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Public Health Infrastructure
Summary

The nation’s public health system suffered catastrophic failures during the Covid pandemic, mostly due to chronic underfunding. A comprehensive fix will require sustained funding, to support better data to track threats, more analytical capacity to inform policies, improved staffing, serious upgrades to communication infrastructure, and better coordination across government.

Public Health Failures never lead to Fundamental Reforms

Following the deadly attacks on 9/11, the federal government restructured the nation’s intelligence and law enforcement agencies. After the terrible events of Hurricane Katrina, Congress reorganized the Federal Emergency Management Agency. And the 2008 financial crisis led to a wholesale reshaping of the nation’s financial regulatory system.

The Covid pandemic cost far more lives and vastly more money than all of those other disasters combined in part because of gaps in the nation’s public health infrastructure, but so far there is limited fortitude in Congress or the White House for the thorough examination to overhaul the system to ensure these catastrophes are never repeated.

Warnings about the need for national reforms have been issued and largely ignored for decades. There were the anthrax attacks in 2001, the SARS-CoV-1 outbreak in 2003, the influenza pandemic in 2009, Ebola from 2014 to 2016, and Zika from 2015 to 2016. The after-action reviews drawn from these crises temporarily bolstered certain preparedness capabilities and funding, as well as training, drilling and exercising, and risk communication tools. Likewise, BARDA, NIH, CEPI, academia, industry, and many others have invested in the development of new countermeasures for known threat agents and the expansion of certain components of the Strategic National Stockpile.

Unfortunately, these and other advances tended to follow a predictable cycle of crisis, response, modest and temporary improvements, and then a return to complacency. As a result, the United States was woefully unprepared for both the acute shock and long duration of the SARS-COV-2 pandemic. As the initial shortages of PPE, ventilators, and tests revealed, the nation fought the latest infectious disease crisis with outmoded systems and tools. This deficient public health system is evidenced by the United States’ low vaccination rates, high death rate, and significant health disparities as compared to other high income countries, including Taiwan, South Korea, Germany, France, and Denmark. Since when has the United States contented itself with last place in its ability to respond to deadly crises?

Warnings about the need for national reforms have been issued and largely ignored for decades.
A thorough after-action assessment and secure long-term funding will be needed to implement a comprehensive public health and biosecurity modernization program.

This response must start now while the need is obvious and motivation is high. In the meantime, the current pandemic is not over, and immediate public health actions should be taken to accelerate successful mitigation and transition to the next normal.

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**Crucial Investments**

The most overarching deficit in public health preparedness is the lack of a coherent, comprehensive, and long-term biosecurity strategy across federal, state, local, tribal, and global jurisdictions. Fixing the system will not only protect the country from pandemics and bioterrorism but save lives from routine threats every day.

Effective public health requires 5 sequential elements: 1) reliable and real-time data, 2) a capacity to analyze those data, 3) a workforce to implement public health measures, especially in vulnerable communities, 4) effective messages to facilitate policy adoption, and 5) the ability to coordinate these measures across geographies and jurisdictions.

Building such an enhanced public health system puts in place many of the tools needed to better reach vulnerable populations and address the racial and socioeconomic disparities that currently plague American healthcare.

**Reliable Data for Timely Decisions**

The CDC’s Data Modernization Initiative (DMI) was designed to address gaps in timely acquisition of reliable health data necessary to monitor and respond to biosecurity threats and pandemic crises. Unfortunately, the first funding for this was not approved until FY2020, the initiative remains woefully underfunded, and it has neither been fully implemented nor updated in light of the pandemic’s revelation of data deficiencies.

As Chapter 6 made clear, the nation’s data infrastructure needs extensive improvements. This data modernization needs to start now, be adequately and sustainably funded, and be advised by an external board. The external board should include representation from state, local, tribal, and territorial (SLTT) public health officials, as well as the Council of State and Territorial Epidemiologists. The effort should link federal public health funding for states, territories, municipalities, and tribes to the adoption of real-time electronic reporting in a standardized format that encompasses various essential public health measures. Key measures include morbidity data, vital statistics on disease-specific outcomes, the results of wastewater testing for infectious pathogens, vaccination status, and hospital occupancy, all of which can inform efforts to fight disparities. By merging non-traditional environmental surveillance data with traditional clinical and epidemiological data, officials can better track outbreaks and target containment in the event of infectious disease threats (see Chapter 3: Testing and Surveillance).

Additionally, healthcare providers’ reporting of individual disease cases is a foundational component of public health surveillance. While timely and accurate reporting is mandated through jurisdictional laws, required case reports are often delayed, incomplete, or never submitted. This results in major data gaps. Public health data needs CMS’ full commitment and support to ensure effective delivery of clinical encounter and healthcare data to public health.
Modernized Data Analytic Capacity

Existing data need to be re-analyzed to be translated into actionable insights that inform public health policies. The public health system needs a range of analytical tools like artificial intelligence and machine learning to improve the speed of insights. Robust support for data cleaning and deduplication are necessary to organize and prepare data for analysis. There also needs to be a real-time, easy-to-use data platform for non-governmental researchers to find and publicize additional insights.

Public Health Workforce Modernization

Long before Covid, the public health workforce in minority, rural, tribal, and other communities was short-staffed and tenuous. Through verbal and physical threats, firings, and burnout, the pandemic has depleted this vital cadre even more.

The workforce needs to be restored to its pre-pandemic levels and more. To do so, the public health workforce has to overcome challenges in recruitment and retention. This can be initiated by financially incentivizing multiple talent pools, including those in public health schools and related health professions, as well as retirees.

But more needs to be done since the pre-pandemic workforce was already short-staffed. Extending the traditional workforce to integrate diverse community health workers, ambulatory care clinicians, epidemiologists, laboratorians, and school nurses will help. Online coaching and retraining of existing workers will improve practice-based mitigation strategies, as well as reduce wasted efforts.

Several initiatives should be started to address workforce issues more systematically. First, financial assistance should be allocated to states, municipalities, and tribes to develop comprehensive community health worker programs targeted at vulnerable communities. These workers should be able to manage public health needs during a pandemic, as well as address the day-to-day challenges of these communities. Funding should sustain approximately 20,000 community health workers on a permanent basis, and payment models that support reimbursement for their services would support this effort. Second, public supports for student loan repayment and fellowship programs (such as those operated by national public health associations) would promote long-term sustainability.

School-age children need special post-pandemic attention to help with vaccinations, long Covid, and mental health issues. Augmenting school nurse programs with better training and compensation and linking them more closely to public health needs would go a long way.

Finally, schools of public health need to be supported to train students and develop public health workers with advanced skills in data science, modeling, epidemiology, behavioral economics, public health emergency preparedness, risk communication, and health promotion.

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Communication

The CDC has a long tradition of communication leadership during public health emergencies. In past crises, the CDC leveraged the Joint Information Center to coordinate information with its federal counterparts. Unfortunately, these approaches were not effectively used in the current pandemic, and too often the CDC’s communications proved unreliable.

As outlined in Chapter 13, the CDC needs to revive its Joint Information Center approach and create centralized information dashboards to help Americans better understand the status of the pandemic in their locality. It should also conduct regular table-top communication exercises that bring together federal, state, local, tribal, and private sector communicators to work through real-world public health crisis scenarios.

The CDC must address the trust deficit with a steady drumbeat of practical evidence-based information. Key public health leaders across jurisdictions, influential scientists, and trusted local community leaders should be involved in creating and assessing messages well before they are disseminated. As recommended in Chapter 13, an independent advisory council to the CDC could vet and coordinate strategies.

These experts can help define ongoing critical information needs, provide real-time input into guidance for communication decisions, and assess the impact of these decisions, all with a lens towards vulnerable communities. These new structures and processes will help restore trust and improve the front lines of effective communication.

Coordination

Effective public health response requires coordination across federal, state, local, tribal, and territorial health agencies. During a public health emergency, policies can be developed centrally but the front line of public health response is local. Coordination requires leadership, inclusive multidirectional exchanges of information and learnings, and clear processes for identifying and addressing resource needs.

National leadership requires a White House-led coordination effort, which can be achieved by elevating the White House lead on biosecurity to a Deputy Assistant to the President for Biosecurity and building a White House biosecurity team that reports to this Deputy Assistant (see Chapter 12: Communication and Education). The Deputy Assistant and their biosecurity leadership team can delineate roles and responsibilities for the CDC, as well as state, municipal, and tribal public health officials in an emergency. The Deputy Assistant must review and revise the National Incident Management System and empower a Joint Information Center and unified command system at the federal level to coordinate communications in all jurisdictions. The White House Biosecurity leadership team needs to conduct regular exercises to test and refine coordination during a threat or emergency.

The CDC must address the trust deficit with a steady drumbeat of practical evidence-based information.
1. Strengthen public health leadership at all levels of government.

- Establish a permanent White House team to oversee biosecurity strategy development and coordinate execution.
- The White House Biosecurity leadership team should expeditiously delineate the specific authorities, directives, tasks, and other responsibilities of the CDC and other federal agencies to state, local, tribal, and territorial governments for addressing biosecurity threats and pandemic outbreaks. The leadership team should include representation from SLTT jurisdictions.
- The White House Biosecurity leadership team should review—and where needed, adapt—the National Incident Management System to improve the unified response to the current pandemic and future biosecurity threats.
- The White House Biosecurity leadership team should establish and empower a Joint Information Center inclusive of CDC, FEMA, SLTT, and other stakeholder communicators to assess, monitor, coordinate, and cascade evidence-based communications and guidance that address critical public information requirements across federal and SLTT jurisdictions.
- The White House Biosecurity leadership team should review existing biosecurity and emergency public health legal and regulatory authorities and strengthen them where necessary to improve emergency response effectiveness, data acquisition and situation awareness, and cross-jurisdictional coordination.
- The White House Biosecurity leadership team should clarify the oversight, mission, capabilities, capacities, and content of the Strategic National Stockpile.
- The White House Biosecurity leadership team should conduct ongoing pandemic operational “action reviews” and biosecurity exercises at the federal and SLTT levels to identify response strengths and address critical areas for improvement.
- Create a CMS Public Health workgroup to ensure public health efforts receive full commitment and support from CMS.

2. Address critical gaps in the pandemic response frontline workforce.

- Provide sufficient emergency funds to retain, recruit, re-employ, and otherwise augment the current public health frontline pandemic response workforce across federal and SLTT jurisdictions.
- Deploy experienced CDC and U.S. Public Health Service Commissioned Corps personnel to SLTT health departments to support the pandemic response.
- Provide funds to expand community health worker and public health nurse programs to provide home and outpatient testing, early treatments, vaccines, and other services in tribal communities, rural settings, and other communities where health disparities are prevalent.
- Fund school nurse programs to assess and triage acute illnesses and behavioral and mental health needs, as well as provide preventive care and immunizations.
- Professionalize and expand recruitment for community health workers and navigators in specific communities of need and make these roles more available.
f. Require that all healthcare institutions receiving federal funding submit documentation that demonstrates they have engaged with and reflected communities’ priorities in their plans, particularly those related to pandemic response.

g. Ensure pandemic response public health workers are provided safe working conditions and proper personal protection equipment, allotted adequate time off from work, and receive hazard pay.

h. Require that public health workers be overseen by healthcare or other leaders that are not politicians, to mitigate politicization or dilution of necessary public health measures.

i. Require fully funded mental health and wellbeing services for the public health pandemic workforce.

j. Expand investment in the Ready Reserves Corps, to deploy during public health emergencies.

k. Support fellowship programs for specialized public health areas, including applied public health epidemiologists and those that will support work in SLTT jurisdictions.

l. Support retention through student loan repayment programs, across both federal and SLTT jurisdictions.

3. Initiate the modernization and expansion of the federal and SLTT public health workforce, with an emphasis on biosecurity and pandemic preparedness.

   a. The White House Biosecurity leadership team should expeditiously conduct a comprehensive assessment of both current and future public health workforce requirements to address biosecurity threats including pandemics, encompassing geographic and jurisdictional capacities, capabilities, diversity, and salary structure, etc., and then develop a responsive national strategy.

   b. Fund the recruitment and training of permanent public health workers to bring the workforce up to requisite size and capability to address biosecurity threats including pandemics.

   c. Require federal and SLTT multi-sector biosecurity emergency preparedness plans and regular exercises with a special emphasis on viral respiratory pandemics.

   d. The White House Biosecurity leadership team should collaborate with the private sector to develop and exercise federal SLTT contingency plans to augment the public health workforce when emergency surge is required or the risk of burnout is increased.

4. Finance the CDC’s accelerated development of standardized, national, real-time, secure data platforms related to SARS-CoV-2, other respiratory viruses, and broader health outcomes.

   a. Fully fund expansion and accelerated implementation of the CDC Data Modernization strategy. Funding must be sustained and include support for SLTT jurisdictions.

   b. Fund modernized real-time data collection platforms to collect and analyze information on 1) cases of viral respiratory illnesses regardless of site of test, and 2) hospitalizations and deaths from viral respiratory illnesses. Ensure the data are linked to de-identified relevant health and socio-demographic information (see Chapter 9: Health Data Infrastructure).

   c. Fund modernized, real-time surveillance systems encompassing environmental (e.g., wastewater) and animal testing, genetic variants, and population immunity (see Chapter 3: Testing and Surveillance).

   d. Fund the five foundational disease surveillance enterprise efforts: electronic case reporting, electronic laboratory reporting, nationally notifiable disease surveillance system, national syndromic surveillance program, and vital statistics. (see Chapter 3: Testing and Surveillance)

   e. Fund data cleaning and deduplication tools necessary to organize and prepare data.
5. **Improve public health decision-making by accelerating analysis and translation of data inputs into actionable insights and practical guidance across all jurisdictions.**

   a. The CDC should establish an independent advisory council including epidemiologists, modelers, data scientists, public health decision-makers, and frontline personnel, responsible for managing and interpreting local data to oversee and enhance data collection and analysis, as well as define ongoing critical data needs.

   b. The CDC should establish transparent protocols for how the evidence for guidance is obtained and how guidance issues and options evolve with stakeholder input in a timely manner.

   c. The CDC should collaborate with the White House Biosecurity leadership team to establish transparent standards for how streamlined clearance of guidance will be managed without political interference, how messages will be vetted and effectively communicated, how well implementation is achieved, and what results ensue.

   d. The CDC should monitor and report the trust and credibility of its public health preparedness and response.

   e. The CDC should establish formal processes to meaningfully engage SLTT leadership throughout decision-making processes.

6. **Develop a tailored public messaging strategy on Covid for the next 8-10 months that bolsters the CDC’s credibility and communication capacity via new internal decision-making processes and diverse sources of external input.**

   a. Empower the CDC to rebuild trust and credibility in its public messaging apparatus with a steady drumbeat of practical, evidence-based information related to boosters, mask-wearing, social distancing, air filtration, and other topics of day-to-day importance for Americans.

   b. The CDC should create a new independent advisory council of community leaders and science communication experts to advise it in determining information needs and crafting public messages, particularly those directed towards vulnerable populations (see Chapter 12: Communication and Education).

   c. Delineate a process for determining the need for and value of proposed guidance and messages before they are disseminated.