ISSUE REPORT

Ready or Not:

PROTECTING THE PUBLIC'S HEALTH FROM DISEASES, DISASTERS, AND BIOTERRORISM 2025

SPECIAL FEATURE: Confronting the H5N1 Bird Flu Threat

Trust for America's Health
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Acknowledgments

Trust for America's Health (TFAH) is a nonprofit, nonpartisan public health policy, research, and advocacy organization that promotes optimal health for every person and community and makes the prevention of illness and injury a national priority. Review *TFAH's 2023–2026 Strategic Plan* at *tfah.org*.

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Executive Summary

In 2024, the United States continued to contend with a complex landscape of public health challenges. While the acute phase of the COVID-19 pandemic had subsided, its lingering effects—along with intensifying natural disasters, workforce shortages, and persistent health disparities—remained evident. From the constant threat of novel infectious diseases to the destabilizing influence of hurricanes, wildfires, and flooding, federal, state, and local health systems faced escalating demands. These conditions underscored a dual imperative: maintaining robust day-to-day public health operations and ensuring readiness for emergencies.

Ready or Not 2025: Protecting the Public's Health from Diseases, Disasters, and Bioterrorism evaluates how prepared the nation and all states are to safeguard residents from a wide range of health threats. This year's analysis draws on 10 key indicators—spanning healthcare workforce mobility, accreditation, public health funding, water system safety, workforce well-being, vaccination coverage, patient safety, laboratory surge capacity, and avoidable mortality. Improving on these measures requires efforts by state legislatures and governors, health departments, the healthcare delivery system, and the general public. This year, Trust for America's Health (TFAH) introduced an indicator examining avoidable mortality and related disparities, offering deeper insights into health outcomes and the equity dimensions of public health emergency preparedness.

NEW INDICATOR MEASURES AVOIDABLE MORTALITY

Beginning with this year's *Ready or Not* report, we are introducing a new indicator designed to measure avoidable mortality. The goal remains to provide a set of actionable indicators that not only reflect states' readiness to protect public health during emergencies but also track their progress over time, helping build healthier and more resilient communities. As a measure of the unaddressed burden of avoidable illness within a state, this new indicator relates to how well the population may withstand and recover from a public health emergency, as communities with stronger overall health tend to fare better during such emergencies.

The avoidable mortality indicator focuses on deaths before age 75 that could potentially be prevented. It combines two sub-measures:

1. **Healthcare-Treatable Causes:** Deaths before age 75 that timely and effective healthcare interventions could have averted.
2. **Preventable Causes:** Deaths before age 75 that public health measures could have averted, such as through vaccinations, safer environments, or improved health behaviors.

This composite measure follows a methodology developed by the Organisation for Economic Co-operation and Development and Eurostat, incorporating nationally standardized death rates and established lists of treatable and preventable causes. The Commonwealth Fund calculates these sub-measures using federal mortality data and U.S. Census population data. By including this metric, TFAH can also assess disparities among different racial and ethnic groups within each state, shedding light on underlying inequities that affect community health.

While TFAH continues to prioritize policies and systems that enable older adults to thrive beyond 75, we recognize the pressing need to address the high rate of premature, avoidable deaths in the United States—especially those that disproportionately harm disadvantaged communities. Adding this indicator brings fresh perspective to Ready or Not and strengthens a collective understanding of what it means for communities to be truly prepared, equitable, and resilient.

The set of 10 indicators that are the basis for this annual report have been selected to provide instructive and actionable assessments of a state's readiness to protect the public's health during an emergency.

In 2024, the United States faced a series of public health emergencies that underscored the nation's vulnerabilities to natural disasters, health crises, and the long-term impacts of environmental challenges.[1] The year began with the continued aftermath of the devastating wildfires in Hawaii, which necessitated multiple renewals of public health emergency declarations due to ongoing health risks, infrastructure challenges, and the prolonged recovery process. These wildfires highlighted the critical need for appropriate environmental health strategies and long-term support for disaster-stricken communities.

As the year progressed, the country was struck by a series of powerful hurricanes. Hurricane Helene wreaked havoc across multiple states, including Florida, Georgia, South Carolina, Tennessee, and North Carolina, disrupting healthcare systems, damaging infrastructure, and leaving communities without power or clean water. Shortly afterward, Hurricane Milton struck Florida, compounding the strain on already overburdened emergency response systems. Public health emergency declarations in these regions facilitated federal assistance and highlighted the need for coordinated disaster preparedness efforts.[2]

Adding to these challenges was the threat of H5N1 bird flu—the topic of a special feature later in this report—which has raised fears of potential human-to-human transmission. The virus's continued spread through livestock, isolated human cases, and the fact that it can be life-threatening in people highlight the need for aggressive containment measures, protective protocols for agricultural workers, vaccine development, and testing strategies.

These concurrent emergencies demonstrated the urgent need for sustained investments in public health infrastructure, robust preparedness systems, and policies that prioritize resilience and equity.

Collectively, these indicators provide a window into states' capacities and vulnerabilities. They highlight areas where states have made commendable progress in building more resilient health infrastructures, as well as areas where critical gaps remain. Ultimately, this report aims to inform policymakers, health leaders, and communities about what it takes to achieve and sustain a robust, equitable system capable of managing routine health needs while also weathering crises.

TABLE 1: Key Indicators of State Public Health Emergency Preparedness and Response Capacity

INDICATORS			
1	**Incident Management:** Adoption of the Nurse Licensure Compact (NLC) to facilitate cross-state nursing practice.	6	**Workforce Resilience and Infection Control:** Employed population usage of paid time off, supporting workforce health and reducing disease spread.
2	**Institutional Quality:** Accreditation by the Public Health Accreditation Board (PHAB), ensuring quality and accountability.	7	**Countermeasure Utilization:** Flu vaccination coverage, reflecting readiness to distribute and administer vaccines.
3	**Institutional Quality:** Accreditation by the Emergency Management Accreditation Program (EMAP), demonstrating emergency response readiness.	8	**Patient Safety:** Percentage of hospitals earning an "A" grade from Leapfrog, signaling strong clinical safety protocols.
4	**Institutional Quality:** Stability or increase in state public health funding, indicating sustained preparedness investments.	9	**Health Security Surveillance:** Laboratory surge capacity plans, ensuring rapid diagnostic response.
5	**Water Security:** Population served by fully compliant community water systems, reflecting strong environmental health protections.	10	**NEW: Health Outcomes:** Avoidable mortality rates and disparities among racial/ethnic groups, illustrating underlying health inequities and system vulnerabilities.

Key Findings:

- **Healthcare Workforce Mobility: The Expanding Nurse Licensure Compact (Indicator 1)** As of January 2025, 41 states participate in the Nurse Licensure Compact (NLC), compared with just 26 states in 2017. This significant expansion underscores a growing recognition that enabling nurses to practice across state lines is essential to addressing chronic workforce shortages and rapidly mobilizing personnel during emergencies. Whether responding to future outbreaks, providing surge staff after natural disasters, or expanding telehealth to underserved regions, the NLC offers a flexible framework that can adapt to changing care demands.

  States that have adopted the NLC find it easier to fill nursing vacancies swiftly, deploy personnel to hard-hit hospitals, and support ongoing patient care in remote or underserved areas. This mobility also benefits telehealth services, allowing nurses to serve patients across jurisdictional boundaries thus strengthening overall system resilience.

- **Public Health and Emergency Management Accreditation (Indicators 2 & 3)** Most states have achieved accreditation through the Public Health Accreditation Board (PHAB) and/or the Emergency Management Accreditation Program (EMAP). Accreditation ensures agencies meet rigorous standards, engage in continuous improvement, and maintain well-defined processes—all foundational elements of emergency readiness. Accredited states often have stronger coordination among stakeholders, clearer governance structures, and better-quality monitoring and evaluation systems.

  However, a handful of states remain unaccredited by either PHAB or EMAP. Their absence from these frameworks may reflect resource limitations or an ongoing accreditation process. Still, accreditation serves as a valuable benchmark: states that attain it are generally better positioned to manage evolving threats, protect their populations, and adapt infrastructure and practices to new challenges as they arise.

- **Stable or Increased State Public Health Funding (Indicator 4)** A majority of states either maintained or increased their public health funding in fiscal year (FY) 2024, signaling recognition that sustained investment underpins resilience. However, 14 states reported funding declines, raising alarms about long-term sustainability. Without stable funding, states may struggle to retain skilled staff, modernize data systems, or invest in preventive measures that reduce the severity of future emergencies.

  The expiration and rescission of onetime federal COVID-19-related funds and the cessation of special emergency allocations related to the pandemic threaten to create "funding cliffs," where ongoing needs exceed available resources. Federal funding constitutes a significant portion of funding for public health programs nationally through money that flows to state and local health departments. Ensuring steady, flexible funding from both federal and state sources is critical for preparedness capabilities such as surveillance, immunization, outbreak investigation, and community engagement. Without reliable financial support, states risk losing ground in their preparedness efforts.

- **Community Water System Safety (Indicator 5)** Most Americans receive safe drinking water from community systems, but some states still grapple with noncompliance issues. On average, about 5 percent of residents rely on systems that fail to meet all health-based standards. Challenges such as aging infrastructure, shifting environmental conditions, and emerging contaminants like per- and polyfluoroalkyl substances (PFAS) further complicates water safety.

  In a health emergency—whether triggered by a natural disaster that floods treatment plants or an infrastructure failure that introduces contaminants—having strong water system safeguards is essential. States that invest in reliable water infrastructure and monitoring capacity can mitigate risks before they become crises, ensuring consistent, safe water access even under stressful conditions.

- **Workforce Resilience and Infection Control: Paid Time Off (Indicator 6)** Around half of workers in each state reported using some form of paid time off (PTO) in a given month. This figure, stable in recent years, highlights the fragmented U.S. approach to PTO, with no federal standard guaranteeing paid sick leave or vacation time. PTO policies serve as a public health tool: workers who can stay home when sick reduce disease transmission and maintain workforce continuity.

  During emergencies, from infectious disease outbreaks to severe weather events, workers who have access to PTO are less likely to come to work while ill, thus helping to prevent outbreaks in critical infrastructure

sectors. States with higher PTO usage often reflect supportive employment policies and greater workforce stability—factors that translate into stronger readiness during emergencies.

- **Seasonal Influenza Vaccination Rates (Indicator 7)** Influenza vaccination rates continue to fall short of national targets. During the 2023–2024 season, only 47 percent of Americans ages 6 months and older received the flu vaccine, down from the previous year and well below the Healthy People 2030 goal of 70 percent. States that increase flu vaccination rates can reduce hospitalizations, free up hospital capacity for other emergencies, and validate systems for rapidly distributing and administering vaccines when novel pathogens arise.

  Barriers to higher coverage persist and include vaccine hesitancy, perceived lack of necessity, and structural access issues. Renewed communication strategies, broader insurance coverage, and more

convenient vaccination opportunities can help increase uptake. Effective immunization programs provide invaluable practice for responding to future infectious disease threats and reinforce a culture of vaccination.

- **Patient Safety in Hospitals (Indicator 8)** The fall 2024 Leapfrog Hospital Safety Grade showed that 27 percent of hospitals in states, on average, earned an "A" grade, a modest improvement over the previous year. However, geographic disparities and variable hospital performance remain. High patient safety standards protect patients from avoidable harm and ensure that hospitals can maintain care quality during surges. When faced with emergency department overcrowding, staffing shortages, or high patient acuity, hospitals that have ingrained safety protocols and cultivated error-prevention cultures fare better.

  Enhanced patient safety infrastructure also builds community trust—an intangible asset that becomes critical when officials issue emergency orders, recommend shelter-in-place measures, or encourage community vaccination efforts.

- **Public Health Laboratory Surge Capacity (Indicator 9)** With the exception of three states (California, Colorado, and Utah), every state plus the District of Columbia reported having a written plan to handle a six- to eight-week surge in laboratory testing capacity. These plans are central to rapid detection, diagnosis, and containment of outbreaks, particularly for novel pathogens that require public health laboratory capabilities. Timely, large-scale testing can prevent localized clusters from becoming widespread catastrophes. States without finalized surge plans should expedite their development. Complete, regularly tested, and updated plans ensure that labs can handle unexpected demands—from novel pathogens to environmental toxic exposures—and preserve the accuracy and speed of diagnostic services under pressure.

- **Avoidable Mortality (Indicator 10)** Introduced this year, the avoidable mortality indicator measures deaths that could be prevented through public health measures or averted with timely and effective healthcare interventions. It also examines disparities among racial and ethnic groups. TFAH's analysis reveals that avoidable mortality rates vary widely by state, with examples such as Massachusetts, Hawaii, and New Hampshire achieving low overall mortality and narrow disparities, while states like Mississippi and West Virginia face high rates coupled with significant disparities. States with low avoidable mortality and narrow between-group disparities reflect equitable healthcare access, effective preventive strategies, and strong chronic disease management. Conversely, states with high rates of avoidable mortality and significant disparities between groups often experience more systemic challenges, including adverse social conditions that limit opportunities for good health, uneven resource distribution, and cultural and linguistic barriers to care.

  When a crisis strikes, these underlying weaknesses are magnified. Communities already facing high burdens of preventable illness or limited treatment options are more vulnerable to severe outcomes during an emergency. Reducing avoidable mortality by addressing underlying drivers is integral to holistic preparedness and strengthened population-wide resilience.

State Tier Placements

The *Ready or Not* report groups states and the District of Columbia into one of three tiers (high, middle, and low) based on their relative performances across the indicators. This year, 21 states and the District of Columbia achieved a high-performance tier score, demonstrating consistent strength across multiple indicators. Sixteen states placed in the middle-performance tier, with moderate results and some areas ripe for improvement. Thirteen states placed in the low tier, underscoring ongoing challenges that warrant targeted interventions. (See "Appendix B: Methodology" for more information on scoring.)

TABLE 2: State Public Health Emergency Preparedness
State performance, by scoring tier, 2024

Performance Tier	States	Number of States
High Tier	CO, CT, DC, DE, FL, GA, ID, MA, MD, ME, MO, NC, NH, NJ, OH, PA, RI, UT, VA, VT, WA, WI	21 states and DC
Middle Tier	AL, AR, AZ, CA, IA, IL, IN, KS, KY, ND, NE, NY, OK, SC, TN, TX	16 states
Low Tier	AK, HI, LA, MI, MN, MS, MT, NV, NM, OR, SD, WV, WY	13 states

Note: See "Appendix B: Methodology" for scoring details. Complete data were not available for U.S. territories.

TFAH Recommendations for Strengthening Preparedness

Based on the data collection and analysis completed for this report, consultation with experts, and lessons from recent crises, TFAH offers a comprehensive set of policy recommendations clustered into seven priority areas:

1. **Provide Stable and Sufficient Public Health Funding:** Predictable, long-term investments are needed to maintain readiness for a range of health threats. TFAH advocates for increasing funding for the Centers for Disease Control and Prevention (CDC) to at least $11.5 billion annually by FY 2026, and to boost public heath emergency preparedness and infrastructure funds to $1 billion annually. Steady funding ensures that public health has the core capabilities—such as workforce, disease detection, laboratory infrastructure, preparedness, and response—to keep communities safe.

2. **Ensure Effective Leadership and Coordination:** Effective, evidence-based decision-making is essential. TFAH supports reauthorizing the Pandemic and All-Hazards Preparedness Act, which promotes independent and evidence-based public health actions, and improves data collection and communication strategies. Strong leadership and coordination at federal, state, and local levels fortify the nation's readiness to face complex threats.

3. **Prevent and Respond to Outbreaks and Pandemics:** Strengthening immunization programs and addressing antimicrobial resistance are critical. TFAH recommends expanding funding for CDC's National Immunization Program and Antimicrobial Resistance Solutions Initiative, which invest in programs to prevent infections; rapidly detect, respond to, and control antimicrobial resistance; and improve appropriate use of antibiotics and antifungals. Timely detection and swift response to outbreaks depend on prevention, detection, and response measures.

4. **Build Healthy and Resilient Communities to Strengthen Preparedness:** A resilient community is one that is prepared for public health emergencies or natural/environmental disasters and one in which every individual and family can adequately recover in the wake of such events. Addressing non-medical drivers of health, improving demographic data reporting, and engaging marginalized communities in planning can bridge longstanding gaps. During emergencies, communities that have addressed housing, transportation, and food security challenges are better equipped to adapt and recover.

5. **Accelerate Development and Distribution of Medical Countermeasures (MCMs):** Accelerating the development, stockpiling, and distribution of vaccines, therapeutics, and diagnostics is essential. TFAH calls for increased funding for the Administration for Strategic Preparedness and Response (ASPR) and endorses legislation like the Protecting America from Seasonal and Pandemic Influenza Act. Strengthening MCM innovation pipelines ensures faster, equitable access to life-saving tools during crises.

6. **Ensure Healthcare System Readiness:** Improving hospital surge capacity, enabling cross-state provider credentialing, and expanding ASPR's Health Care Readiness programs are key steps to a healthcare system that is ready to meet the challenge of a public health emergency. When disasters strike, hospitals must rapidly adjust to increased patient loads, supply shortages, and infrastructural damage. A healthcare system primed for emergencies delivers consistent, safe care and stabilizes communities.

7. **Prepare for Environmental Threats and Extreme Weather:** Environmental hazards and new weather patterns demand proactive measures. TFAH supports funding CDC's National Center for Environmental Health, conducting vulnerability assessments via CDC's Building Resilience Against Climate Effects framework, and establishing stronger indoor and outdoor air-quality standards. Environmental health investments support rapid responses and reduce the health burdens of heat waves, chemical accidents, wildfires, and flooding.

Cross-Cutting Themes and the Road Ahead

The following themes are critical to strong emergency preparedness and recovery:

- **Equity:** Regardless of geographic or demographic differences, equitable access to healthcare, preventive services, and response and recovery resources is critical. Without centering equity in planning and response, preparedness efforts risk leaving behind underserved communities.
- **Infrastructure Modernization:** Modern data systems, robust workforce training, and updated regulatory frameworks position states to respond more quickly and effectively.
- **Trust and Authority:** Protecting scientific integrity and public health officials' ability to implement public health emergency safeguards when needed, ensuring transparent communication, and defending public health actions from political interference foster public trust—an indispensable asset during emergencies.
- **Prevention as a Baseline:** Chronic and infectious disease prevention, routine immunizations, environmental safeguards, and injury prevention are essential building blocks of emergency resilience.

In the year ahead, states and communities will face new and unpredictable threats. By sustaining investments, promoting equity, and reinforcing core public health functions, the nation can forge a more resilient future. Improving baseline conditions—healthier communities, a strengthened public health infrastructure and workforce, and tools to quickly respond to disasters—pays dividends when crises strike. States that choose to invest strategically today will find themselves better equipped to protect their residents and preserve their economies in the face of tomorrow's emergencies.

EMERGENCY PREPAREDNESS PROGRESS MILESTONES

In 2024, the nation made important progress in strengthening emergency preparedness and response. Examples include:

Provide Stable, Flexible, and Sufficient Funding for Public Health and Strengthen Public Health Infrastructure.

- CDC continued to award funds through the Public Health Infrastructure Grant Program (2022–2027), having thus far awarded $4.5 billion to assist 107 health departments nationwide in promoting and protecting health in their communities. An additional $361 million has been awarded to three national partners. After decades of underfunding, these resources are helping ensure health departments are better equipped to detect and prevent outbreaks, protect food and water, and respond to emergencies.

Control the Spread of Infectious Diseases.

- CDC's Center for Forecasting and Outbreak Analytics (CFA) has awarded more than $100 million to *Insight Net* partners to advance the use of outbreak data to control infectious disease outbreaks.[3] CFA also developed Respiratory Disease Season Outlooks for the 2023–2024 and 2024–2025 seasons.[4] These annual outlooks use modeling to estimate the trajectory of COVID-19, influenza, and respiratory syncytial virus (RSV) to help state and local public health planners prepare for changes in hospital demands and allocate resources to keep their communities healthy.[5]
- CDC expanded the National Wastewater Surveillance System to help jurisdictions better understand and respond to infectious disease threats. Since late summer 2024, specific testing for avian influenza A, or H5N1, wastewater has been implemented across almost 400 sites in 46 states, the District of Columbia, and two U.S. territories to provide additional data in detecting influenza virus in a community.[6,7] When wastewater testing shows a detection, public health and agriculture partners investigate to better understand what may be contributing to the detection and whether any public health actions should be taken.
- Thanks to funding for CDC's Data Modernization program, the administrative burden for healthcare facilities related to data collection and reporting was substantially reduced. The number of healthcare facilities using electronic case reporting to public health agencies increased from 153 in January 2020 to over 50,000 in all 50 states and two territories in February 2025.[9,10] Secure, automated case reporting allows for more efficient outbreak management and monitoring of disease trends.

- As part of the Data Modernization program, CDC also continues to expand healthcare facility participation in the National Healthcare Safety Network pilot to capture real-time bed capacity data that will allow health departments, other state agencies, and healthcare facilities and health systems to understand hospital capabilities. More accurate and timely tracking of hospitalizations allows for improved collaboration among decision-makers to optimize and mitigate resource constraints, especially in rural and underserved communities.[11]

Build Healthy and Resilient Communities

- CDC and AmeriCorps joined forces through Public Health AmeriCorps to support thousands of members embarking on public health careers.[8] These members address public health needs and workforce shortages in local communities, particularly rural, tribal, and urban underserved areas. Members improve community health outcomes through support for nonprofits, local governments and health departments, universities, and community health centers.
- In October 2023, federal law began requiring Medicaid programs to cover all recommended vaccines administered by a physician for adults with no cost to the patient.[12] Additionally, the U.S. Department of Health and Human Services (HHS) released new data showing that more than 10 million Medicare beneficiaries have received a free vaccine.[13]
- The Centers for Medicare & Medicaid Services released a final rule to simplify the renewal process for Medicaid, the Children's Health Insurance Program, and Basic Health Program.[14]
- Fifteen states and the District of Columbia have adopted paid sick leave laws requiring private employers to provide paid sick leave to employees attending to their own health or that of a family member.[15] Alaska, Missouri, and Nebraska will require employers to provide paid sick leave beginning in 2025.[16]

Accelerate Development and Distribution of Medical Countermeasures.

- ASPR's Center for Biomedical Advanced Research and Development Authority (BARDA) allocated approximately $27 million through the Rapid Response Partnership Vehicle (RRPV) Consortium to bolster development and manufacturing of diagnostics to address future biological threats.[17]
- The 2023–2024 respiratory season was the first during which RSV vaccination was recommended for older adults and pregnant women.[18,19] The vaccines have been found to be very effective at reducing hospitalization and severe illness.[20]
- ASPR funded efforts to boost domestic manufacturing of active pharmaceutical ingredients for essential medicines to prevent supply-chain disruptions.[21,22] Through its Center for Industrial Base Management and Supply Chain, established in 2023, ASPR enables and sustains an enduring domestic supply chain to support preparedness and response and recovery from public health emergencies and disasters.[23]

Prepare for Environmental Threats and Extreme Weather.

- The National Oceanic and Atmospheric Administration (NOAA) issued a National Heat Strategy and provided funding for extreme heat preparedness. This builds on the efforts of 29 federal departments and agencies, led by NOAA, the Federal Emergency Management Agency, and HHS, including CDC, all of which collaborated on the launch of the National Integrated Heat Health Information System and its web portal, *Heat.gov*, including the HeatRisk tool.[24]
- The Occupational Safety and Health Administration (OSHA) issued a proposed rule on Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings. This significant step toward a federal heat standard that protects workers would require all employers conducting indoor and outdoor work across all industries under OSHA jurisdiction to create a plan to evaluate and control heat hazards in their workplace and protect employees from hazardous heat conditions.[25]

SPECIAL FEATURE:

Confronting the H5N1 Threat

Avian influenza A (H5N1), commonly known as bird flu, poses a serious threat to the public's health, and the United States must act decisively to prevent it from evolving into a new pandemic. That is the consensus of public health experts who also say that the current response, especially in the area of testing, has not yet matched the scale of the challenge.[26,27,28] Critically, because avian influenza viruses can evolve to become extremely deadly and more easily transmissible between humans, the prospect of a flu pandemic is particularly alarming. Bird flu has already had severe economic impacts on the poultry and dairy industries and could lead to food product shortages and surging prices.[29]

Key Challenges to Preparedness

H5N1 exemplifies the importance of implementing a *One Health* response—a multisector approach that addresses the interconnected needs and health risks of people, animals, and their shared environment.[30]

The current H5N1 outbreak is escalating as the nation's public health system faces heightened pressure from chronic underfunding, politicization of health guidance, and challenges to public health authorities[31]—factors that complicate efforts to contain H5N1. Additionally, widespread misinformation about vaccines and the public health system could undermine any large-scale control measures if H5N1 develops into a pandemic.

Several systemic issues that could heighten the difficulty of controlling H5N1 include:

- **Underfunded Infrastructure and Workforce:** Persistent underinvestment in data modernization and the public health workforce leaves some public health systems insufficiently equipped to identify and track emerging infections and adequately staff their workforce. In addition, public health is facing a serious funding cliff as monies infused into the system as part of the COVID-19 pandemic response are expiring or in some cases rescinded.
- **Erosion of Authority:** Emerging legal and political challenges to public health authority could impede swift decision-making and weaken trust in official guidance.
- **Misinformation and Disinformation:** When misinformation and disinformation lead to distrust and skepticism about vaccine safety and public health recommendations, vaccine acceptance may be reduced, which could hinder outbreak containment efforts.

These conditions contributed to some of the early missteps of the COVID-19 response, raising concerns that the United States risks repeating past mistakes unless it strengthens preparedness now.

According to infectious disease experts, there are two critical factors that, if managed, will reduce the risk that the current H5N1 outbreak turns into a pandemic: (1) reducing the number of undetected/unreported infections and (2) limiting the conditions that would allow for changes in the virus that could result in more effective human-to-human transmission.[32]

Outbreak Status and Spread

The current outbreak is rapidly changing. As of February 2025, the H5N1 outbreak is circulating among various species:[33]

- **Poultry:** Between February 2022 and February 2025, infections have been reported in 51 jurisdictions, affecting over 162 million birds.
- **Wild Birds:** Between January 2022 and February 2025, infections have been detected in 51 jurisdictions, with more than 12,000 reported cases.
- **Dairy Cows:** Between March 2024 and February 2025, 16 states have reported infections in dairy herds, involving 972 herds in total.

In humans, 70 bird flu cases had been confirmed as of February 2025, and the country experienced its first death due to the outbreak in January 2025.[34] Health officials believe the person was exposed to the virus via infected birds in a backyard flock.[35]

To date, according to CDC, the risk to the general public is low,[36] and most known infections have been linked to exposure to infected animals. There are no known cases of person-to-person transmission and most infections have been mild. However, the possibility of more

efficient human spread or more virulent infections is a significant concern.[37]

An additional concern is the potential for people to become infected with both seasonal flu and H5N1, which would potentially allow the two viruses to exchange genetic material and create a virus strain that more easily spreads among people.[38] The process by which the virus could develop the ability to easily pass between people is, at this point, not well-understood. The concern is that if the virus were to mutate in such a way that human-to-human spread was occurring, it is possible health officials might not be able to detect such spread in time to limit it.[39]

Additional data that will help public health officials track the outbreak are from the National Wastewater Surveillance System. As of February 2025, there had been detections of avian influenza A in wastewater in a limited number of jurisdictions across the country. Detection in wastewater can stem from human waste, animal waste, or food-product contamination (disposed raw milk or milk products), underscoring the need for comprehensive surveillance and targeted surveillance when wastewater signals are detected.[40]

According to a risk assessment by the Johns Hopkins Center for Outbreak Response Innovation issued in December 2024, the risk of H5N1 infection for farmworkers is high, the risk to people who come in contact with infected farmworkers or animals is moderate, and the risk to the general public and healthcare workers is currently low.[41] But the Center's team included the following caution in their report: "While the immediate risk to the general public and healthcare workers is still currently low, the long-term consequences of continued, uncontrolled transmission present a high risk to all populations."[42]

Ensuring Adequate Testing and Epidemiology Capacity

Public health experts say that a national and expanded testing strategy is needed for both animals and people, particularly farmworkers. Numerous epidemiologists have expressed concern that due to very limited testing, we do not know the full extent of the virus outbreak.[43] Many observers see parallels to the country's slow initial response to the COVID-19 outbreak.

Through February 2025, more than 127,000 specimens have been tested for H5N1 virus in public health laboratories nationwide,[44] although most public health experts say that much more testing is needed.

In December 2024, the U.S. Department of Agriculture (USDA) announced a new National Milk Testing Strategy requiring that unpasteurized milk samples be collected and sent to USDA for testing upon request in an effort to increase infection monitoring. Samples could be collected from dairy farms, milk transporters, milk transfer stations, and dairy processing facilities. Such testing will allow federal and state officials to identify where the disease is present, implement measures to prevent further spread, and monitor trends.[45] This action complements an earlier federal order mandating H5N1 testing of lactating dairy cows before interstate shipment.[46] USDA's Animal and Plant Health Inspection Service and the U.S. Fish and Wildlife Service also test for the virus in livestock and wild birds. Such measures aim to map the virus's presence more accurately and understand its spread.

A study conducted during summer 2024 found that 7 percent of 115 farmworkers in Michigan and Colorado had serologic evidence (H5 antibodies) of H5N1. Of the eight people who had H5 antibodies, four did not recall having any symptoms. This finding illustrates how limited testing can allow some numbers of undetected cases to persist, raising the possibility of ongoing virus transmission.[47]

Laboratory testing capacity will have a critical role to play if H5N1 infections accelerate. Among the recommended actions to increase testing are allowing more diagnostic laboratories to test for the virus, expanding testing access in and beyond laboratories (i.e., tests for workplace or in-home use), and providing insurance reimbursement for testing.[48] At the end of 2024, approximately 145,000 H5N1 specific tests were available to be administered through public health laboratories if needed and an additional 750,000 tests are ready for distribution.[49] Since early 2023, CDC has offered and provided access to its 510(k) H5 test design to both test manufacturers and commercial laboratories. There are now three commercial laboratories that can do H5 tests that physicians can order (Quest Diagnostics, LabCorp, and ARUP Laboratories). Also, CDC entered into contracts with Hologic and Alveo Health to advance H5 test development.[50]

According to a 2024 Epidemiology Capacity Assessment (ECA) report of state and territorial health departments, the number of applied epidemiologists working nationally will "drop drastically" as COVID-19 response funding runs out, with states anticipating losing nearly one-fifth of the current epidemiology workforce. This is on top of an existing

gap in the epidemiology workforce, as the ECA highlighted the need for at least 2,500+ additional epidemiologists in state and territorial public health agencies, with the greatest number of epidemiologists needed in infectious diseases (+1,019) and informatics (+249). The report further noted the need for additional funding to build state capacity in the areas of outbreak forecasting and disease transmission modeling.[51] More than 80 percent of the nation's epidemiology activities are supported by federal funds.[52] Epidemiology capacity will also be critical to outbreak response.

Public Health, Agriculture, Veterinary, and Healthcare Sectors Are Working Together on Response Activities

Preventing the spread of H5N1 requires coordinated efforts across public health, agricultural, veterinary, and healthcare sectors and across geographic boundaries. Officials are employing a *One Health* approach, recognizing that human, animal, and environmental health are deeply interconnected.[53]

Federal initiatives:

- The USDA and HHS have launched programs supporting dairy farmers, including financial support for biosecurity measures, personal protective equipment (PPE) procurement, safe milk disposal, and veterinary testing.[54] The USDA's National Milk Testing Strategy and related orders aim to detect dairy herds' infections early.
- CDC is working with state and local partners to monitor influenza virus activity through multiple indicators.[55] In addition, it is bolstering laboratory capacity, including working with commercial labs to provide an H5N1 test,[56] tracking and reporting on virus spread, and working with state and local health departments to detect the virus and protect groups that are at higher risk. CDC has additionally distributed over 100,000 doses of seasonal flu vaccine to states with known dairy cow infections. Use of such vaccines could help prevent severe seasonal flu cases and thus reduce the risk of co-infection and virus mutation.[57]
- CDC collaborated with the Michigan Department of Health and Human Services and the Colorado Department of Public Health and Environment to implement serologic surveys during the summer of 2024 to ascertain the prevalence of recent infection with HPAI A(H5) virus among dairy workers. Among 115 people, eight (7 percent) had serologic evidence of recent infection with A(H5) virus; all reported milking cows or cleaning the milking parlor. Among persons with serologic evidence of infection, four remembered having symptoms around the time cows were ill with symptoms being experienced before or within a few days of A(H5) virus detections among cows.[58] This finding supports the need to identify and implement strategies to prevent transmission among dairy cattle to reduce worker exposures and for education and outreach to dairy workers concerning prevention, symptoms, and where to seek medical care if symptoms develop.
- The National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health, supports influenza research through its Centers of Excellence for Influenza Research and Response. Those centers monitor wild birds for H5N1 infections and test retail milk for infection, among other activities, to understand the conditions under which the virus can spread.[59]
- FDA monitors food safety, including working with the dairy industry and state partners to ensure the safety of milk and other milk-based products.[60]
- ASPR is investing in influenza antiviral therapeutics development and vaccine manufacturing[61,62] in

preparation for a possible vaccination campaign, if needed, offering PPE for farmworkers[63] and restocking the Strategic National Stockpile.[64] Through its Center for Biomedical Advanced Research and Development Authority, ASPR has provided about $72 million to three companies for vaccine manufacturing including having ready-to-use vials and pre-filled syringes ready to be distributed if needed.[65]

- A May 2024 federal order required the testing of cattle before interstate movement, which has helped to limit H5N1's spread to new states.[66]

Medical Countermeasures and Vaccines:

- Two vaccines effective against the currently circulating strain are stockpiled, with hundreds of thousands of doses deployable within weeks and up to 100 million doses available within months if needed.[67] In July 2024, HHS provided $176 million to Moderna to develop an mRNA-based H5N1 vaccine,[68] potentially expediting the nation's ability to prevent severe illness if human cases surge. In January 2025, HHS announced an additional $590 million in funding for Moderna to accelerate the development of an H5N1 mRNA influenza vaccine that is well-matched to bird flu strains currently circulating in birds and cows.[69]

Examples of Multisector Collaborations:

- CDC is working with the National Center for Farmworker Health (NCFH) to protect against the threat of H5N1 among animal production workers. Among the joint projects are the development of H5N1 educational materials produced for health departments to provide to farmworkers in English, Spanish, and other languages. Furthermore, with CDC funding, NCFH is working with grassroots outreach partners in 11 states to educate dairy and poultry workers about how to protect themselves against the virus.[70]
- The National Milk Producers Federation through its Farmers Assuring Responsible Management (FARM) Program and with the American Association of Bovine Practitioners has created biosecurity guidelines specific to H5N1 and encourages their member farms to work with their state animal health officials and herd veterinarians to protect against virus infections and spread.[71]
- Numerous federal, state, and industry agencies are supporting ongoing information-sharing specifically tailored to farmworkers, including media interviews, messaging on social media, and radio announcements. Information materials were produced in both English and Spanish. As of late November 2024, CDC estimated that its message outreach to farmworkers throughout the United States had earned over 45 million audience impressions.[72]
- The Public Health Communications Collaborative in partnership with the Health Action Alliance created "What Agricultural Producers Should Know and Do About H5N1 Bird Flu" available on both organizations' websites.[73]

Examples of State-level Responses and Localized Strategies:

- In Colorado, the Department of Agriculture and the Department of Public Health and Environment are working together to protect against virus spread. The Department of Agriculture programs include mandatory bi-weekly bulk-tank testing for all licensed dairy cow farms in the state. The Department of Public Health and Environment is providing four weeks of free protective equipment to any poultry or dairy farm within the state.[74] State officials are also encouraging residents to take preventive steps to safeguard the health of their flocks, including keeping their domestic birds away from wild birds, keeping their food and water sources away from migrating birds, and reporting any deaths or signs of illness within their domestic flock to the state veterinarian.[75]
- The Michigan Department of Health and Human Services, the Michigan Primary Care Association, the Great Lakes Bay Federally Qualified Health Center, and local health departments throughout the state are working together to increase access to seasonal flu vaccination and to implement other precautions among dairy and poultry farmworkers statewide.[76] The state Department of Agriculture and Rural Development is working with state and federal partners as well as the veterinary community to monitor for infections, encourage stepped up biosecurity measures, and to share information.[77]
- The California Department of Public Health is working with local, state, and federal partners to monitor for bird flu infections in animals and people. The department has distributed PPE to farmworkers and has made seasonal flu vaccination readily available for people who work with dairy cows. In addition, the department has created informational flyers and communication toolkits in English and Spanish on how farmworkers and members of the public can protect themselves from bird flu.[78]

- CDC, the Ohio Department of Health, and the American Association of Bovine Practitioners (AABP) worked together to conduct a serosurvey to test for exposure to influenza A (H5) among veterinarians, veterinary technicians, and veterinary students at the 2024 AABP annual conference.[79]
- The Wisconsin Department of Health Services is working with the state Department of Agriculture, Trade, and Consumer Protection and local health departments to monitor for virus infections, including through wastewater detection from 22 sites throughout the state. The department is also distributing PPE to farms, dairy-processing plants, and slaughterhouses upon request.[80]

Protecting Populations at Highest Risk—Farmworkers and Beyond

Farmworkers, especially those in direct contact with infected cows and poultry, face heightened risks. Yet many lack access to information, testing, PPE, health insurance, or paid sick leave. Fear of job loss, immigration concerns, and language barriers may also further restrict access to care and testing.[81] Collaborations with grassroots organizations and culturally competent outreach are essential to overcoming these obstacles. Without trust and accessible services, detecting and containing infections in vulnerable communities is far more difficult.

Concerns about business disruption or economic loss on the part of farmers and farm employers may also be hindering virus-testing and other safeguards.[82]

Recommendations for Preventing the Spread of H5N1

Federal agencies and health security experts, including those at the Johns Hopkins Center for Outbreak Response Innovation, have issued H5N1 prevention guidance, including:[83]

- **Enhance Surveillance and Testing:** Increase diagnostic testing and genomic surveillance in cattle and poultry populations, as well as in human sentinel and wastewater samples. Authorize additional major clinical laboratories to test for H5N1 and consider introducing workplace or at-home testing options.
- **Strengthen Biosecurity and Infection-Control Measures:** Separate infected from uninfected cattle, carefully manage suspected food products, and enforce rigorous PPE use among farmworkers and other at-risk groups.
- **Improve Communication and Build Trust with Affected Communities:** Implement multilingual outreach, protect farmworkers from penalties related to illness reporting, and ensure public messaging is transparent, science-based, and widely accessible. Provide paid sick leave to all workers.
- **Build Capacity for Rapid Response:** Support vaccination strategies (including seasonal flu vaccination to reduce the risk of co-infections), maintain high-quality data systems, ensure epidemiologists are retained and funded, and encourage close collaboration between agricultural and public health sectors.

Conclusion

While experts currently consider the immediate risk of H5N1 to the general public to be low, the virus's presence across species, its potential for mutation, and limited surveillance, particularly in higher-risk occupational and community settings, raise alarms. The lessons from the COVID-19 pandemic remain fresh: waiting for the threat to escalate before acting is costly in terms of human lives, economic stability, and social trust.

Investing now in expanded testing, data modernization, workforce retention, and interagency coordination can prevent a crisis later. Strengthening frontline partnerships—among federal, state, and local public health agencies, agricultural and veterinary organizations, community outreach groups, and private-sector—will be crucial. By approaching H5N1 through a *One Health* lens and prioritizing equity, transparency, and cultural competence, the nation can position itself to detect, contain, and mitigate this emerging threat before it evolves into a full-blown emergency.

Interview with: Natasha Bagdasarian, M.D., MPH, FIDSA, FACP

Chief Medical Executive, State of Michigan

TFAH: Michigan was one of the first states to experience H5N1 infections in dairy cows. What's the current status of the outbreak within the state?

Dr. Bagdasarian: That's right, Michigan was an early impacted state. In terms of dairy H5N1, we got cows from the initial shipment from Texas in March of 2024. We had a number of dairy cases during that initial time period and had two of the first human cases. We were impacted early and had a very robust early response. Since that time, some of the dairy spread seems to have leveled off, we're not seeing the number of dairy farms turning positive as we did in those early days. But it's very important for us to remember and for everybody else to remember that H5N1 is not regionally gone—not by any means. We are still seeing infections in poultry, and we've seen infections in turkey farms recently, and it's still in wild birds. And so, we in Michigan are very cognizant that H5N1 is not done with us. This highlights the need for sustained and flexible funding for public health so that public health can best respond to evolving needs.

TFAH: What would you say you did right early to tamp down the outbreak?

Dr. Bagdasarian: I think we did a lot of things early very well. As a starting point, we had really good relationships with folks in the Michigan Department of Agriculture, and they were able to get us in communication with dairy farms early on. They were able to get local health departments on to and communicating with dairy farms, so a lot of our symptomatic monitoring was really robust from the beginning. These relationships allowed us to speak to farmers and got local public health involved early on. Last summer, a few colleagues and I went to dairy farms and spent time on dairy farms so we could actually understand some of the barriers and constraints to things like PPE.

CDC recommends full head-to-toe PPE for dairy workers. It became apparent to us, because we were on the farms, that no one was wearing full PPE and that it wasn't practical to wear full PPE on farms. For example, boot covers get soggy and fall off. How do I know that? Because I was wearing boot covers and they got soggy and fell off.

You can only give people guidance if you see what is happening in that setting. We were able to come up with some really tailored, nuanced guidance that took into account what would work for farmworkers. We came up with some tailored guidance about protecting your face because that's where contamination is going to happen. Our advice was, "Wear a mask and wear a face shield." We got masks and face shields to farms, and people said, "Yes, we will wear them."

The issue wasn't PPE availability. Farms experiencing an outbreak of H5N1 may request PPE through their local health departments (LHD), provided at no cost. The Michigan Department of Health and Human Services has established a process with LHDs where PPE is offered at the onset of a detection. We also continue to work with the department's Farmworker Outreach Services Division to make PPE available to farmworkers across the state through their various outreach efforts, including through local partners.

The issue is PPE acceptability. It's really difficult to get someone to wear full PPE for a 12-hour shift, every day for many months when working in the August heat. So, we tried to be very nuanced about it. In Michigan, if a worker is involved with a big poultry cull, they should be wearing full PPE because we're talking about a few days. For dairy farms, if you cannot wear the full PPE, and of course wearing full PPE is best, we recommend wearing a mask and a face shield, washing your hands, no food or drinks in the milking areas, and changing your clothes at the end of the shift and to not take those clothes home. So, for those who cannot follow the full PPE guidance, we have these minimum recommendations that may be more sustainable for people who are working on impacted farms for many months.

We also did testing of locally sourced pasteurized milk (purchased at farm stands) early on. That testing showed that the outbreaks were isolated to particular regions of the state. We were also one of six states to do raw-milk testing in conjunction with the FDA through bulk-tank testing on the actual farms, which allowed us to spot a problem early.

We also participated in CDC's serology study, which provided useful information.

TFAH: Can you say more about the safety protocols you recommend for dairy farmworkers?

Dr. Bagdasarian: The additional guidance was really practical guidance: wash your clothes or leave your clothes at work so you're not risking taking the infection home with you, wash your hands, and no eating or drinking in the milking parlor. Again, if you're giving people guidance that is so far from their reality, they are not going to adhere to it. So, we gave really practical guidance, like don't take your coffee cup into the milking area.

TFAH: What's been the role of Federally Qualified Health Centers (FQHCs) in responding to the outbreak?

Dr. Bagdasarian: We worked with a couple of FQHCs in rural areas to pilot protocols for anyone who comes in with flu-like illness. They were asked about exposure to dairy farms and were tested for H5N1. The program started over the summer and there wasn't much influenza illness, but we hope to repilot it during flu season. This is another example of relationships. The program was built on our existing relationships with FQHCs and the centers' relationships with their rural patients.

TFAH: What strategies have you used to overcome concerns that some farmworkers may have about being tested or interacting with a public health official?

Dr. Bagdasarian: Again, it's about trust and the preexisting relationships that were already built. We have a Farmworker Outreach Program that has done a lot of work on COVID and with vaccine-outreach programs. Members of the outreach team know their community really well, and are primarily either Spanish or Arabic speakers. And the local health departments are amazing, and they know their communities. There is no substitute for knowing the lay of the land, knowing what your individual communities' needs and obstacles are.

TFAH: What's your level of concern about the possibility of increasing numbers of human infections?

Dr. Bagdasarian: I am concerned about the possibility of human-to-human spread—if not now, when? Given long enough, at some point there will be additional spread to humans. What that will look like is hard to say right now. One of the things I want to highlight is that this has to be done at a national level. Michigan is doing some truly innovative, wonderful things, but this cannot be a state-by-state, piecemeal approach.

In Michigan we have a fairly robust influenza surveillance program as is, so we are doing a lot of subtyping. That data will give us an early flag so we can take early steps.

The things I mentioned before, our relationships with agricultural workers and our local health departments, are hugely important.

TFAH: Is enough testing being done?

Dr. Bagdasarian: As a nation, the more we are testing, the better off we are. To me the upper limit of how much testing we need is yet to be defined. At this point, the more testing we do the better.

TFAH: Has access to farms been a barrier for public health's work to stem the outbreak?

Dr. Bagdasarian: I cannot say that it has not been an obstacle, but it hasn't been an obstacle in the same way that it has been in other states. One of the things we learned with COVID is that you cannot build relationships during a public health crisis. We were lucky that we had existing relationships with our colleagues in agriculture, and they had deep relationships and trust with their partners in the ag industry.

I also think there's some benefit to just showing up. When you show up—go to a farm to meet people one on one and understand the work they do—you can build a relationship in a way you cannot with an official visit with 20 people showing up.

I went to farms and said, "There's this guidance; I want to know if it works for you." People like being asked, they wanted me to know what it was like working on a dairy farm so we could make decisions that made sense.

TFAH: How important is it that H5N1 response is based in a *One Health* perspective?

Dr. Bagdasarian: Very important. We are used to talking about human health and animal health in separate buckets. H5N1 highlights the importance of a *One Health* approach going forward. What we are seeing in animal species has a direct impact on what we are seeing in humans. Unless we take a holistic approach at the highest levels—that means USDA, FDA, and CDC working together—we won't be able to view this through that *One Health* lens.

Michigan is doing a good job at a state level with our counterparts, but this is something that needs to be done at a national and international level, because the virus is not going to be contained by any artificial geographic boundaries. What happens in Asia and in South America is directly going to impact us here.

TFAH: Anything else you'd like to share?

Dr. Bagdasarian: It's important to note that everything I've talked about is based on what we are seeing in the state now, but it's all subject to change. This is a virus that has the potential to mutate and the potential for genetic reassortment, particularly reassortment with seasonal flu. Right now, it's flu season. When there are co-infections, there will be genetic reassortment. So, we have to be nimble, and we have to say what we know and what we don't know based on the current data.

Editor's notes:

This interview was conducted in early January 2025. It was edited for length and clarity.

CDC periodically updates and adds greater specificity to its guidance to employers and people who work with animals to reduce bird flu exposure, including on administrative controls, engineering controls, PPE use, health-monitoring, testing, and treatment. See: Interim Guidance for Employers to Reduce Exposure to Avian Influenza A Viruses for People Working with Animals.[84]

Assessing States' Preparedness

In 2024, the United States faced a series of public health emergencies that exposed critical vulnerabilities in the nation's preparedness systems. From the prolonged aftermath of Hawaii's devastating wildfires to the widespread devastation caused by Hurricanes Helene and Milton, these events disrupted healthcare systems, damaged infrastructure, and left communities struggling to recover. Adding to these challenges was the looming threat of H5N1 bird flu, which continued to spread through livestock and raised concerns about potential human-to-human transmission. Together, these crises underscored the urgent need for sustained investments in public health infrastructure, equity-driven policies, and proactive strategies to strengthen resilience against future threats. As these challenges evolve, understanding each state's capacity to prevent, detect, and respond to emergencies has never been more essential.

To guide policymakers, practitioners, and other stakeholders, this report presents an analysis of 10 key indicators that collectively provide a snapshot of state-level emergency readiness. These measures track a range of capabilities—from ensuring swift medical workforce mobilization and maintaining safe community water systems, to fostering workforce well-being, achieving accreditation benchmarks, securing sustained funding, and ensuring safe, high-quality hospital care. This year, we introduced a new indicator—avoidable mortality and the disparities therein—which illustrates how effectively states reduce deaths from causes that could have been prevented or treated across all communities and how equitably they deliver healthcare and preventive services.

Each indicator reflects a fundamental dimension of preparedness, and together they illustrate areas of strength and identify opportunities for targeted improvement. As detailed in "Appendix B: Methodology," we analyzed state performance on these indicators, then placed states into one of three tiers—high, middle, or low—based on their relative scores. While some indicators can be influenced directly by state policymakers or health agencies, others require more comprehensive, multisectoral approaches involving local governments, healthcare institutions, community-based organizations, and residents themselves. By providing a clear framework and benchmarks, these indicators help states evaluate their progress, learn from peers, and prioritize actions that bolster preparedness.

INDICATOR 1: ADOPTION OF THE NURSE LICENSURE COMPACT (NLC)

KEY FINDING: Participation in the NLC has expanded to 41 states, enhancing interstate nursing workforce mobility.

Healthcare workforce shortages, starkly highlighted during the most critical phases of the COVID-19 pandemic, have strained systems beyond their capacities. During peak periods—December 2020, September 2021, and January 2022—over 20 percent of U.S. hospitals anticipated imminent staff shortages.[85] The ability to swiftly mobilize medical personnel across state lines is essential for an effective healthcare response during such crises.

However, newly graduated or relocating nurses often face licensure delays that can stretch for months, especially in larger states, as revealed by a 2022 NPR analysis of licensing records in 32 states.[86] These bottlenecks hinder the rapid deployment of nurses where they are most needed.

This indicator evaluates the adoption of the NLC, established in 2000 by the National Council of State Boards of Nursing. The NLC allows registered and practical nurses to practice in any member state with a single multistate license, eliminating the need for emergency declarations and reducing administrative burdens. This agreement streamlines cross-state healthcare responses by facilitating nurse mobility and expanding access to care.

Before the NLC, nurses had to obtain individual licenses for each state where they wished to practice, navigating a complex maze of applications, fees, and varying state-specific requirements, including differing continuing education standards. This cumbersome process impeded their ability to swiftly address workforce shortages, respond to emergencies, or pursue career opportunities in multiple states. Consequently, restrictive licensing practices contributed to delays in healthcare delivery, particularly in regions lacking sufficient medical personnel or during times of critical need, such as natural disasters or widespread health crises.

The introduction of the NLC has significantly enhanced nurse mobility, allowing them to practice across multiple states with a single license, thereby increasing the flexibility and responsiveness of the nursing workforce. This increased mobility has proved especially valuable during public health emergencies, enabling prompt deployment of nurses to areas in need without the hindrance of obtaining individual state licenses. Additionally, by permitting nurses to provide care across state lines, the NLC has been instrumental in expanding telehealth services, broadening access to efficient healthcare delivery.

Membership in the NLC is a significant indicator of a state's healthcare preparedness for several reasons:

1. **Rapid Mobilization of Staff:** It allows for swift deployment of nursing staff across state lines during emergencies, enhancing a state's capacity to respond quickly to health crises such as outbreaks or natural disasters.
2. **Facilitation of Telehealth Services:** The NLC enables nurses to provide telehealth services across state borders, essential for delivering care in remote or underserved areas, especially during emergencies when in-person visits may be challenging.

3. Standardization of Care: By harmonizing licensure requirements, the NLC helps ensure a consistent level of nursing care across member states, maintaining quality healthcare standards even in emergency situations.

Beyond emergency response, the compact has been pivotal in addressing chronic nursing shortages by allowing seamless recruitment of nurses into areas with persistent staffing gaps. This has supported healthcare delivery in rural and underserved communities. Nurses can remotely manage chronic conditions and offer behavioral healthcare to patients when travel is difficult, further expanding the reach of healthcare services.

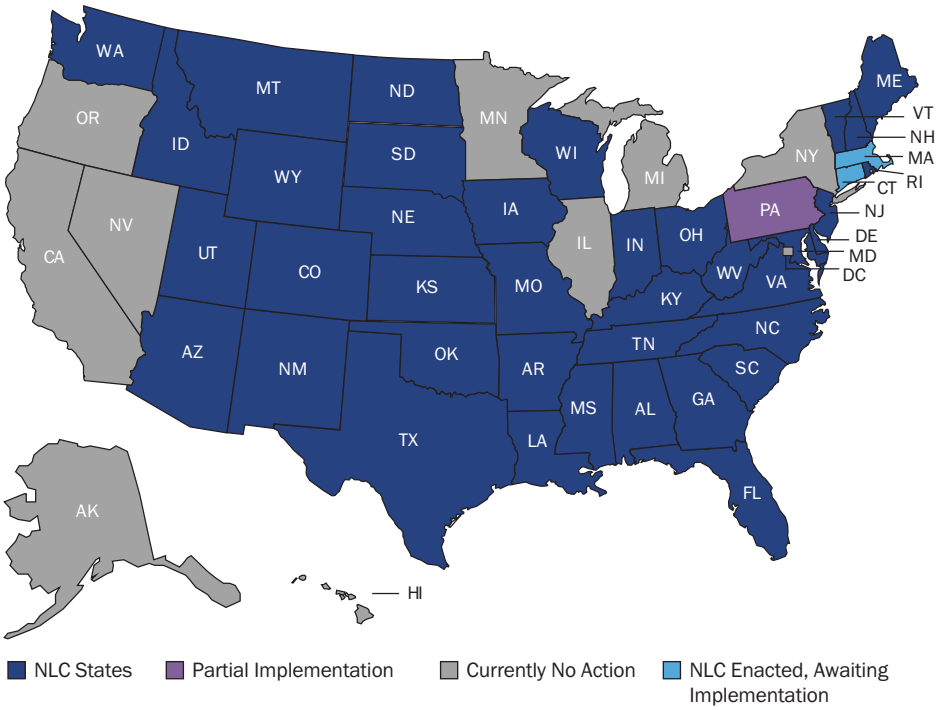
During the COVID-19 pandemic, hospitals nationwide faced extraordinary pressure as surging infections dramatically increased admissions. States that were members of the NLC had an advantage: they could more readily bring in nurses from other member states without harmful delays or send nurses to assist when other states experienced acute shortages.[87]

As of January 2025, the NLC has been adopted by 41 states, with Massachusetts being one of the latest to join. This represents a net increase of more than a dozen states since 2017. Several other states are actively considering legislation to join the NLC, reflecting a growing recognition of its benefits for healthcare delivery and emergency preparedness.

In November 2024, Massachusetts Governor Maura Healey signed legislation for the state to join the NLC.[88] This significant move aimed to address the state's nursing shortage and improve staffing in hospitals and healthcare facilities.

The adoption of the NLC in Massachusetts was celebrated by the Massachusetts Health & Hospital Association (MHA) and other healthcare leaders.[89] Emily Dulong, vice president of government advocacy and public policy at the MHA, noted that with approximately 5,100 vacant registered nurse hospital positions throughout the state, the NLC provides a safe and transformative solution to source qualified nurses promptly. She highlighted that this advancement aligns Massachusetts with other states to support frontline caregivers, improve patient access to services, expand virtual care, and better prepare for emergencies.

Figure 1: Nurse Licensure Compact Membership Across the United States



Note: As of January 2025: Connecticut and Massachusetts have enacted the NLC but are awaiting implementation, with no specific implementation dates determined. In Pennsylvania, the NLC has been enacted, allowing nurses with active compact licenses from other states to practice there; however, resident nurses in Pennsylvania cannot apply for a compact license until full implementation is complete.

Source: National Council of State Boards of Nursing[90]

INDICATORS 2 AND 3: ACCREDITATION STATUS OF STATE PUBLIC HEALTH AND EMERGENCY MANAGEMENT SYSTEMS

KEY FINDING: Most states are accredited by the Public Health Accreditation Board (PHAB) and/or the Emergency Management Accreditation Program (EMAP); however, six states lack accreditation from either body.

The accreditation status of state public health and emergency management systems are crucial indicators of a state's readiness to handle public health emergencies. Accreditation by recognized bodies like PHAB and EMAP signifies that an agency meets rigorous standards for performance, accountability, and continuous improvement.

Public Health Accreditation Board

The PHAB is an independent organization dedicated to advancing the quality and performance of public health departments across the United States. PHAB administers a national accreditation program that sets rigorous standards for public health services and operational efficiency. This process involves a comprehensive evaluation against nationally recognized, evidence-based standards designed to enhance the effectiveness of public health departments.

PHAB's standards cover various aspects of public health practice, including:

- Community health assessment
- Policy development
- Environmental health
- Health education
- Emergency response

Accreditation by PHAB signifies a health department's commitment to continual quality improvement, transparency in operations, and accountability to the communities they serve. It is a mark of excellence indicating dedication to meeting the health needs of the population effectively and efficiently.

Emergency Preparedness Standards

PHAB accreditation includes several standards relevant to emergency preparedness:

- **Standard 2.2** focuses on preparing for and responding to public health emergencies.[91,92] Requirements include:
  - Emergency operations plans
  - Continuity of operations plans
  - Risk communication plans
  - 24/7 communication and coordination processes with partners
  - Conducting exercises to test emergency plans
  - Utilizing after-action reports for improvements
- **Standard 6.1** involves monitoring and enforcing public health laws and regulations, critical during emergencies.[93]

These standards help ensure health departments have the necessary plans, partnerships, and practices to respond effectively to emergencies. They emphasize capabilities like surveillance, data analysis, communication, workforce development, and information technology management, which are foundational for an effective emergency response.

Emergency Management Accreditation Program

EMAP specifically accredits formal emergency management programs operated by state, territorial, local, or tribal governments, as well as other public or private entities. While these programs may be part of a larger government agency, EMAP focuses on the dedicated emergency

management function—those with recognized responsibility for all-hazards preparedness, planning, and response—rather than all aspects of a government agency. Established by a consortium of key emergency management organizations, EMAP promotes standardization and excellence by evaluating programs against comprehensive standards and best practices.

EMAP Accreditation Process

To achieve EMAP accreditation, an emergency management program must undergo:

- **Self-Assessment:** Evaluating capabilities across numerous standards.
- **Peer Review:** Independent practitioners review the program.
- **Site Visits:** EMAP assessors conduct meticulous on-site evaluations.

EMAP's standards encompass critical areas, including:

- Program administration
- Legal authorities
- Fiscal management
- Communications systems
- Training programs
- Operational planning
- Exercise evaluation
- Crisis response procedures

The process helps agencies identify gaps, drive continuous improvement, and build frameworks for appropriate crisis coordination with other accredited entities.

Significance of PHAB and EMAP Accreditations

Both PHAB and EMAP accreditations are valid and meaningful indicators of public health emergency preparedness because they:

- **Ensure Comprehensive Evaluation:** Agencies must meet rigorous, nationally recognized standards.
- **Demonstrate Readiness:** Accredited departments show they can effectively manage emergencies, including disease outbreaks and natural disasters.
- **Emphasize Continuous Improvement:** Accreditation requires ongoing evaluation and adaptation to evolving public health challenges.
- **Promote Community Engagement:** Engaging with the community builds trust and enhances collaboration during crises.
- **Facilitate Coordination:** Accreditation promotes standardized practices, enabling better coordination between agencies during multi-jurisdictional emergencies.

Current Accreditation Status

As of January 2025:

- A total of **28 states** plus the **District of Columbia** hold accreditation from both PHAB and EMAP, demonstrating a comprehensive commitment to public health and emergency management excellence.
- **Thirteen states** have achieved accreditation from PHAB but not from EMAP, indicating strong public health capabilities with potential room for growth in emergency management accreditation.

- **Three states** are accredited by EMAP but not by PHAB, reflecting robust emergency management programs with opportunities to enhance public health accreditation.
- **Six states** lack accreditation from either PHAB or EMAP, which may reflect barriers such as workforce or financial limitations or that accreditation is in process.
- **Notable Changes in Accreditation Status.** Over the past year, there has been a slight shift in accreditation distribution:
  - The number of states accredited by both PHAB and EMAP decreased from 29 states + DC to 28 states + DC, as **Mississippi** moved out of this group.
  - The number of states accredited by only PHAB grew from 11 states to 13 states, with **Alaska** achieving PHAB accreditation and **Mississippi** transitioning from dual accreditation.
  - The number of states without accreditation decreased from seven states to six states, as **Alaska** achieved PHAB accreditation.

Accredited states have demonstrated their ability to meet rigorous standards, ensuring they are better prepared to protect the health and safety of their communities during emergencies. Accredited states often have stronger coordination among stakeholders, clearer governance structures, and better-quality monitoring and evaluation systems. More states pursuing accreditation can enhance the nation's overall preparedness for future public health threats, fostering a more resilient and responsive public health infrastructure. However, a handful of states remain unaccredited by either PHAB or EMAP. Their absence from these frameworks may reflect resource limitations or an ongoing accreditation process.

TABLE 3: 44 States and the District of Columbia Accredited by PHAB and/or EMAP
Accreditation status by state, January 2025

PHAB and EMAP			PHAB ONLY	EMAP ONLY	No Accreditation
Alabama	Idaho	Ohio	Alaska	Michigan	Hawaii
Arizona	Illinois	Oklahoma	Indiana	Nevada	New Hampshire
Arkansas	Kansas	Pennsylvania	Iowa	Tennessee	South Dakota
California	Maryland	Rhode Island	Kentucky		Texas
Colorado (Conditional EMAP)	Massachusetts	South Carolina	Louisiana		West Virginia
Connecticut	Missouri	Utah	Maine		Wyoming
Delaware	New Jersey	Vermont	Minnesota		
District of Columbia	New York	Washington	Mississippi		
Florida	North Carolina	Wisconsin	Montana		
Georgia	North Dakota		Nebraska		
			New Mexico		
			Oregon		
			Virginia		
28 states + DC			**13 states**	**3 states**	**6 states**

Note: Colorado has conditional EMAP accreditation, indicating substantial compliance with EMAP standards while working toward full accreditation. In past years, states with conditional accreditation were listed as "not accredited." TFAH's decision to classify states with conditional accreditation as accredited reflects their substantial compliance with EMAP standards and their active efforts to address identified deficiencies. Lack of accreditation does not necessarily indicate a deficiency; it may reflect barriers such as workforce or financial limitations, or that a state's accreditation is in process. This analysis is limited to state-level accreditations and excludes local or tribal health departments, which may hold their own accreditations separate from state health departments.

Source: Accreditation data from PHAB[94] and EMAP,[95] retrieved January 2025.

INDICATOR 4: STATE PUBLIC HEALTH FUNDING TRENDS

KEY FINDING: A majority of states maintained or increased their public health funding in fiscal year (FY) 2024, but 14 states reduced funding, three more than the previous fiscal year.

Recent public health emergencies have highlighted the critical need for sufficient, flexible, and sustained funding for public health systems. Adequate funding is essential for preparedness and response capacity, including the detection, prevention, and control of disease outbreaks, as well as mitigating the health consequences of disasters.

Core public health capabilities—such as epidemiology, environmental hazard detection and control, infectious disease prevention and control, and risk communication—are vital for maintaining routine operations and providing surge capacity during emergencies. These capabilities, along with targeted emergency response resources, require sustained, predictable funding to ensure a trained, ready, and community-aware public health workforce.

The Public Health Activities and Services Tracking project at the University of Washington identifies six core areas of state public health programming and services:[96]

1. **Communicable Disease Control:** Services related to epidemiology, hepatitis, HIV/AIDS, immunization, sexually transmitted diseases, tuberculosis, etc.
2. **Chronic Disease Prevention:** Services related to asthma, cancer, cardiovascular disease, diabetes, obesity, tobacco use, etc.
3. **Injury Prevention:** Services related to firearms, motor vehicles, occupational injuries, senior fall prevention, substance use disorders, other intentional and unintentional injuries, etc.
4. **Environmental Public Health:** Services related to air and water quality, fish and shellfish safety, food safety, hazardous substances and sites, lead-exposure, onsite wastewater, solid and hazardous waste, zoonotic diseases, etc.
5. **Maternal, Child, and Family Health:** Services related to care coordination, direct services, family planning, newborn screening, population-based maternal and child health, supplemental nutrition programs, etc.
6. **Access to and Linkage with Clinical Care:** Services related to beneficiary eligibility determination, provider or facility licensing, and facilitating connections between individuals and clinical care services.

Public health infrastructure enables states not only to carry out emergency response activities but also to promote health equity and build resilience in populations. However, public health funding, often discretionary, is prone to neglect or reduction, especially during tight fiscal periods. Decades of underfunding have weakened emergency preparedness and response capabilities. State investments play a crucial role in health agencies' operations: about 28 percent of state and territorial health department revenues[97] and 21 percent of local health department revenues come from state sources, on average.[98]

Thirty-six states and the District of Columbia either maintained or increased their public health funding in FY 2024, as indicated in Figure 2. However, 14 states reduced their funding, potentially compromising their preparedness and responsiveness in critical situations. (This indicator does not assess the adequacy of states' public

health funding. Notably, due to inflation and population growth, stable funding may effectively represent a reduction.)

From FY 2019 to FY 2022, state-supported funding for public health services experienced significant fluctuations due to pandemic-related actions. In some instances, a temporary infusion of state-supported funds was allocated for just one year. In other cases, state-supported funding was temporarily reduced and supplanted by federal pandemic aid. Much of the funding provided to respond to COVID-19 was onetime funding that has been spent, is set to expire, or has been rescinded by Congress, creating funding cliffs for many departments. This reliance on federal aid highlights the need for states to develop sustained, adaptable funding models that can effectively integrate federal funds, ensuring a cohesive financial strategy for long-term public health goals.

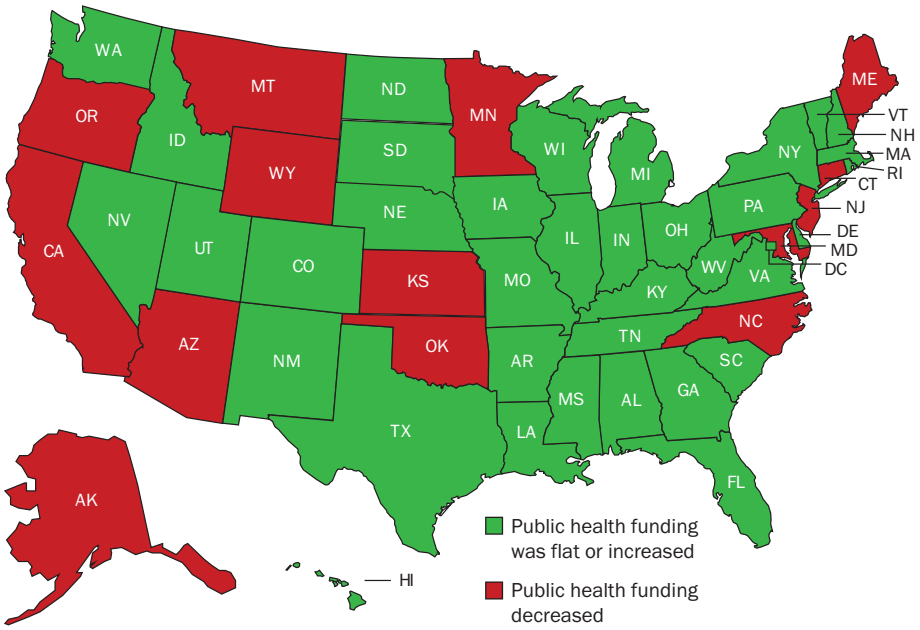
Moreover, the distribution and adequacy of public health funding are pivotal for ensuring access to health services, particularly among under-resourced or marginalized communities. During an emergency, a funding strategy that ensures that all communities, regardless of socioeconomic status, have access to essential resources is crucial to protecting health and economic security.

The trend in a state's public health funding serves as a valid and meaningful indicator of its preparedness for public health emergencies. Adequate and consistent funding is the cornerstone of building and maintaining a robust public health infrastructure, which includes developing a well-trained workforce, advanced surveillance systems, effective use of technology and communication channels—essential components for rapid and efficient responses to health crises. When funding is stable or increasing, it indicates a state's commitment to strengthening its public health systems and enhancing its capacity to respond to emergencies, such as disease outbreaks, natural disasters, or bioterrorism events. Conversely, declining or fluctuating funding can create vulnerabilities in the public health system, potentially leading to gaps in emergency preparedness and response capabilities. Therefore, monitoring funding trends provides critical insights into a state's readiness to protect its population's health in the face of unforeseen challenges, making it a key metric for evaluating overall public health emergency preparedness.

For this report, TFAH asks states to provide only their state-supported public health funding.

Figure 2. State Public Health Funding Held Stable or Increased in 36 States and DC

Public health funding, by state, FY 2023 to FY 2024



Note: To understand the nuances and methodology behind the data collection, including TFAH's specific criteria for defining public health funding, please refer to "Appendix B: Methodology."

Source: TFAH analysis of state-reported public health funding data for FY 2023 and FY 2024. Data collected through a TFAH survey of state health officials based on a standardized definition of public health funding.

INDICATOR 5: COMMUNITY WATER SYSTEM SAFETY

KEY FINDING: In most states, 5 percent or fewer residents used contaminated community water systems, but there were exceptions.

Access to safe water is crucial for consumption, sanitation, hygiene, healthcare, and the operation of other critical infrastructure. In the United States, the vast majority of the population relies on public water systems.[99] The U.S. Environmental Protection Agency (EPA) establishes legal limits on contaminants in drinking water, including microorganisms (bacteria and viruses), disinfectants (e.g., chlorine) and their byproducts, various chemicals (e.g., industrial pollutants and lead), and radionuclides (radioactive materials).[100] The EPA also requires states to regularly report on the quality of drinking water from public water systems within their jurisdictions.[101] These systems are obligated to report any violations, such as noncompliance with established monitoring and reporting schedules, treatment techniques, maximum contaminant levels, and customer-notification requirements.[102]

Current Challenges and Notable Incidents

The United States boasts one of the world's safest public drinking water supplies. However, some communities, particularly those with a high proportion of low-income residents and communities of color, lack consistent access to safe water. CDC data indicate that waterborne pathogens—just one type of contamination—cause approximately 7 million illnesses and more than $3 billion in healthcare costs annually.[103] When water-safety issues arise, a multisector emergency and long-term public health response is necessary.

The increasing number of extreme weather events have created additional risks for community water systems due to the rising frequency of wildfires, storms, and flooding. When combined with aging water infrastructure, such events can lead to water crises for local communities.

- **Wildfires:** In January 2025, due to the extensive **Los Angeles**–area wildfires, several California utilities declared their drinking water supply unsafe pending testing. The concern was that toxic chemicals created by the fires may have entered the water supply.[104]
- **Storms and Flooding:** Intensified storms can damage water infrastructure, contaminate waterways, and cause power outages, leading to issues with potable water access and safety.[105] When **Hurricane Ian** struck coastal Florida in September 2022, it disrupted water infrastructure in Lee County, including Fort Myers, severing water lines[106] and leaving three hospitals without water, necessitating the evacuation of some patients. In Polk County, wastewater treatment systems were overwhelmed, leading to concerns about untreated water backflowing into homes. The Florida Department of Health issued nearly 50 boil-water advisories during this period.[107]
- **Water System Failures:** In **Jackson, Mississippi,** heavy rainfall in August 2022 overwhelmed the city's water system, leaving 150,000 residents without water for days. This followed a prolonged boil-water notice caused by flooding.[108] In December 2022, subfreezing temperatures further damaged the system, resulting in another boil-water order and leaving some residents without water.[109] Low-income areas were disproportionately affected, experiencing twice as many boil-water notices as higher-income areas between 2017 and 2022.[110] To address the crisis, a third-party administrator was appointed in late 2022,[111] and Congress allocated $600 million for repairs.[112]

- **Saltwater Intrusion:** Shifting environmental conditions and decades of groundwater pumping have increased the risk of saltwater intrusion, threatening drinking water supplies in coastal regions. In 2023, communities along the **Mississippi River**, particularly in **New Orleans** and surrounding areas in Louisiana, faced a crisis due to saltwater intrusion from the Gulf of Mexico, exacerbated by drought conditions.[113] This environmental challenge posed health risks, especially for pregnant individuals, and could corrode old pipes, potentially releasing harmful materials. The situation led to emergency actions, including a federal emergency declaration and the construction of an underwater sill in the Mississippi River—a temporary solution.[114]

- **Drought:** Prolonged drought and overuse have contributed to an unprecedented water crisis in the **Colorado River Basin**, a vital water source for seven U.S. states and Mexico.[115]

- **Hurricane Helene and Asheville's Water Crisis:** In September 2024, the remnants of Hurricane Helene devastated Asheville, North Carolina, causing catastrophic flooding and landslides that severely damaged the city's water infrastructure.[116] Residents were left without drinkable tap water for 53 days, relying on bottled water and makeshift solutions for basic needs like bathing and cooking.[117] The storm overwhelmed the North Fork Reservoir, the primary water source, with sediment, rendering treatment efforts ineffective. Officials implemented phased repairs, but the city's economic and social fabric suffered, with businesses and schools closing and residents enduring significant hardship.[118]

Emerging Contaminants

Efforts to ensure that all Americans have access to safe drinking water also face challenges from the increasing presence of per- and polyfluoroalkyl substances (PFAS), long-lasting human-made chemicals found in everyday products that are linked to potential health risks such as cancer, liver damage, and immune system disruption.[119] Researchers have found pervasive contamination of water sources by PFAS, with about 31 percent of groundwater and 16 percent of surface water samples worldwide showing levels considered harmful to human health, even in areas far from known contamination sources.[120] In March 2023, the EPA initiated a significant regulatory step,[121] proposing enforceable maximum contaminant levels for six specific PFAS compounds in drinking water. The proposal also introduced a novel approach to regulating some types of PFAS, using a Hazard Index method to assess the collective risk of these substances when present together in water. Public water systems would be required to monitor these PFAS, inform the public if levels exceed the set standards, and implement measures to reduce PFAS concentrations.

Federal Initiatives and Investments

The federal **Infrastructure Investment and Jobs Act**, enacted in November 2021, took significant steps to expand access to safe drinking water. Its provisions, which received bipartisan praise from governors and mayors when passed, included $24 billion in grants to states under the Clean Water Act (focused on regulating pollution and protecting surface-water quality[122]) and the Safe Drinking Water Act (focused on protecting waters designated for drinking[123]). The Act allocated $15 billion to replace lead pipes and service lines, $9 billion to address emerging PFAS, and several initiatives to provide dedicated assistance to small, disadvantaged, low-income, rural, and tribal communities.[124,125]

In the first three years of the law's implementation, the EPA has made progress in advancing drinking water safety and infrastructure nationwide.[126] As of November 2024, over $40.3 billion had been allocated to improve water infrastructure, marking the largest investment in clean water in U.S. history. This includes $9 billion specifically dedicated to replacing lead service lines. Additionally, thousands of drinking water and wastewater projects were funded, which not only improve access to safe drinking water but also enhance resilience to drought and other environmental challenges.

A significant milestone in the effort to safeguard communities from the health risks of lead exposure was achieved in October 2024, when the EPA finalized the Lead and Copper Rule Improvements (LCRI).[127] The LCRI requires the vast majority of water systems to replace lead service lines within 10 years. The rule also strengthens public health protections by lowering the lead action level, the threshold that requires water systems to take specific actions to reduce lead exposure. When water system sampling exceeds this level, systems are required to notify the public and take steps to reduce lead exposure.

Indicator Data

According to the EPA, in 2023, an average of 5 percent of residents in each state used a community water system that did not meet all applicable health-based standards, a decrease from 7 percent in 2018.[128] In seven states—Connecticut, Hawaii, Iowa, Maryland, Nevada, North Dakota, and Vermont—this proportion

was effectively 0 percent. (See Table 5.) However, in four states—Louisiana, New York, Oklahoma, and Oregon—15 percent of residents or more relied on community water systems with health-based violations. Key health-based standards tracked by the EPA include safety limits for harmful substances like chemicals, germs, radioactive materials, and the chemicals used to clean water, as well as their leftover byproducts.

It is important to note that approximately 23 million U.S. households obtain their drinking water from private wells,[129] which can be contaminated or unusable following extreme weather events. The data presented by this indicator do not account for the water quality in these households.

Significance of the Indicator

This metric directly reflects a state's capability to provide a fundamental necessity—safe drinking water—which is a cornerstone of public health. Effective management and regulation of water quality are vital for preventing waterborne diseases and safeguarding against health crises. High compliance rates indicate robust public health infrastructure and effective oversight. Conversely, higher percentages of noncompliance reveal potential vulnerabilities. Therefore, monitoring this percentage offers critical insights into the overall readiness of a state to handle public health emergencies, especially those related to water safety and quality.

TABLE 4: In Most States, Less Than 5 Percent of Residents Used Contaminated Community Water Systems

Percent of each state's population served by a community water system in violation of health-based standards, 2023

States	Percent of Population
CT, HI, IA, MD, ND, NV, VT	0%
AZ, FL, IL, IN, ME, MN, MO, NE, VA, WA	1%
GA, ID, KS, MI, NH, PA, UT	2%
AR, CO, NC, SD	3%
CA, DE, TX, WI	4%
AK, DC, KY, MT, NM, OH, RI, TN	5%
SC	6%
NJ	7%
AL, WY	9%
MS	11%
MA, WV	13%
OK	15%
LA, OR	18%
NY	46%

Note: Over 23 million U.S. households rely on private wells,[130] which are not represented in these data. Only regulated contaminants are included, and water systems on Indian reservations are excluded. A single large city's violation can disproportionately affect its state's percentage (e.g., Shreveport, Louisiana; New York City; Moore, Oklahoma; and Portland, Oregon).

New York's high percentage is largely due to an uncovered reservoir within New York City's drinking water system, which does not comply with the Long-Term 2 Enhanced Surface Water Treatment Rule. Established by the EPA, this rule requires additional treatment or protective measures for open reservoirs to prevent potential contamination. This type of violation indicates non-compliance with required preventive safeguards rather than necessarily indicating that the water is contaminated or unsafe. The violation remains open, meaning the city has not yet fully addressed the compliance issue.

Source: TFAH analysis of data from the EPA.

INDICATOR 6: USE OF PAID TIME OFF (PTO)

KEY FINDING: On average, just over half of workers in each state used some form of paid time off—including sick leave, vacation, or holidays—during a given month. While most states hovered around this average, some stood out with notably higher or lower usage rates.

Note: These figures represent a one-month snapshot intended to illustrate relative usage across states, not the total percentage of workers who used paid time off over the entire year.

Historical Context and Policy Landscape

The United States has no comprehensive federal mandate requiring paid time off, relying instead on employer policies as well as state and local laws. As a result, access to PTO and paid leave varies widely. While 87 percent of U.S. private-sector employees have some form of paid leave, access is uneven, with nearly half of the lowest earners and over one-third of part-time workers lacking any paid-leave options.[131] According to the Center for Law and Social Policy, 34 million workers—22 percent of the civilian labor force—do not have a single day of paid sick leave.[132] The Family and Medical Leave Act of 1993 provides up to 12 weeks of unpaid, job-protected leave for certain medical and family reasons but does not require compensation. Over time, limited federal action has led to a patchwork system, with some states and localities passing their own paid-leave laws. This approach, highly dependent on employers and regional mandates, stands in contrast to the standardized policies seen in peer countries.

Public Health Benefits of Paid Time Off

PTO contributes significantly to public health by allowing workers to recover at home when ill or taking care of a sick family member, thereby reducing the transmission of infectious diseases. It enables employees to keep up with routine medical care and chronic disease management, resulting in better long-term health outcomes.[133] PTO also supports mental health by preventing burnout, improving workforce morale, and increasing overall productivity. Thus, adequate PTO is not only a workforce benefit but also a crucial component of a healthier, more resilient population.

Inequalities and the COVID-19 Context

The COVID-19 pandemic underscored the importance of PTO. Many essential and frontline workers, disproportionately women, low-wage earners, and Black and Hispanic workers, had limited or no access to paid sick leave.[134,135,136] Without PTO, all workers faced difficult a choice: working while ill and risking community health, or forgoing wages and financial stability.

Ensuring job-protected paid sick leave is an essential part of infection control[137,138] and economic and business stability, especially in public-facing industries. Research shows that areas with mandated paid sick leave have lower flu rates[139,140] and that a substantial share of foodborne illness outbreaks is linked to workers handling food while ill, problems that could be mitigated through adequate PTO.[141]

During the early stages of the COVID-19 pandemic, the Families First Coronavirus Response Act (FFCRA) provided temporary paid sick leave for certain employees.[142] States that benefited from FFCRA's emergency paid sick leave saw fewer confirmed COVID-19 cases, demonstrating the direct link between paid-leave policies and reduced disease transmission.[143,144,145] However, these protections were not extended beyond 2020. Some employers took advantage of voluntary tax credits through September 2021,[146] but without a lasting federal requirement, coverage remains inconsistent.

State and Local Initiatives

In the absence of a federal standard, numerous states and localities have implemented their own paid-leave laws.[147] States such as Arizona, California, Colorado, Connecticut, Maryland, Massachusetts, Michigan,

Minnesota, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, Washington, and the District of Columbia mandate paid sick leave. Illinois, Maine, and Nevada require accrued PTO that is not strictly limited to sick leave.[148] These policies help fill the void left by federal inaction, but wide variability persists across the country. Some cities have enacted paid leave policies, while 23 states preempt localities from passing their own requirements.[149]

The Illinois Paid Leave for All Workers Act took effect on January 1, 2024.[150] The law requires most employers to provide employees with one hour of paid leave for every 40 hours worked (up to 40 hours per year), which can be used for any reason after a 90-day waiting period without needing to disclose the purpose. The law applies throughout Illinois, except in Chicago and Cook County, which have their own paid-leave ordinances.

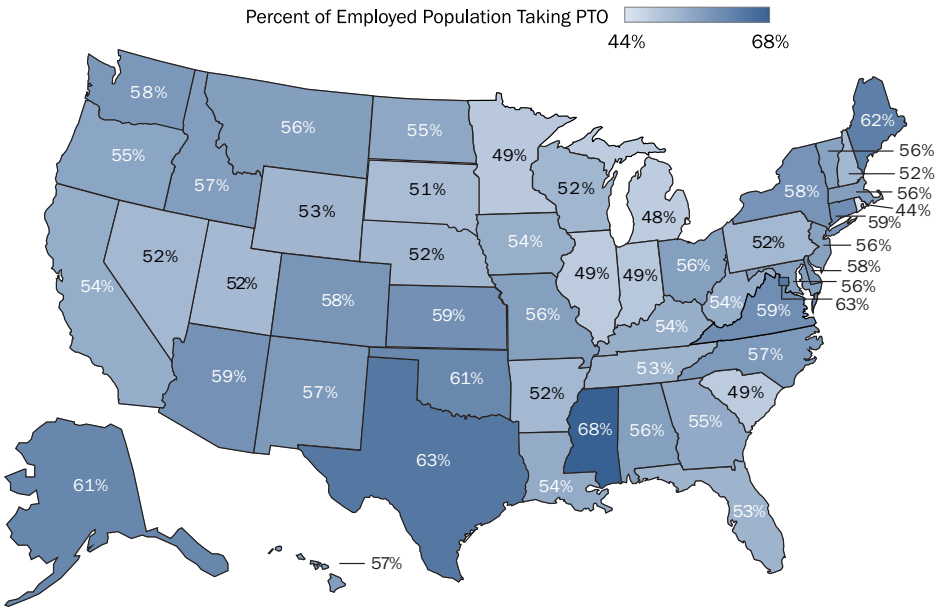
Voters in Alaska, Missouri, and Nebraska approved paid sick-leave measures in November 2024.[151]

Current Data and State Variation

Between March 2019 and March 2024, data from the Current Population Survey revealed that, on average, 55 percent of workers took some form of PTO, consistent with previous years.[152] Several states and the District of Columbia reported higher-than-average PTO usage, including Mississippi (68 percent), Texas (63 percent), DC (63 percent), Maine (62 percent), Alaska (61 percent), and Oklahoma (61 percent). Conversely, several states saw lower PTO usage, such as Indiana (49 percent), Minnesota (49 percent), South Carolina (49 percent), Illinois (49 percent), Michigan (48 percent), and Rhode Island (44 percent), which reported the lowest usage rates. This data highlights significant variability in PTO utilization across the country.[153] (See Figure 3.)

Figure 3: Around Half of Workers Used Paid Time Off, On Average

Percentage of employed population who took paid time off during March 2019–2024



Note: "Paid time off" includes sick leave, vacation, and holidays. These data are drawn from a survey of the general population. Figures represent a one-month snapshot to illustrate comparative usage across states and do not reflect the total percentage of workers who used PTO over the entire year. Differences in percentages may reflect variations in state policies, employer practices, and worker access to leave benefits.

Source: TFAH analysis of data from the Annual Social and Economic Supplement of the Current Population Survey.

Relevance to Public Health Emergency Preparedness

The percentage of workers who utilize PTO is a meaningful indicator of public health emergency preparedness. In crises such as disease outbreaks and pandemics, the ability to stay home without losing income or job security is crucial to slowing disease spread. Higher PTO usage suggests that a state's policies and workplace cultures support employees in taking time off as needed, thereby reducing strains on the healthcare system and fostering a healthier, more resilient workforce. Monitoring PTO usage thus provides valuable insights into a state's capacity to manage public health threats effectively.

However, this measure does not necessarily reflect whether a state has a formal paid sick-leave or PTO requirement. Instead, it captures actual usage, which can vary greatly based on local workforce composition, employer practices, and economic factors. It also combines different forms of leave (e.g., sick leave, vacation, holidays) into a single statistic, making it less precise for assessing medically necessary leave alone. Consequently, states with strong paid-leave laws might not display high usage rates if employers or workforce demographics differ, and states without statewide policies could still exhibit higher uptake due to local practices or larger employers offering PTO.

INDICATOR 7: FLU VACCINATION RATE

KEY FINDING: During the 2023–2024 influenza season, only 47 percent of U.S. residents ages 6 months and older were vaccinated against the flu,[154] falling short of the 70 percent annual vaccination target set by *Healthy People 2030*. This marks a decline from recent years and highlights persistent challenges in achieving recommended coverage levels.

Seasonal Flu: Health and Economic Implications

Each year, seasonal influenza infects millions of Americans, resulting in substantial numbers of medical visits, hospitalizations, and deaths. The impact varies by season and is influenced by circulating strains, vaccine effectiveness, and population immunity. Specific populations—older adults, young children, pregnant women, and those with chronic health conditions—are at elevated risk of severe illness and complications. Beyond direct health consequences, the flu exerts a significant economic toll due to healthcare expenses and lost productivity. Moreover, influenza outbreaks often coincide with other respiratory health challenges, including COVID-19 and respiratory syncytial virus (RSV), compounding the strain on healthcare systems.

Importance of Vaccination

Annual flu vaccination is the primary strategy for reducing influenza's public health burden. High vaccination coverage helps to mitigate disease spread, reduces the severity of illness, lowers hospitalization and mortality rates, and eases the strain on healthcare resources.[155] Vaccination efforts rely on robust infrastructure, effective communication, equitable access, and sustained public trust. These efforts also foster skills and capacities—such as vaccine distribution and administration—that are crucial during other public health emergencies, reinforcing the overall resilience of the public health and healthcare systems.

Recent Vaccination Trends

In the 2023–2024 season, the national flu vaccination rate of 47 percent was the lowest since 2017–2018, continuing a reversal of modest gains made in prior years.[156] After an uptick that peaked in the 2020–2021 season—likely fueled by heightened awareness of respiratory illnesses during the COVID-19 pandemic—rates stabilized and then declined. Disparities persist among age groups:[157]

- Children (6 months–17 years): 55 percent vaccinated
- Adults (18–49 years): 33 percent vaccinated (lowest of these age groups)
- Adults (50–64 years): 46 percent vaccinated
- Older adults (65 years and older): 70 percent vaccinated (highest coverage)

Racial and ethnic disparities also persist, with Black and Hispanic populations typically having lower flu vaccination rates than white populations.[158]

Geographic Variation

Some jurisdictions achieved higher vaccination coverage, such as Massachusetts (62 percent), the District of Columbia (62 percent), and Rhode Island (61 percent). In contrast, Mississippi, Nevada, Wyoming, Idaho, Alabama, Louisiana, and Florida reported vaccination rates of 40 percent or lower. (See Figure 4.)

Looking Forward: Challenges and Innovations

Achieving higher vaccination rates remains challenging due to factors like vaccine hesitancy, misconceptions about vaccine efficacy and safety, and perceived lack of necessity, especially among younger adults. Healthy People 2030 aims for a 70 percent annual flu vaccination rate,[159] but reaching this goal will require overcoming these barriers. Emerging data suggest that polarization around COVID-19 vaccines may negatively influence acceptance of other vaccines, including the flu shot.[160]

Encouragingly, scientists are working toward more effective, longer-lasting influenza vaccines.[161] Research into "universal" or "super-seasonal" vaccines aims to reduce the need for seasonal strain predictions and thereby improve overall vaccine effectiveness. Meanwhile, advancements in RSV vaccines and immunizations for infants and older adults mark progress in controlling a range of respiratory pathogens.

In a major advancement, Moderna announced successful late-stage trial results for a combined COVID-19 and flu vaccine in 2024, demonstrating higher immune responses in older adults compared with receiving the vaccines separately.[162,163] This innovation represents a significant step toward streamlining immunization efforts. By reducing the number of injections required, the combined vaccine is expected to improve vaccination uptake, simplify logistics for healthcare providers, and lower barriers to access for individuals with limited time or resources. The dual vaccine could play a pivotal role in managing concurrent outbreaks of COVID-19 and influenza, ensuring broader protection for the population while conserving healthcare resources. Regulatory approval will be necessary before the product can be brought to market.

Also in 2024, the Food and Drug Administration (FDA) approved AstraZeneca's FluMist, a nasal-spray influenza vaccine, for self- or caregiver-administration outside of healthcare settings, marking a shift in vaccine accessibility.[164,165] The vaccine remains prescription-only but can now be administered at home by adults ages 18–49 to themselves, or by caregivers to individuals ages 2–17, offering unprecedented convenience. At-home flu vaccination strengthens the nation's resilience by enabling rapid, decentralized immunization during flu surges, other outbreaks, or pandemics, reducing strain on healthcare facilities.

Policy and Practice Strategies

Most recommended vaccines, including flu shots, are covered by insurance when obtained from in-network providers. However, gaps remain, especially in states without Medicaid expansion. Overcoming barriers may involve:

- Expanding vaccine access via pharmacies, schools, workplaces, and community centers.
- Enhancing public education campaigns to dispel myths and highlight the flu's seriousness.

- Improving immunization information systems and using tailored outreach to groups at higher risk of flu or serious flu outcomes.
- Implementing policies like paid sick leave to enable individuals to get vaccinated without financial hardship.
- Authorizing additional healthcare providers—such as pharmacists, podiatrists, dentists, paramedics, and optometrists—to administer flu vaccines.
- Reducing nonmedical exemptions for school-required vaccinations to strengthen herd immunity.

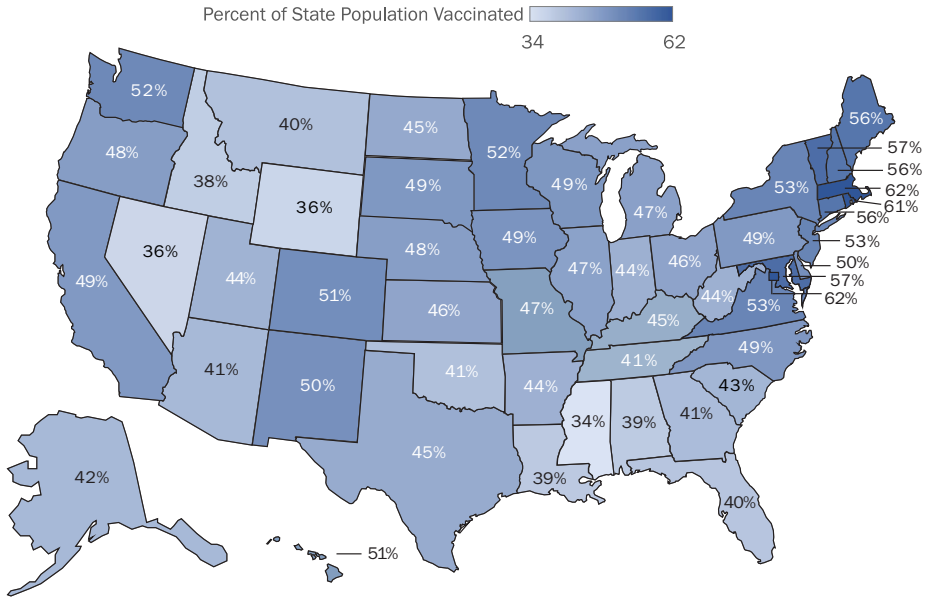
In recent years, states have innovated to expand the pool of authorized vaccinators and to reduce logistical barriers.[166] These efforts, combined with ongoing scientific research for improved vaccines, can help bridge gaps in flu vaccination coverage and strengthen the nation's readiness against both seasonal and emerging public health threats.

Indicator Significance for Emergency Preparedness

Seasonal flu vaccination rates offer insight into a state's public health emergency preparedness. High coverage indicates strong public health infrastructure—effective vaccine distribution, community engagement, and trust-building measures—that can be rapidly mobilized during emergencies. Better vaccine uptake contributes to herd immunity, reducing the disease burden and preserving healthcare capacity for other urgent needs. It also reflects how well public health messaging and resources support preventive health measures at scale.

Figure 4: Just Under Half of U.S. Residents Received a Seasonal Flu Vaccination

Seasonal flu vaccination rates for people ages 6 months and older, by state, 2023–2024



Note: Data are derived from a population-based survey and are subject to sampling error. "Flu vaccination" refers to receipt of any seasonal influenza vaccine during the 2023–2024 flu season.

Source: Centers for Disease Control and Prevention.[167]

INDICATOR 8: PATIENT SAFETY IN HOSPITALS

KEY FINDING: In the fall 2024 Leapfrog Hospital Safety Grade assessment, 27 percent of U.S. general acute-care hospitals, on average, earned an "A"—a slight increase from 25 percent in fall 2023. While some states saw more than half of their hospitals achieve the highest rating, others had none.

Historical Context and the Evolution of Patient Safety

The concept of hospital patient safety in the United States has evolved over the past century. Early technological advances and the introduction of antibiotics improved outcomes but introduced new types of risk. In the late 20th century, growing awareness of medical errors led to increased scrutiny and legal action, culminating in the 1999 Institute of Medicine report To Err Is Human.[168] This landmark study sparked a national conversation and drove the adoption of systematic safety protocols, quality-improvement strategies, and technologies like electronic health records.[169] Most recently, the COVID-19 pandemic underscored the critical importance of robust infection control and healthcare system resilience, further emphasizing the need for continual patient safety improvements.

In 2024, the American Hospital Association (AHA) launched a Patient Safety Initiative aimed at addressing systemic challenges in healthcare safety and improving outcomes across hospitals and health systems.[170] By focusing on fostering a culture of safety, enhancing health equity, and prioritizing workforce well-being, the initiative recognizes the interconnectedness of patient safety and healthcare resilience. Embedding safety into operational strategies, this initiative not only addresses routine care but also aims to strengthen facilities' capacity to manage surges in demand during emergencies, ultimately safeguarding community health and trust in healthcare systems. From the perspective of public health and emergency preparedness, the AHA's efforts are significant as they are intended to bolster the healthcare system's ability to respond to crises, such as disease outbreaks, pandemics, or natural disasters, by ensuring safer environments for both patients and providers.

Patient And Staff Safety as a Component of Preparedness

Despite progress, hospital errors, injuries, accidents, and infections are still among the leading causes of death in the United States,[171] claiming roughly 200,000 lives annually. [172] Ensuring patient safety is integral to preparedness. Hospitals that excel in patient safety are less likely to inadvertently harm patients or exacerbate a public health crisis. They are also more capable of maintaining quality standards under stress, such as during infectious disease outbreaks, natural disasters, or surges in patient volume.

Lessons from the COVID-19 Pandemic

During the pandemic, hospitals faced an unprecedented test of their infection-control measures and overall safety protocols.[173] Strategies like universal masking, appropriate use of personal protective equipment (PPE), adequate ventilation, and strict hand hygiene were essential for preventing viral transmission within facilities. However, hospital overcrowding in regional COVID-19 waves revealed vulnerabilities: reduced care quality, delayed treatments, medication errors, and increased mortality.[174] These experiences illustrate how strong patient-safety foundations are crucial for managing and mitigating public health emergencies.

The Leapfrog Group's Hospital Safety Grade

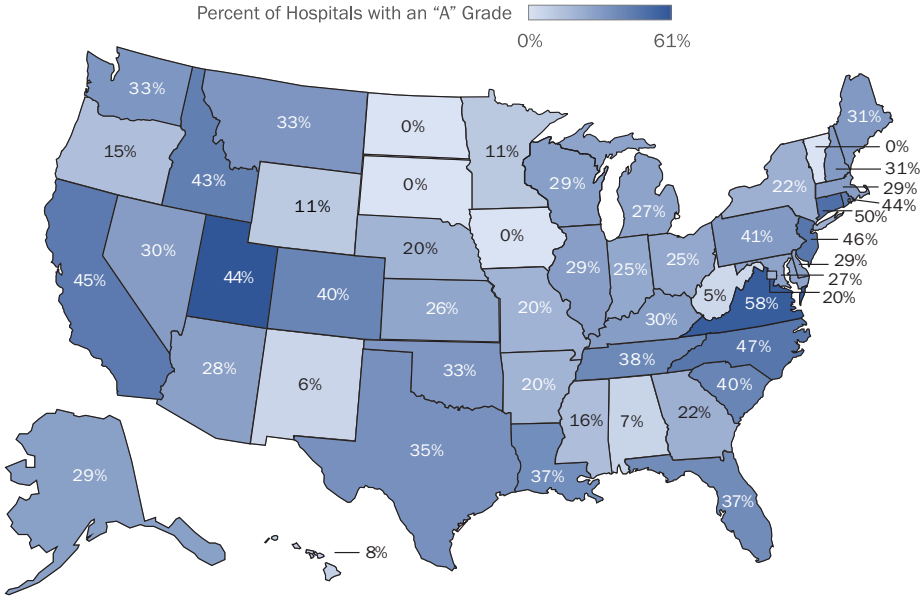
Established in 2000, the Leapfrog Group is a nonprofit organization focused on enhancing U.S. healthcare quality and patient safety. Its Hospital Safety Grade, issued twice a year, evaluates nearly 3,000 general acute-care hospitals using up to 22 national patient safety measures sourced from the Centers for Medicare & Medicaid Services and other data providers.[175] Each hospital's performance is distilled into a single letter grade (A through F), reflecting its success in preventing medical errors, infections, and other forms of harm.

Measures That Matter for Public Health Emergencies

The Safety Grade considers both process/structural and outcome measures, each accounting for 50 percent of the overall grade. Key indicators include computerized physician order entry (to reduce medication errors) and infection-control measures (e.g., rates of MRSA [*methicillin-resistant Staphylococcus aureus Bacteria*], C. diff [*clostridium difficile*], and surgical-site infections). High performance in these areas is critical during health crises, when rapid, accurate treatment and effective infection management help maintain care quality and prevent hospital-based disease spread.

Figure 5: Hospital Patient Safety "A" Grades Remain Uneven Across States

Percentage of general acute-care hospitals earning an "A" grade, fall 2024



Note: This measure applies exclusively to general acute-care hospitals. Data are drawn from The Leapfrog Group's "Fall 2024 Hospital Safety Grade" assessments.

Source: The Leapfrog Group.[177]

Variation Across States

In fall 2024, 27 percent of hospitals nationwide, on average, received an A grade, but the distribution varied widely.[176] Some states excelled, with over half of their hospitals earning top marks (such as Utah at 61 percent and Virginia at 58 percent), while others, including Iowa, North Dakota, South Dakota, and Vermont, had none achieving the highest grade. (See Figure 5.) Tracking and comparing these outcomes over time helps states identify gaps and prioritize improvements, thereby strengthening healthcare systems against future emergencies.

Reinforcing Preparedness Through Patient Safety

The Leapfrog Hospital Safety Grade provides a standardized, evidence-based method for gauging hospital quality and safety. High-performing hospitals demonstrate strong readiness to manage routine care and respond effectively to crises. By highlighting performance and pinpointing areas needing improvement, these assessments drive better resource allocation, strategic policy changes, and enhanced community trust—key elements for robust public health emergency preparedness.

INDICATOR 9: STATE PUBLIC HEALTH LABORATORY SURGE CAPACITY

KEY FINDING: In 2024, 47 states and the District of Columbia—reported having a written plan to handle a surge in laboratory-testing capacity for six to eight weeks in response to an outbreak or other public health event. Three states reported not having such a plan.

Historical Context and the Evolving Role of Public Health Laboratories

State public health laboratories have a long history, dating back to the late-19th and early-20th centuries. Originally focused on controlling communicable diseases like tuberculosis, diphtheria, and typhoid fever, these institutions have expanded their functions over time. Today, they contribute to a wide range of activities, including environmental health testing, emergency response, bioterrorism preparedness, and the surveillance of chronic diseases. They also advance public health research, train laboratory professionals, and integrate new testing methods and technologies—efforts that have become increasingly important in an era of emerging health threats.

ESSENTIAL COMPONENTS OF PUBLIC HEALTH LABORATORIES

Public health laboratories serve as frontline responders in detecting and mitigating health threats. Their responsibilities include:

- **Disease Testing and Identification:** Rapidly diagnosing infections and monitoring their spread.
- **Ensuring Quality of Food and Water Supplies:** Testing to prevent contamination and related illnesses.
- **Supporting National Health Programs:** Collaborating with federal agencies, such as CDC, to implement national initiatives at the state level.
- **Workforce Training and Technology Development:** Preparing laboratory staff and refining diagnostic tools to meet evolving public health needs.

These laboratories' adaptability and resilience were vividly demonstrated during major public health emergencies, including the H1N1 influenza pandemic and the COVID-19 crisis, where they rapidly scaled testing and supported data-driven policy decisions.

Lessons from the COVID-19 Pandemic

During COVID-19, state public health laboratories were central to the nation's response. As key players in the Laboratory Response Network, they led early detection, provided confirmatory tests, and conducted genomic sequencing to track viral spread and variants.[178] Their efforts in testing, data collection, analysis, and reporting informed public health decisions and interventions at the local, state, and federal levels.

Importance of Surge Capacity

In times of outbreaks or disasters, public health laboratories must be able to handle sudden increases in testing demands, similar to how hospitals must scale up to treat more patients. According to the Association of Public Health Laboratories, "internal surge capacity" involves a laboratory's ability to implement substantial operational changes—such as reallocating staff, adding shifts, and using all available resources—to meet surging testing volumes.[179]

Effective surge capacity also depends on having proper infrastructure. This includes adequate biosafety cabinets, fume hoods, supplies, and the physical space needed to process, store, and analyze a large volume of samples. It

also requires sufficient equipment, PPE, reliable power supplies, and flexible staffing arrangements. Together, these factors ensure that a lab can maintain high-quality, efficient testing during a public health emergency.[180]

Planning for Surge Events

Public health laboratories develop detailed surge plans that map out how they will quickly and effectively expand their operations during emergencies. Key elements of these plans include:

- **Facilities and Equipment:** Ensuring adequate space, up-to-date instruments, and robust supply chains.
- **Staffing and Training:** Identifying well-trained personnel ready to be redeployed or brought in as needed.
- **Operational Guidelines:** Establishing protocols for various scenarios to maintain accuracy and safety under increased testing loads.
- **Partnerships and Communication:** Coordinating with other labs, healthcare facilities, and government agencies and clearly communicating with the public.
- **Continuous Improvement:** Regularly updating plans to incorporate new technologies, adapt to emerging threats, and learn from past incidents.

State Progress and Barriers to Finalizing Plans

In 2024, California, Colorado, and Utah were the only jurisdictions without a completed written surge plan. (See Table 6.)

Significance of Having a Surge Plan for Preparedness

A written public health laboratory surge plan is a critical indicator of a state's emergency preparedness. Such a plan demonstrates readiness to quickly scale up laboratory operations during a crisis, ensuring timely diagnosis, containment, and management of public health threats. By emphasizing a broad scope—from staffing and training to equipment procurement, inter-agency coordination, and adaptation to diverse emergencies—these plans strengthen the entire public health response infrastructure.

Ultimately, having a well-developed, regularly updated surge plan reassures the public, fostering trust in a state's ability to handle health emergencies effectively.

Still, while a written plan serves as a key indicator of preparedness, it does not in itself guarantee real-world surge capacity. Actual capacity depends on factors like staffing, supplies, facilities, and training. A plan is a roadmap, but successful response also requires regularly testing, updating, and resourcing that plan to ensure a laboratory can meet demands in a genuine emergency.

TABLE 5: All But a Few States Have a Written Laboratory Surge Plan
State public health laboratories with or without a written plan for a six- to eight-week surge in testing capacity, 2024

Had a Plan				No Plan
Alabama	Indiana	Montana	Pennsylvania	California
Alaska	Iowa	Nebraska	Rhode Island	Colorado
Arkansas	Kansas	Nevada	South Carolina	Utah
Arizona	Kentucky	New Hampshire	South Dakota	
Connecticut	Louisiana	New Jersey	Tennessee	
Delaware	Maine	New Mexico	Texas	
District of Columbia	Maryland	New York	Vermont	
Florida	Massachusetts	North Carolina	Virginia	
Georgia	Michigan	North Dakota	Washington	
Hawaii	Minnesota	Ohio	West Virginia	
Idaho	Mississippi	Oklahoma	Wisconsin	
Illinois	Missouri	Oregon	Wyoming	

Note: This indicator only reflects the existence of a written surge plan. It does not assess the plan's quality, comprehensiveness, or how frequently it is tested or utilized.

California reported that it does not have a fully compiled or centralized surge plan. While an older Continuity of Operations Plan exists, it has not been reviewed since before the COVID-19 pandemic. The state indicated that developing an updated surge capacity plan is on their agenda for the current year.

Colorado reported that it does not have a consolidated surge capacity plan, though various existing plans contain relevant components. Developing a formal plan is a priority, particularly given the state's recent experience with surge testing during COVID-19, mpox, and H5N1.

Utah reported that it has a completed Continuity of Operations Plan plan but has yet to finalize a written surge capacity plan. The state anticipates completing this as part of its federal public health preparedness requirements in the next funding cycle.

Source: Association of Public Health Laboratories.

INDICATOR 10: AVOIDABLE MORTALITY

KEY FINDING: Avoidable mortality—premature deaths from preventable or healthcare-treatable causes—varies widely by state and often differs significantly among racial and ethnic groups. Some states have low overall mortality rates and smaller disparities between groups, while others face high mortality rates and large gaps, reflecting underlying health inequities and related challenges to emergency readiness.

Understanding Avoidable Mortality

Avoidable mortality is a composite concept that brings together two categories of premature deaths occurring before age 75:

1. Preventable Causes: These are deaths that could be averted in places where equitable access to health-promoting resources exists and where commonly available public health measures are in place. Such interventions include environmental- and workplace-safety regulations, community-wide prevention efforts, and access to strong primary care. Examples of preventable causes include fatalities from certain infectious diseases that vaccination programs or surveillance systems could prevent, injuries that might be reduced through policies and environmental safeguards, and conditions such as alcohol- or drug-related mortality that can be mitigated through robust prevention and early intervention strategies.

2. Healthcare-Treatable Causes: Treatable deaths refer to those that proper, timely, and effective healthcare interventions should prevent. These include conditions such as diabetes-related complications, certain heart diseases, and cancers (e.g., colon and breast cancer) that, if identified early and managed appropriately, need not lead to premature death. These conditions test the efficiency, accessibility, and quality of a state's healthcare delivery system. When timely screening, diagnostic, and therapeutic interventions are consistently and equitably available, these fatalities can be significantly reduced.

The age-75 threshold for defining premature mortality originates from longstanding international practices aimed at ensuring comparability in tracking preventable and treatable deaths across countries. It has been used by the Organisation for Economic Co-operation and Development, an international organization that promotes economic growth and development, and Eurostat, the European Union's statistical office that provides data for policymaking, in their joint methodology, which the Commonwealth Fund—TFAH's source for state avoidable-mortality data—has adopted in its analysis. While the threshold ensures consistency across causes of death and reflects the context of countries with lower life expectancies, it may underestimate deaths that could potentially be avoided beyond age 75.

Combined, these two domains offer a window into how well a state's health system works across the entire care continuum—from the upstream preventive measures at the community level to the downstream treatments and chronic disease management in clinical settings. Low rates of avoidable mortality indicate that a state's efforts in prevention, primary care, chronic disease management, and treatment are aligning effectively to spare individuals from preventable death. High rates, on the other hand, illuminate breakdowns in these systems.

Equity is central to the concept of avoidable mortality. Even if a state demonstrates relatively low overall avoidable mortality rates, large disparities among racial and ethnic groups, and between urban, suburban, and rural populations, signal that not all communities are benefiting equally from prevention or treatment opportunities.

The Importance of Equity

Equity is central to the concept of avoidable mortality. Even if a state demonstrates relatively low overall avoidable mortality rates, large disparities among racial and ethnic groups, and between urban, suburban, and rural populations, signal that not all communities are benefiting equally from prevention or treatment opportunities. Persistent inequities are often rooted in complex non-medical drivers of health, including differences in insurance coverage, neighborhood conditions, language barriers, cultural competency of healthcare providers, and underlying systemic biases. Addressing these root causes is imperative for states aiming to strengthen their overall health resilience and their ability to respond collectively to emergencies.

For example, if preventable diseases disproportionately affect Black or Hispanic populations in a state, this suggests that the public health infrastructure and outreach efforts may not be reaching or resonating with these communities. Similarly, if treatable conditions are more lethal for American Indian/Alaska Native (AI/AN) or Asian American, Native Hawaiian, and Pacific Islander (AANHPI) groups, it may indicate differences in access to timely, high-quality medical care. Reducing these disparities is not only an ethical imperative but also a practical one, enhancing a state's capacity to protect everyone's health when crises arise.

Methods of Analysis

For this indicator, TFAH relied on avoidable mortality data from the Commonwealth Fund, focusing on:

- **Overall Avoidable Mortality Rates for All Individuals:** Using standardized (age-adjusted) death rates from both preventable and healthcare-treatable causes before age 75, we examined how states compared.[181] States with significantly lower rates are those that appear to be succeeding in both their public health and clinical interventions. States with high rates may need to identify gaps in preventive care or treatment pathways.
- **Racial and Ethnic Disparities in Avoidable Mortality:** The Commonwealth Fund data also allowed us to assess differences between the highest and lowest mortality rates across major racial and ethnic groups.[182] We analyzed the data to highlight states with particularly large or small gaps.

Results: Patterns Across States

An analysis of avoidable mortality reveals distinct patterns in both overall rates and racial/ethnic disparities across the nation. Some states excel at minimizing preventable and treatable deaths before age 75, while others struggle. Adding complexity, states that perform well overall sometimes exhibit large racial and ethnic gaps, and conversely, states with high overall mortality sometimes have relatively narrow disparities. Several key themes emerge from the data.

Overall Avoidable Death Rates

States like **Massachusetts (222 per 100,000 people), Minnesota (230 per 100,000 people), and Hawaii (230 per 100,000 people)** lead the nation with the lowest avoidable mortality. Their success likely stems from strong public health efforts, accessible primary

care, and effective treatment services. These states experience fewer missed opportunities in preventing and managing disease.

At the other end of the spectrum, **Mississippi (519 per 100,000 people), West Virginia (493 per 100,000 people), and Oklahoma (460 per 100,000 people)** have the highest avoidable death rates. These states often contend with higher chronic disease burdens, socioeconomic barriers, and limited healthcare access.

Northeastern states generally fare better, possibly due to more robust health coverage, stronger infrastructure, and larger or more stable public health investments. In contrast, many Southern states lag behind, reflecting deep-rooted socioeconomic factors, including higher poverty rates, lower educational attainment, and more limited healthcare access. These interrelated conditions impede improvements in overall mortality, leading to substantial disparities. Other regions show more moderate overall performance but harbor significant internal inequities, demonstrating that strong aggregate results can mask pockets of disadvantage and the persistent influence of social determinants of health on community outcomes.

Racial and Ethnic Disparities

The data reveal a common pattern: within states, Black Americans and AI/AN populations frequently experience the highest avoidable mortality rates. In addition, although there are variations between AANHPI communities, AANHPI communities often have the lowest. Disparities can be stark. For example, in **South Dakota, Wyoming, and North Dakota**, the difference between the states' highest (AI/AN) and lowest (AANHPI) mortality rates ranges from 946 to 1,192 per 100,000, reflecting significant inequities.

In contrast, **Hawaii (106), New Hampshire (185), and Rhode Island (192)** show some of the smallest racial/ethnic gaps when comparing each state's highest- and lowest-risk groups, indicating that preventive measures, screenings, and treatments are reaching populations more evenly.

Yet not all high-performing states on overall mortality also achieve equity. For instance, **Minnesota** has one of the lowest overall rates but one of the largest gaps between population groups. Similarly, **Nebraska, North Dakota, and Montana** combine relatively low overall rates with significant inequities, which disproportionately impact AI/AN communities. Low overall rates, therefore, do not automatically translate into equity, underscoring the need for more targeted interventions in states that are otherwise leaders in health outcomes.

Conversely, some states have high overall mortality but smaller disparities. **Georgia, Louisiana, and Arkansas**, despite higher-than-average overall rates, show narrower gaps than might be expected, suggesting that health challenges are more evenly distributed. This implies that broad interventions might lift all groups rather than needing highly targeted approaches.

A few states excel in both dimensions. **Massachusetts, Hawaii, and New Hampshire** maintain low overall mortality and relatively small gaps. Their strong outcomes across the board

indicate robust, well-integrated systems that emphasize access, quality, and equality. Such systems are likely to be more resilient in times of public health emergencies, capable of protecting all populations effectively.

At the opposite extreme, states like **West Virginia and Mississippi** struggle with both high avoidable mortality and large disparities, signaling deep systemic issues—economic hardship, workforce shortages, rural healthcare infrastructure weaknesses, insufficient preventive programs, and a lack of culturally tailored interventions. Addressing these root causes will be essential to improving everyday health outcomes and bolstering preparedness.

Other Insights

About 70–75 percent of total avoidable mortality stems from preventable causes, underscoring the importance of upstream interventions. Improving health behaviors, reducing injuries, ensuring robust vaccination programs, mitigating environmental hazards, and controlling infectious diseases can yield substantial gains. Addressing these root causes may help states lower overall death rates and reduce disparities, thus creating a healthier baseline.

Treatable causes, while fewer, still matter. Ensuring timely screening, effective chronic disease management, and high-quality treatment helps avert premature mortality from conditions that medical care can address.

Toward Continuous Improvement

Improving avoidable mortality rates and reducing disparities requires a multifaceted strategy. States may need to:

- **Invest in public health infrastructure,** including surveillance systems, workforce development, and community outreach.
- **Encourage cross-sector partnerships,** involving healthcare providers, schools, faith-based organizations, employers, and local leaders in public health planning and emergency preparedness.
- **Strengthen primary care networks** and access to care to ensure that screenings and early interventions are widely available.
- **Expand insurance coverage and remove financial barriers,** ensuring that cost does not deter individuals from seeking preventive or therapeutic services.
- **Enhance cultural and linguistic competency,** ensuring that information and services resonate with all communities.
- **Regularly measure and report disparities,** by race and ethnicity, geography, income, and other factors, to guide targeted interventions.

These steps, among others, can gradually lower avoidable mortality, narrow inequities, and set the stage for a health system that not only thrives under everyday conditions but also demonstrates resilience and adaptability in the face of new and unforeseen challenges.

Significance for Public Health Preparedness

Avoidable mortality, and especially the patterns of who benefits from existing healthcare structures and health drivers and who does not, serves as a diagnostic tool for identifying gaps in states' underlying health infrastructures and vulnerabilities. States that keep avoidable mortality low and disparities narrow have shown they can deliver preventive care, prompt treatment, and supportive public health services in ordinary times. These strengths are crucial when an unexpected public health threat emerges.

In an emergency—whether a rapidly spreading infectious disease, a natural disaster that disrupts healthcare facilities, or a bioterrorism event—states that have already invested in robust, equitable systems are likely to respond more swiftly and effectively. They will be well-positioned for early detection, contact-tracing, and ensuring care continuity. They may also face fewer barriers when engaging diverse communities, making it more likely that information about protective measures and available treatments is both understood and acted upon. Reducing language, cultural, and socioeconomic barriers can foster stronger relationships with at-risk groups and encourage higher participation in preventive interventions.

In contrast, states with high avoidable mortality and large disparities enter crises at a disadvantage. If certain population groups already lack adequate preventive and treatment services under normal conditions, these inequalities will likely intensify under stress. A novel pathogen or a sudden environmental emergency will put added pressure on an already strained system, potentially leading to higher casualties, more chaos, and less trust in public health directives.

Thus, avoidable mortality and its distribution among groups is intimately tied to a state's readiness to handle unexpected threats. Reducing avoidable mortality through enhanced prevention (e.g., robust vaccination campaigns, effective public health regulations, injury-prevention programs) and improved treatment (e.g., timely screenings, better chronic disease management, culturally competent care) lays the groundwork for resilience. Likewise, closing gaps between racial and ethnic groups ensures that protective measures and quality care reach everyone, bolstering a state's capacity to weather crises collectively.

By understanding which states fare well and which struggle, and by examining the factors behind these outcomes, policymakers, healthcare leaders, and communities can identify effective strategies that support lower death rates, more equitable care, and stronger emergency preparedness.

TABLE 6: STATES' AVOIDABLE MORTALITY RATES AND RACIAL/ETHNIC DISPARITIES

Death rates from preventable and treatable causes of death before age 75, by state, including overall avoidable mortality, highest and lowest racial/ethnic group rates, and the resulting disparities, 2020–2021.

	Death Rate from Treatable Causes (per 100,00 people)	Death Rate from Preventable Causes (per 100,00 people)	Total Avoidable Death Rate (per 100,00 people)	Rank by Total Avoidable Death Rate
Alabama	116	302	418	42
Alaska	80	262	342	31
Arizona	88	275	363	37
Arkansas	135	316	451	48
California	76	198	273	17
Colorado	67	204	271	15
Connecticut	66	182	247	6
Delaware	85	233	318	25
D.C.	121	311	432	44
Florida	86	241	327	28
Georgia	105	251	356	36
Hawaii	78	152	230	3
Idaho	69	199	268	14
Illinois	87	212	299	22
Indiana	100	267	367	39
Iowa	82	203	285	21
Kansas	92	235	328	29
Kentucky	119	325	444	45
Louisiana	125	323	449	46
Maine	70	212	282	18
Maryland	88	214	302	23
Massachusetts	59	163	222	1
Michigan	99	245	344	32
Minnesota	61	169	230	2
Mississippi	155	363	519	51
Missouri	103	269	372	40
Montana	78	246	323	26
Nebraska	77	189	266	11
Nevada	93	262	356	35
New Hampshire	65	173	237	4
New Jersey	75	182	258	10
New Mexico	95	335	430	43
New York	78	190	268	13
North Carolina	97	245	342	30
North Dakota	77	208	285	20
Ohio	100	266	366	38
Oklahoma	128	332	460	49
Oregon	68	199	267	12
Pennsylvania	86	221	307	24
Rhode Island	64	189	253	8
South Carolina	106	293	399	41
South Dakota	85	241	326	27
Tennessee	119	330	449	47
Texas	98	250	348	33
Utah	69	169	238	5
Vermont	65	183	249	7
Virginia	85	200	285	19
Washington	70	185	255	9
West Virginia	128	365	493	50
Wisconsin	74	199	273	16
Wyoming	85	269	354	34

Note: "Avoidable" deaths are those that could be prevented through effective public health measures or averted with timely, high-quality healthcare. Data represent broad racial and ethnic categories and may not reflect variations within these groups. For ranking metrics, lower ranks (e.g., 1, 2, 3) indicate relatively lower death rates and smaller disparities, while higher ranks reflect poorer outcomes.

Source: Commonwealth Fund analysis of CDC restricted-use Multiple Cause-of-Death files, 2018–2019 and 2020–2021, and U.S. Census Bureau population data.

TABLE 6: STATES' AVOIDABLE MORTALITY RATES AND RACIAL/ETHNIC DISPARITIES

Death rates from preventable and treatable causes of death before age 75, by state, including overall avoidable mortality, highest and lowest racial/ethnic group rates, and the resulting disparities, 2020–2021.

	Race/Ethnicity with Highest Avoidable Death Rate	Race/Ethnicity with Lowest Avoidable Death Rate	Avoidable Death Rate Gap	Rank by Avoidable Death Rate Gap
Alabama	Black	AANHPI	387	21
Alaska	AI/AN	Hispanic	568	41
Arizona	AI/AN	AANHPI	743	45
Arkansas	Black	AI/AN	452	34
California	Black	AANHPI	356	17
Colorado	AI/AN	AANHPI	402	22
Connecticut	Black	AANHPI	299	7
Delaware	Black	AANHPI	327	13
D.C.	Black	White	603	42
Florida	Black	AANHPI	316	10
Georgia	Black	AI/AN	311	9
Hawaii	AI/AN	AANHPI	106	1
Idaho	AI/AN	AANHPI	414	26
Illinois	Black	AANHPI	473	37
Indiana	Black	AANHPI	426	27
Iowa	Black	AANHPI	378	19
Kansas	Black	AANHPI	426	28
Kentucky	Black	AANHPI	411	24
Louisiana	Black	AANHPI	410	23
Maine	AI/AN	AANHPI	430	29
Maryland	Black	AANHPI	307	8
Massachusetts	Black	AANHPI	211	4
Michigan	Black	AANHPI	506	40
Minnesota	AI/AN	White	784	46
Mississippi	AI/AN	AANHPI	863	47
Missouri	Black	AANHPI	490	39
Montana	AI/AN	AANHPI	868	48
Nebraska	AI/AN	AANHPI	694	43
Nevada	Black	AANHPI	319	12
New Hampshire	Black	AANHPI	185	2
New Jersey	Black	AANHPI	354	16
New Mexico	AI/AN	AANHPI	722	44
New York	Black	AANHPI	293	6
North Carolina	AI/AN	AANHPI	371	18
North Dakota	AI/AN	AANHPI	946	49
Ohio	Black	AANHPI	444	32
Oklahoma	AI/AN	AANHPI	463	35
Oregon	AI/AN	AANHPI	328	14
Pennsylvania	Black	AANHPI	413	25
Rhode Island	AI/AN	AANHPI	192	3
South Carolina	Black	AANHPI	379	20
South Dakota	AI/AN	AANHPI	1192	51
Tennessee	Black	AANHPI	440	31
Texas	Black	AANHPI	340	15
Utah	AI/AN	White	438	30
Vermont	AI/AN	AANHPI	263	5
Virginia	Black	AANHPI	316	11
Washington	AI/AN	AANHPI	465	36
West Virginia	Black	AANHPI	479	38
Wisconsin	Black	AANHPI	446	33
Wyoming	AI/AN	AANHPI	1069	50

TABLE 7: ALL STATES/ALL INDICATORS

	Nurse Licensure Compact (NLC)	Public Health Accreditation Board (PHAB)	Emergency Management Accreditation Program (EMAP)	Public Health Funding	Water Security	Paid Time Off	
	State participates in NLC, 2024	Accredited by PHAB, 2024	Accredited by EMAP, 2024	Funding change, FY 2023-24	Percent of population who used a community water system in violation of health-based standards, 2023	Percent of employed population who used paid time off, March 2019-24	
Alabama	✓	✓	✓	↑	9%	56%	
Alaska		✓		↓	5%	61%	
Arizona	✓	✓	✓	↓	1%	59%	
Arkansas	✓	✓	✓	↑	3%	52%	
California		✓	✓	↓	4%	54%	
Colorado	✓	✓	✓	↑	3%	58%	
Connecticut	✓	✓	✓	↓	0%	59%	
Delaware	✓	✓	✓	↑	4%	58%	
D.C.		✓	✓	↑	5%	63%	
Florida	✓	✓	✓	↑	1%	53%	
Georgia	✓	✓	✓	↑	2%	55%	
Hawaii				↑	0%	57%	
Idaho	✓	✓	✓	↑	2%	57%	
Illinois		✓	✓	↑	1%	49%	
Indiana	✓	✓		↑	1%	49%	
Iowa	✓	✓		↑	0%	54%	
Kansas	✓	✓	✓	↓	2%	59%	
Kentucky	✓	✓		↑	5%	54%	
Louisiana	✓	✓		↑	18%	54%	
Maine	✓	✓		↓	1%	62%	
Maryland	✓	✓	✓	↓	0%	56%	
Massachusetts	✓	✓	✓	↑	13%	56%	
Michigan			✓	↑	2%	48%	
Minnesota		✓		↓	1%	49%	
Mississippi	✓	✓		↑	11%	68%	
Missouri	✓	✓	✓	↑	1%	56%	
Montana	✓	✓		↓	5%	56%	
Nebraska	✓	✓		↑	1%	52%	
Nevada			✓	↑	0%	52%	
New Hampshire	✓			↑	2%	52%	
New Jersey	✓	✓	✓	↓	7%	56%	
New Mexico	✓	✓		↑	5%	57%	
New York		✓	✓	↑	46%	58%	
North Carolina	✓	✓	✓	↓	3%	57%	
North Dakota	✓	✓	✓	↑	0%	55%	
Ohio	✓	✓	✓	↑	5%	56%	
Oklahoma	✓	✓	✓	↓	15%	61%	
Oregon		✓		↓	18%	55%	
Pennsylvania	✓	✓	✓	↑	2%	52%	
Rhode Island	✓	✓	✓	↑	5%	44%	
South Carolina	✓	✓	✓	↑	6%	49%	
South Dakota	✓			↑	3%	51%	
Tennessee	✓		✓	↑	5%	53%	
Texas	✓			↑	4%	63%	
Utah	✓	✓	✓	↑	2%	52%	
Vermont	✓	✓	✓	↑	0%	56%	
Virginia	✓	✓		↑	1%	59%	
Washington	✓	✓	✓	↑	1%	58%	
West Virginia	✓			↑	13%	54%	
Wisconsin	✓	✓	✓	↑	4%	52%	
Wyoming	✓			↓	9%	53%	
51-state average	**N/A**	**N/A**	**N/A**	**N/A**	**5%**	**55%**	

Note: See "Appendix B: Methodology" for a description of TFAH's data-collection process and scoring details. States with conditional or pending accreditation at the time of data collection were classified as having accreditation. Some state residents use private drinking-water sources, rather than community water systems. Private sources are not captured by these data. Only regulated contaminants are measured. Paid time off includes sick leave, vacations, and holidays.

TABLE 7: ALL STATES/ALL INDICATORS

		Seasonal Flu Vaccination	Patient Safety	Public Health Lab Capacity	Avoidable Mortality		Performance Tier
		Seasonal flu vaccination rate for people ages 6 months or older, 2023–24	Percentage of hospitals with "A" grade, fall 2024	Public health laboratories had a written plan for a six- to eight-week surge in testing capacity, 2024	Total avoidable death rate (per 100,000), 2020-21	Avoidable death rate gap (per 100,000), 2020-21	Scoring tier, 2024
	Alabama	38.5	7%	✓	418	387	Middle
	Alaska	42.1	29%	✓	342	568	Low
	Arizona	41.1	28%	✓	363	743	Middle
	Arkansas	43.9	20%	✓	451	452	Middle
	California	48.5	45%		273	356	Middle
	Colorado	50.8	40%		271	402	High
	Connecticut	56	50%	✓	247	299	High
	Delaware	50.3	29%	✓	318	327	High
	D.C.	62.2	20%	✓	432	603	High
	Florida	39.5	37%	✓	327	316	High
	Georgia	41.4	22%	✓	356	311	High
	Hawaii	51.1	8%	✓	230	106	Low
	Idaho	37.9	43%	✓	268	414	High
	Illinois	46.7	29%	✓	299	473	Middle
	Indiana	44	25%	✓	367	426	Middle
	Iowa	49.4	0%	✓	285	378	Middle
	Kansas	46.2	26%	✓	328	426	Middle
	Kentucky	45.1	30%	✓	444	411	Middle
	Louisiana	38.8	37%	✓	449	410	Low
	Maine	55.6	31%	✓	282	430	High
	Maryland	57.4	27%	✓	302	307	High
	Massachusetts	62.2	29%	✓	222	211	High
	Michigan	47	27%	✓	344	506	Low
	Minnesota	51.7	11%	✓	230	784	Low
	Mississippi	33.7	16%	✓	519	863	Low
	Missouri	46.8	20%	✓	372	490	High
	Montana	40.4	33%	✓	323	868	Low
	Nebraska	47.5	20%	✓	266	694	Middle
	Nevada	36.2	30%	✓	356	319	Low
	New Hampshire	55.8	31%	✓	237	185	High
	New Jersey	52.7	46%	✓	258	354	High
	New Mexico	50.2	6%	✓	430	722	Low
	New York	52.5	22%	✓	268	293	Middle
	North Carolina	48.8	47%	✓	342	371	High
	North Dakota	45.2	0%	✓	285	946	Middle
	Ohio	46.4	25%	✓	366	444	High
	Oklahoma	40.6	33%	✓	460	463	Middle
	Oregon	47.7	15%	✓	267	328	Low
	Pennsylvania	48.5	41%	✓	307	413	High
	Rhode Island	60.6	44%	✓	253	192	High
	South Carolina	42.8	40%	✓	399	379	Middle
	South Dakota	48.7	0%	✓	326	1192	Low
	Tennessee	40.8	38%	✓	449	440	Middle
	Texas	45	35%	✓	348	340	Middle
	Utah	43.5	61%		238	438	High
	Vermont	57.2	0%	✓	249	263	High
	Virginia	52.5	58%	✓	285	316	High
	Washington	51.7	33%	✓	255	465	High
	West Virginia	44.1	5%	✓	493	479	Low
	Wisconsin	48.9	29%	✓	273	446	High
	Wyoming	36.4	11%	✓	354	1069	Low
	51-state average	**47.3**	**27%**	**N/A**	**330**	**467**	**N/A**

The patient safety measure captures only general acute-care hospitals. "Avoidable" deaths are those that could be prevented through effective public health measures or averted with timely, high-quality health care. The avoidable mortality rate gap reflects the difference between the racial/ethnic group in a state with the highest rate of premature deaths from preventable or treatable causes and the group with the lowest rate.

Policy Recommendations

The nation's health security is foundational to the economic security, health, and well-being of every community. TFAH's recommendations for action by policymakers, public health officials, healthcare system and providers, community leaders, and businesses are intended to build a nation that is safer, more resilient, and better prepared for longstanding and emerging health threats.

TFAH based the following policy recommendations on research and analysis, consultation with experts, and a review of gaps in federal and state preparedness. These recommendations are directed toward policymakers at all levels as well as other sectors to improve public health emergency readiness. They are intended to build a stronger foundation for responding to a range of public health emergencies.

TFAH's recommendations cross seven priority areas:

- **Priority Area 1: Provide Stable, Flexible, and Sufficient Funding for Domestic and Global Public Health Security**
- **Priority Area 2: Ensure Effective Leadership and Coordination**
- **Priority Area 3: Prevent and Respond to Outbreaks and Pandemics**
- **Priority Area 4: Build Healthy and Resilient Communities to Strengthen Preparedness**
- **Priority Area 5: Accelerate Development and Distribution of Medical Countermeasures**
- **Priority Area 6: Ready the Healthcare System to Respond and Recover**
- **Priority Area 7: Prepare for Environmental Threats and Extreme Weather**

Editor's note: *These recommendations were finalized in February of 2025.*

Priority Area 1: Provide Stable, Flexible, and Sufficient Funding for Domestic and Global Public Health Security

Congress has made impactful investments in public health infrastructure, workforce, and data capabilities over the past five years. These investments are paying off. Thanks to funding for CDC's Data Modernization, from January 2020 to February 2025, the number of healthcare facilities using electronic case reporting to public health agencies increased from 153 to over 50,000 in all 50 states and three territories.[183] This automatic exchange of data significantly reduces staff time and speeds the detection of outbreaks.[184] The newly formed CDC Center for Forecasting and Outbreak Analytics, which improves response to public health emergencies by advancing outbreak-forecasting tools and techniques, has already helped advance disease predictions for COVID-19, measles, Mpox, polio, and acute pediatric hepatitis.[185] Communities across the country have filled long-standing vacancies thanks to investments in the public health workforce. However, due to funding cliffs, this progress is at risk.

Building and sustaining public health preparedness systems require more than onetime investments. Funding cuts do not only impact federal agencies, they affect the health security of every state and community. More than 80 percent of CDC's domestic funding is allocated to state, local, territorial, and tribal health departments, academic partners, and community-based organizations to protect the nation's health and contain health threats. The recommendations below are critical to sustaining the nation's defenses against health emergencies.

RECOMMENDATIONS FOR FEDERAL GOVERNMENT:

- **Congress should protect and increase overall funding for CDC to strengthen public health and save lives nationwide.** TFAH supports providing sustained, predictable annual appropriations for CDC of at least $11.5 billion in FY 2026, with continued growth in the years that follow.
- **Congress and state lawmakers should ensure continuous improvement of public health infrastructure.** TFAH supports sustained funding for the people, services, and systems needed to build foundational public health capabilities and provide essential services nationwide. Congress should enact legislation such as the Public Health Infrastructure Saves Lives Act, which would provide ongoing funding for CDC's Public Health Infrastructure Program to ensure health departments have more effective emergency responses, faster disease detection, and continuous progress toward preventing chronic diseases. In the interim, Congress should provide at least $1 billion in annual appropriations for CDC's Public Health Infrastructure Grant program, ramping up to $4.5 billion per year.
- **Congress should expand public health emergency preparedness funding for state, tribal, local, and territorial jurisdictions.** CDC's Public Health Emergency Preparedness (PHEP) cooperative agreement requires at least $1 billion per year in the near term. PHEP has saved lives by building and maintaining a nationwide public health emergency management system that enables communities to prepare for and rapidly respond to public health threats. PHEP supports nearly 6,000 state, tribal, local, and territorial preparedness staff across the country, including significant investments in laboratory, medical countermeasures distribution, and epidemiological infrastructure.
- **Congress should invest in continuous public health data modernization.** CDC's Public Health Data Modernization is designed to update and sustain the data infrastructure at CDC and at state, local, tribal, and territorial health departments. This initiative enables real-time and actionable data to improve responses to epidemics and the effectiveness of related programs. Investments to date are already yielding benefits, such as faster case reporting, improved interoperability with clinical care systems, and reduced staff hours needed by both healthcare and public health workers. *The Data: Elemental to Health* campaign estimates at least $7.84 billion is needed over the next five years to strengthen public health data collection and reporting at the state and local levels.[186]
- **Congress should increase overall funding for the Administration for Strategic Preparedness and Response (ASPR).** Increasing ASPR's base budget would enable a more effective preparedness and response infrastructure at the agency. In addition to key preparedness program and policy work, ASPR deploys response teams for a range of emergencies—from wildfires to overrun hospitals—but receives limited funding to both prepare and respond.

- **Congress should create a Health Defense Operations budget designation to exempt health defense programs central to health security from the annual discretionary budget allocations and to ensure these critical activities receive the sustainable resources necessary to secure Americans' health, economic, and national security.** The biodefense exemptions would include programs such as PHEP, the Hospital Preparedness Program, the Strategic National Stockpile, and other critical programs. Budget caps and competing priorities in the nondefense discretionary budget category continue to constrain annual discretionary appropriations, making it nearly impossible to invest in medium- to long-term health defense.

- **Policymakers at all levels should expand strategies to recruit, train, and retain public health personnel at all levels.** Federal, state, and local governments must prioritize recruitment and retention of the health security workforce, including addressing barriers to hiring. Congress can build the public health workforce by expanding CDC's Public Health Workforce line, which includes programs that embed professionals into state, tribal, local, territorial health agencies. Congress should also add $100 million per year for Public Health AmeriCorps, which faces a funding cliff that will effectively end the program. The program has successfully recruited and trained future public health leaders to address health needs in rural, urban, and tribal underserved communities. Congress should also support recruitment and retention of the workforce by funding the Health Resources and Services Administration's Public Health Workforce Loan Repayment Program. The U.S. Department of Education and the U.S. Department of the Treasury should expand student loan repayment and forgiveness programs for public health workers, including current public health workers.

- **Congress should accelerate emergency response through existing crisis-response mechanisms and faster, flexible supplemental funding.** In addition to stable core funding, the federal government needs readily available funds on hand to enable a rapid response while Congress assesses the necessity for supplemental funding. Congress should continue a no-year infusion of funds into the Public Health Emergency Rapid Response Fund and/or the Infectious Diseases Rapid Response Reserve Fund to serve as available funding that may provide a temporary bridge between preparedness and supplemental emergency funds. Congress should also pass emergency supplemental funding quickly and allow sufficient flexibility in such funding so awardees can leverage funds for overlapping emergencies.

- **Congress and the executive branch should demonstrate a long-term, sustainable commitment to global health security** by implementing the global health security goals laid out in the National Biodefense Strategy and the U.S. Global Health Security Strategy. The United States should advance U.S. health and national security interests by rebuilding partnerships with international bodies, such as the World Health Organization (WHO), while working with partner countries to strengthen core public health capabilities. Congress should solidify America's role as a global health leader by committing sufficient resources to proven initiatives, such as CDC's Global Public Health Protection program, the Field Epidemiology Training and Global Laboratory Leadership Programme, Public Health Emergency Operations Centers, and National Public Health Institutes. Congress should fund and CDC should implement the modernization of the U.S. port health system, including information technology systems, port health stations, and traveler engagement and information.

Priority Area 2: Ensure Effective Leadership and Coordination

Safeguarding the health of communities during emergencies is a core responsibility of public health and its partners at all levels. The U.S. Constitution sets a framework for the federal government and states to protect the health of communities and to take actions to stop the spread of infectious diseases into the United States.[187,188] Recently, some state legislatures have acted to restrict the authority of health officials to respond to an emergency—limiting, for example, the ability to issue emergency orders (even when they are reviewable by the courts), making it more difficult for states and localities to control outbreaks.[189] In addition, some proposals to divide federal agencies by function or eliminate operating divisions would make it much more difficult to respond effectively to disasters and outbreaks. As eight former CDC directors, who served in both Republican and Democratic administrations, recently stated, "Limiting our health defense to just some threats would be like allowing our military to protect us from only some types of attack, telling the National Weather Service to warn people about tornadoes but not hurricanes, or allowing doctors to treat only some diseases."[190]

Policymakers at all levels must continue to shore up the leadership, coordination, and legal authorities of the agencies tasked with protecting the nation against health threats and must work to earn the trust of its residents.

RECOMMENDATIONS FOR FEDERAL, STATE, AND LOCAL GOVERNMENT:

- **Congress should reauthorize the Pandemic and All-Hazards Preparedness Act (PAHPA).** PAHPA provides the statutory framework for the nation's health emergency enterprise, including public health and healthcare-readiness grants, medical countermeasures research and development, and situational awareness. Congress should leverage the opportunity to enact legislation to transform and modernize preparedness efforts through the provisions described below. Congress should avoid using PAHPA as a vehicle for weakening federal health authorities.
- **The White House should maintain coordination and leadership around public health emergencies and biodefense.** Given the threat of bird flu, Ebola, and other global events, the White House should preserve the Office of Pandemic Preparedness and Response Policy to ensure permanent public health security leadership in the White House to advise the president and coordinate interagency activities around biodefense.
- **The Administration and Congress should ensure federal health operating agencies have the workforce, expertise, and resources needed to protect the nation's health.** Proposals to fundamentally alter federal health agencies are detrimental to promoting and protecting the public's health during emergencies and would be an inefficient use of taxpayer dollars. These proposals would create needless divisions across programs that typically work together in emergency responses.
- **The Administration should protect the scientific integrity of public health agencies and leaders.** The U.S. Department of Health and Human Services (HHS) should finalize and implement its updated Scientific Integrity Policy to ensure the independence, transparency, and accountability of scientific processes

across the agency. The Administration and public health agencies should make policy decisions based on the best available science, with collaboration from public health experts in communication and policy, to support transparent, clear, actionable, and options-based guidance.

- **HHS agencies should continue to prioritize the development of public health guidance that is timely, rooted in science, and easy to understand and implement.** During emerging health threats, HHS agencies should clarify that guidance is based on the best available information and therefore will need to adapt as more evidence becomes known. Guidance may need to be adapted to different regions and audiences, including tribes and territories.

- **Congress should enact the Improving Data Accessibility Through Advancements (DATA) in Public Health Act to strengthen and streamline public health data reporting.** The legislation would establish uniform standards for sharing public health data and allow HHS to strengthen data-sharing processes between public and private health entities. Such legislation updates archaic health data-sharing standards while ensuring confidentiality of data.

- **Congress and the Administration should ensure timely, complete, disaggregated demographic data collection and reporting, including during public health emergencies.** Complete, disaggregated public health data as outlined in *Statistical Policy Directive No. 15: Standards on Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity*, are vital to effective public health preparedness and response. HHS and public health departments should build on progress thus far to ensure demographic data disaggregation are central to data-modernization efforts, including prioritizing funding for under-resourced communities, educating and working with patients and providers, and ensuring sustained community engagement in decisions around public health data-system design and use.[191]

- **Lawmakers and courts should reject laws that weaken or preempt public health authorities, which could threaten such basic public health protections as outbreak detection, vaccination, and response.** To fulfill their core functions, public health agencies need the authority to act effectively and efficiently to support the public's health, including by collecting data to inform policy; administering programs and services, such as those that help to reduce the spread of disease; and investigating and controlling the spread of disease through testing, tracing, and other effective measures.[192] Courts should strive to support public health authorities by continuing to uphold laws and policies that are reasonably related to public health and safety and that properly balance the common good against constitutionally guaranteed individual rights.

- **Congress and HHS should invest in and prioritize effective and accurate public health communications.** Agency communications with the public regarding health issues should be timely, clear, credible, and actionable by different audiences. Public health communications funding should include research into best practices for different audiences, creating mechanisms for effectively engaging and listening to communities, incorporating communications into planning and response, and modernizing communication channels. HHS and its agencies should engage with and provide resources to a diverse group of community partners and maintain a trusted messenger network to research and test effective messaging, counter and prevent intentional or unintentional false information, assist in message development, and conduct outreach.

Priority Area 3: Prevent and Respond to Outbreaks and Pandemics

Protecting Americans from infectious disease outbreaks—through cleaner water and food, sanitation, improved disease detection and testing, and vaccination—are among the most impactful public health achievements of the 20th century.[193,194] In fact, these advances contributed to a sharp decline in infant and child mortality and a nearly 30-year increase in life expectancy over the century.[195] However, outbreaks of measles and other highly contagious infections, lower rates of childhood vaccination, and the looming threat of H5N1 bird flu demonstrate that the nation cannot let its guard down. The only way to stay ahead of outbreaks is to shore up prevention, detection, and response capacities across the country.

RECOMMENDATIONS FOR FEDERAL AND STATE GOVERNMENT AND HEALTHCARE:

- **Congress should support CDC's National Immunization Programs.** Congress should provide significant increases for CDC's National Immunization Programs to support immunization infrastructure, outbreak response, and vaccine delivery across the country. The Immunization Program supports state, local, and territorial immunization systems to increase vaccination rates among uninsured and underinsured adults and children as well as to respond to outbreaks of vaccine-preventable diseases. However, the growing number of outbreaks and increasing costs of immunizations means states have less money to support these efforts. Increased funding would enable jurisdictions to better respond to outbreaks, educate the public, target populations experiencing worse outcomes, improve vaccine confidence, establish partnerships with trusted messengers, and operate data systems. Congress should also increase annual funding to study and address the causes of vaccine hesitance and improve communications and engagement.
- **Congress should enact legislation to ensure access to vaccines for uninsured and underinsured adults.** Uninsured and underinsured adults still face barriers to vaccination. A recent study found that adult vaccines could return up to 19 times their initial investment in health and economic benefits.[196] Congress should enact legislation to authorize a permanent program to enable all uninsured and underinsured adults to have access to recommended vaccines at no cost.
- **HHS, states, and healthcare systems should enable universal childhood vaccinations and increased vaccination of healthcare workers.** States should enact, protect, or strengthen policies that enable universal childhood vaccinations to ensure children, school personnel, and the public are protected from vaccine-preventable diseases. Healthcare personnel should receive all Advisory Committee on Immunization Practices–recommended vaccinations to protect staff and patients and to achieve necessary healthcare infection control. Healthcare facilities should ensure access to and education about vaccines for all staff and contractors, and they should remove any barriers to staff receiving vaccines. HHS should ensure that information shared with the public regarding vaccines remains rooted in the best available scientific evidence.

- **Congress should enable next-generation detection and forecasting of pathogens.** Congress should continue funding for CDC's modernized outbreak-detection capabilities, including sustainable support for expanded wastewater surveillance for infectious diseases and the national infrastructure for genomic sequencing through the Advanced Molecular Detection Program. Congress should continue funding for the Center for Forecasting and Outbreak Analytics. Congress should also continue to invest in core infectious disease–detection capabilities across the country through the Epidemiology and Laboratory Capacity program.

- **Congress should take significant steps to address antimicrobial resistance (AMR).** Public-private partnership in drug, diagnostic, and vaccine development and antimicrobial stewardship is imperative. Congress should enact a new financing mechanism for novel antimicrobials that delinks payment from volume used in order to drive sustainable innovation. Congress should also provide resources to antimicrobial stewardship programs in healthcare facilities. Congress should increase funding for HHS initiatives to combat antimicrobial resistance through increased support for CDC's Antimicrobial Resistance Solutions Initiative, which funds Healthcare Associated Infection & Antimicrobial Resistance Programs, the Antimicrobial Resistance Laboratory Network, and global AMR and infection-prevention and -control programs.

- **Centers for Medicare & Medicaid Services (CMS), CDC, and other healthcare entities should improve infection prevention and decrease inappropriate use of antibiotics and antifungals by implementing infection-prevention and -control efforts and bolstering antibiotic stewardship and use reporting.** CMS should enforce infection-prevention efforts and stewardship requirements for hospitals and long-term care facilities and work with public health stakeholders to track progress in healthcare-associated infections, antibiotic and antifungal prescribing rates, and resistance patterns.[197] CMS and CDC should work with healthcare, public health, professional societies, and patient advocates to develop improvements to the current infection-prevention and -control efforts and to promote Condition of Participation programs, such as by creating staffing standards to ensure that infection-prevention and stewardship programs are sufficiently resourced to meet their goals. CMS should also advance policies to improve outpatient antibiotic prescribing, such as through quality measures and value-based reimbursement programs. All relevant facilities must improve their reporting of infections and antimicrobial use and resistance through the National Healthcare Safety Network, adopt stewardship programs that meet CDC's Core Elements, and improve healthcare worker training on infection-prevention and -control efforts and the importance of the appropriate use of antibiotics and antifungals across healthcare settings.[198]

- **Congress should create a national standard requiring employers to provide job-protected paid sick, family, and medical leave for all employees,** including for taking care of a sick family member or staying home when sick themselves. Paid sick leave has public health benefits, such as reducing the risk of spreading infections among employees and customers, while paid family leave is proven to improve maternal and child health.[199,200]

Priority Area 4: Build Healthy and Resilient Communities to Strengthen Preparedness

Some communities and populations are at higher risk of negative health outcomes from outbreaks and disasters because of age, high rates of chronic disease, socioeconomic and health disparities, mental health conditions, and other factors. Emergencies can also exacerbate chronic health conditions and mental health concerns due to disaster-related stress, interruption of care, poor nutrition and hydration, and exposure to environmental hazards.[201] Keeping people healthier in the first place and engaging community groups in emergency planning will contribute to more resilient populations during health emergencies.

RECOMMENDATIONS FOR FEDERAL, STATE, AND LOCAL GOVERNMENT AND COMMUNITY LEADERS:

- **Congress, agencies at all levels of government, and their grantees should plan with communities, rather than *for* them, and provide resources and technical assistance to community-based organizations to enhance resilience before, during, and after an event.** All sectors involved in emergency planning and response must conduct meaningful engagement, partnerships, and listening efforts and work together to identify and plan with communities at higher risk of health impacts during an emergency, such as older adults, people living in rural or underserved areas, people with disabilities, people experiencing homelessness, organizations that serve youth, and individuals with chronic health conditions. These efforts should include direct resources to community-based organizations and community health networks that work with groups that bear a disproportionate risk during emergencies. Doing so will help ensure emergency plans, procedures, communications strategies, and evacuation shelters meet the needs of all in the community.

- **Congress should invest in the capacity to address the non-medical drivers of health.** People at highest risk during disasters and those who have the hardest time recovering are often those with unstable or unhealthy housing, those with limited access to transportation, and those who live in low-socioeconomic-status communities.[202] Addressing these non-medical factors, sometimes called social determinants of health (SDOH), can improve community resilience. Congress should ensure that CDC is able to continue its research and incorporate best practices related to non-medical drivers into its preparedness, infectious and chronic disease work. The Centers for Medicare & Medicaid Services should continue to support state efforts to address beneficiaries' health-related social needs.

- **All levels of government should adopt strategies and accountability metrics to incorporate community resilience and health into preparedness, including HHS, CDC, state, local, tribal, and territorial governments should build up internal infrastructure to reduce disparities in emergency responses by:**
  - Identifying a leadership role in the emergency operations center and/or incident command structure for all-hazards events focused on community resilience and health.
  - Developing and disseminating communications materials that are culturally and linguistically tailored; and to collect and leverage data to identify unique community assets and measures of well-being before and during events.

- **HHS should increase transparency of its progress on the recommendations of the National Advisory Committee on Children and Disasters, National Advisory Committee on Individuals with Disabilities and Disasters, and National Advisory Committee on Seniors and Disasters.** The federal government should formally respond to the Advisory Committees' recommendations (where possible), including an explanation of how the government plans to implement the recommendations and, if not, what the barriers to implementation are.

- **Jurisdictions, CMS, and the Substance Abuse and Mental Health Services Administration (SAMHSA) should address mental health and substance use gaps, bolster crisis resources, and incorporate mental health first-aid and treatment access into disaster response and recovery strategies.** All jurisdictions should assess existing mental health and substance use resources and gaps before the next emergency, strengthen partnerships across sectors, and incorporate these assets into preparedness planning. CMS and other policymakers must consider in advance what waivers may be needed to ensure continuity of care for people in treatment. SAMHSA can bolster preparedness efforts by increasing research and monitoring of disaster behavioral health issues, the impact of climate emergencies and extreme weather on behavioral health, and effective post-disaster interventions.

For additional discussion of strengthening the prevention of alcohol, drug, and suicide deaths, see TFAH's Pain in the Nation *report series.*

Priority Area 5: Accelerate Development and Distribution of Medical Countermeasures

Effective medical countermeasures (MCM) enterprises have the power to disarm future chemical, biological, radiological, and nuclear threats. Public-private partnership is essential to protecting lives against high-consequence events. Policymakers must continue to support American innovation in this space, so the country is equipped to protect health and economic security during future emergencies. The United States has achieved notable progress in MCM research, development, and procurement, but the system is precarious without sustained investment. The success of the MCM system depends on continual support from initial research through distribution and dispensing.

RECOMMENDATIONS FOR FEDERAL GOVERNMENT AND PRIVATE-SECTOR PARTNERS:

- **Congress should invest in MCM research, development, stockpiling, and distribution for a range of pathogens as well as for threat-agnostic products.** Supporting the entire public health emergency MCM enterprise—from seed research to distribution—across HHS is needed to neutralize the risk of known and unknown health threats. Congress should provide additional funding for ASPR to address emerging infectious diseases, which remain a serious threat to human health. The United States should continue to grow its investment in innovative, flexible technologies, products, and platforms that will enable faster production of items for a range of threats, rather than only focusing on products for a single pathogen.
- **HHS should continue to improve the Public Health Emergency Management Countermeasure Enterprise leadership and transparency.** ASPR should continue to ensure coordinated, aligned, and transparent MCM activities across HHS and other relevant agencies and with private-sector, public health, and academic partners. These activities should include regular interagency meetings; engagement with private-sector and nonprofit supply-chain partners; improved transparency and coordination with state, local, tribal, and territorial agencies; and collaborative long-term planning and evaluation. HHS should clarify roles and responsibilities for supply-chain management in consultation with private-sector and public health partners, and it should develop and disseminate best practices for supply management.[203]
- **Congress should provide ASPR additional contracting authorities, similar to those of the U.S. Department of Defense, to enable the agency to quickly procure supplies needed for public health security.**
- **Congress should pass the Protecting America from Seasonal and Pandemic Influenza Act to strengthen the pipeline of influenza vaccines, diagnostics, and therapeutics.** The comprehensive authorizing bill would implement and build on the National Influenza Vaccine Modernization Strategy. The bill would take steps to speed up vaccine development, support immunization information systems, strengthen the supply chain for these products, and authorize sustainable funding for the federal influenza ecosystem.
- **HHS should improve MCM guidance, communications, and dispensing for groups at higher risk of health impacts during an event.** HHS should consult with experts and work with healthcare professionals and state, local, tribal, and territorial public health partners to develop standardized guidance for dispensing MCMs to groups such as infants, children, pregnant and postpartum people, older adults, people with disabilities, and people who are homebound. HHS and state, local, tribal, and territorial agencies should leverage public-private partnerships for communications as well as for dispensing and administering MCM, especially to communities at disproportionate risk. Communities need to be engaged before an outbreak or event to ensure their understanding of the risks, benefits, and distribution challenges of introducing a medical product to a large portion of the population and ultimately improving acceptance and access to MCMs. It is important to provide clear and accurate guidance to the public in multiple formats and languages, via trusted sources and multiple communications channels, including formats that are accessible to people with low literacy and/or hearing or vision loss.

Priority Area 6: Ready the Healthcare System to Respond and Recover

Ensuring the healthcare system is equipped to continue care during emergencies is a significant challenge, compounding the strain healthcare facilities face every day. Workforce shortages and hospital closures are disrupting how people receive care, especially in rural and underserved areas. Add in a natural disaster, severe respiratory virus season, or serious disease outbreak, and many healthcare facilities are unable to endure. Health system readiness is an essential element of health security and recovery. Readiness benefits the healthcare systems, their patients and staff, and the communities they serve.

RECOMMENDATIONS FOR FEDERAL GOVERNMENT AND HEALTHCARE:

- **Congress should fortify the emergency readiness of the healthcare delivery system by increasing its investment in ASPR's Health Care Readiness programs.** The portfolio of programs includes the Hospital Preparedness Program, Regional Disaster Health Response System, and National Special Pathogen System. The programs receive less than $250 million in annual funding to support the readiness of the nation's healthcare delivery system; even so, they have helped save lives during disasters across the country.
- **ASPR should strengthen requirements under the Hospital Preparedness Program to include crisis standards-of-care planning and mandate that hospital participants complete a Pediatric Readiness Assessment, as recommended by the National Advisory Committee on Children and Disasters.**
- **Congress and HHS should create incentives and ramifications to build sustainable preparedness and surge capacity across healthcare systems.** In addition to strengthening existing systems, Congress and HHS should consider long-term sustainability for building healthcare readiness across the system, including meaningful incentives and disincentives for sustained preparedness, specialized care, and surge capacity. Congress and HHS should also consider an external self-regulatory body—in alignment with federal policy goals—that would set, validate, and enforce standards for healthcare facility readiness, stratified by facility type, with authority for financial ramifications.[204]
- **The Assistant Secretary for Technology Policy and Office of National Coordinator for Health Information Technology (ASTP/ONC) should advance additional rules that promote efficient and timely data exchange between healthcare and public health to improve the ability of public health agencies to respond to threats.** New rules may include a certification program for public health tools and products that support standards-based data exchange and should work to ensure that public health has the resources and time needed to meet certification requirements.
- **Emergency management, public health, and healthcare leaders should work together to integrate healthcare delivery into emergency preparedness and response.** All jurisdictions should continue to increase engagement and integration of the healthcare sector into emergency planning and responses, including plugging healthcare coalitions and other entities representing private

healthcare and the healthcare supply chain into emergency planning and response and incident command. Health systems, healthcare coalitions, and public health should develop memoranda of understanding ahead of disasters to improve situational awareness across healthcare and to enable movement of patients, personnel, and supplies. Private-sector healthcare leadership should prioritize preparedness by supporting meaningful participation in healthcare coalitions, trainings, workforce protections, regular exercises, drills for a range of disasters, and detection and reporting for emerging threats.

- **States should strengthen policies regarding disaster healthcare delivery, surge capacity, and crisis standards of care.** States should review credentialing standards to ensure healthcare facilities can call on providers from outside their states, and health systems should ensure they can receive outside providers quickly during a surge response. To promote healthcare readiness and ease the ability to surge care and services, states should adopt policies such as the NLC, the Interstate Medical Licensure Compact, the Recognition of EMS Personnel Licensure Interstate CompAct,[205] the Uniform Emergency Volunteer Health Practitioners Act,[206] emergency prescription refill laws and protocols, and implementation and education of providers regarding crisis standards-of-care guidelines.[207,208] State and healthcare leaders must take crisis standards-of-care planning and implementation seriously and ensure transparency for healthcare providers who must make decisions in constrained conditions. Jurisdictions must ensure equitable application of crisis standards of care so as not to create or exacerbate disparities.
- **Congress and state lawmakers should continue to expand access to and improve the affordability of health insurance.** Doing so includes extending marketplace subsidies that are set to expire after 2025 and supporting incentives for the expansion of Medicaid in remaining states.
- **Should federal courts overturn part or all of the Affordable Care Act's preventive-services requirements, Congress should act quickly to restore coverage of such services without cost-sharing.** A court ruling could disrupt access to life-saving preventive services, such as vaccines, to millions of Americans.

Priority Area 7: Prepare for Environmental Threats and Extreme Weather

Environmental hazards pose significant and growing threats to human health. Whether exposure to wildfire smoke in the western United States, water and food safety issues resulting from Hurricane Helene, or a chemical fire in Georgia, states across the country worked across agencies, with federal partners, and across sectors to keep their residents safe in 2024. Environmental health involves detecting and protecting people from hazardous conditions in air, water, food, and other settings, and it is therefore a critical component of the nation's health security.

RECOMMENDATIONS FOR FEDERAL AND STATE GOVERNMENT:

- **Congress should support nationwide efforts to protect against environmental and climate-related health threats through CDC's National Center for Environmental Health (NCEH).** NCEH safeguards the health of people across the country from environmental hazards such as lead poisoning, chemical and radiological hazards, and extreme weather, but limited funding prevents lifesaving programs from reaching all states. Congress should provide sufficient funding for NCEH programs to reach all states and territories.
- **Congress should also increase funding to extend CDC's National Environmental Public Health Tracking Program to every state.** The network helps states collect key data around environmental health threats and target interventions to save lives. The Tracking Network also partners with the Climate and Health Program and National Oceanic and Atmospheric Administration on the Heat and Health Tracker, a national resource that provides local heat and health information so communities can better prepare for and respond to extreme heat events.
- **Congress should expand the ability of the Agency for Toxic Substances and Disease Registry (ATSDR) to respond to emergencies.** Congress should provide at least $100 million in funding for ATSDR in the near term. ATSDR's expertise and ability to respond around the clock have been critical in addressing chemical incidents through Assessment of Chemical Exposures (ACE), including events like the East Palestine, Ohio, train derailment, and Red Hill jet-fuel leak. ATSDR capabilities are also utilized in other environmental incidents such as Canadian wildfire smoke and contamination from PFAS. ATSDR expands the environmental health capacity in state health departments, allowing them to do critical work to identify if and how people are exposed to hazardous substances and make recommendations to prevent and address those exposures.
- **Congress and the Administration should ensure there is an HHS office focused on addressing climate-related health impacts.** The office would coordinate and align efforts across the agency to develop community and health sector resilience against environmental events, particularly within populations and geographic regions that are disproportionately impacted.

- **Congress and the Administration should support interagency efforts to address the impact of extreme heat on health.** The burden of extreme heat is not evenly distributed across populations; older adults, young children, pregnant people, individuals with chronic and mental health conditions, people with disabilities, people with low incomes, people who work outdoors, people who are unhoused, and some communities of color face the most risk. Extreme heat can also be a significant contributor to severe maternal morbidity and is the leading cause of weather-related death in the United States.[209] Congress should sustain funding for multiagency efforts to address the health impacts of extreme heat, including the National Integrated Heat Health Information System.

- **The White House, EPA, and federal partners should take steps to improve indoor and outdoor air quality.** Poor indoor air quality is a significant environmental health risk, one that is exacerbated during emergencies like wildfires and extreme heat events,[210] and drives the spread of transmission of many infectious diseases.[211] Yet, healthy indoor air quality is not well-defined and is largely unregulated.[212] The EPA, in collaboration with CDC, the National Institute for Occupational Safety and Health, and other relevant federal agencies, should establish guidelines for indoor air quality in public buildings and schools and provide incentives for retrofitting existing buildings. The administration should also protect, enforce, and strengthen the Clean Air Act, in particular the National Ambient Air Quality Standards, which place national limits on pollutants such as particulate matter (soot) and ozone (smog). The EPA should protect particulate-matter standards from legal challenges and continue to build on this progress to protect public health.

- **The Administration and Congress should protect and strengthen the Clean Water Rule to safeguard clean water for all U.S. residents.** The rule includes measures to ensure a safe water supply, such as by addressing the ongoing problem of lead, PFAS, and algal toxins in drinking water; taking steps to reduce the potential for waterborne illnesses; and increasing protection against potential acts of terrorism on America's drinking and agricultural water systems.

- **Every state should develop a comprehensive climate vulnerability assessment and adaptation plan, integrating public health in line with CDC's Building Resilience Against Climate Effects (BRACE) framework.** The BRACE framework can help jurisdictions identify likely climate-related health impacts, as well as populations and locations at high risk of these health impacts, and it can help jurisdictions create and implement adaptation plans. State and local public health officials should also weave environmental health considerations into their emergency operations planning and incident command systems. As interventions are put into practice, continuous evaluation and quality improvement should be prioritized to ensure their effectiveness.

Year in Review: An Overview of 2024's Major Public Health Emergencies, Threats, Reports, and Strategies

Food Safety

According to the FDA, through October, nearly 1,200 food products were recalled for the year. In 2023 over 2,000 food recalls took place.[213] Food products recalled due to E-coli outbreaks included organic carrots, onions, organic walnuts, raw cheese, and ground beef.[214] During the year, salmonella outbreaks linked to food included eggs, cucumbers, fresh basil, and charcuterie meats.[215]

CDC estimates that about 48 million people are sickened every year due to foodborne illness, about 128,000 are hospitalized, and approximately 3,000 die.[216]

Environmental Hazards

PFAS

Data collected by the EPA found that approximately 143 million people in communities across the United States used drinking water that tested positive for Per- and polyfluoroalkyl (PFAS), so called "forever chemicals."[217] More needs to be learned about the health effects of PFAS exposure. Current data suggests links between exposure to PFAS and increased cholesterol, changes in liver enzymes, some cancers, and pregnancy-induced hypertension and preeclampsia.[218]

Chemical Fire

In September, a massive fire broke out at a chemical plant in Conyers, Georgia, resulting in plumes of toxic smoke containing chlorine and other hazardous substances.[219]

Extreme Weather Events

Drought

As of November, 41 percent of the United States and Puerto Rico and nearly 50 percent of the lower 48 states were experiencing drought conditions.[220] Almost 93 percent of states in the Northeast experienced abnormal dryness or drought in October leading to high fire risk and low reservoir levels.[221]

Floods

A record 91 flash-flood emergencies were issued by the National Weather Service through October. Scientists point to the warming planet as the reason for the extreme rainfall associated with flash floods.[222]

In May, the Houston area picked up nearly two months' worth of rain in a single day, leading to widespread flooding and evacuations. More than 400 people had to be rescued from their homes.[223]

Extreme Heat

Last year, 2024, was the hottest year on record and the first year in which a warming limit set by the Paris Climate Agreement was surpassed.[224] According to NASA data, July 22 was the hottest day ever recorded on Earth.[225]

Phoenix, Arizona, experienced 113 consecutive days of temperatures over 100 degrees leading to hundreds of heat-related deaths and scores of wildfires.[226]

In May 2024, Delhi, the capital of India, experienced an all-time heat record of 49.9 degrees Celsius (121.8 Fahrenheit).[227] According to a University of Cambridge study, heat waves in India are fueled by environmental conditions and are a threat to the population's health and the nation's economic development.[228]

June 2024 was the warmest June on record globally in NOAA's 175 years of temperature tracking.[229] During the month, approximately 100 million people, about one-third of the U.S. population, were under excessive heat warnings, including for temperatures close to or above the 100-degree mark in parts of Arizona, the Midwest, and the South and Northeast regions of the country.[230]

A study published in April found that emergency department visits for heat-related illnesses, such as heat exhaustion or heat stroke, substantially increased in several U.S. regions in 2023 compared with previous years. Emergency department visits in those regions remained high for a prolonged period.[231]

Hurricanes

Through November, the United States experienced 11 hurricanes, including five major hurricanes (i.e., a category 3 or higher storm). Named storms and hurricanes typically average 14 and seven, respectively, per year.[232]

Hurricane Helene was a category 4 storm. It led to 234 deaths, destroyed homes, roads, and businesses along a 500-mile path through Florida, Georgia, Tennessee, and North Carolina. Helene was the third-deadliest hurricane of the 21st century. Estimates of storm damage ranged from $225 to $250 billion.

Tornadoes

The total number of tornadoes in the United States stood at 1,670 as of September, only three years on record had similar count totals since 1950. Tornadoes were reported in 30 states.[233]

Wildfires

Nationally, the 2024 wildfire season was one of the worst on record. In October, 404 wildfires threatening 1.6 million acres and scores of communities were active, including in interior parts of the country and on both coasts.[234]

In December, the Franklin Fire in the Malibu area of California burned over 4,000 acres. The fire was extremely fast-spreading and fueled by high winds and dry conditions.[235]

Between August and November, California experienced 10 major wildfire incidents; more than 1 million acres within the state were burned and 1,708 structures were destroyed.[236]

In November, a fast-moving fire named the Mountain Fire fueled by strong winds southwest of Los Angeles forced the evacuation of more than 10,000 residents. More than 30,000 people lost power due to the fire.[237]

The February Smokehouse Creek Fire in the panhandle section of Texas was the largest in the state's history, scorching more than 1 million acres. The fire took three weeks to contain.[238]

Infectious Diseases

H5N1 Bird Flu

As of February 2025, CDC, working with local public health officials, had confirmed 70 cases of H5N1 bird flu in people across the United States during the current outbreak.[239] The sources of infection included both infected poultry and infected dairy cows. The majority of the infected persons had minor symptoms.[240] In late November, a suspected case of bird flu in a California child was confirmed. The child experienced mild symptoms and was treated with flu antivirals.[241] In January, a first human death (a Louisiana resident over 65 years of age) associated with H5N1 was reported.[242] Health officials believe the victim was exposed to infected birds in backyard flocks.[243]

As of early February 2025, H5N1 outbreaks had been reported in 972 infected dairy herds in 16 states. In addition, infected poultry flocks were reported in 51 jurisdictions, spreading to over 162 million birds.[244]

In January 2025, CDC released an advisory to health providers that patients hospitalized due to flu symptoms should be tested for H5N1 within 24 hours of being admitted.[245]

Also in January, the Biden-Harris Administration committed an additional $306 million to strengthen multiple aspects of H5N1 preparedness, including testing, disease tracking, hospital readiness, and research on therapeutics, diagnostics, and vaccines.[246]

In December, California Governor Gavin Newsom declared a state of emergency to "streamline and expedite the state's response to Avian Influenza A (H5N1)."[247]

In December, the USDA announced a new National Milk Testing Strategy requiring that unpasteurized (raw) milk samples be collected and sent to USDA for testing upon request. Samples could be collected from dairy farms, milk transporters, milk transfer stations, and dairy-processing facilities.[248] A USDA order in April required that all lactating dairy cows be tested for H5N1 before interstate shipment.[249]

During the summer months, a study conducted of people in Michigan and Colorado who worked on farms with infected cows found that 7 percent (eight out of 115) showed evidence of recent infection, including several workers who did not recall feeling sick or experiencing symptoms associated with H5N1 infections—raising concerns about a silent spread of the infection from animals to humans.[250]

In April, the FDA announced that trace amounts of H5N1 virus had been detected in about 20 percent of grocery store milk samples. Pasteurization deactivates harmful bacteria and viruses, meaning the traces of bird flu were not live or infectious. According to the FDA, the commercial supply of pasteurized milk is safe for consumption.[251]

Cholera

Several regions of the world experienced increases in cholera cases and deaths in 2024, with the highest number of cases in the eastern Mediterranean, Africa, and the Americas. Worldwide, there were approximately 195,000 reported cases and over 1,900 deaths.[252]

COVID-19

Researchers estimated that about 1.4 million excess U.S. deaths occurred during the pandemic, with the highest relative mortality increase in adults ages 25 to 64.[253]

An analysis of data from 620 facilities showed that about one in five U.S. COVID deaths during the Delta wave were due to overwhelmed hospital capacity.[254]

HRSA estimates that the COVID-19 Uninsured Program funded about 39 million COVID-19 vaccines between December 2020 and April 2022, nearly 11 percent of all COVID-19 vaccines administered to adults ages 19–64.[255]

Survey data collected across the country between June 2020 and January 2023 suggests that about 54 million U.S. COVID-19 infections went uncounted once home tests were widely available and in large measure replaced institutional testing.[256]

Between April 2022 and September 2023, fewer than half of patients ages 65 and older with an outpatient COVID-19 diagnosis received a recommended COVID-19 antiviral medication, and treatment declined with increasing age. Use of COVID-19 treatment was found to be lowest among the oldest adults.[257]

Other COVID-19 Pandemic-Related Health Impacts

A study published in September reported that U.S. cancer diagnoses dropped by nearly 10 percent below expected rates in 2020 as people missed screenings. The study estimated that during the first two years of the pandemic, a potential 150,000 cases of cancer were undiagnosed.[258]

The effects of a COVID-19 infection can last more than three years and cause lingering pulmonary and gastrointestinal issues, a large study of U.S. veterans found.[259]

A large United Kingdom study found that having COVID-19 could be a risk factor for having a heart attack or stroke up to three years after the infection.[260] A second study conducted by researchers at the University of Southern California and the Cleveland Clinic found similar results: that a COVID-19 infection doubled a person's risk for a major cardiovascular event during the three-year period post-infection.[261]

The percentage of American adults with anxiety and depression symptoms increased significantly between 2019 and 2022, as measured before the outbreak and during the pandemic.[262]

Schools nationwide have made progress toward returning student performance to pre-pandemic levels, but that improvement has been uneven across regions of the country and among population groups. Nationally, students made up one-third of their pandemic losses in math during the past school year and one-quarter of the losses in reading, according to the Education Recovery Scorecard.[263]

A study published in the JAMA Health Forum showed that states with the strongest mask and vaccine requirements and stay-at-home orders during the COVID-19 pandemic had lower rates of excess deaths due to COVID-19. The study additionally concluded that if such requirements had been in place in all states, an estimated 447,000 lives could have been saved.[264]

Long COVID

As of late 2023, Long COVID–related illness was a contributing factor to approximately 5,000 U.S. deaths.[265]

A study published in August reported that approximately 400 million people worldwide have had or have Long COVID, and the estimated economic cost of Long COVID, including healthcare services and missed work, is approximately $1 trillion annually.[266] A June National Academies of Sciences,

Engineering, and Medicine study found that people who were seriously ill during their initial COVID-19 infection were more likely to have long-term symptoms and that women, people who were not adequately vaccinated, people with preexisting medical conditions, or current and former smokers were at greater risk for Long COVID.[267]

A study published in December based on 2023 data found that between three and over six out of 100 people in the United States were experiencing Long COVID. One in five adults with Long COVID who were surveyed reported limitations in performing daily activities.[268]

In February, the HHS Office of the Assistant Secretary for Health released an update on the Implementation of the Government-Wide Response to Long COVID, including activities around research, clinical practice, coordination, and other domains. The report stated that an estimated 11 percent of adults in the United States were currently experiencing Long COVID, and 25 percent of those individuals experience significant activity limitations.[269]

Dengue Virus

In June, CDC issued a Health Alert Network Health Advisory to notify healthcare providers, public health authorities, and the public of an increased risk of dengue virus infections in the United States. Global incidence of dengue in 2024 were the highest on record. From January 1, 2024–June 24, 2024, countries in the Americas reported nearly 9.4 million dengue cases, twice as many as in all of 2023. In the United States, Puerto Rico has declared a public health emergency[270] (1,498 cases) and a higher-than-expected number of dengue cases have been identified among American travelers (745 cases) from January 1, 2024–June 24, 2024.[271]

Peru reported its largest dengue outbreak ever in 2023. During January 1, 2023–July 29, 2023, there were a total of 222,620 dengue cases in Peru—more than 10 times the average number of cases during the same period over the previous five years (21,841 cases).[272]

A 2023 CDC study found that about 60 percent of children and adolescents ages 9-16 in American Samoa have had a dengue virus infection, and about one in four experienced symptoms.[273] In the fall of 2023, health officials in California found two people in a Pasadena neighborhood had locally acquired dengue virus infections and also found counts of Andes mosquitoes near the patients' homes were eight times higher than in other surveillance areas.[274]

Flu

According to CDC estimates, the disease burden of the 2024–2025 flu season as of February 2025 was: approximately 29 million cases leading to between 370,000 and 820,000 hospitalizations and 16,000–79,000 deaths.[275]

Flu Vax Effectiveness

A CDC analysis found that the 2023–2024 flu season vaccines reduced children's risk of flu-related medical visits by about 66 percent and flu-related hospitalizations by about half. For adults, being vaccinated reduced the risk of flu medical visits and hospitalizations by about 40 percent.[276]

Marburg virus

In September, public health officials in Rwanda reported 26 cases of Marburg virus, the nation's first outbreak of the disease. Over the ensuing weeks, the infection total rose to 66 cases. By late October, the number of new reported cases was greatly reduced, and the cases' fatality rate was reported to be 22.7 percent much lower than the approximately 90 percent fatality rate seen in other Marburg outbreaks. Rwanda health officials attribute the success in limiting the number of deaths to the quick establishment of separate treatment facilities for Marburg patients to avoid virus exposure to other patients.[277,278] BARDA provided an investigational vaccine (ChAd3-MARV) and an investigational therapeutic (MBP-091) for use in clinical trials as part of the outbreak response.[279] In late December, the WHO declared that the outbreak was officially over.[280]

Measles

During 2024, U.S. measles cases totaled 285, with cases reported in 33 jurisdictions. Fifty-eight percent of the cases were in children over 5 years of age.[281] During the first two months of 2025, measles cases were reported in five jurisdictions for a total of 14 cases, patients required hospitalization in six of the 14 cases.[282]

In April, CDC warned that a rapid increase in the number of measles cases in the United States during the first quarter of 2024 threatened the country's measles elimination status. U.S. cases during that period rose 17-fold compared with mean first-quarter averages of the previous three years.[283]

Worldwide measles cases increased to 10.3 million in 2023, a 20 percent increase over 2022, and the number of countries with large measles outbreaks increased from 36 to 57. Worldwide measles vaccination coverage in 2022–2023 was 83 percent, below what it was before the COVID-19 pandemic.[284]

Mpox

Worldwide, more than 100,000 cases of Mpox (clade 2) were reported in 122 countries in 2024. There were also reported outbreaks of Mpox (clade 1)

in Central and Eastern Africa and a few cases in people from other countries after they traveled to the region.[285] In the United States, clade 2 Mpox continued to circulate at relatively low levels in 2024 but higher than in 2023. The first case of clade 1 Mpox was confirmed in the United States in November in a person who had recently traveled from Eastern Africa.[286]

In August, the WHO declared a public health emergency due to Mpox outbreaks in the Democratic Republic of Congo and other African nations.[287]

Meningococcal infections

As of December, 477 cases of meningococcal disease had been reported for 2024, compared with 384 cases for the same period in 2023. During all of 2023, 438 cases were reported, a 10-year high. Population groups with higher-than-average infections rates were people between 30 and 60 years of age, Black and African American people, and adults with HIV.[288]

A meningococcal outbreak in Virginia between 2022 and 2024 had an elevated fatality rate and disproportionately affected Black people. The overall fatality rate during the outbreak was 19 percent, 78 percent of the cases were non-Hispanic Black and African American people.[289]

Oropouche Virus

Between January and August, approximately 8,000 cases of Oropouche were reported in the Americas. Two deaths associated with the virus were reported in Brazil. Travel-associated cases have been reported in the United States and Europe.[290]

Pertussis (whooping cough)

According to a December CDC report, the number of reported cases nationwide was more than six times higher in 2024 than in 2023.[291] As of December 28, 2024, 35,435 pertussis cases had been reported, the case total at the same time in 2023 was 5,611cases.[292] Pertussis cases in the United States were down during the pandemic but began to return to and exceed pre-pandemic levels in 2024.

Worldwide, pertussis is one of the leading vaccine-preventable causes of death.[293]

In October 2024, CDC's Advisory Committee on Immunization Practices lowered the age recommendation for all adults receiving a pneumococcal conjugate vaccine from 65 to 50. Lowering the age for routine pneumococcal vaccine gives more adults the opportunity to protect themselves from pneumococcal bacteria, which can cause serious illnesses including pneumonia, meningitis, and bloodstream infections.[294]

Polio

According to CDC, progress has been made in detection of polio needed to track polio eradication, but gaps remain. CDC reports that countries with low vaccination rates continue to experience outbreaks and that strengthening surveillance systems worldwide is crucial to ensuring a rapid response to cases and outbreaks. From January 2024 to June 2024, 74 outbreaks were detected in 39 countries, predominately in Africa.[295,296] In addition, new cases of wild type 1 poliovirus in Pakistan and Afghanistan between January 2023 and June 2024 threatened those countries efforts toward polio eradication.[297] Between January 2017 and March 2024, 39 cases of variant poliovirus type 2 were detected in Somalia, with some spread into the neighboring countries of Kenya and Ethiopia.[298]

Rocky Mountain Spotted Fever

Six cases of Rocky Mountain Spotted Fever occurred in California in persons who had traveled to Tecate, Mexico, between July 2023 and January 2024; three of the six patients died.[299]

Respiratory Syncytial Virus (RSV)

Through November, RSV-related emergency department visits were low but increasing.[300]

Surveillance data show that nirsevimab is 90 percent effective at preventing RSV-associated hospitalizations in infants during their first RSV season. CDC recommends administration of nirsevimab for infants younger than 8 months who were born to mothers who did not receive the maternal RSV vaccine during pregnancy to protect against RSV-associated lower respiratory tract infection during their first RSV season and for some children ages 8–19 months at increased risk for severe RSV disease who are entering their second RSV season. RSV is the leading cause of hospitalization for babies in the United States.[301]

Rubella

During January 2022–June 2024, 17 U.S. jurisdictions reported a total of 58 confirmed rubella cases to CDC. Between 2013–2021, reported cases of rubella virus infections declined by 81 percent worldwide as vaccine coverage rates improved from 40 percent to 68 percent during the same period.[302]

Tuberculosis

The number of U.S. tuberculosis cases in 2024 were the highest in a decade with more than 9,600 cases, with increases in 40 states and across all age groups.[303] In January of 2025, a tuberculosis outbreak in Kansas included approximately 70 active cases and at least two deaths.[304]

West Nile Virus

As of late November, CDC reported 1,466 human cases of West Nile Virus in the United States during 2024. West Nile Virus infections occurred in 49 states.[305]

Reports, Convenings, Strategies, Policies, Actions, and Tools

Environmental Health and Risks

The EPA announced new, strengthened particle pollution standards, reducing the annual standard to 9 micrograms per cubic meter of air, down from the previous standard of 12 micrograms.[306] Particle pollution can cause serious health harms from asthma attacks and other breathing issues, cardiovascular problems, lung cancer, and fetal harm.[307]

The Occupational Safety and Health Administration released a proposed rule on Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings.[308]

CDC released a new ventilation guidance update designed to reduce the number of respiratory viruses that circulate in indoor air.[309]

The HeatRisk Forecast Tool, developed by CDC and NOAA, provides a seven-day heat forecast nationwide in order to alert people when temperatures may reach levels that could harm their health. CDC's HeatRisk Dashboard integrates the HeatRisk Forecast Tool data with other information, including details on local air quality, to inform the public on how best to protect themselves when outdoor temperatures are high and could impact their health.[310]

The American Lung Association released its 25th annual *State of the Air Report*, including the key finding that nearly four in 10 people in the United States live in places with unhealthy levels of air pollution.[311]

A new study looked at the confluence of an aging world population and the warming planet and estimated that the number of older adults exposed to chronic and extreme heat will number over 200 million by 2050.[312]

CDC and ATSDR, in partnership with OCCHE and the HHS Office of the Assistant Secretary, released the *Heat and Health Index* a new tool intended to help people stay safe during heat events. The *Heat and Health Index* combines historic temperature data and emergency medical services data on heat-related emergency responses from the past three years, as well as data on community characteristics, including pre-existing health conditions, socio-demographic information, and characteristics of the natural and built environment, to provide a final heat and health index rankings by ZIP code.[313]

At the 2024 UN Climate Conference (COP29), ended with approximately 200 nations committing $300 billion a year by 2035 to help "developing countries" protect their populations and economies against climate disasters.[314] The funding is a three-fold increase over current funding but still too small, according to climate experts and leaders of at-risk countries.[315]

TFAH released its fifth public health policy blueprint report for the Administration and Congress that took office in January 2025. The report, *Pathway to a Healthier America: A Blueprint for Strengthening Public Health for the Next Administration and Congress*, outlines a policy roadmap for improving the nation's health and ensuring its economic and national security. The report was authored after consultation with over 45 experts, practitioners, and community members.[316] *www.tfah.org/reports/*

Health Data Collection and Interoperability

The Office of the Assistant Secretary for Technology Policy and the Office of the National Coordinator for Health IT announced a proposed rule on health data and public health interoperability.[317]

The Office of Management and Budget finalized Statistical Policy Directive No. 15: Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, which are intended to result in more accurate and useful race and ethnicity data across the federal government.[318]

CDC released its Public Health Data Strategy for 2025–2026 as well as a 2024 progress report. The reports summarize progress in public health data aggregation and accessibility and defines future directions of public health data modernization, especially efforts to integrate more data and data systems.[319] In addition, CDC announced its updated Public Health Data Strategy, which focused on encouraging more data-sharing partnerships among hospitals and local health departments and expanding the use of electronic case reporting.[320]

Health Security and Biodefense

The White House released *The U.S. Global Health Security Strategy*, which outlines the ways in which the United States and international partners will work to prevent, detect, and respond to infectious disease threats worldwide. The strategy articulates a whole-of-government approach to protecting the health and economic well-being of the nation and builds on the United States working in bilateral partnerships, expanding the nation's formal global health security partnerships from 19 countries to 50 countries.[321]

The Bipartisan Commission on Biodefense released its report, *The National Blueprint for Biodefense*, its second such report. The report made recommendations for strengthening nation's biodefense against future biological events, including biological weapons attacks or another pandemic.[322]

The White House announced new policies broadening regulations on potentially dangerous microbes and toxins, in an effort to prevent laboratory accidents that could unleash a pandemic. The new policy applies to research funded by the federal government and strengthens the government's oversight of such research.[323]

A WHO report found that there are more than 30 pathogens that could trigger a future pandemic.[324]

The North American Preparedness for Animal and Human Pandemics Initiative, a joint project of the United States, Canada, and Mexico, was released in October. The initiative is designed to strengthen regional capacities for disease control built on lessons learned from COVID-19 and other healthy security events.[325]

Protecting the Health of Individuals, Families, and Communities

A National Academics of Sciences, Engineering, and Medicine report concluded that little progress had been made in advancing health equity in the United States over the past two decades and that such inequities are a "fundamental flaw" in the nation's healthcare system.[326]

The Johns Hopkins Center for Health Security released a policy analysis suggesting actions for collaboration between primary care, public health, and community-based organizations that would improve emergency preparedness and health outcomes.[327]

A second Johns Hopkins Center for Health Security report, *PanREMEDY*, looked at the measures that state and local policymakers should use to determine if holistic recovery programs are working, especially for communities most impacted by COVID-19.[328]

Prior to the COVID-19 pandemic, 10 states and the District of Columbia had laws requiring employers to provide paid sick leave. As of May, five additional states—Colorado, New York, New Mexico, Illinois, and Minnesota—have passed laws offering some kind of paid time off for illness. Oregon and California expanded previous paid-leave laws.[329] In November 2024, voters in Missouri, Alaska, and Nebraska passed paid sick-leave ballots in those states.[330]

A study by The Commonwealth Fund released in September ranked the United States last in a comparison of health and healthcare in 10 high-income countries. U.S. scores were particularly low for health equity, access to care, efficiency, and health outcomes.[331]

The WHO released a report on antibacterial agents in clinical and pre-clinical development. They highlighted a pressing need for new agents for serious infections to replace agents that are ineffective due to widespread use.[332]

A 2024 Government Accountability Office report highlighted that officials from the Strategic National Stockpile have not sufficiently engaged with Tribal Nations to address unique logistical challenges, such as inadequate storage infrastructure and geographical remoteness, in delivering stockpile assets. Unlike jurisdictions with specialized storage sites funded through the PHEP program, tribes often rely on improvised spaces like hotels or casinos.[333] Also in 2024, ASPR released its *Strategy for Improving Access to Federal Resources During a Public Health Emergency Response for Federally Recognized Tribal Governments, Indian Health Service Health Care Providers, Tribal Health Authorities, and Urban Indian Organizations.* [334]

Dig Deep, an organization dedicated to ensuring that all families in the United States have access to running water, released *Draining: The Economic Impact of America's Hidden Water Crisis*, reporting that at least 2 million Americans do not have access to running water or a working toilet at home.[335]

Public Health Infrastructure and Emergency Preparedness

FEMA released the 12th annual *National Preparedness Report* in December 2023. The report identified preparedness gaps at the household, community, and national levels.[336]

The Council of State and Territorial Epidemiologists conducted its eighth national assessment of core epidemiology capacity in state and territorial health departments. Among the key findings was that while the number of epidemiologists nationwide has increased since the last assessment in 2021, it is still well below the number needed, and most departments expect to be forced to reduce staff as pandemic funding ends.[337]

The National Governors Association released its *Public Health Emergency Playbook* as a resource to guide governors and their staffs in effectively preparing for, managing, and recovering from health crises.[338]

Six U.S. companies will manufacture medical gowns to store in the Strategic National Stockpile. The availability of such gowns was depleted only weeks into the COVID-19 pandemic. Approximately 250 million gowns

will be added to the stockpile, about a 90-day supply.[339] ASPR committed over $367 million to the purchase of personnel protective equipment to replenish the Strategic National Stockpile.[340]

In response to Hurricane Helene damaging an IV fluids manufacturing plant in North Carolina, ASPR is coordinating and funding efforts to increase U.S. supplies of IV fluids.

ASPR funded multiple companies to diversify and boost domestic manufacturing of active pharmaceutical ingredients for essential medicines and the health supply chain in an effort to prevent supply-chain disruptions.[341,342]

CDC announced a new "Community Snapshot" tool to allow Americans to check levels of respiratory virus circulation for their local communities. Data will include circulation levels—whether high or low—for COVID-19 and flu among other diseases. The data will be drawn from hospitals, emergency rooms, wastewater sampling, and testing laboratories.[343]

CDC launched a web-based portal of planning and communication tools to support emergency preparedness for people with disabilities.[344]

Trust in Public Health System, Challenges to Public Health Authority

A random national survey of 2,663 respondents conducted in late 2023 found that most expressed "at least some" trust in health recommendations from CDC (75 percent) and their state's health department (79 percent), an improvement over levels of trust during the COVID public health emergency. The issues receiving the most support for work done by CDC and state health departments were preventing chronic disease, preventing and addressing mental illness, reducing infant mortality, and addressing opioid and substance addiction.[345]

In October, a regional public health department board in Southwest Idaho voted four-three in favor of a ban that blocked health departments in a six-county area from providing COVID-19 vaccines to residents.[346]

As of March 2023, at least 30 states have passed laws since 2020 that limit public health authority, according to a Washington Post analysis of laws collected by *Kaiser Health News* and the Associated Press as well as the Association of State and Territorial Health Officials, and the Center for Public Health Law Research at Temple University. Health officials and governors in more than half the country are now restricted from issuing mask mandates, school closures, and other protective measures, or they must seek permission from their state legislatures before renewing emergency orders, the analysis showed.[347] According to a review of state laws intended to limit public health authorities, conducted by the Center for Public Health Law Research at the Temple University Beasley School of Law, between January of 2021 and May 2022, state legislators introduced 1,531 bills to change the scope or levers of public health and/or emergency response authorities during the reviewed timeframe. Approximately 12 percent of the bills were enacted.[348] Texas and Utah have enacted bills that limited the authority of state and local public health officials to close businesses, require face coverings, require vaccination, or issue isolation or quarantine orders.[349]

In July, the U.S. Supreme Court decision in *Loper Bright Enterprises v. Raimondo* overturned the long-standing precedent established in *Chevron v. Natural Resources Defense Council*, known as the "Chevron doctrine." The doctrine created a framework under which courts would look to federal agency expertise when interpreting statutory law. Many public health officials have expressed concern about the ways in which the diminishment of the Chevon precedent could undermine public health regulations.[350]

Vaccine Uptake, Safety, Effectiveness, and Confidence

Vaccine Uptake

CDC published data reporting that an estimated 35 percent of adults 18 years of age and older had been vaccinated against seasonal flu during the first months of the 2024–2025 flu season, and 18 percent had been vaccinated against COVID-19 during the same time period, as of fall 2024.[351] As of early November, 58 percent of nursing home residents were vaccinated against seasonal flu, but only three in 10 had received an updated COVID-19 vaccine.[352]

Data show that the Vaccines for Children (VFC) program has impacted childhood immunization rates but that there is also room for improvement in those rates. As of 2002, 61 percent of VFC-eligible children born in 2020 received the seven selected vaccines by their 2nd birthday. Coverage overall was still high, however: among VFC-eligible children born during 2011 to 2020, coverage by age 24 months with one or more measles, mumps, rubella (MMR) dose and the combined seven-vaccine series was stable: 88.0 to 89.9 percent and 61.4 to 65.3 percent, respectively.[353] Since its establishment in 1994, the Vaccines for Children program has prevented an estimated 508 million illnesses and over 1 million deaths.[354]

Routine childhood vaccination in the U.S., including against MMR and polio, among kindergarten students

declined to less than 93 percent in the 2023–2024 school year, down from 95 percent in 2019–2020 and 93 percent in 2022–2023. At the same time, vaccination exemptions increased to a record 3.3 percent, up from 3.0 percent and 2.6 percent, respectively. *Healthy People 2030* includes a target goal of 95 percent MMR vaccination rate for all kindergarteners.[355]

Survey data estimates that about 38 percent of U.S. seniors, people ages 65 and above, had received an updated COVID-19 vaccine by November of the 2024 respiratory virus season, a strong increase over the percentage vaccinated during the same time period in 2023 (23 percent). Uptake of the COVID-19 vaccine among younger adults was also up in 2024 as compared with 2023.[356]

Routine U.S. childhood vaccination rates were lower among children born in 2020 and 2021 compared with those born in 2018 and 2019. Lower vaccination coverage was seen among Black, Hispanic, and American Indian or Alaska Native children, children insured by Medicaid or other non-private insurance, children who were uninsured, children living in rural areas, and children in families with incomes below the federal poverty level.[357]

WHO and UNICEF report that global childhood immunizations levels have not rebounded since the beginning of the coronavirus pandemic. The data shows that the number of children worldwide who have not received a single dose of the DPT (diphtheria, tetanus and pertussis) vaccine increased from 13.9 million in 2022 to 14.5 million in 2023. Measles vaccine coverage is also down, with 22.2 million children unvaccinated in 2023, an 83 percent worldwide coverage rate for the vaccine's first dose. Health experts say that 95 percent immunization is necessary for population-wide immunity to measles.[358]

Vaccine Confidence

Researchers surveyed 23 high- and middle-income countries on five continents and found that 61 percent "expressed being more willing to get vaccinated for diseases other than COVID-19 as a result of their experience during the pandemic."[359]

A study of preparedness in 177 countries found that among other factors, a population's trust in government was associated with higher COVID-19 vaccination rates and lower COVID-19 infection rates in middle- and high-income countries.[360]

A national health survey conducted by the Annenberg Public Policy Center at the University of Pennsylvania in July 2024 reported that about one in four Americans believe false information about the COVID-19 vaccine. Specifically, the survey found that 28 percent of respondents believed that the COVID-19 vaccine had caused thousands of deaths, and 22 percent believed that it was less risky to get infected with the COVID-19 virus than to be vaccinated against it.[361]

Vaccine Impact and Effectiveness

Hospital and health systems data showed that the updated 2023–2024 COVID-19 vaccines reduced the risk of emergency department and urgent care visits or hospitalization with COVID-19 by about half among vaccinated people. During September 2023–January 2024, adults with healthy immune systems who received an updated COVID-19 vaccine were about 50 percent less likely to visit an emergency department or urgent care facility or be hospitalized with COVID-19 compared with those who had not received an updated COVID-19 vaccine.[362]

Childhood vaccines—including those that target measles, tetanus, and diphtheria—have saved the United States $540 billion in healthcare costs, according to CDC. Over the last three decades, routine childhood vaccinations have prevented approximately 508 million cases of illness, 32 million hospitalizations, and 1,129,000 deaths.[363]

About 90 percent of babies who had to be hospitalized for COVID-19 had mothers who were not vaccinated against COVID-19 during pregnancy. Babies too young to be vaccinated had the highest COVID-19 hospitalization rate of any age group except people over 75. Infants below six months are too young to be vaccinated. Their protection comes from vaccinating pregnant women, who pass the antibodies on to their newborns.[364]

The "We Can Do This" COVID-19 vaccination public-education campaign saved $732 billion by averting illness and related costs during the delta and omicron variant waves, with a return of nearly $90 for every dollar spent on the campaign, according to a study by HHS and the research firm Fors Marsh.[365]

Vaccine Safety

Researchers at Yale University found no connection between COVID-19 vaccines and any negative birth outcomes. In addition, data showed that pregnant women who had received COVID-19 vaccines in pregnancy were at a decreased risk of preterm birth.[366]

A study of over 5,600 U.S. children who received at least one dose of an mRNA COVID-19 vaccine between the ages of 6 months and 24 months found no new safety concerns. The most common reactions among the infants were fussiness (30 percent), a local reaction (21 percent), and fever (14 percent).[367]

Report Methodology

Indicator Selection Criteria

Indicators are chosen based on the following requirements:

- **Significant:** Each indicator must meaningfully gauge states' readiness for public health emergencies. The original criteria were developed through a multistage Delphi process conducted by the National Health Security Preparedness Index (NHSPI) and were later reassessed by TFAH in consultation with additional experts.
- **Broad Relevance and Accessibility:** Indicators must apply to all states and the District of Columbia, with timely and accessible data. Although TFAH aims to include U.S. territories and certain federally recognized tribes, data availability and sustainability limit such inclusion.
- **Timeliness:** Indicators must be updated regularly.
- **Scientific Validity:** Data sources must be credible, rigorously constructed, and methodologically sound.
- **Nonpartisan:** Indicators and data must be free from political bias.

The goal is to select a range of actionable indicators that TFAH—and other stakeholders, including states—can use to track progress over time. The indicators have been chosen to reflect performance consistently across states.

Public Health Funding Data: Collection and Verification

TFAH surveyed state officials for data on state-supported public health funding. Drawing from the University of Washington's Public Health Activities and Services Tracking project, TFAH defines public health services as including:

- **Communicable Disease Control:** For instance, epidemiology, COVID-19, hepatitis, HIV/AIDS.
- **Chronic Disease Prevention:** Such as programs addressing asthma, cancer, cardiovascular disease.
- **Injury Prevention:** Spanning firearms, motor vehicles, substance-use disorders, and other injury areas.
- **Environmental Public Health:** Covering air and water quality, food safety, and related concerns.
- **Maternal, Child, and Family Health:** Encompassing family planning, newborn screening, and related services.
- **Access to and Linkage with Clinical Care:** For example, determining beneficiary eligibility.

Insurance coverage programs and inpatient clinical facilities are excluded. State respondents guided TFAH in updating and refining the FY 2023 baseline data for improved comparability. Every state and the District of Columbia verified prior funding data and provided new data for the latest year.

Scoring and Tier Placements

TFAH grouped states into three performance tiers—high, middle, and low—based on results across 10 indicators (some awarded partial credit).

Indicators and Scoring:

1. Adoption of the NLC (Nurse Licensure Compact):

- Adopted: 0.5 point
- Not adopted: 0 points

2. Accreditation by PHAB (Public Health Accreditation Board) and EMAP (Emergency Management Accreditation Program):

- Each accreditation: 0.5 point
- Not accredited: 0 points

3. State Public Health Funding Trends:

- Increased or no change (nominal): 0.5 point
- Decreased: 0 points

4. Community Water System Compliance (Percent of Residents Using Systems Meeting All Health-Based Standards):

States were scored based on how many standard deviations (SD) they fell above or below the mean percentage of residents using compliant systems:

- Within one SD above the mean (including states at 0% noncompliance): 1 point
- Within one SD below the mean: 0.75 point
- One to two SDs below: 0.5 point
- Two to three SDs below: 0.25 point
- More than three SDs below: 0 points

5. PTO (Paid Time Off) Usage (Percent of Employed Population Using PTO):

Using standard deviations from the mean:

- More than one SD above mean: 1 point
- Within one SD above mean: 0.75 point
- Within one SD below mean: 0.5 point
- More than one SD below mean: 0.25 point

6. Seasonal Flu Vaccination Coverage (Ages 6 Months+):

Using standard deviations from the mean:

- More than one SD above mean: 1 point
- Within one SD above mean: 0.75 point
- Within one SD below mean: 0.5 point
- More than one SD below mean: 0.25 point

7. Leapfrog Hospital Safety Grade ("A" Grades Percentage):

Using standard deviations from the mean:

- More than one SD above mean: 1 point
- Within one SD above mean: 0.75 point
- Within one SD below mean: 0.5 point
- Positive but more than one SD below mean: 0.25 point
- No "A"-grade hospitals: 0 points

8. Public Health Laboratory Surge Plan (6- to 8-Week Capacity Increase):

- Has a written plan: 0.5 point
- No plan reported: 0 points

9. Avoidable Mortality

TFAH used a min-max method to convert each state's results into a 0-to-1 scale (where higher scores are better) for both overall avoidable mortality and the gap between the highest and lowest racial/ethnic group rates. States with the best outcomes for overall avoidable mortality and the smallest gaps received scores closer to 1, while states with worse outcomes and larger gaps received scores closer to 0. These two scores—one for the overall rate and one for the gap—were then averaged to produce a single combined score between 0 and 1.

Based on that combined score, TFAH assigned points as follows:

- A combined score from 0.76 to 1: 1 point
- 0.51 to 0.75: 0.75 points
- 0.26 to 0.50: 0.5 points
- 0 to 0.25: .25 points

The highest possible total is 7.5 points.

Tier Assignments:

- High-performance tier: Top 17 scores (this year ranging from 5.75 to 6.75 points).
- Middle-performance tier: 18th to 34th states (5 to 5.5 points).
- Low-performance tier: 35th to 51st states (3 to 4.75 points).

Ties in state scores can affect distribution across tiers.

Assuring Data Quality

TFAH conducted several rigorous phases of quality assurance to strengthen the integrity of the data and to improve and deepen TFAH's understanding of states' performance, especially that of outliers on specific indicators. During the state public health funding data collection, each verified file was systematically inspected for errors, inconsistencies, or incompleteness. Respondents were then contacted for data completion or correction.

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