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Perspective

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FUNDAMENTALS OF PUBLIC HEALTH

The Patchwork U.S. Public Health System

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At a national summit on food safety held in Baltimore, attendees participate in panel discussions and training on such topics as public education, food preparation, and outbreak response. Soon after the summit ends, 16 attendees experience stomach pain and diarrhea.

In this not-hypothetical case,[1] stricken conference-goers first reported their symptoms using the local 311 line to the Baltimore City Health Department — a city health agency that investigates localized foodborne outbreaks on its own. Had the outbreak crossed a jurisdictional boundary or been large enough to require additional personnel, the state health department would have joined the response. Had a pathogen been identified, the local or state communicable disease team would have queried federal databases to spot a genetic link to outbreaks in other states. At that point, federal health agencies would have become involved.

If held elsewhere in the United States, this same ill-fated food-safety summit would most likely have elicited a different response. In New Mexico, the state health department is the first to respond to a report of an ill diner; in Louisiana, a regional health department takes the call. In some locations, there may be no investigation at all; the number of outbreaks reported per capita varies by a factor of nearly 10 across the country. At the federal level, the Centers for Disease Control and Prevention (CDC) coordinates the epidemiologic response to foodborne disease; the U.S. Department of Agriculture has authority for beef, poultry, and some egg products; and the Food and Drug Administration has authority for many other food items. Involvement of multiple offices from all three agencies might be needed to trace a given problem to a production facility or coordinate product recalls.

The response to foodborne illness — a quintessential public health activity — is a microcosm of the uneven patchwork that characterizes all of U.S. public health. In the shadow of a pandemic, understanding this haphazard architecture is a step toward appreciating the U.S. paradox of enormous health expenditures but poor outcomes for population health.

To begin with, there is no clear administrative structure that organizes the many federal agencies involved in public health (see table). Twenty-one major federal agencies have a role in pandemic preparedness and response, for example, and more than 100 fed-

Key Components of the Architecture of the U.S. Public Health System.

Level of Government and Agencies	Examples of Authority
Federal The 21 federal agencies that have major public health authority include the Centers for Disease Control and Prevention, the Food and Drug Administration, the National Institutes of Health, the Environmental Protection Agency, and the Department of Agriculture.	Guidance and oversight for the control of infectious and chronic illness Food-safety standards and inspections of production Regulation of drugs, devices, vaccines, tobacco products, and cosmetics Support for research and development of new public health approaches, therapies, and countermeasures Regulation of toxic pollutants and greenhouse gases Laboratory testing services for rare or novel pathogens not available at local and state labs
State Of 50 state public health agencies, 29 are independent agencies and 21 are a unit of a larger umbrella agency; 27 have a state board of health or similar entity.	Public health emergency response Programs and policies to address maternal–child health, environmental health, chronic illness, tobacco control, and infectious disease Vital statistics Infectious and chronic disease surveillance Maintenance of immunization registries Licensing and regulation of health care service providers Newborn screenings Laboratory testing, including foodborne illness testing and influenza typing
Local Of 2459 local health departments, 1887 are locally governed, 404 are units of the state health department, and 168 have shared governance; 70% have a local board of health.	Response to reports of foodborne illness Regulation, inspection, and licensing of businesses such as restaurants and day care centers Environmental inspections, including checks of septic systems and recreational water Adult and childhood immunization programs Community outreach and education on public health topics such as food safety, physical activity, and health screenings Screening for diseases or conditions such as tuberculosis and sexually transmitted diseases

eral offices have been engaged in work during the Covid-19 pandemic.

At the state and local levels, variation is the rule, not the exception. Twenty-nine state health departments stand alone, and the others are part of larger health and human services agencies. About half of states have a board of health to provide guidance for public health activities; in the other half, no such board exists. About two thirds of state health officials are appointed by the governor, and the other third are appointed by the secretary of the larger human services agency, a state public health board, or some other entity.

Similarly, there is little consistency in the relationships between state and local health departments. In 7 states, the state health department operates all local health offices; in 30 states, local health departments operate largely without state control; and in the remainder, various amounts of collaboration occur. A 2012 review noted the challenge of classification: "Even in states that are considered centralized, it is not uncommon for local government entities to exhibit some authority; likewise, in some decentralized states, state government has some powers regarding the local health unit."[2]

There are about 2800 local health departments in the United States, most of which serve fewer than 50,000 people. About half of local health departments report to a local board of health, which may be an elected body such as a county council or an independently appointed group. Another 20% work with the local board of health in an advisory capacity.

The activities undertaken by health departments also vary. In 1994, the U.S. Department of Health and Human Services convened the Core Public Health Functions Steering Committee to define the 10 Essential Public Health Services, a list that was recently updated by a coalition of public health groups (see box) to center equity and include addressing structural causes of poor health, including poverty, racism, and gender discrimination. The federal agencies and state health departments have broad responsibilities, but typically, local health departments perform less than half of vital public health activities. Nearly all local health departments report that they re-

The 10 Essential Public Health Services.*

Assessment
- Assess and monitor population health
- Investigate, diagnose, and address health hazards and root causes

Policy Development
- Communicate effectively to inform and educate
- Strengthen, support, and mobilize communities and partnerships
- Create, champion, and implement policies, plans, and laws
- Take legal and regulatory actions

Assurance
- Build and maintain a strong organizational infrastructure for public health
- Improve and innovate through evaluation, research, and quality improvement
- Build a diverse and skilled workforce
- Enable equitable access

* From the Public Health National Center for Innovations and the De Beaumont Foundation. The Centers for Disease Control and Prevention website states, "The 10 Essential Public Health Services provide a framework for public health to protect and promote the health of *all people in all communities*. To achieve equity, the Essential Public Health Services actively promote policies, systems, and overall community conditions that enable optimal health for all and seek to remove systemic and structural barriers that have resulted in health inequities. Such barriers include poverty, racism, gender discrimination, ableism, and other forms of oppression. Everyone should have a fair and just opportunity to achieve optimal health and well-being" (https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html).

spond to outbreaks of infectious disease (including foodborne disease), support childhood immunization programs, and participate in community health assessments. However, one fifth of local health departments do not offer tobacco prevention programs, more than half do no work to prevent opioid addiction, three fifths do not offer programs to prevent chronic diseases, and nearly two thirds do not conduct surveillance on injuries.[3]

Although information technology and data capacity are key to public health capacity, much of state and local public health work remains based on paper, with large gaps in the ability of health departments to obtain, analyze, and share information expeditiously. More than one third of local health departments are unable to access an electronic surveillance system with data from local emergency departments, which could facilitate early identification of illnesses of concern, including foodborne illness. Only 3% of local health departments reported that their information systems are all interoperable, a limitation that hampers both daily prevention work and coordinated responses. Complicating this picture further is a lack of systematic collection of data in critical areas, such as data on race and ethnicity needed to track disparities and equity.

Another key issue is the dearth of financial resources: although there is no systematic accounting for all relevant spending, it is clear that public health in the United States has been chronically underfunded. In addition to gaps in support for specific federal health efforts such as pandemic preparedness, state government funding for public health has stagnated, with no growth occurring between 2008 and 2018.[4] A recent proposal calls for additional investments of $4.5 billion annually in the state and local public health system.

Meanwhile, the public health workforce is in crisis. Nationally, all local health departments employ an estimated 153,000 workers, down from more than 184,000 before the recession of 2008. Few public health departments have staff in specialized roles that are critical to the delivery of essential public health services, such as community health workers, epidemiologists and statisticians, or public information professionals. These gaps are even more acute in rural areas, where many health departments are struggling to maintain the provision of safety-net health care services.

In 2007, the federal government and philanthropic foundations launched a national effort to strengthen state and local public health agencies by means of accreditation. Fourteen years later, 37 state health departments and 269 local health departments have achieved accreditation, a status associated with offering more comprehensive services. There is evidence, however, that health departments with higher capacity at baseline are the ones that seek accreditation. A recent survey found that 37% of local health departments are undecided or do not know of plans to apply, and an additional 32% have decided not to seek accreditation at all.[3]

The Covid-19 pandemic has brought the weaknesses of the U.S. public health system into sharp relief. Other countries with strong, centralized public health systems have been able to rapidly implement testing, case investigation and contact tracing, and vaccination. In the United States, federal agencies and state and local health departments have

struggled to mount a full-scale response, with major consequences for health and equity.

Before the pandemic, funds for public health represented less than 3% of health care expenditures in the United States. This imbalance in support persisted despite the worst public health catastrophe in a century. In early 2020, Congress provided $178 billion to support the health care system, even as many health departments could not scale their efforts or were forced to lay off workers. This disparity exposed the long-standing dynamic whereby powerful interests in health care can make their needs clear to policymakers, while public health agencies, which have much less visibility, rarely succeed in inspiring essential investments in disease control and prevention.

An audio interview with Dr. Sharfstein is available at NEJM.org

Political polarization has complicated matters further. Health leaders supporting evidence-based public health measures such as mask mandates have experienced unprecedented levels of harassment, intimidation, and threats. Hundreds of public health officials across the United States have been fired or have resigned, and 32 states have adopted new laws limiting public health authority during emergencies.[5]

Appreciation of the struggles of the U.S. public health system during the Covid-19 pandemic has created the best chance in many years for change. The American Rescue Plan, the most recent and largest infusion of funding for public health, includes, among other investments, $47 billion for Covid mitigation (including testing and contact tracing), $7.7 billion to expand the public health workforce, and $500 million for the CDC to update the public health information technology infrastructure throughout the country. A next step would be to establish a national plan for achieving a high-functioning public health system to guide new investments, establish realistic expectations, and deliver meaningful improvements in health, equity, and preparedness.

As the pandemic's impact wanes, the window of opportunity may start to close. The powerful desire to return to "normal" quickly, however, will not erase the fact that the United States relies on a patchwork public health system at its own peril. Only with a major and sustained upgrade to the national public health infrastructure will a salmonella outbreak at a food-safety summit be just an ironic news story, and not also a metaphor for the distance between the aspirations and the reality of health in the United States.

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HISTORY OF MEDICINE

Obstacles to Physicians' Emotional Health — Lessons from History

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Beyond its obvious and devastating effects on patients, the Covid-19 pandemic has exacerbated deep-seated vulnerabilities in health care systems and revealed the challenges they face in protecting the mental health and well-being of physicians. Even before the pandemic, physician burnout was a concern for the medical community and, increasingly, for policymakers.[1] And although the conditions of the current crisis are unique, medical professionals have been known to struggle in the past, and remedies have been tried. Insights from the history of medicine may help us craft