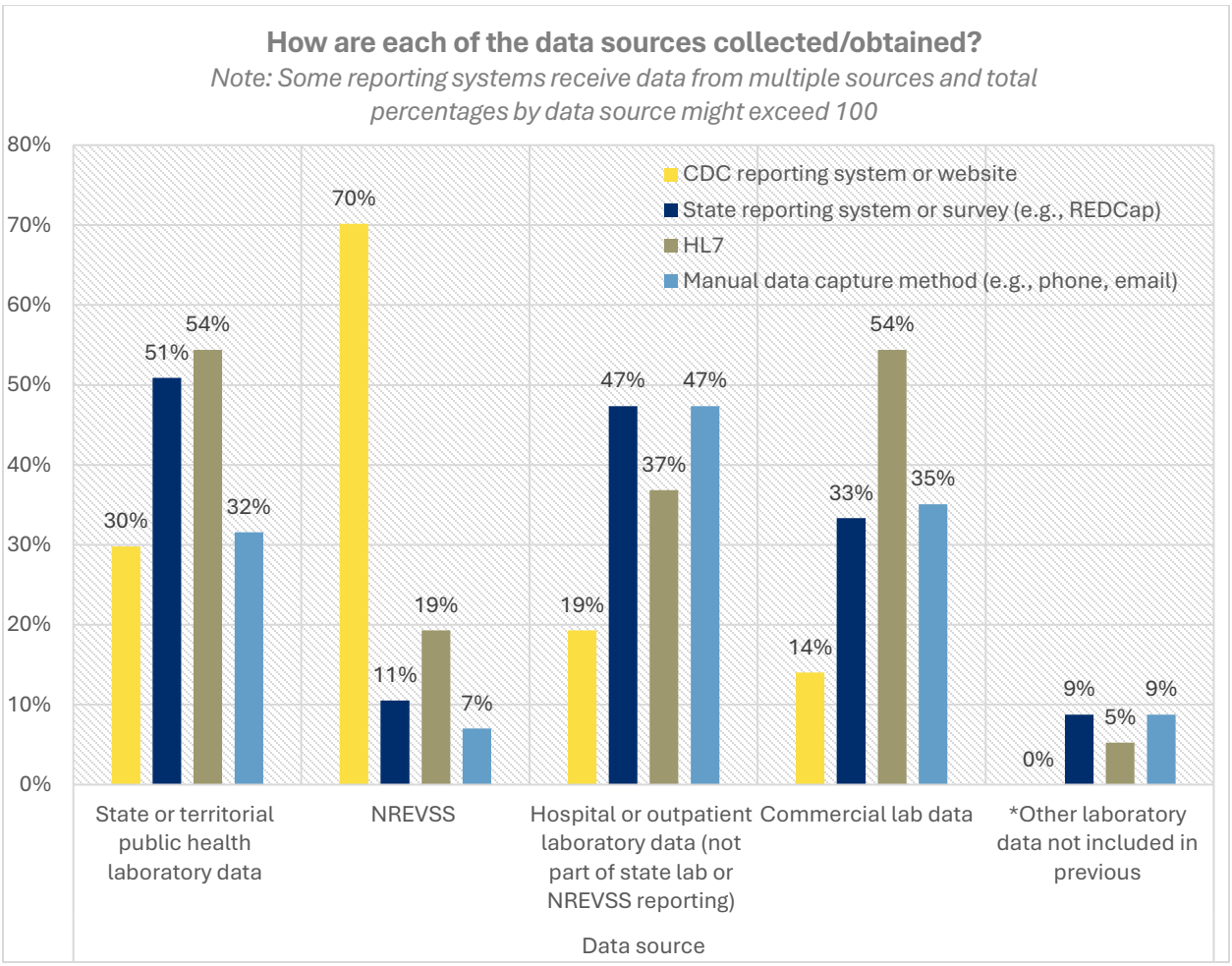

Figure 9. Data collection – Laboratory
**Other laboratory data are detailed in a bulleted list above.*

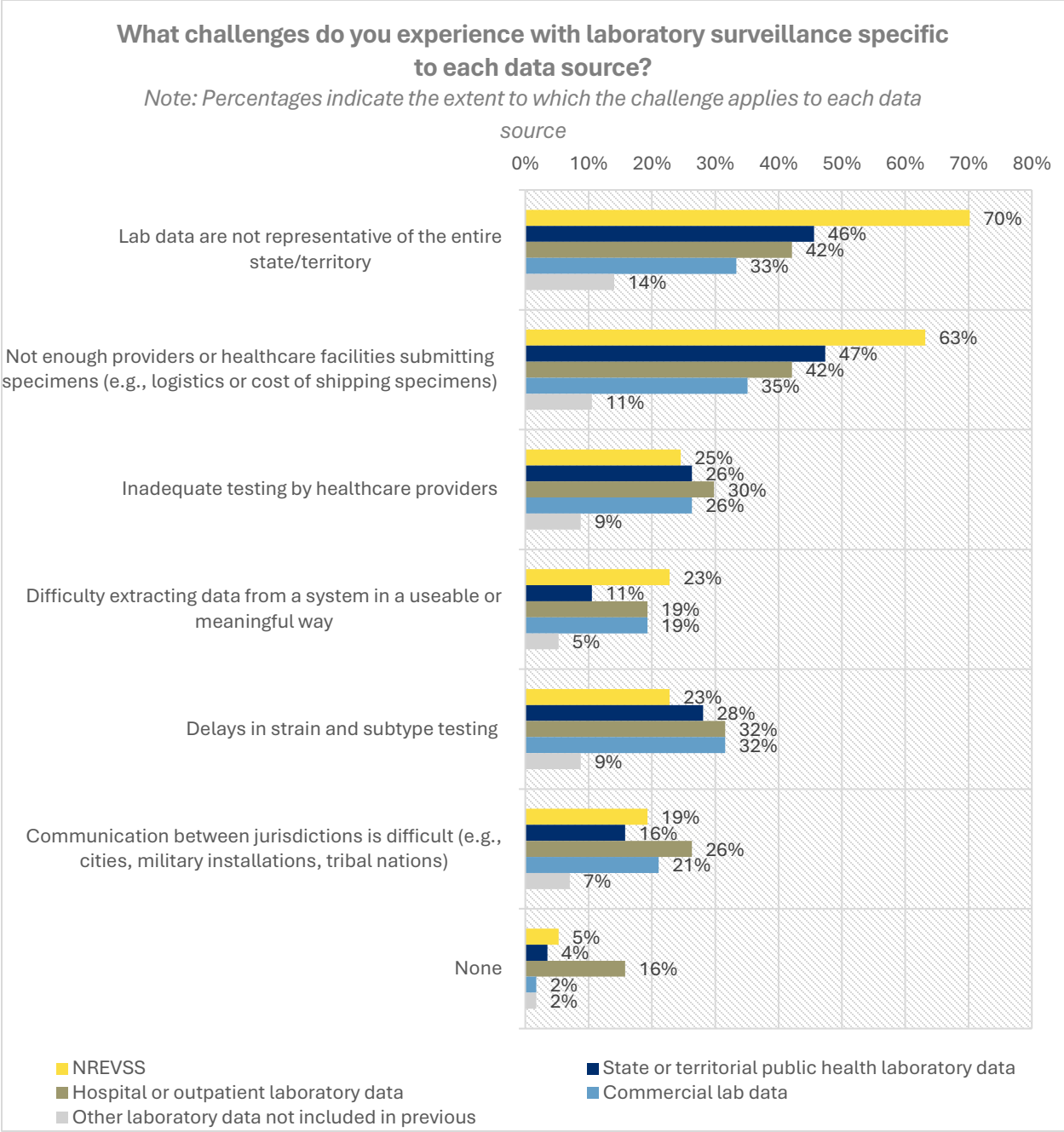

Figure 10. Challenges – Laboratory
*Other laboratory data are detailed in a bulleted list above.

Other Challenges and Observations with Laboratory Surveillance

- Funding and Resource Challenges
    - Recent cuts to ELC COVID-19 funding have impacted the ability to fund couriers for routine shipping of respiratory specimens to the public health laboratory for influenza subtyping and COVID-19 testing.

    - No formal screening protocol exists to guide testing utilization, leading to rapid consumption of more complex tests (e.g. BioFire Respiratory Panel). Shipping for specialized analyses adds delays and increases costs, especially in remote locations.
    - State laboratory shortages of CDC-provided test kits led to temporary gaps in testing capacity.
    - There were historical challenges in providers submitting specimens. Once APHL supplemental funding allowed for in-person laboratory visits, participation was improved. Future funding for this is, however, uncertain.
    - Funding this past influenza season allowed for a new approach in getting specimens to a jurisdiction's public health laboratory more successfully, but future funding constraints may impact sustainability.
    - Of specimens received, only 11.5% of positive influenza A specimens received subtyping due to cost barriers for PCR testing.
- Data Quality and Reporting Issues
    - Ongoing data quality issues from a major health system spanning multiple jurisdictions have prevented inclusion of their data in the state's public-facing reporting and NREVSS submissions.
    - Many laboratories still submit results via fax, which requires manual entry into the surveillance system. It is also challenging to communicate with the public that the laboratories are not representative of all cases and that the volume is dependent on testing and reporting activities.
    - Influenza results are only reportable for hospitalizations and deaths, so the denominator of influenza cases is limited. Some of the NREVSS conditions are reportable while some are not, so there are inconsistencies in data completeness.
    - Only some laboratories subtype influenza and because influenza is not reportable, the commercial laboratory data is never fully representative.
    - Most influenza data is sent in aggregate via email which requires processing time at the state. Moving towards ELR data will help reduce workload.
    - State laboratory databases sometimes do not participate in ELR.
- Participation and Recruitment Challenges
    - Recruiting facilities to submit specimens remains difficult.
    - Expanding participation from long-term care facilities and additional providers is needed to improve coverage for point of care testing.

- Connecting clinical/hospital laboratories to NREVSS via API could streamline reporting and improve participation with less manual submissions.
- Military facilities are a small proportion of cases, but present unique surveillance challenges.
- There are efforts in one jurisdiction to make NREVSS more representative of the state through automated aggregate reporting of laboratory results from their electronic disease surveillance system.

Key Informant Interview Findings

Opportunities

In general, states are moving toward a pan-respiratory approach with laboratory testing. While all jurisdictions track tests for influenza, COVID-19, and RSV, some test for additional acute respiratory infections (ARI). Obtaining these data is valuable to establishing ARI trends and informing clinicians about actively circulating viruses.

A common best practice is establishing a regular meeting cadence with the state public health laboratory. During influenza season, some states hold weekly meetings that include influenza, COVID-19, and wastewater surveillance epidemiology teams, as well as their respective state public health laboratories. Others meet bi-weekly or as needed. These meetings offer multiple benefits including epidemiologists sharing trend data and analytics from non-laboratory surveillance systems, the laboratory sharing viral positivity data, and both groups assessing the reagent inventory, the frequency and adequacy of influenza specimen submission, and any challenges with the statewide courier system.

As previously stated, statewide courier systems are critically important for obtaining specimens from sentinel sites, especially in rural areas. Some states have had courier systems for years, while others created or expanded services during COVID-19. Recent funding cuts have affected courier services in several jurisdictions, and some are in jeopardy of losing the services altogether.

The value of NREVSS varies across jurisdictional influenza coordinators interviewed. Some states report exceptionally strong participation with more than 100 laboratories contributing data, while others find it challenging to engage some of the larger health systems. States differ as to whether they can de-duplicate data from NREVSS with results from other laboratory surveillance systems.

Gaps

There is variability by state as to whether enough clinical laboratories can perform subtyping. In some states, large hospital laboratories can perform subtyping, whereas in other states, they must send specimens to the state laboratory or a reference laboratory. Expanding subtyping capabilities within clinical laboratories would be beneficial. Commercial laboratories in some instances help fill these gaps. For example, in one jurisdiction, LabCorp can perform subtyping whereas Quest must reflex H5 or H1. One coordinator mentioned it would be ideal to have an assay that tests for H1, H3, and H5.

In another jurisdiction, only influenza-associated hospitalizations are routinely tested for influenza. One municipality only uses NREVSS as part of a contract with CDC and participation in RESP-NET. Outpatient specimens are only tested in one jurisdiction if there is an animal exposure indicating an avian flu exposure or if the rapid test or health facility laboratory test yields inconclusive results.

A few states are developing the capacity to sequence influenza and COVID-19. One jurisdiction is in the validation process currently. Expanding sequencing capacity across additional states could reduce reliance on CDC for specimen sequencing and improve timeliness.

Jurisdictions use a variety of methods to receive laboratory data. While some use ELR, one jurisdiction reported using REDCap surveys to capture laboratory tests and results. Some jurisdictions continue to rely on emailed workbooks, Word documents, or summary counts submitted via email.

Current CDC funding supports pan-respiratory testing only for defined geographic areas within a limited number of states, such as the program one jurisdiction described in the Syndromic Surveillance section of this report. If CDC priorities shift towards pan-respiratory surveillance, additional funding will be needed to test for other acute respiratory pathogens.

Barriers

All influenza coordinators reported ongoing challenges in managing the limited number of reagents available to state public health laboratories for influenza testing every year. Influenza coordinators find they must ration reagents by deselecting specimens for testing, and while most have strong communication with their state laboratories, one influenza coordinator noted they had to reject specimens at the end

of the influenza season because they ran out of reagents. The CDC Health Alert Network (HAN) message released in January 2025 exacerbated this problem as hospitals began expanded testing of patients hospitalized with influenza. Even with established criteria defining an influenza-associated hospitalization, the combination of the HAN and a severe influenza season significantly increased testing demand, requiring careful allotment of limited reagents.

At times, influenza coordinators also reported confusion as to whether CDC should be communicating directly with a health system, healthcare provider, or the state for issues with laboratory testing, such as confirmatory testing for an unsubtypeable sample or for recruiting new participants for ILINet. Influenza coordinators note CDC is helpful in recruiting provider participation in several areas of influenza surveillance, but most influenza coordinators prefer to manage ongoing relationships with providers within their jurisdiction. Occasionally, when CDC sets direct relationships with hospital or health system laboratories, that leaves the state out of the communication loop. For example, in one jurisdiction, a large health system communicates directly with CDC when submitting specimens for influenza testing to support WHO surveillance, but the health system does not respond to state requests for information. This is particularly concerning when the health system has unsubtypeable specimens that require follow-up.

Hospital Surveillance

Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

- Influenza-related hospitalizations are reportable in 42% of the respondent jurisdictions. The systems used for influenza-associated hospitalization surveillance vary across jurisdictions. Of the jurisdictions, 25% use FluSurv-NET, 23% participate in EIP, 40% use NHSN, with 14% planning to use it in the future, and 19% use other sources. Data from these systems were indicated as important when used.
- Other data sources include weekly surveys, hospital capacity systems, health system collaborations, ESSENCE, use of ED visits resulting in admission as a proxy, and data submitted through preparedness teams.
- Nearly half of influenza coordinators expressed interest in having access to vaccination status for hospitalized patients, as well as improved differentiation between influenza, pneumonia secondary to influenza, and other ARIs.
- Several influenza coordinators reported it was time-consuming and difficult to confirm whether hospitalizations due to influenza met the CDC case definition.
- Many comments focused on NHSN. Influenza coordinators expressed interest in expanding site participation to improve representativeness of their jurisdiction. Some influenza coordinators tried to increase participation, but onboarding to NHSN was paused by CDC and then resumed. Others do not use NHSN and would like training or more information about the system. The need for additional data quality checks was requested by several influenza coordinators, especially before CDC publicly posts aggregate data.

Assessment Findings

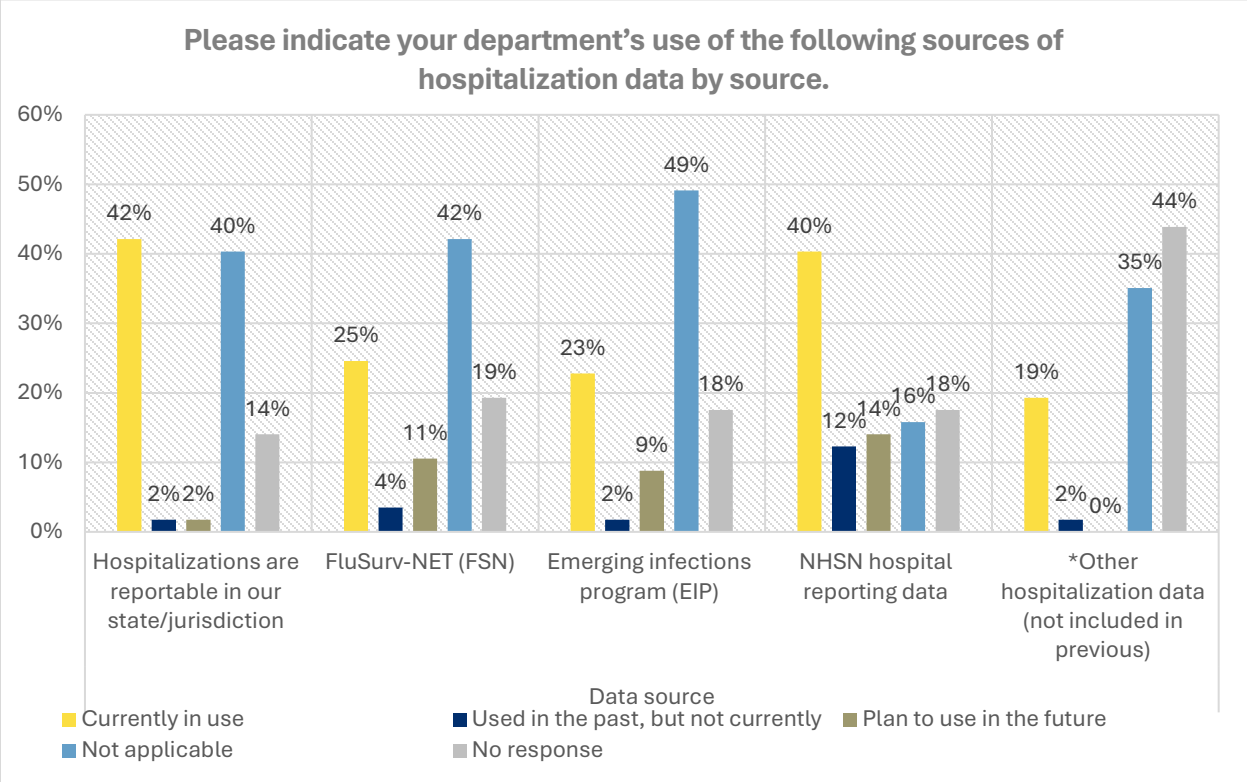

Figure 11. Use of hospitalization data sources
*Other hospitalization data are detailed in in a bulleted list below.

Uses of other hospitalization data, as indicated in Figure 11

- Partnerships with the state HIE are used to obtain influenza hospitalization data.
- A weekly survey is distributed to hospitals statewide during the influenza season to collect influenza-like illness admission data.
- Available inpatient data are used to monitor influenza-related hospitalizations through a respiratory disease dashboard.
- The state health department collaborates with a health system to monitor trends in pneumonia, influenza, and RSV hospital admissions.
- State Hospital Capacity System.
- In some jurisdictions, only specific subsets of hospitalizations are reportable (e.g. ICU hospitalizations related to influenza).
- ESSENCE.
- ED visits resulting in admissions are used as a proxy for hospitalizations.
- Data submitted from hospitals to the preparedness team.

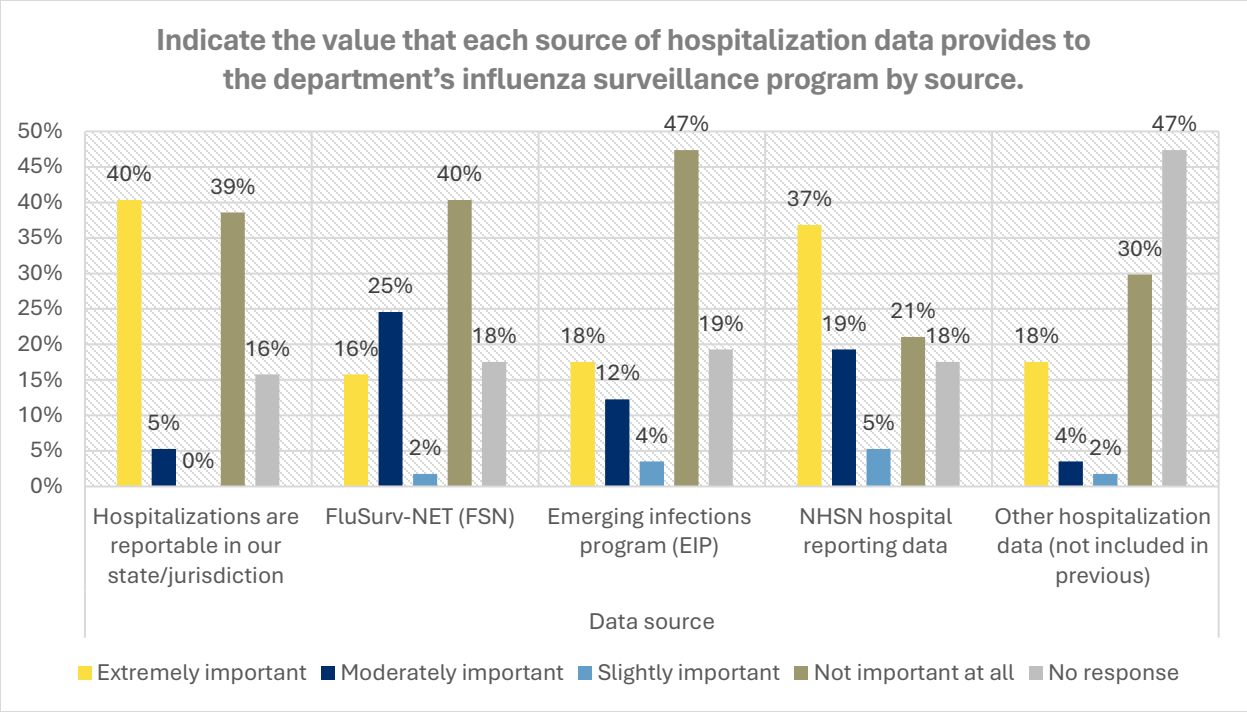

Figure 12. Value of each data source – Hospitalizations
*Other hospitalization data are detailed in a bulleted list above.

Summary of Responses on Opportunities to Improve the Value of Sources Rated as "Slightly Important" or "Not Important at all"

- Many jurisdictions do not participate in FluSurv-NET or EIP but expressed interest. For those that do participate in FluSurv-Net, one jurisdiction indicated that more geographic coverage could add value to the data.
- One jurisdiction was recently onboarded as a FluSurv-NET site and expressed the data will be more useful as multi-year data accumulates.
- Required reporting in jurisdictions would increase the value of data sources.
- Some indicated sources were not important at all if they don't use the data source.
- NHSN is a complicated system so additional training on it would be beneficial.
- If NHSN data were case based, it may be more valuable, but for now, there are other systems in place.
- For NHSN hospital data, it was important to identify hospitals for recruitment to become sentinel facilities. Utility has not been assessed in one jurisdiction as it has not been used for several years.

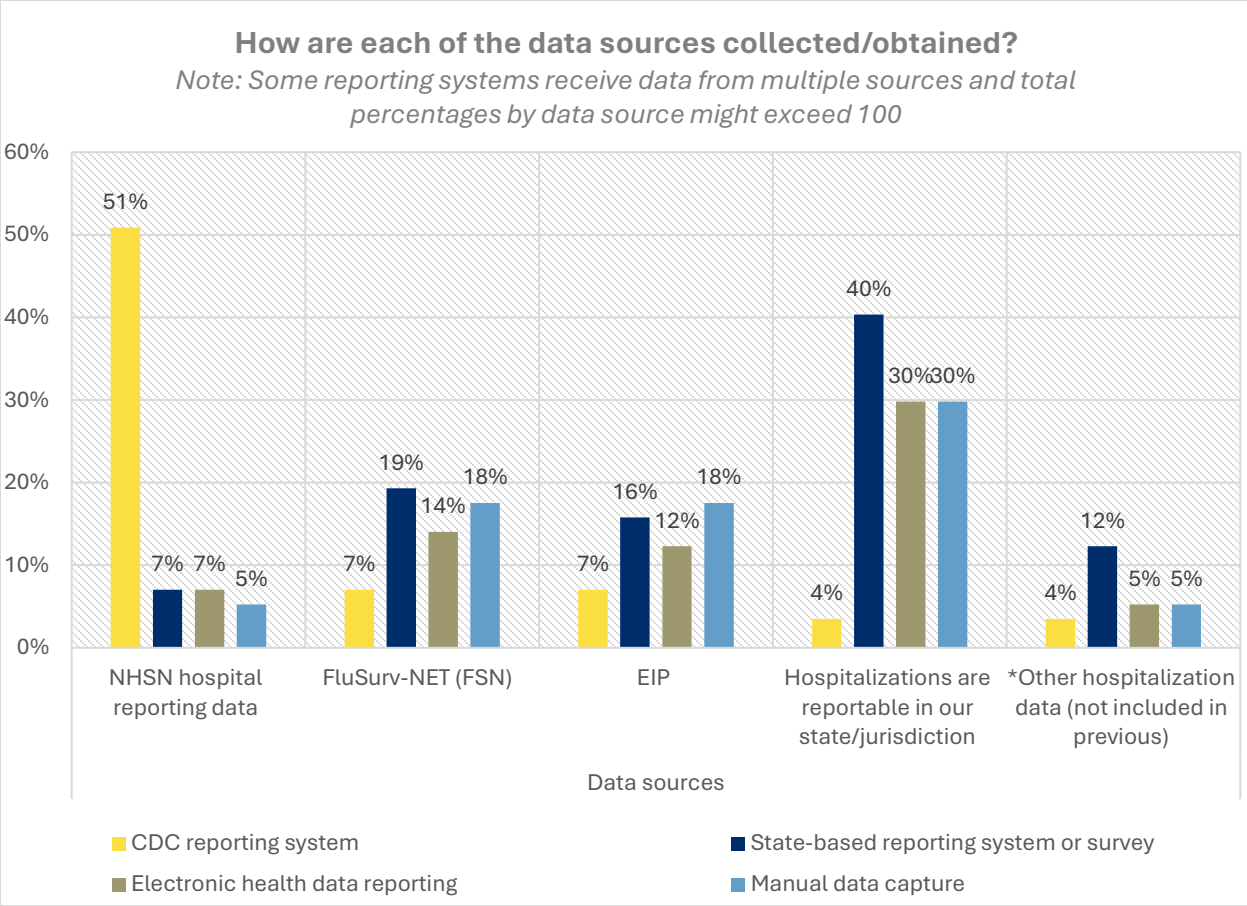

Figure 13. Data collection – Hospitalizations
*Other hospitalization data are detailed in a bulleted list above.

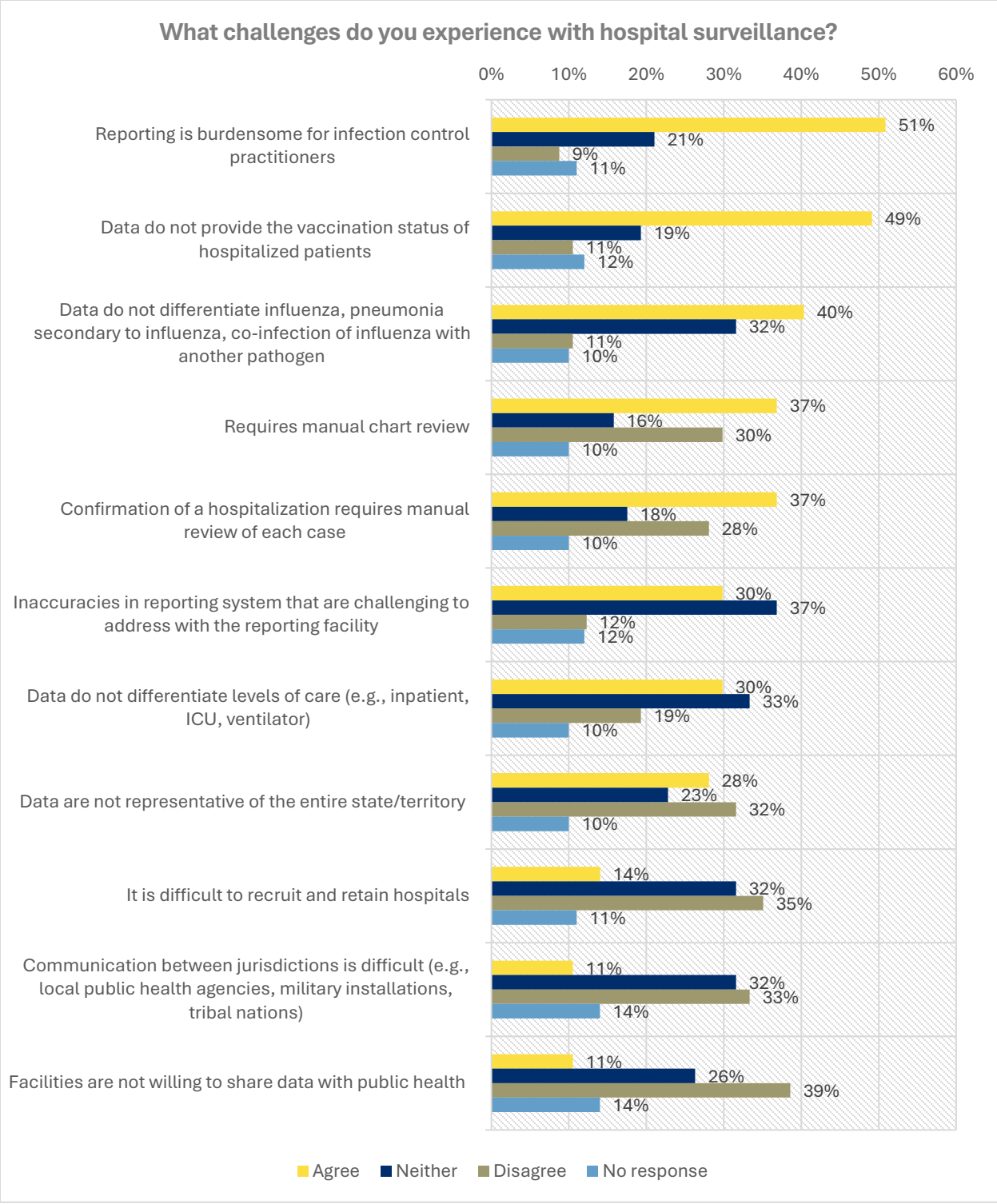

Figure 14. Challenges – Hospitalizations

Other Hospital Surveillance Challenges Shared by Influenza Coordinators

- Reliance on NHSN data reportability
    - Surveillance activities depend on data being reportable to NHSN.
- Data quality and formatting
    - Persistent issues with data formatting, even in hospitals that have reported for a while.
    - Time-consuming for staff to review data and records.
    - Reformatting is needed when handling raw data in the systems even with transition from manual systems to SAS.
    - Progress was made with SAS coding, but was supported by COVID-19-funded staff. Their departure raises concerns about sustainability.
    - Hospitals submit data via Excel, which contributes to variability in data structure.
- Manual and resource-intensive processes
    - Epidemiologists spend significant time manually reviewing medical records.
    - Manual verification is often required for cases imported as incomplete or unknown visit type.
    - Jurisdictions do not always have the resources to verify whether influenza was the cause for admission when influenza-associated hospitalization cases are marked because they meet the time frame.
    - Manual review of cases places a burden on staff. There is a need for system upgrades and additional resources.
    - Multiple hospital reporting routes create additional manual workload for health departments.
- Staffing and capacity constraints
    - Influenza coordinators with multiple program responsibilities have limited time to pursue alternative data sources beyond NHSN.
    - Adding new conditions (such as influenza hospitalizations) to state reportable disease rules requires additional staff time.
- Hospital participation challenges
    - Weekly reporting to ILI admissions can be difficult for hospital partners.
    - Delays in reporting from local hospitals hinder timely public health response efforts.
- System development and automation
    - Effort is required to establish automated reporting systems and eCR processing workflows.

- Development of a HIE to improve access to records is ongoing.
- Planned use of NHSN hospitalization data for influenza, RSV, and COVID-19 may reduce reliance on separate provider surveys.

Key Informant Interview Findings

Opportunities

Influenza-associated hospitalizations are reportable in several states. One state's reporting law requires notification of laboratory-confirmed influenza hospitalizations or deaths within one working day. Influenza coordinators in these jurisdictions believe mandatory reporting improves data accuracy and completeness.

NHSN is viewed as a value-added data source for hospitalization surveillance rather than a primary source in most states, with one exception among those interviewed. Several jurisdictions only use NHSN for LTCF surveillance data. Influenza coordinators who use NHSN are pulling COVID-19 and RSV data in addition to influenza. One influenza coordinator appreciated help from CDC in developing a dashboard to display NHSN data.

The use of eCR for influenza hospitalization surveillance represents an emerging opportunity. Two jurisdictions interviewed currently receive eCRs, with one of the jurisdictions planning to complete their validation this summer. Part of that validation involved comparing hospitalizations reported through the state's current disease reporting system, against eCR. That jurisdiction found that eCR picks up slightly more cases with substantially less effort. While there is a plan to transition completely to eCRs, influenza coordinators will still need to match ELR with eCR data, which is burdensome for the surveillance team. Another jurisdiction has an automated system for obtaining hospital data. ELR data are fed into the state's current disease reporting system and the jurisdiction then gets eCR for anyone positive for influenza. An algorithm determines if the hospitalization meets the CSTE case definition. One jurisdiction receives an increasing number of eCR reports in place of what infection control practitioners previously reported. While not eCR, another jurisdiction implemented an automated process, initiated during the COVID-19 response, where admissions and other events such as ICU days for influenza and RSV are extracted directly from healthcare facilities.

A few influenza coordinators interviewed also participate in RESP-NET for COVID-19, influenza, and RSV hospital surveillance. Some of the surveillance data from these systems is also available in ESSENCE.

Finally, strong relationships with infection control practitioners (ICPs) were consistently noted as valuable to many influenza coordinators. ICPs are generally willing to support surveillance activities, including completing weekly reporting workbooks and collaborating to troubleshoot and correct eCR data issues.

Gaps

Two influenza coordinators interviewed do not use NHSN. One is unable to utilize the data due to staffing constraints, and the other participates in EIP and obtains data through that system.

Although more of a risk than a gap, there are some instances of dependency on the willingness of a few dominant health systems to provide representative and complete data. Without participation from these key systems, several states could lack any hospitalization data at all. For example, one jurisdiction interviewed relies on health system-supplied data for hospitalization surveillance data but found that NHSN data provides influenza and COVID-19 data from other health systems. The jurisdiction continues to use the original health system's data for RSV surveillance data and no longer needs a separate data feed. Another jurisdiction interviewed is entirely dependent on reporting from two health systems, with one health system covering most of the state.

Barriers

Even with the widespread availability of ELR for hospital laboratory reporting, several influenza coordinators reported continuing to receive results via fax or performing manual data entry for results not submitted electronically. One jurisdiction maintains an influenza hotline for reporting influenza-associated hospitalizations.

Several influenza coordinators interviewed must perform chart reviews to confirm a hospitalization was influenza related. In one jurisdiction, the health department receives history, treatment, outcome, and symptoms on every case. A subset of that information is entered into their NNDSS-based system. This process is extremely labor-intensive given the jurisdiction reviewed 358 cases in the previous influenza season, which surged to 597 cases in the most recent season. The lack of automation in one jurisdiction's reporting process presents a barrier to completing timely reviews and obtaining accurate counts. Other influenza coordinators interviewed mentioned needing to do chart reviews but had dedicated staff to manage this workload.

One influenza coordinator stated their jurisdiction attempted to implement hospital surveillance two seasons ago with support from CDC. The program was discontinued when funding was dissolved. Agency leadership wanted reporting for all hospital systems, which was not feasible as the jurisdiction's HIE does not cover the entire state. The influenza coordinator felt the program could have been successful but did not have a chance to do a muti-season review or compare data with mortality record data. As a result, hospital surveillance is no longer included in the jurisdiction's influenza program.

School, LTCF, & Wastewater Surveillance

Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

General

- Of all respondents, 81% incorporate wastewater surveillance into their influenza surveillance program, 75% conduct school-based surveillance, and 33% use NHSN, and 56% utilize other methods to capture LTCF activity.
- School-based and LTCF surveillance data were indicated as valuable when utilized.
- Some influenza coordinators questioned the utility of outbreak reporting. Reports are often delayed or sporadic, and investigating outbreaks is labor-intensive. It is difficult to obtain specimens to confirm influenza outbreaks, particularly now with the widespread availability of rapid influenza tests. One influenza coordinator noted that an influenza outbreak case definition would be helpful.

LTCF Outbreaks

- Multiple methods are used to capture LTCF outbreaks, including REDCap (most common), the jurisdiction's reportable conditions surveillance system, web-based survey, and manual reports via phone or fax. In some jurisdictions, local health departments (LHDs) help capture and report data to the state. Strong relationships with LHDs in their communities were noted to be valuable in responding to and mitigating outbreaks.
- NHSN could become a more widely used source of LTCF data if more influenza coordinators knew how to access and use the data.

Wastewater Surveillance

- Wastewater surveillance was considered extremely or moderately important by 74% of respondents. Influenza coordinators noted that its utility could be enhanced by increasing the number of surveillance sites. There are also challenges with funding for testing and personnel, and communication between the wastewater and influenza teams. Influenza coordinators are

unsure how to interpret wastewater surveillance data and would benefit from guidance as well as recommended baseline values.

- Wastewater surveillance could be expanded by more jurisdictions when outbreaks, unsubtypeable laboratory tests, or surges in clinical indicators occur, though, as noted, wastewater data may not always correspond with clinical data.
- Subtyping wastewater data can take 3-4 weeks, which limits the operational value of the data.
- Two influenza coordinators interviewed stated that wastewater surveillance detections and trends did not always correspond with clinical surveillance data and sometimes aligned only half the time.
- Influenza coordinators have mixed opinions on public reporting of wastewater data. There is disagreement regarding whether subtyping results, particularly for H5, should be published. Current limitations prevent differentiation between human and animal origin for H5 detections, posing a challenge for influenza coordinators wanting to interpret and use these data.

Assessment Findings

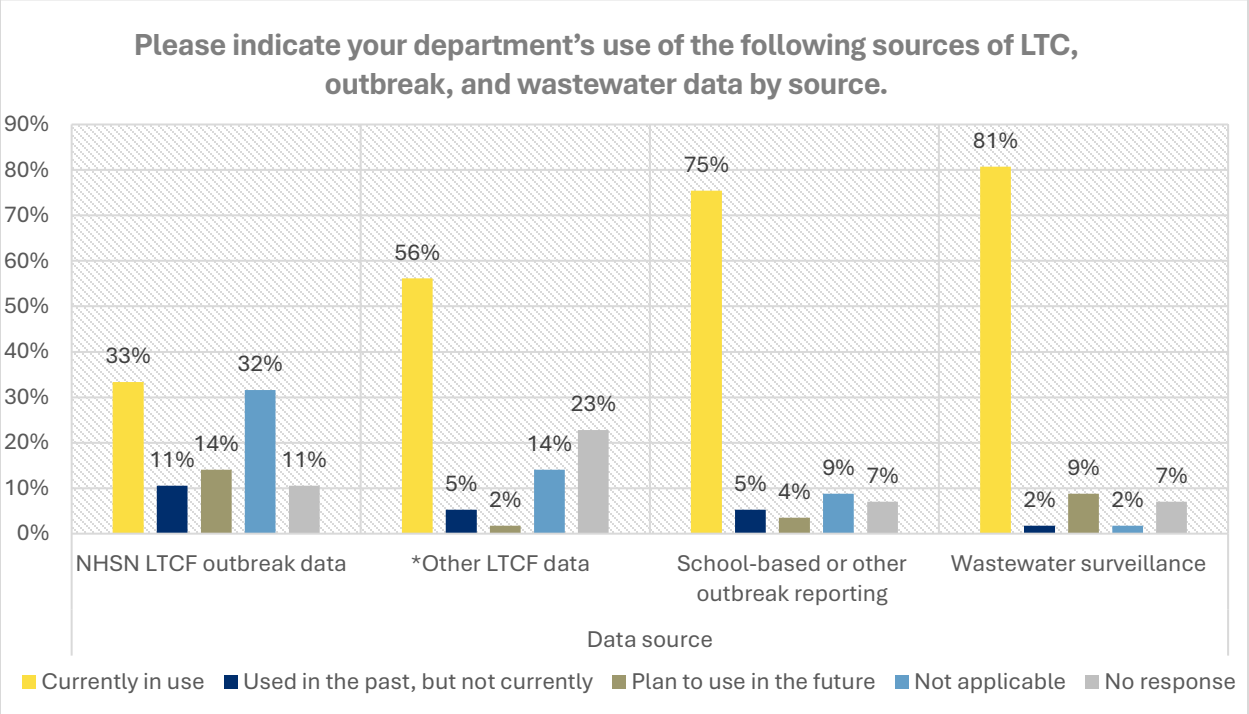

Figure 15. Use of data sources - LTCF, Wastewater, & Outbreak
*Other LTCF data sources are detailed in a bulleted list below.

Other sources of LTCF surveillance data are noted below. Many respondents noted that outbreak data from LTCFs is utilized, but there was variation in how outbreak data was received.

- Local Health Department Reports
    - LTCF outbreak reports are received from local health departments.
    - Local and regional public health partners assist in capturing outbreak data.
    - Local county health departments have established respiratory surveillance reporting for LTCF data in some jurisdictions.
- Facility Submitted Data
    - LTCFs report outbreaks directly via surveys, REDCap, or Qualtrics.
    - LTCFs submit outbreak information including vaccination status, antiviral use, and case details.
    - Assisted living facilities (ALFs) that do not report to NHSN submit outbreak reports via REDCap as reporting is required.
- Electronic and State Systems
    - REDCap-based outbreak management system tracks respiratory illness outbreaks (influenza, COVID-19, RSV) across LTCFs, ALFs, group homes, prisons, and closed hospital wings.
    - Threshold-based outbreak definitions trigger automated reporting in REDCap or other state survey mechanisms.
    - Outbreaks are reportable on internal reportable disease websites.
    - Some jurisdictions maintain spreadsheets or folders to track outbreak data and provided materials.
- Manual Reports
    - Manual reports from LTCFs or local health departments are received via phone or fax.
    - Patient addresses in laboratory reports are used to identify LTCF residents for follow-up.
    - Influenza hotline for reporting influenza-associated hospitalizations and outbreaks is still maintained within the jurisdiction.
- Investigation and Other Resources
    - Suspect ILI outbreaks in LTCFs are investigated.
    - Infection Preventionists (ICPs) and HAI epidemiologists collaborate with facilities to capture influenza cases, hospitalizations, and deaths among residents and staff.

- Facilities may receive follow-up calls, treatment/prevention recommendations, or Infection Control Assessment and Response (ICAR) visits.
- All outbreaks are reportable to the jurisdiction's health department. An outbreak team aids the district level epidemiologists with the state and local public health agencies in responding to any LTCF outbreaks.

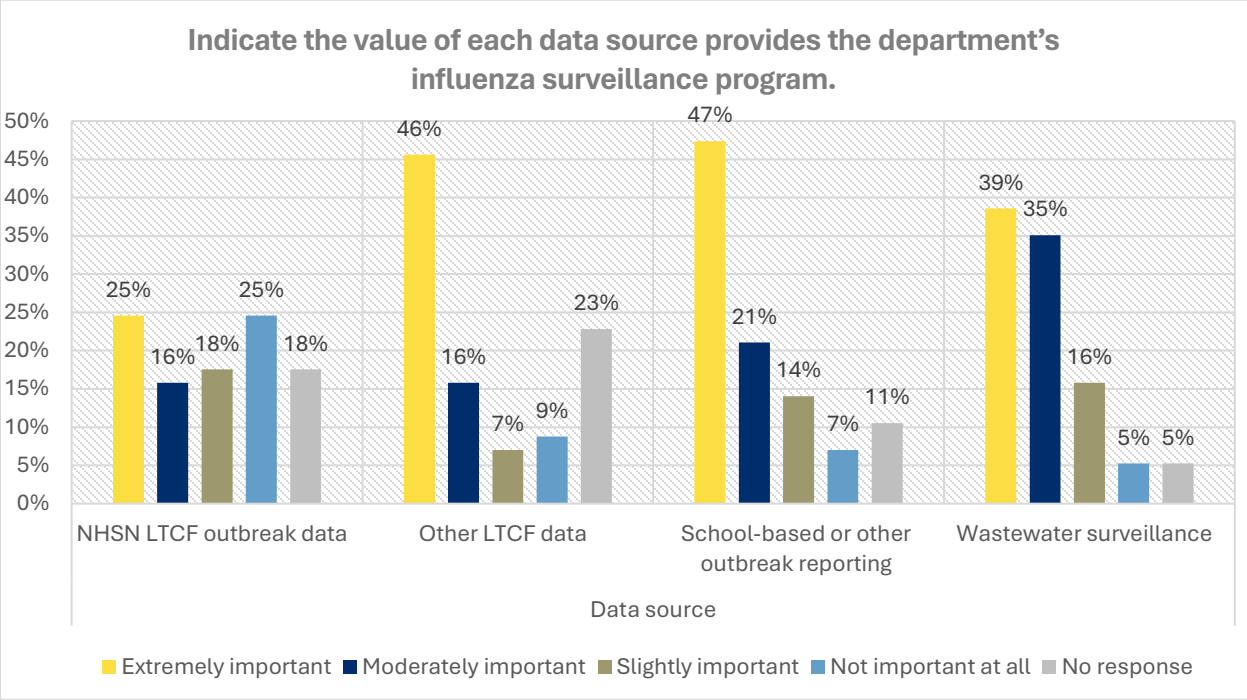

Figure 16. Value of each data source - LTCF, Wastewater, & Outbreak
*Other LTCF data sources are detailed in a bulleted list above.

Summary of Responses on Opportunities to Improve the Value of Surveillance Systems Rated as "Slight Important" or "Not Important at all"

- NHSN LTCF Outbreak Data
  - Several respondents do not currently use NHSN LTCF outbreak data, often due to lack of access or limited relevance.
  - Underrepresentation of NHSN-reported outbreaks compared to state-required reporting reduces its utility.
  - There is interest in learning more about NHSN LTCF data in general and about its potential in a few jurisdictions, so that it can be utilized more.
- School-based Reporting
  - More consistent reporting of school outbreaks is needed, especially during the school year for outbreaks that are not expected or are out of the ordinary.

- Wastewater Surveillance
    - Need for guidance on interpreting wastewater data and understanding its limitations. Multiple respondents noted uncertainty about how to use wastewater data effectively and would like to learn more from other jurisdictions as to how they use wastewater data.
    - Establish baselines and standardized guidelines for interpreting wastewater data to improve utility.
    - Expanding the number of wastewater sites as current coverage in some jurisdictions is not representative of the jurisdiction.
    - Funding support is needed for recruitment and retention of wastewater facilities for influenza testing.
    - Additional guidance is needed to improve the testing quality and to assess the wastewater system to fully understand its limitations.
    - Limited staff time and competing responsibilities to dedicate time to learning more about wastewater surveillance. Silos within jurisdictions also can limit influenza coordinators' ability to be involved in wastewater surveillance.
- Data Quality and Timeliness
    - More timely data.
    - More funding for subtyping and whole genome sequencing.
    - Data should be more actionable.

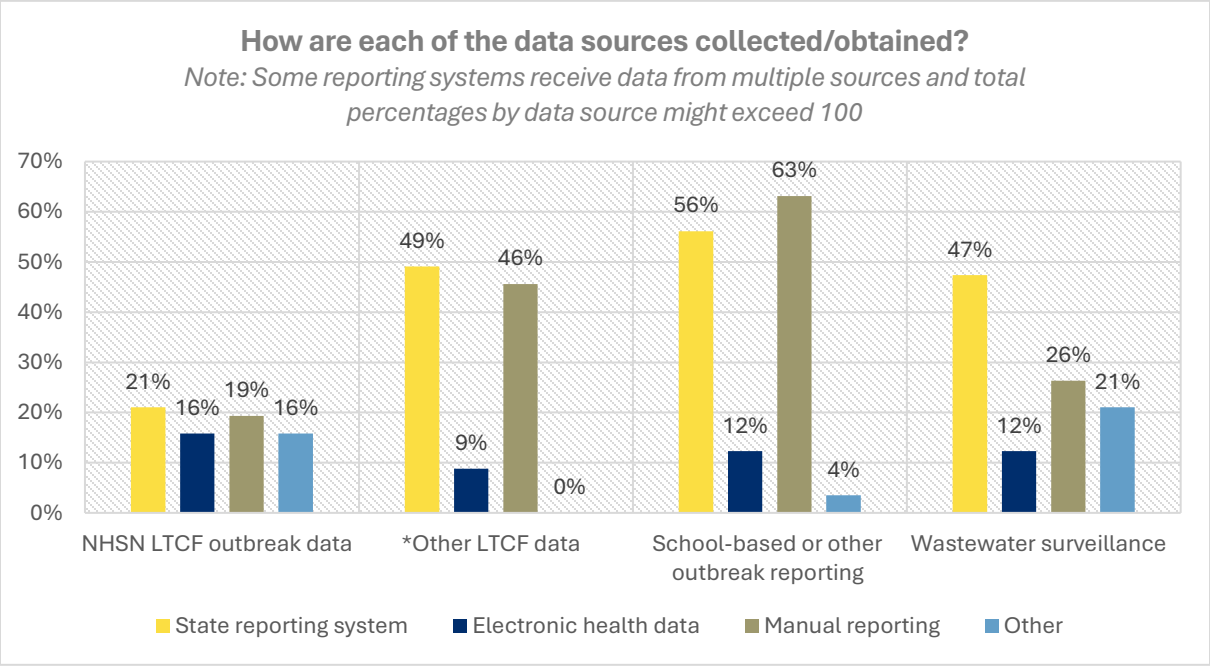

Figure 17. Data collection - LTCF, Wastewater & Outbreak
*Other LTCF data sources are detailed in a bulleted list above.

Other Data Collection Methods Noted

- NHSN LTCF Outbreak Data
  - An API from NHSN is used.
- School-based or Outbreak Reporting
  - Via phone and logged in an excel spreadsheet.
  - State application provides school absentee data.
- Wastewater surveillance
  - Samples are sent to the public health laboratory for testing and analysis at the state health department.
  - Data is collected, tested, and analyzed through separate partners.
  - Data provided through DCIPHER.
  - An API from NWSS is used.
- Other
  - State-based surveillance systems.
  - Download from 1CDC

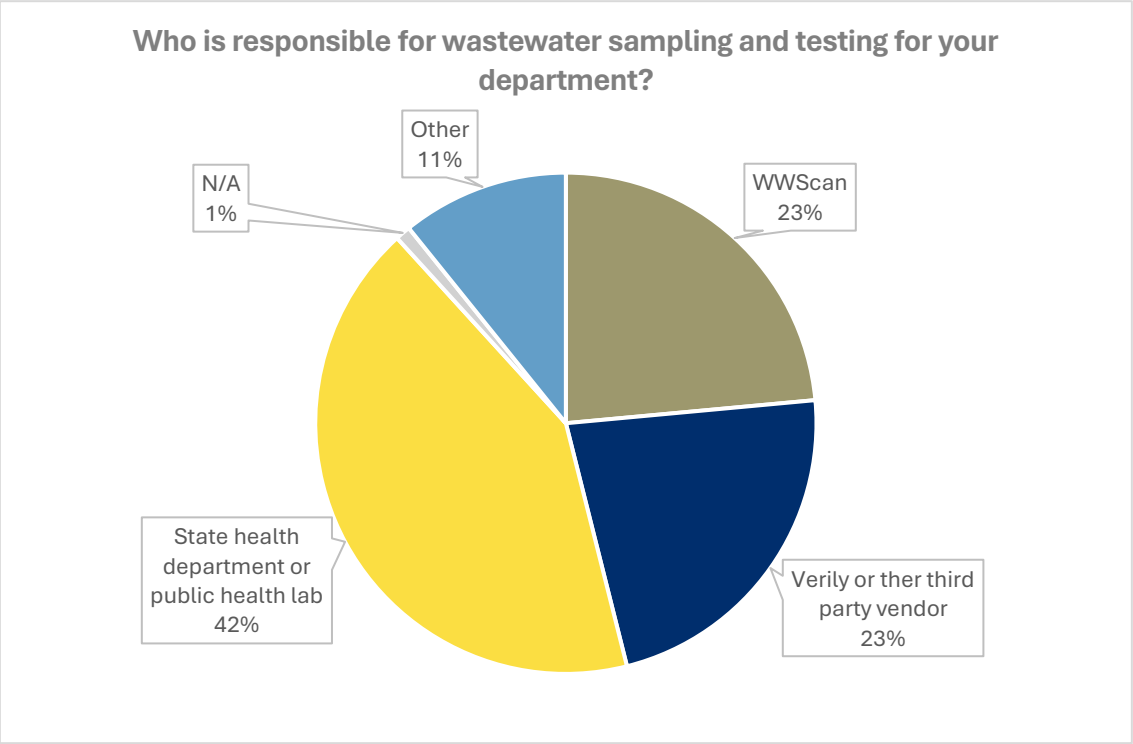

Figure 3. Responsibility for wastewater sampling and testing

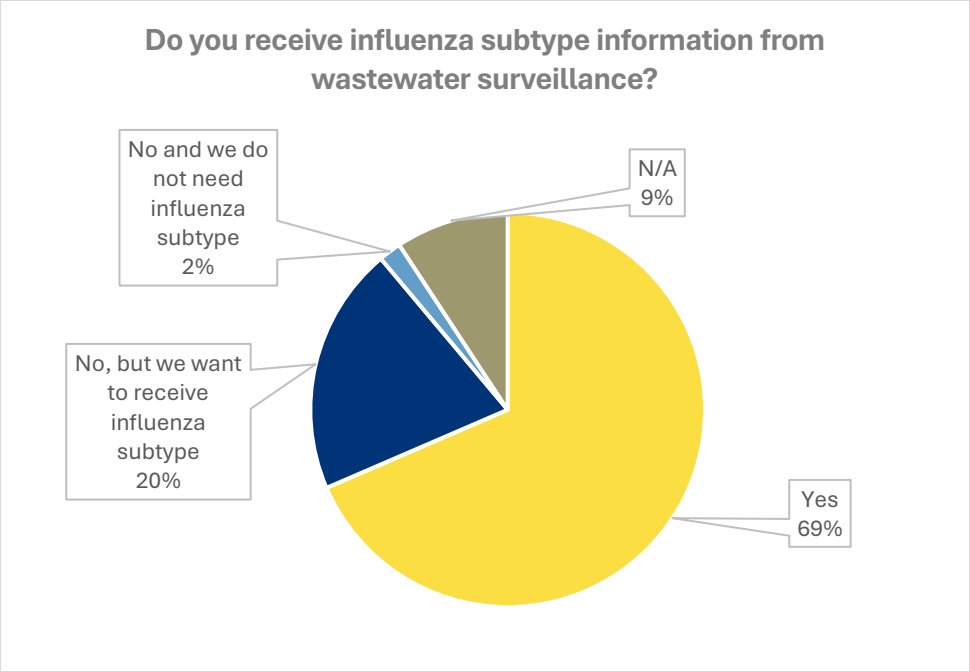

Figure 19. Influenza subtyping - Wastewater

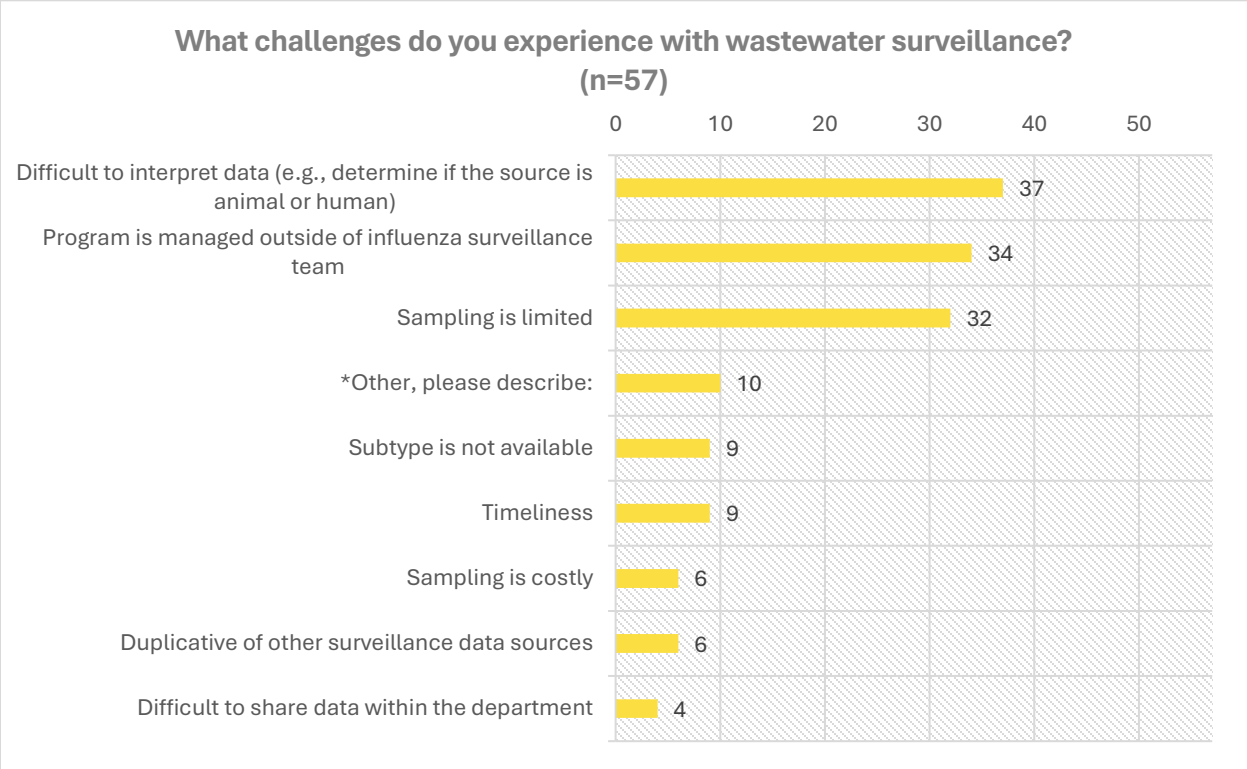

Figure 20. Challenges with wastewater surveillance
*Responses "Other, please describe" are listed below.

Other Challenges Shared Regarding Wastewater Surveillance

- Data interpretation
    - Discrepancies when mapping wastewater data with case data, with expected spikes only seen about half of the time.
    - Influenza wastewater surveillance not trending with or before the clinical data.
    - Difficulty understanding how to use the data effectively and what the data truly mean given the jurisdiction's geographic size.
    - Challenges deciding what public health actions to take based on wastewater data.
    - Wastewater surveillance is a relatively new field, and there is no unified methodology for data analysis across sites.
    - Trying to account for external and environmental factors across all sites is a challenge.
    - Influenza surveillance through wastewater is new, so exploring how to use the data as it becomes available.
- Program Capacity and Development
    - Lack of staffing to allow for a wastewater program.
    - Currently onboarding new wastewater testing at the state laboratory, so will see increased samples with that development.
    - Wastewater surveillance team is at maximum capacity for number of wastewater sites.
- Communication and Coordination
    - Influenza coordinators are sometimes excluded from communications about wastewater surveillance.

Other challenges with LTCF, Outbreak, or Wastewater Surveillance Not Previously Noted

- Inconsistent Reporting by Facilities
    - A small proportion of schools routinely report respiratory absenteeism and outbreaks in some jurisdictions.
    - Facilities may be reluctant to report outbreaks due to concerns about potential regulatory impacts.
    - Outbreak reporting is sometimes submitted by facilities (e.g. schools, daycares) that lack information on testing results, making it difficult to determine the causative respiratory virus.
    - Individual outbreaks are often not reported by schools.

- Organizational Barriers
    - LTCF are managed by a different department in some jurisdictions.
- Resource and Capacity Constraints
    - Outbreak response activities are time consuming and place a burden on partners.
    - Delays in specimen collection can impact identifying and responding to outbreaks in a timely manner.
    - Confirmation testing for outbreaks has been challenging due to limited availability of rapid test kits.
    - Frequent staff turnover and staffing shortages at LTCFs and ALFs is a barrier to reporting, compounded by limited staff capacity, restricted access to resources such as testing supplies, and funding challenges.
- Outbreak Definition Limitations
    - There is a lack of standardized influenza outbreak definition that is sufficiently specific. Some jurisdictions feel the definition is too general.

Key Informant Interview Findings – Outbreak Surveillance

Opportunities

Among the jurisdictions interviewed, LHDs frequently serve as the primary identifiers and managers of outbreaks of influenza. Outbreak surveillance efforts are mainly focused on LTCFs, although some agencies also monitor school outbreaks and work with the state to track and report outbreak activity. LHD community relationships are beneficial in expediting response and mitigation outbreaks. However, not all jurisdictions have LHDs, which can increase reliance on influenza coordinators and their staff.

NHSN is a commonly used source for LTCF outbreak data . Others not interviewed may have alternative mechanisms for receiving outbreak data.

In one jurisdiction, LTCF and schools are required to report outbreaks of any kind which are managed by a different team. LTCF outbreaks are reportable in another jurisdiction interviewed, but regional epidemiology staffing issues hindered efforts to monitor these closely.

Gaps

One influenza coordinator mentioned having incentives for LTCF or school outbreak reporting would be helpful.

Reporting school-based outbreaks is often incomplete. In one state, the Department of Education tracks outbreaks and emails the influenza coordinator weekly during influenza season. Another jurisdiction shared they use a web-based reporting portal.

Barriers

In one jurisdiction interviewed, the high volume of cases is a barrier to efficient surveillance of outbreaks. Their epidemiologists estimate that about 50% of their annual cases occur in people ages 0-19 years. Data collection relies on an Excel workbook, which the agency trains schools to use at least once a year. Regional epidemiologists help with school-based outbreaks, but the work is labor-intensive.

Key Informant Interview Findings – Wastewater Surveillance

Opportunities

All states interviewed generally maintain separate teams for managing wastewater surveillance, which monitors influenza, COVID-19, and other pathogens. These programs seem well-developed, and in some cases have extensive coverage throughout states with the ability to scale based on detections of abnormalities, such as avian influenza. However, influenza coordinators expressed mixed opinions regarding the overall value of wastewater surveillance for influenza-specific monitoring.

One jurisdiction shared that they proactively add sentinel wastewater sites during disease outbreaks or public health emergencies. This jurisdiction was recently invited to participate in sequencing as part of a Wastewater Center of Excellence and maintains a nearly fully automated process for publishing wastewater surveillance reports.

While influenza and COVID-19 are the diseases of focus for wastewater surveillance, a few states have expanded to include H5 influenza and in some jurisdictions, measles.

Gaps

There are sometimes disconnects between the influenza coordinators and the wastewater surveillance teams. The wastewater teams often publish separate reports and may not send their data to the influenza coordinator for inclusion in the influenza reports. Wastewater teams do not always notify influenza coordinators of usual surges in influenza activity or detections of unsubtypable specimens. Additionally, some influenza coordinators report uncertainty regarding the methods wastewater teams

use to select surveillance sites, question the timeliness of the results, and are unsure whether detections truly indicate disease presence in people.

One coordinator noted that wastewater data has no baseline, and epidemiologists are unsure how to use it. There is skepticism around its utility for assessing community-level influenza activity in a manner comparable to sentinel surveillance.

Other concerns include the inability to distinguish human influenza infections from those in animals. This limitation highlights the potential need to consider the proximity of wastewater sampling sites to agricultural operations when interpreting data.

Barriers

The recent reduction in COVID-19 funding has jeopardized wastewater surveillance programs. Some jurisdictions have experienced staff reductions and others have reduced test sites, or the number of tests performed.

Additional limitations affecting the perceived value of wastewater surveillance include delays in receiving or reporting results (sometimes up to three to four weeks), an inability to differentiate between influenza subtypes (H1 vs. H3), uncertainty as to whether detections represent fragments or virus, and the presentation of data solely as viral loads.

Although H5 avian influenza has been detected by wastewater programs in most states interviewed, jurisdictions are generally unable to determine whether the source was human or animal. As a result, many jurisdictions choose not to publicly report their H5 results.

Mortality Surveillance

Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

- Of all jurisdictions assessed, 82% use vital statistics systems to capture influenza-associated deaths. 25% of jurisdictions use other methods for mortality reporting. Pediatric deaths are reported in 91% of jurisdictions. All systems are deemed extremely or moderately important for the majority who use them.
- While most influenza coordinators are using electronic vital statistics systems, approximately one quarter use manual reporting as part of adult mortality surveillance, and 72% use manual methods for pediatric death reporting. Systems used other than vital statistics include the jurisdiction's reportable disease surveillance system, REDCap, eCR, and ESSENCE.
- Delays in confirming and reporting influenza-associated deaths were noted as a challenge by 70% of respondents. Additionally, 58% believe influenza deaths are underreported, 54% reported challenges due to limited postmortem testing, and 39% face challenges in obtaining laboratory results before death.
- Manual chart review required to confirm influenza-associated deaths, particularly pediatric deaths, which over 70% of influenza coordinators report conducting, is burdensome, time-consuming, and results in delays in reporting. The length of the 40+ question case report form is time-consuming.
- Many influenza coordinators indicated the need for a case definition for adult influenza-associated mortality.

Assessment Findings

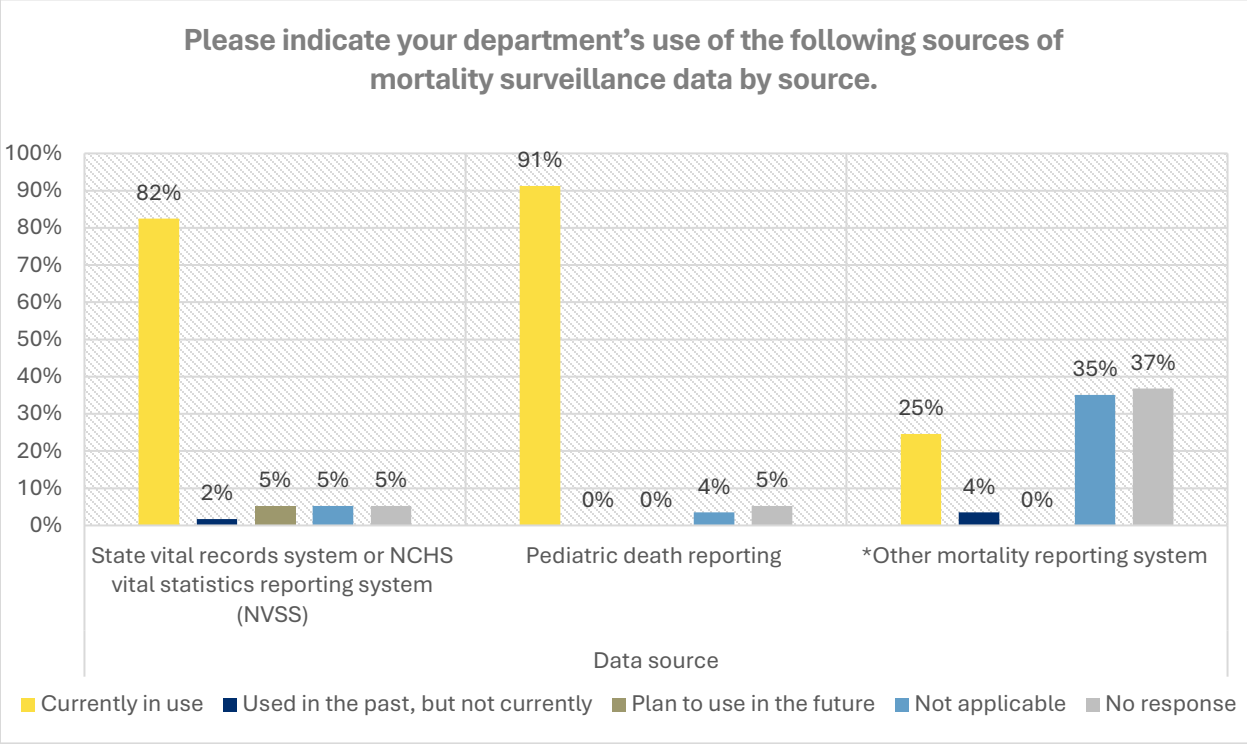

Figure 21. Use of data sources – Mortality
*Other mortality reporting systems are detailed below.

Other Mortality Reporting Systems used by Jurisdictions

- Vital statistics registry data
- Unexplained Death and Critical Illness Program
- State based reportable disease system
- REDCap
- eCR
- ESSENCE
- EDRS Data

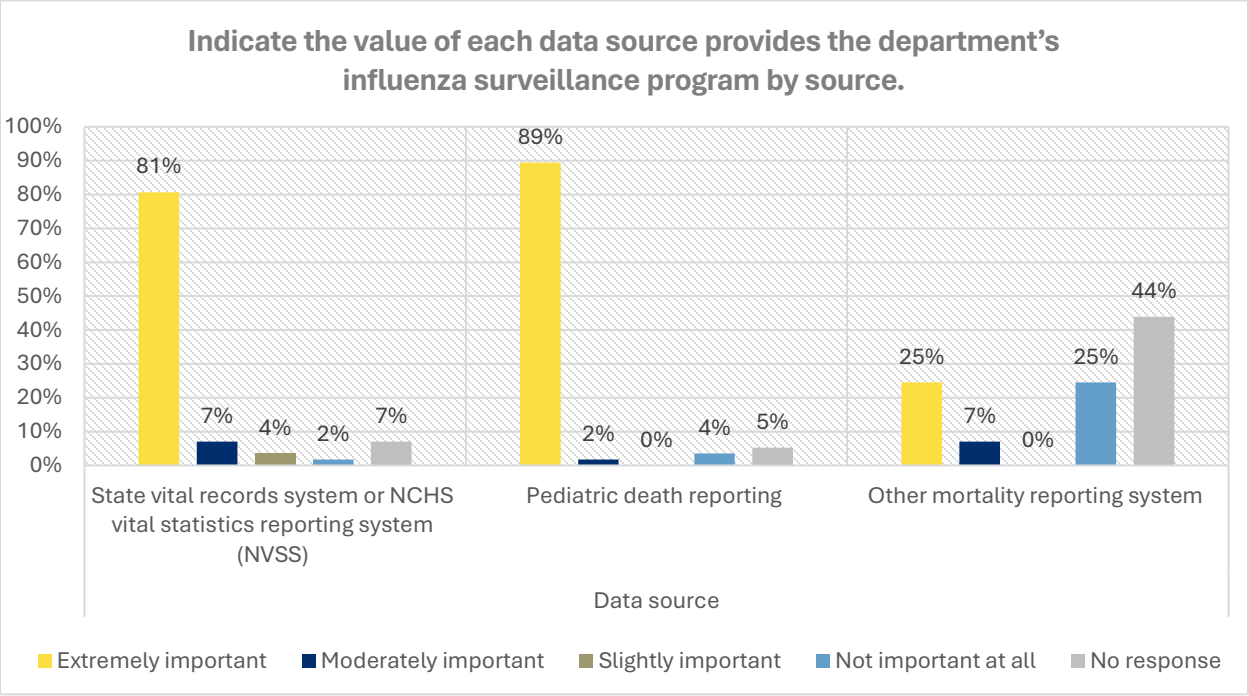

Figure 22. Value of each data source - Mortality
*Other mortality reporting systems are detailed in a list above.

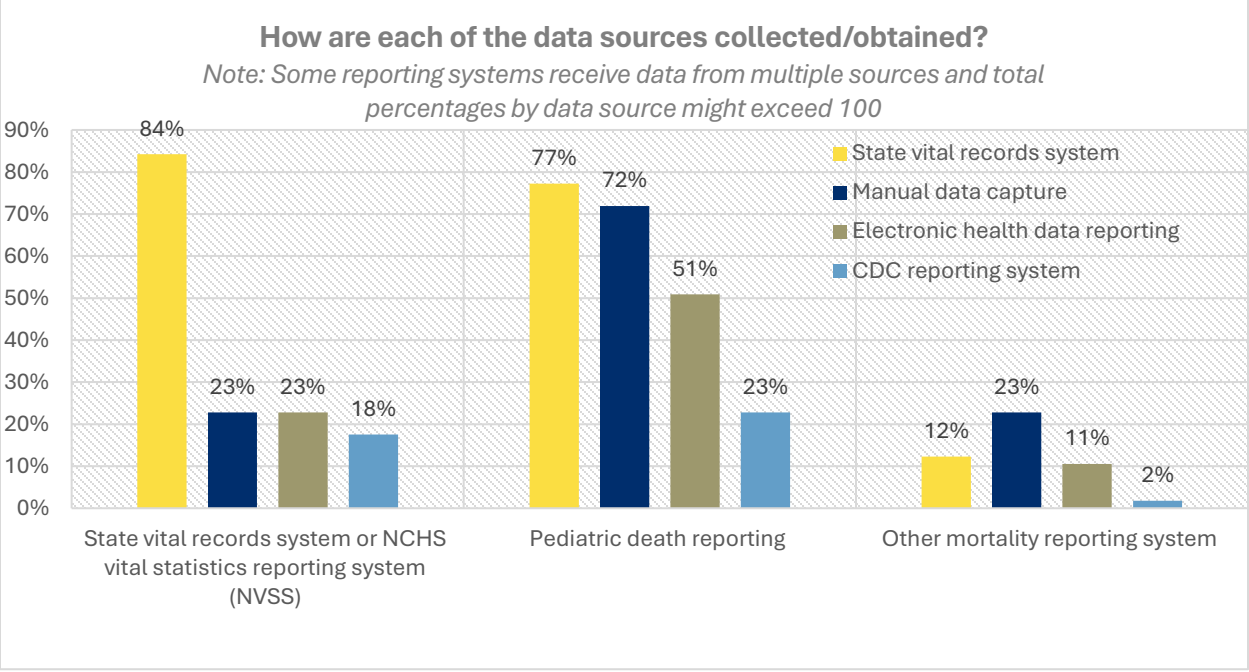

Figure 23. Data collection – Mortality
*Other mortality reporting systems are detailed in a list above.

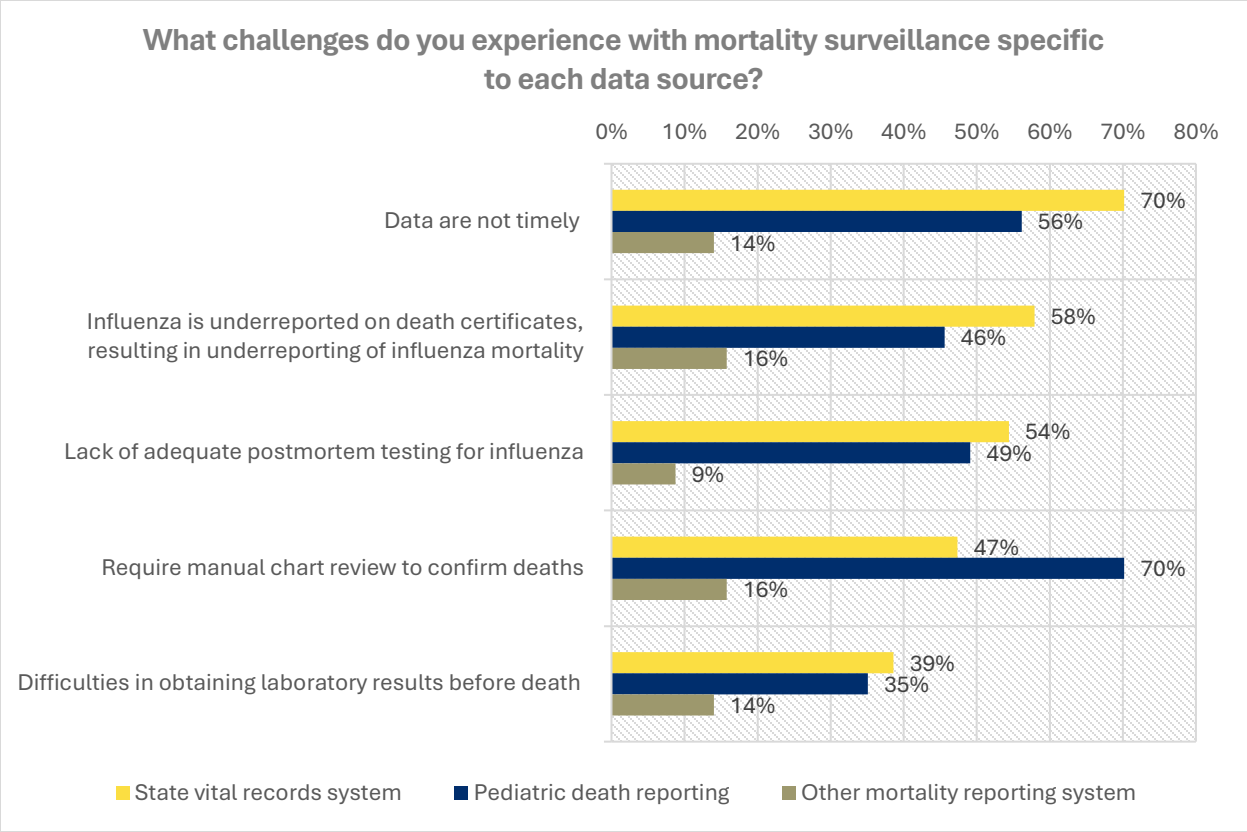

Figure 24. Challenges – Mortality
*Other mortality reporting systems are detailed in a list above.

Other Challenges in Influenza Mortality Surveillance

- Differences in reporting and case definitions
    - Efforts are underway with a few jurisdictions to develop a definition for influenza-associated deaths in the adult population, as previously case determination relied on provider reports and medical record review.
    - There is currently no standardized definition for adult influenza-associated mortality for jurisdictions seeking to count cases.
- Timeliness of data
    - Delays with NCHS data and obtaining death certificates.
    - Delays in receiving autopsy reports, which are necessary in some jurisdictions to make final determinations.
    - Identification of cause, autopsy, local public health reporting, investigation and state level reporting can take several months.
- Access and data sharing
    - Vital records may reside in a separate bureau within some health departments, complicating data sharing.

    - Limited access to vital records can impede mortality surveillance.
- Inconsistencies in reporting
    - Variation exists across jurisdictions in the reporting of causes of death on death certificates.
- Limited reportability
    - Adult influenza deaths are not reportable.
    - Reporting relies primarily on vital records because adult deaths are not reportable.

Key Informant Interview Findings

Opportunities

Several states interviewed require reporting of both adult and pediatric influenza deaths, which improves the accuracy and timeliness of data but can be burdensome for influenza coordinators. One jurisdiction requires reporting of all adult and pediatric influenza fatalities. Local public health agencies investigate cases using a weekly communicable disease fatality list that includes influenza. Influenza deaths are also reportable in another jurisdiction interviewed, but the case counts do not always align with death certificate data and require reconciliation. In a different jurisdiction, deaths must be reported within one day, which enhances timeliness, but can place strain on hospital infection control practitioners, who submit most of the reports. Another jurisdiction shared that all influenza deaths are reportable from infection control practitioners when patients are hospitalized. The state conducts audits against vital records to capture any missed cases. This auditing process relies on large Excel files.

One jurisdiction is using ESSENCE for mortality reporting as the system links to vital statistics. This was the only state to mention using ESSENCE for influenza death surveillance, which could be a method for other states to adopt.

The most common method for obtaining influenza-related mortality data is through electronic vital records feeds. One state sends a letter to all coroners annually reminding them of the requirement to report influenza-associated adult and pediatric deaths.

Gaps

Influenza-related mortality is believed to be underreported. Influenza coordinators have conducted analyses comparing influenza hospitalizations resulting in deaths

with death certificates and found regularly occurring inaccuracies. In several jurisdictions, local health departments work to verify hospitalizations and find influenza-related deaths that are not captured in vital records. The most often misclassifications are viral pneumonia or just pneumonia.

Barriers

The time required to investigate pediatric influenza deaths is a barrier. While pediatric influenza deaths are reportable in all jurisdictions interviewed, influenza coordinators and their teams are trying to perform chart reviews and complete a 40+ question case report form, which several stated is burdensome. Questions were raised regarding the practical impact of this effort, including whether it results in meaningful clinical recommendations or notifications. One influenza coordinator suggested shortening the initial case report form but adding a second form if adverse outcomes were detected, such as the increase in encephalopathies in the 2024-2025 respiratory season.

Capacity, Resources, and Support Needs for Influenza Surveillance

Key highlights are presented below, followed by detailed figures that provide the underlying data and additional context.

Highlights

- Influenza coordinators reported significant financial constraints. Specifically, 81% identified funding for additional reagents as critical (70%) or important (11%), 80% cited the need for support for avian influenza response, 87% highlighted funding to expand the use of electronic data, and 86% noted funding to support routine surveillance activities.
- Collaboration and professional development are highly valued. 88% of respondents indicated a need to increase collaboration with other influenza coordinators, 72% expressed interest in mentoring for new coordinators, and 78% would like to participate in a statistical user group.
- In the categories of software, tools, and training, approximately 60% of respondents considered improvements to software, technical assistance, and training as either critical or important.
- Program sustainability challenges were common with 67% of coordinators reporting funding or staffing reductions in the past year. About 50% reported challenges related to burnout or staff resignations, resistance from health care providers to report surveillance data, and insufficient training to perform analyses.
- To develop or expand new surveillance activities, 93% of influenza coordinators reported a need for additional financial support from ELC, or if not ELC, 88% would benefit from general fund appropriations. Approximately 75% of influenza coordinators indicated that increased collaboration with other influenza coordinators, stronger internal leadership support, data modernization, and external support would be extremely or moderately useful.
- In the key informant interviews, influenza coordinators shared common concerns about funding and sustainability. At the same time, they shared that they believe their work is valued and important. Influenza coordinators interviewed shared that engagement from CSTE and CDC through initiatives such as workshops, webinars, and other convenings reinforce this perception.

Influenza coordinators appreciated the opportunity to discuss their programs and express interest in this project's outcomes. There was broad agreement that assessing national influenza surveillance capacity is essential given ongoing funding reductions, the threat of an avian influenza pandemic, evolving virulence of known respiratory pathogens, and the potential emergence of novel respiratory diseases.

Assessment Findings

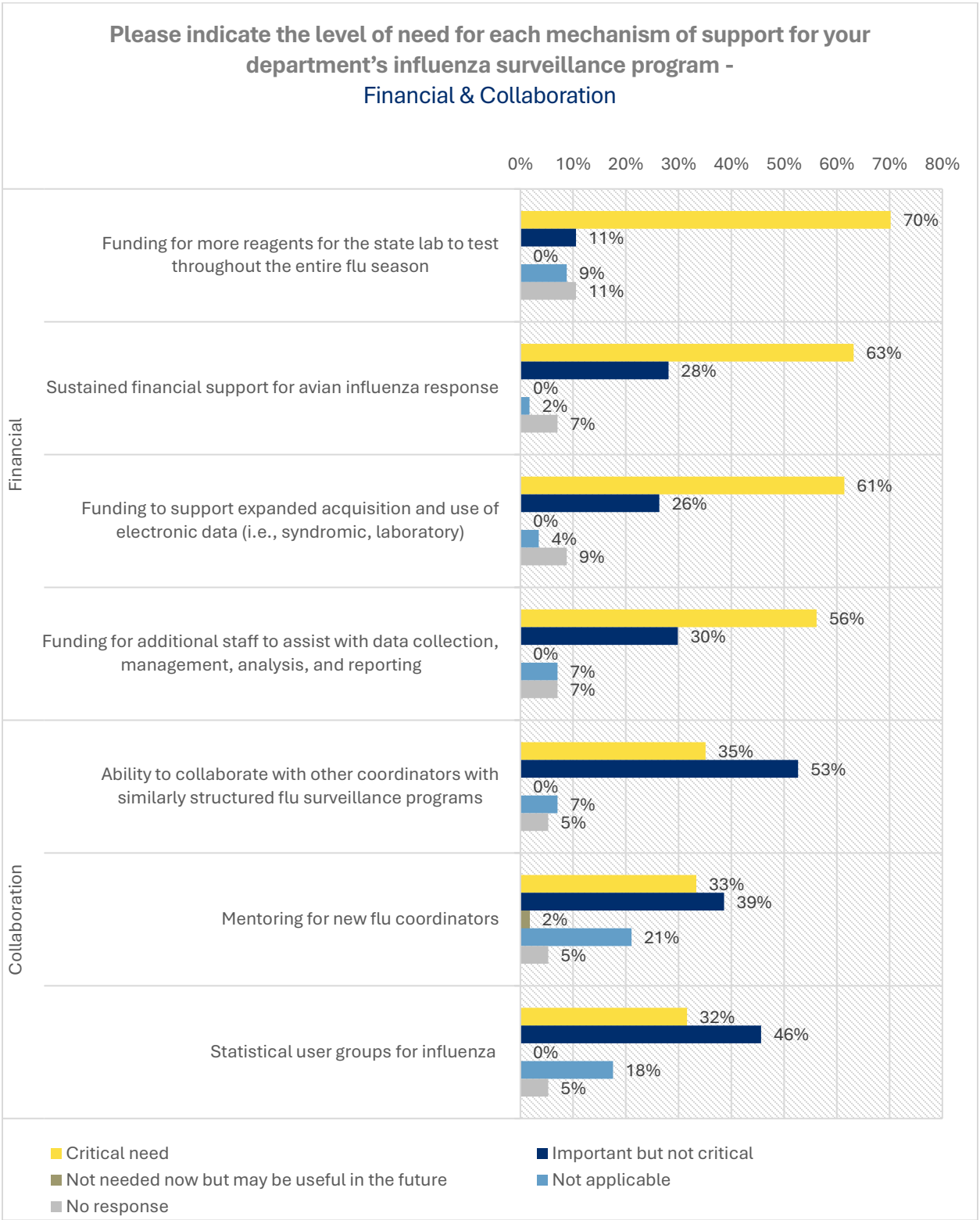

Figure 25. Level of need by mechanism of support – financial & collaboration

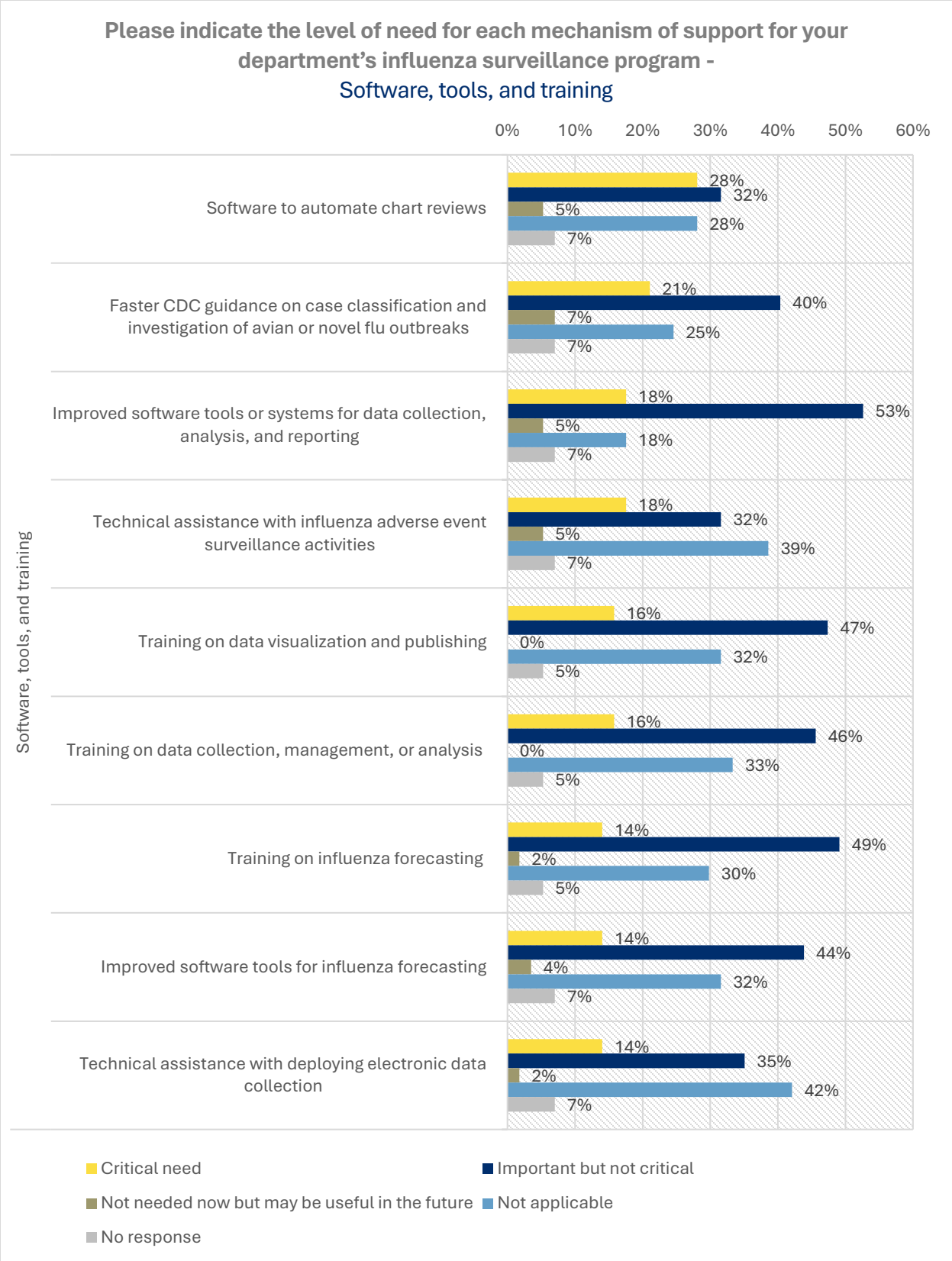

Figure 26. Level of need by mechanism of support – software, tools, and training

Other Critical or Important Needs for Influenza Surveillance Programs

- Technical skills including SQL, R, and Tableau.
- Assistance with syndromic surveillance.
- Cross-collaboration on the use of LTCF and school outbreak data for influenza surveillance, as well as guidance on incorporating hospitalization data into state surveillance systems.
- Mentoring to provide guidance from individuals in the same role, including explanations of the various data sources and processes.
- Ongoing engagement with influenza coordinators following the Influenza Workshop at the CSTE Annual Conference, including continued discussion of challenges.
- Support for contact monitoring for novel influenza events.

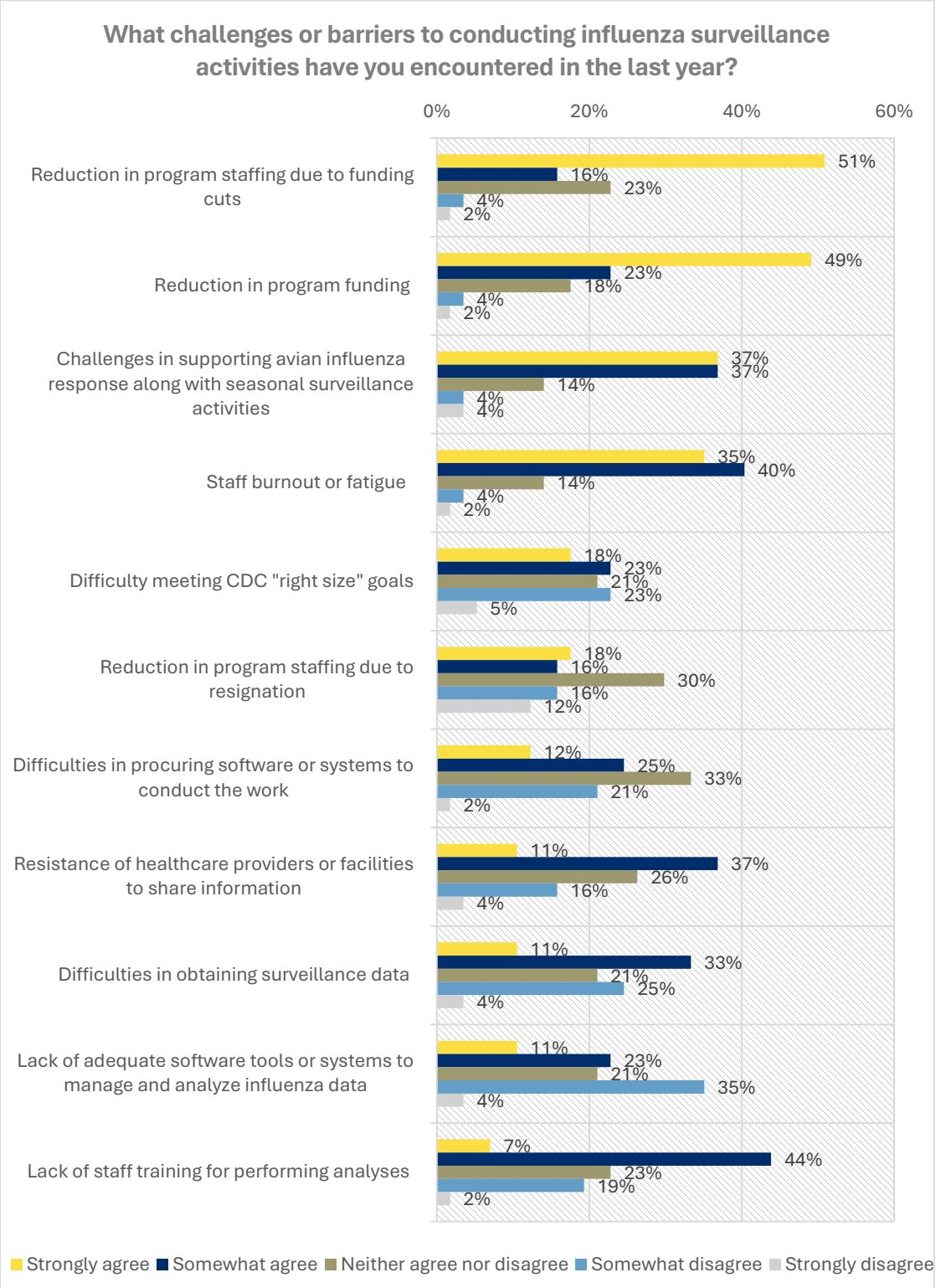

Figure 27. Challenges or barriers in the last year

Summary of Additional Challenges Identified

- Policy changes at the federal level.
- Limited resources and infrastructure for rapid testing and reporting, which can delay the identification of influenza outbreaks and impede timely public health responses.
    - Reliance on specific supplies and reagents for testing, creating vulnerabilities in the event of supply disruptions or shortages.
- Integration of COVID-19 surveillance into influenza surveillance, including the concurrent management of RSV and COVID-19 data alongside influenza surveillance.
- Silos within state health departments.

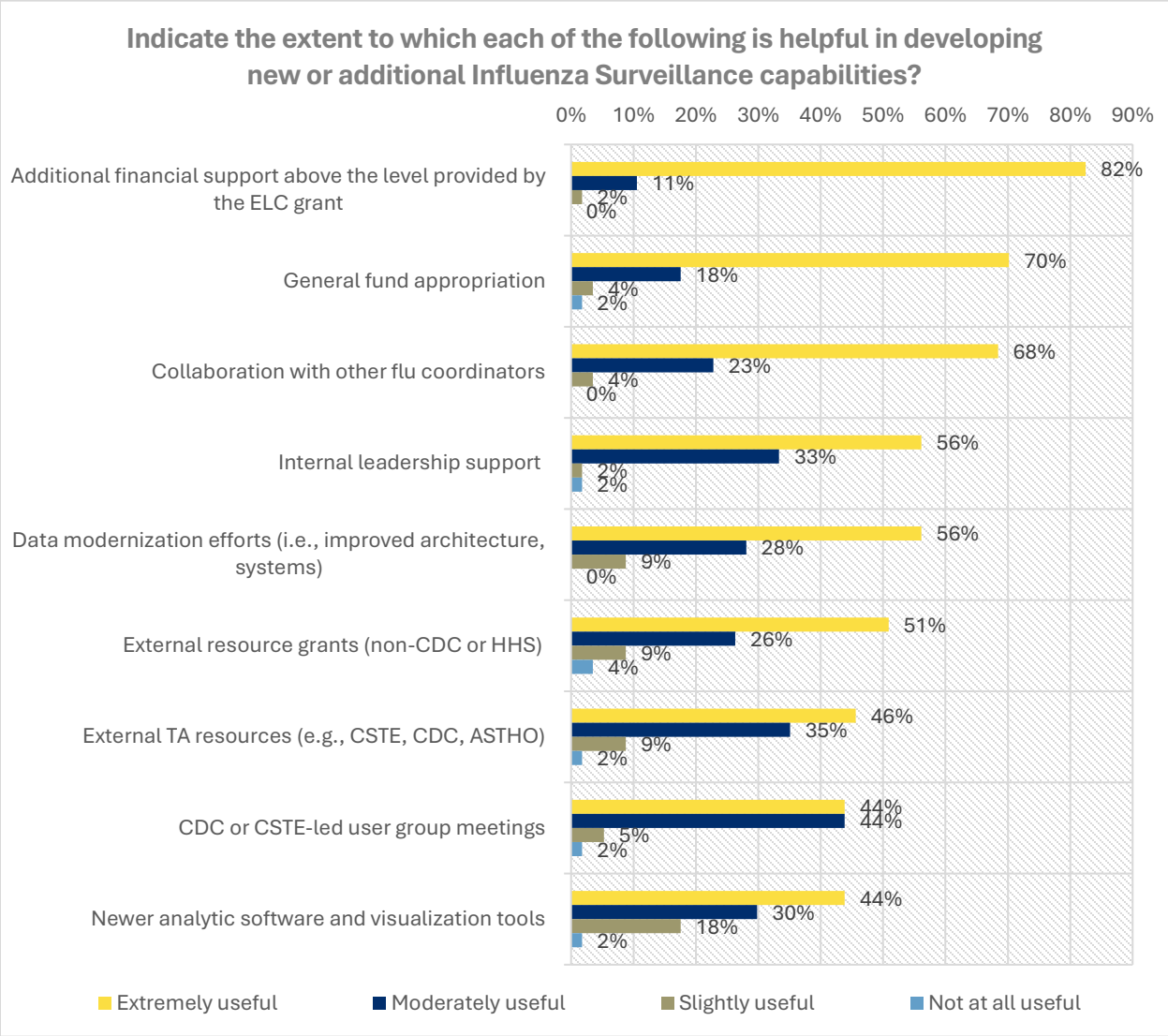

Figure 28. Value of support for developing new or additional capabilities

Conclusion

Influenza surveillance programs in U.S. states, cities, and territories represent a cornerstone of the nation's public health infrastructure. These programs provide timely, actionable data that guide prevention efforts, inform clinical and public health decision-making, and support situational awareness for seasonal influenza as well as emerging respiratory threats. As respiratory surveillance has expanded in the wake of the COVID-19 pandemic, influenza programs increasingly serve as a foundational platform for monitoring multiple pathogens, making their continued strength and sustainability critical to national health security.

Findings from this assessment highlight both the value of these programs and the significant challenges they face. Influenza coordinators manage complex surveillance systems, often relying on manual processes and fragmented data streams while simultaneously responding to increasing expectations for real-time, integrated respiratory surveillance data. Coordinators identified clear opportunities to strengthen the system through expanded electronic reporting, greater participation in national surveillance platforms, enhanced collaboration across jurisdictions, and improved access to training, tools, and analytic capacity. However, progress in these areas is constrained by persistent funding and staffing limitations.

The results of this assessment underscore that sustained and increased investment in influenza surveillance are essential. Resources are needed to support workforce capacity, modernize data systems, ensure consistent laboratory reagent availability, expand new and innovative surveillance approaches, and enable jurisdictions to participate fully in national surveillance networks. Without stable resources and support, programs risk losing critical expertise, reducing surveillance coverage, and limiting their ability to detect and respond to emerging threats.

At a time when the threat of avian influenza, evolving respiratory pathogens, and potential novel disease emergence remain pressing concerns, strong influenza surveillance systems remain essential. Continued support and technical collaboration are vital to maintaining and strengthening these programs so that jurisdictions are better prepared to detect outbreaks early, respond effectively, and protect the health of communities across the United States in the years ahead.

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