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REPORT MAY 17, 2022

How Investing in Public Health Will Strengthen America's Health

Investments in public health not only improve the health of society but also advance equity and foster economic and climate resiliency.



Strengthening Health, Health, Health Coverage and Access, +2 More





A doctor administers a Pfizer COVID-19 vaccine booster shot at the Safew ay on Capitol Hill in Washington, D.C., on October 4, 2021. (Getty/CQ-Roll Call Inc./Tom Williams)

This report contains a correction.

Introduction and summary

Most of the gains in life expectancy achieved in the 20th century came not from medical progress. Rather, they resulted from public health advances such as cleaner air and water, improved sanitation and food safety, safer environments and thus fewer injuries, and vaccines to protect against infectious disease.¹

The World Health Organization defines public health as "the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society."⁴ Public health systems, which address the needs of entire populations, are separate from medical or health care systems, which primarily address the needs of individual patients. In the United States, the public health system is dedicated to disease prevention and health promotion through federal, state, and local agencies and departments that track and predict emerging and persistent threats, respond to health risks and events, and promote health through education, intervention, and policymaking. It also identifies and addresses health disparities.

The challenge facing public health systems, both in the United States and around the world, is that public health interventions are successful only when misfortunes do not happen. When prevention works as intended, public health often goes unnoticed; but when prevention does not work, public health attracts attention.

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The challenge facing public health systems is that public health interventions are successful only when misfortunes do not happen.

This phenomenon has become all too evident amid the response to the COVID-19 pandemic. The challenges that the United States has faced in preventing the spread and reducing the impact of COVID-19 are in large part the result of inadequate public health preparedness and response. In fact, the United States has suffered more COVID-19 deaths overall than any other country in the world, with disproportionate impacts on people of color and low-income communities. On the other hand, countries that invested in public health preparedness before the pandemic have been able to respond more effectively to COVID-19. Still, infectious diseases respect no borders: U.S. domestic public health challenges must be married with strengthened capacity and coordination around the globe.

Chronic underinvestment has long challenged the U.S. public health system, and the lack of support and resources available during the pandemic, coupled with political polarization, has led many individuals to be unwilling to prioritize the evidence-based solutions needed to control the spread of COVID-19. The lack of public understanding of public health's contribution to preventing disease, improving living conditions, and extending life expectancy may contribute to poor funding and policy decisions at the federal and state levels, while also undermining efforts to address critical social, economic, and environmental issues that contribute to health.^{\$‡} This underinvestment puts the health, safety, and quality of life of both individual people and entire communities at risk.

This report considers the depth of the United States' underinvestment in public health—and how better funding for public health can bolster the workforce, data, technology, and other infrastructure needed to prepare and respond to existing needs and future health threats, which are increasing in frequency and severity. It calls for investments that align with the benefits produced, from health improvement to financial savings to equity.

Specifically, the following recommendations can build a strong and responsive public health system:

Funding Prioritize stable, sustained public health system investments. Replace siloed, disease-specific funding with comprehensive approaches to shoring up public health infrastructure.

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 Upgrade and expand disease surveillance systems and lab capacity to identify unmet needs and emerging health threats.

Data

Preparedness

- Improve and standardize public health data collection efforts, including by capturing data on vulnerable communities.
- Invest in modern public health data capabilities that are flexible, dynamic, and interoperable.

Workforce

- Build a diverse and culturally competent workforce with training in strategic and systems thinking, data science, communication, and policy evaluation.
- Provide incentives for public health service, such as loan repayment, bonus payments, pay equity, and opportunities for job growth.
- Build strategic partnerships and training pathways that can be leveraged during times of crisis to shore up the public health system's surge capacity.

Communications

- Develop, test, and disseminate clear and consistent messaging on what public health is and why it matters.
- Strengthen public-private partnerships to advocate for public health.

Standardization

 Ensure that every community has access to a public health agency with fundamental public health services and capabilities.

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International risk

Bolster public health preparedness globally.

The U.S. public health system has long been underfunded

For decades before and leading up to the emergence of COVID-19, U.S. public health infrastructure was both frail and fragmented due to chronic funding challenges. Public health funding is traditionally heavily siloed, with dollars dedicated to specific diseases or focus areas and allocated across several entities in the public health system.⁴ The responsibility to fund and conduct public health activities largely falls on state and local health departments, while the federal government provides supplementary funds through the U.S. Department of Agriculture (USDA); Health Resources and Services Administration (HRSA); Substance Abuse and Mental Health Services Administration; Environmental Protection Agency (EPA); Food and Drug Administration; Department of Homeland Security; and Centers for Disease Control and Prevention (CDC). The CDC is the main federal agency through which state and local funding for public health activities flows.⁷ Despite this, the CDC's funding has declined over the years.[®] Figure 1 shows a more than 8 percent decrease in CDC funding since 2010.

Figure 1

U.S. Centers for Disease Control and Prevention (CDC) program funding has declined since 2010

CDC funding from 2010 through 2021 in thousands, adjusted for inflation



Note: The authors calculated inflation adjustment using the Consumer Price Index Inflation Calculator from the U.S. Bureau of Labor Statistics. For consistency, the authors assumed each year's dollar value accounts for the May rate and converts the value in a given year to May 2021 dollars. Fiscal year 2018 includes one-time lab funding, and FY 2019 does not account for a transfer of funds from the CDC to the Office of the Assistant Secretary for Preparedness and Response.

Source: Source: This figure was adapted from Matt McKillop and Dara Alpert Lieberman, "The Impact of Chronic Underfunding on America's Public Health System: Trends, Risks, and Recommendations" (Washington: Trust for America's Health, 2021), available at https://www.tfah.org/report-details/pandemic-provedunderinvesting-in-public-health-lives-livelihoods-risk/; U.S. Centers for Disease Control and Prevention, "Operating Plans," available at https://www.cdc.gov/ budgd/paperting_plang/index_httpl (Jast accessed May 2022): U.S. Purcey of

Historically, federal public health funding has been inconsistent and reactionary, with waves of increases following the 9/11 terrorist attacks and the passage of the Affordable Care Act but sharp cuts shortly after other events such as the passage of the Tax Cuts and Jobs Act of 2017 and the Great Recession.^{*} Indeed, under both the Obama and Trump administrations, federal funds meant to support public health programs and prevention efforts were reallocated to other non-public health priorities.¹⁰

Waves of public health funding often come after a public health emergency and are linked to specific diseases or issues, such as H1N1, Ebola, Zika, and now COVID-19.¹¹ Yet after the immediate danger from such threats subsides, funding is slashed.¹² In particular, the Public Health Emergency Preparedness (PHEP) cooperative agreement, which is the primary source of federal funds for state and local public health emergency preparedness and response, was a victim of that volatile funding and, despite temporary influxes during emergencies, has trended downward over the past 10 years. (see Figure 2)

Emergency preparedness funding has declined over time

Federal funding for state and local preparedness and response in thousands, 2003–2021



Notes: Funding for 2011–2021 is from U.S. Centers for Disease Control and Prevention's (CDC's) operating plans. Funding for 2003–2011 is from CDC's congressional justifications. Funding totals for 2003–2005 reflect "Upgrading State and Local Preparedness." Funding for 2007–2010 includes public health cooperative agreements, centers for public health preparedness, advanced practice centers, and all other state and local capacity. Funding for 2012–2015 includes public health cooperative agreements, academic centers, and all other state and local capacity. 2016 includes immediate zika response funding. 2017–2021 includes public health cooperative agreements and academic centers. These discrepancies reflect changes in CDC reporting. 2003 numbers were sourced directly from Trust for America's Health historical data files shared with the Center for American Progress.

Source: Source: Figure adapted from Matt McKillop and Dara Alpert Lieberman, "The Impact of Chronic Underfunding on America's Public Health System: Trends, Risks, and Recommendations" (Washington: Trust for America's Health, 2021), available at https://www.tfah.org/report-details/pandemic-provedunderinvesting-in-public-health-lives-livelihoods-risk/; U.S. Centers for Disease Control and Prevention, "Operating Plans," available at https://www.cdc.gov/ budget/operating-plans/index.html (last accessed May 2022); U.S. Centers for

Additionally, federal contributions to overall public health spending have long remained flat.¹ As such, state and local funding sources must compensate for the increasing lack of federal funding, and many have struggled to make up the difference, leading to a patchwork of public health investment across the nation.¹ Relying heavily on state and local funding for even minimum public health needs—for instance, investigating foodborne outbreaks, providing substance abuse services, and promoting maternal and child health—creates a system rife with inequities because investment, and therefore capabilities, varies significantly across the country. While each locality has a different mix of funding sources, local public health agencies rely in part on local revenue streams such as property taxes, which public school funding research has shown leads to racial and socioeconomic disparities.¹⁵ Considering these differences in how state budgets prioritize public health, the inconsistencies in local public health service offerings are unsurprising.¹⁶

A 2018 study found that in the United States, "only 51% of the population is served by a comprehensive public health system."¹⁷ The Public Health National Center for Innovations has outlined eight foundational capabilities

that each public health agency must have to provide the services in each of the five foundational areas of public health. (see Figure 3) These foundational capabilities reflect crosscutting skills and capacities needed for community health and well-being, and the foundational areas reflect the minimum level of public health services and protections needed to improve community health.

Figure 3



Foundational public health services for ev

Skills, capacities, services, and protections needed well-being, and equity

Foundational area

Communicable disease control

Chronic disease and injury prevention

Environmental public health

Foundational capabil

Equity

	Assessment and surveillance	Community partnership development	E
	Policy development and support	Accountability and performance management	Eme prepa and r
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Source: Public Health National Center for Innovations, "Foundational Public H 2022), available at https://phnci.org/uploads/resource-files/FPHS-Factsheet-2

The boom-and-bust, disease-specific, and underfunded approach to public health makes it challenging to ensure that every community is served by a comprehensive public health system; it leaves little room for public health systems to protect health and well-being or to conduct the preparedness and surveillance efforts necessary to anticipate a health emergency. Indeed, the Government Accountability Office has found enduring deficiencies in the ability of the United States to prepare for, and respond to, a range of public health emergencies, including COVID-19 and other infectious diseases as well as extreme weather events such as hurricanes.¹⁰ Final authorizations of federal funding after the onset of a public health emergency have ranged from immediately after the emergency—in the case of Hurricane Katrina—to 235 days after, as seen in 2016 with the U.S. response to the Zika virus.¹⁰

The country must enact significant policy changes to provide adequate, flexible, and sustained funding for public health in order to protect against disease and disability as well as to respond quickly to a broad range of potential threats.

Public health funding challenges affect workforce, data, and technology

The weakened state of the public health system has had disastrous effects on the nation's ability to respond to COVID-19⁴⁴—a reality, as public health experts warned, loomed well before 2020.⁴⁴ Public health agencies lack the resources needed not only to handle the pandemic but also to address issues currently overshadowed by COVID-19 as well as to prepare for future emergencies.⁴⁴ In the face of COVID-19, agencies temporarily abandoned core services such as HIV/AIDS education, smoking cessation programs, and maternal and child health promotion, among other services. As a result, state and local public health officials have reported a range of issues, including increases in drug overdoses, sexually transmitted diseases, cases of the flu, and intimate partner violence, as well as drops in reports of child abuse despite increasing concerns of risk among caseworkers.⁴⁴ Meanwhile, climate-related emergencies that pose public health challenges are occurring at alarming rates.⁴⁴

As a result, two years into the pandemic, public health professionals are incredibly strained after having to do more with fewer resources and workers.

Defining the public health workforce

Yet this list only begins to capture the public health workforce. In fact, there are many workers with job duties that fall within the scope of public health but whose employers fall outside the traditional public health system. Despite this, by far, the main employers of public health workers are federal, state, and local government public health departments and agencies.⁴⁰ This report largely focuses on investment in those governmental public health agencies and their public health laboratories, while also highlighting ways in which those agencies can partner with nongovernmental public health entities.

A 2017 study of the public health workforce highlighted the system's vulnerabilities pre-pandemic, finding that more than 56,000 local health department jobs had been eliminated since 2008 and that nearly half of the workforce planned to leave their job or organization by 2022 due to "inadequate pay," "lack of support," "lack of advancement," or "workplace environment," among other reasons." From 2008 to 2019, local public health department full-time staff decreased by 16 percent, while state agencies lost 10 percent of their staff from 2012 to 2019. Figure 4 shows a shrinking workforce ill-staffed to deal with even core public health

services ahead of one of the worse public health emergencies in modern times.

Figure 4



The numbers of state and local public health workers are declining

Full-time equivalent employees at state and local public health agencies and health departments, 2008–2019



2019

Notes: State figures are for full-time equivalent employees in state public health agencies excluding those states without comparable data: Kansas, New Jersey, Texas, and Wyoming. Local figures are for full-time equivalent employees in local health departments. Data gaps in 2008, 2012, and 2013 are the result of varying survey timing for state and local agencies.

Source: Sources: Figure adapted from Laura Weber and others, "Hollowed-Out Public Health System Faces More Cuts Amid Virus," Kasier Health News and Associated Press, July 1, 2020, available at https://khn.org/news/us-public-health-system-underfunded-under-threat-faces-more-cuts-amid-covid-pandemic/; National Association of County and City Health Officials, "National Profile of Local Health Departments" (Washington: 2019), available at https:// www.naccho.org/uploads/downloadable-resources/Programs/Public-Health-Infrastructure/NACCHO_2019_Profile_final.pdf; Kaiser Health News, "2020 Underfunded and Under Thread Data," available at https://github.com/ khnews/2020-underfunded-under-threat-data/blob/master/data/01-state-public-health-agencies.csv (last accessed Mav 2022).

In the public health sector, recovery from the pandemic has been slow.²⁴ In fact, workforce issues have become even more pronounced in the wake of COVID-19, with public health workers facing fatigue, hostility, and erosion of authority.²⁵ A January 2022 study of state and local public health staff revealed troubling findings: 56 percent of public health employees "report at least one symptom of post-traumatic stress disorder," and others are generally struggling with their mental health.²⁶ Additionally, nearly 1 in 3 public health workers are "considering leaving their organization within the next year," with 39 percent of those who intend to leave saying the pandemic increased the likelihood of their exit.²⁶ According to the study, the top two reasons for leaving were "pay" and "work overload/burnout."²⁷

Under the intense politicization of the pandemic, many public health officials have reported facing unreasonable amounts of pressure, verbal abuse, and physical threats from the public and, in rare cases, other government officials. Indeed, over the past two years, 41 percent of public executives have felt bullied, threatened, or harassed by people opposing health measures, while 56 percent have had their public health expertise challenged or undermined. Their authority to implement key public health measures to combat the coronavirus has been weakened substantially: 32 states have enacted more than 100 new laws or other legal tools that either limit the power of public health officials altogether or ban certain public health interventions such as mask and vaccine mandates. One Missouri public health official compared working under such restrictions to having one's "hands tied in the middle of a boxing match."

Under these circumstances, the public health sector has become an inhospitable environment for even the most dedicated and passionate individuals. According to a Kaiser Health News-Associated Press report, more than 300 state or local public health officials either resigned, retired, or were fired from April 2020 to September 2021 likely due to pressures and restrictions on authority resulting from COVID-19. As a result, "1 in 5 Americans have lost a local health leader during the pandemic."

THE NEED TO IMPROVE PUBLIC HEALTH: BY THE NUMBERS

51%

Percentage of the population served by a comprehensive public health system 1 in 5

Share of Americans who have lost a local health leader during the pandemic

\$4.5B

Estimated new and permanent annual funding needed to ensure equitable and sustained foundational public health services for all 80K

Minimum number of additional workers needed to ensure public health departments can provide basic public health services

On top of these challenges, compensation remains a major issue for workers in the public health field who have more advanced and specialized training. Salaries in many public health roles are significantly lower than those in private sector jobs while still largely requiring the same advanced education. For example, entry-level salaries for workers with a graduate degree in public health are between \$30,000 and \$50,000, while the starting salaries of those with the same degree at consulting firms are typically higher. Meanwhile, entry-level public health nurses make roughly \$50,000, whereas a newly trained nurse could instead make more than \$65,000, on average, in the private sector.

These salary gaps only add to the public health system's workforce shortage. Even within the private sector, workers focused on public health can receive lower pay than others. For example, infectious disease specialists, the doctors who work alongside epidemiologists to diagnose and research pathogens, are the lowest-paid physicians in the United States. The fact that workers must accept both lower pay and the additional stressors brought on by the pandemic makes retaining and recruiting a strong public health workforce difficult. Together, these issues have drained the public health workforce such that 80,000 to 100,000 more workers are currently needed to ensure that state and local departments can perform minimum public health services.

Effects on technology and data systems

Many public health departments and agencies are also severely lacking in modern technology and data systems to support services that help identify community risk and inform prevention activities, such as conducting realtime disease surveillance, tracking mortality trends, and monitoring safety and environmental conditions.⁴⁰ This also limits agencies' ability to target interventions and coordinate cross-jurisdictional solutions to large-scale public health emergencies.⁴⁰ In the early days of the pandemic, not only did labs experience backlogs of more than 10 days to process COVID-19 test results, but also some state health departments were relying on paper-based and manual entry procedures to receive and report results.⁴⁰ Because the CDC relies on state data in monitoring and tracking outbreaks, these rudimentary data systems at the local and state level delayed and hampered the federal government's ability to rapidly respond to and contain COVID-19 early on in the pandemic.⁴¹

The data problem in public health is multilayered. On the most basic level, there are simply not enough workers to properly process, interpret, and leverage the data.⁴⁴ For example, informatics specialists that develop data tools, work processes, and interfaces necessary for public health work only make up 1 percent of health department roles;⁴⁵ this means that other public health staff must fill the gaps in agency needs.⁴⁶ Meanwhile, inconsistencies in recording key demographic information such as race and ethnicity hinder the ability to track disparities in order to inform response strategies and resource allocation.⁴⁶ Another major issue with public health data systems is the lack of interoperability.⁴⁶ Historically, data systems have not communicated with one another in ways that facilitate timely data exchange.⁴⁷ These failures exist across settings, geographic regions, and government levels.

The overwhelming majority of Americans support funding increases to improve public health and believe that public health agencies are necessary for improving the nation's health.

To fully understand the state of the U.S. population's health both within and outside of an emergency, medical systems, nursing homes, jails, and other congregate settings must have data systems that feed into local or state public health data systems. Public health departments must also be able to share data across localities and states as people move around. Specifically, local, state, and federal public health agencies must have robust data-sharing capabilities that facilitate the development of coordinated responses to widespread threats.

Even within the same department, interoperability can be a challenge based on function. During the pandemic, for instance, many states' systems meant for tracking COVID-19 test results could not communicate with systems used for case management.²⁰ And as the threat of COVID-19 increased, many departments relied on manual data entry and cleaning processes to overcome these shortcomings, which often added

to data errors and inconsistencies.²⁴ Even the best data systems were illequipped and strained under the weight of the massive amount of data it takes to monitor a pandemic.²⁴

The failures of public health data systems reflect the consistent lack of funding in public health. Even when funding has been directed toward public health, it has rarely been used specifically for data system improvement.⁴⁴ The lack of direct investment into data infrastructure has hindered health departments' ability to effectively carry out their core public health functions and projects, which often rely on certain data capabilities.⁴⁴ Before the pandemic, the last influx of public health funding for data modernization came from the 2010 Affordable Care Act.⁴⁴ Thanks to new funding from the Coronavirus Aid, Relief, and Economic Security (CARES) Act and American Rescue Plan Act (ARPA), there has been improvement from those early pandemic days when the weaknesses of public health data systems were exposed. But the work is not done, and without additional funding, this progress will be short-lived. Public health officials at all government levels still report feeling less than prepared to handle the data needs of future emergencies.⁴⁴

While the pandemic has helped raise public awareness about the importance of public health,⁴⁴ misinformation and the politicization of COVID-19 have shaken Americans' trust in the system. Indeed, a study from the Robert Wood Johnson Foundation and Harvard T.H. Chan School of Public Health found that less than half of the public reports having trust in public health agencies—and only 52 percent trust the CDC, while 70 percent trust health care workers.⁴⁴ Despite this, the overwhelming majority of Americans support funding increases to improve public health and believe that public health agencies are necessary for improving the nation's health.⁴⁴ These findings highlight the real need to reassure the public of the competency of the public health system, in conjunction with increased investments and the creation of safeguards to ensure that public agencies are free of political interference.⁴⁴

In the absence of such actions, uptake of public health strategies and interventions will suffer—as illustrated by COVID-19 mitigation efforts. In 2020, researchers published an evidence-based model in *Frontiers in Public Health* that can help build and maintain public trust in public health officials, particularly during emergencies such as a pandemic.⁴⁴ Key tenets of this model were transparency, development of protocols and procedures, credibility, proactivity, collaboration, prioritization of the public, and education.⁴⁴

Public health funding must be increased and made permanent

As with other public health emergencies, the COVID-19 pandemic brought on a wave of renewed funding at all levels of government. In 2020, Congress approved more than \$300 billion in supplemental funding for federal public health agencies and the Public Health and Social Services Emergency Fund (PHSSEF) to respond to the coronavirus pandemic including \$500 million for public health data modernization through the CARES Act.¹¹ Meanwhile, ARPA, which was signed into law in March 2021, provided nearly \$93 billion in additional funding for public health activities, including vaccine education and distribution; data modernization, testing, and contract tracing; bolstering the Strategic National Stockpile, a repository of therapeutics, vaccines, and medical supplies and equipment ready for rapid distribution;¹¹ and workforce development.¹² Of note, the Infrastructure Investment and Jobs Act, signed into law on November 15, 2021, made important investments in public health, even though it did not necessarily fund public health systems directly.¹⁴ Some of these include \$63 billion for water infrastructure, \$21 billion for clean-up of environmental hazards, and \$65 billion for power grid and clean energy improvements.¹⁵

In addition, the House-passed reconciliation package would provide \$10 billion over five years for "core public health infrastructure" and other public health activities.⁷⁶ While these investments are helpful and necessary to mitigate the impacts of COVID-19, more and longer-term support is needed to bolster foundational services and preparedness capabilities within the system and move beyond public health's history of one-time crisis funding.

More and longer-term support is needed to bolster foundational services and preparedness capabilities within the system and move beyond public health's history of one-time crisis funding.

The appropriations process is also an opportunity to infuse more sustained funding into public health. The fiscal year (FY) 21 congressional appropriations included a number of provisions that support public health, including funding to strengthen lab capacity, enhance data modernization, and support workforce development.¹⁷⁷ Then, the FY 22 congressional appropriations built on this progress by making notable increases to federal public health agencies, compared with 2021 spending: a \$582 million increase for the CDC, \$200 million of which is directed to state and local infrastructure needs; a \$325 million increase for the Office of the Assistant Secretary for Preparedness and Response (ASPR), \$140 million of which goes to the Strategic National Stockpile; \$148 million for the Biomedical Advanced Research and Development Authority (BARDA); and a \$33 million increase for other public health efforts.¹⁷⁰

These are important steps away from one-time, crisis funding. At this stage in the pandemic, however, legislators appear less willing to invest in immediate pandemic recovery and mitigation strategies, let alone long-standing public health infrastructure. The White House has indicated that without further investments, further funding for COVID-19 efforts such as testing, vaccine distribution, and therapeutic procurement is not available, and it recently requested \$22.5 billion from Congress.¹⁰ This lack of funding is alarming, specifically how it impacts the uninsured.¹⁰ Yet some legislators have been hesitant to invest more, claiming unused prior allocations and a lack of transparency around how funds are being spent.¹¹

These issues point to perpetual challenges in funding public health: 1) it is not always easy to see the fruit of public health investments quickly; and 2) public health needs long-term sustained funding. It makes little sense to expect states and localities to rely on temporary funding to address longterm structural needs exacerbated by the pandemic. In particular, states and localities cannot hire staff if that staff cannot be maintained without continued funding.

Without timely action, progress in the public health system made from supplemental investments during the pandemic is at risk of erosion. Federal legislators should therefore focus on ensuring sufficient and consistent funding for public health, while also supporting pandemic emergency response efforts, which would support the Biden administration's goals as well as calls from public health experts.⁴⁴ A panel convened by the Public Health Leadership Forum found that \$4.5 billion in new and permanent annual funding is needed to ensure equitable and sustained foundational public health services for all.⁴⁴ This comes down to an investment of \$32 per person. Current national investments, however, amount to only \$19 per person.

Research suggests that ensuring equitable and sustained public health requires an investment of \$32 per person, but current national investments amount to only \$19 per person.

Investing in public health has many benefits

In 2020, life expectancy in other industrialized countries surpassed that of the United States by nearly five years.⁴⁴ The United States' struggle to control COVID-19 while experiencing the world's largest death toll added to a trend already in motion: the declining health of Americans.⁴⁵ Indeed, new academic analysis estimates that in 2021 U.S. life expectancy continued to decline, despite the development and distribution of effective COVID-19 vaccines.⁴⁶ Conversely, many of the United States' peer countries saw their life expectancy rebound in 2021 after dropping in 2020.⁴⁷ Excess deaths among the working-age population are also on the rise.⁴⁶

Research makes clear that public health interventions improve health and quality of life exponentially.

Improved health outcomes

Moderate increases in public health spending have been linked to as much as a 7 percent decrease in mortality rates." Studies have found that even a \$10 per capita increase in local public health spending is associated with reduced overall mortality and a greater share of the population reporting being in "good," "very good," or "excellent" health." Likewise, reductions in low birth weight, foodborne illnesses, rates of sexually transmitted diseases, and more have been linked directly to spending on public health interventions.⁴¹ In fact, one study in California found that every \$1 invested in public health yields up to \$88 in improved health status and benefits to society,⁴² proving the adage that an ounce of prevention equals a pound in cure.

Reduced health care costs

Investments in public health also have important implications for the health care system. In 2019, the United States spent roughly \$3.8 trillion on health, but less than 3 percent of that was spent on public health specifically⁴⁴—a decline from the 3.2 percent spent on public health in 2000.

Over the past 20 years, only 2 to 3 percent of health spending has gone to public health.

More recently, spending on health in the United States was \$4.1 trillion in 2020 and is projected to rise to \$6.2 trillion by 2028. Despite spending more on health care than peer nations, however, Americans are not any healthier. Population health in the United States continues to decline, while health care costs are rising and the vast majority of health care spending is used to treat conditions that could have been prevented.

Yet public health services are designed to do just that: prevent disease and injury before medical intervention is necessary. State-level analyses have shown that increases in public health spending reduce Medicare utilization, especially in areas with high poverty and uninsurance rates as well as areas with fewer health professionals. Other estimates show that for every \$1 invested in public health interventions focused on reducing common chronic conditions such as diabetes and cardiovascular disease, at least \$5 in health spending is saved. Likewise, spending more on social services than on health care has also been shown to produce better health outcomes, supporting the idea that public health, and its focus on social determinants, requires investment to reach its goal of improved health.

"Public health is what we, as a society, do collectively to assure the conditions in which people can be healthy."

Source: Institute of Medicine Committee for the Study of the Future of Public Health, "The Future of Public Health" (Washington: National Academies Press, 1988), available at https://www.ncbi.nlm.nih.gov/books/NBK218215/#ddd00011.

For a concrete example of how the public health system works to protect individuals and communities and to promote health and well-being, see Figure 5 below, which shows how public health helps a parent, Jamie, and a child, Shay, in their everyday lives.

Figure 5



Meet Jamie and their 12-year-old child, SI Public health interventions keep them he



Source: This scenario is based on the authors' knowledge of public health sys

Public health interventions that help Jamie and Shay include:

Lead-free water in schools Lead service lines deliver water in some schools and child care centers, even though there is no safe blood lead level for children. The health department can test for lead in school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poisoning. The school drinking water to reduce Shay's chance of exposure and poison drinking water to reduce Shay's chance of exposure and poison drinking water to reduce Shay's chance of exposure and poison drinking water to reduce Shay's chance of exposure and poison drinking water to reduce Shay's chance of exposure and school drinking water to reduce Shay's chance of exposure and poison drinking water to reduce Shay's chance of exposure and school drinking water to reduce Shay's chance of exposure and school drinking water to reduce Sh

Safety guidance

Through electronic case reporting, laboratory information management systems, and disease reporting hotlines, health departments can track safety issues and alert communities.¹⁴² The health department can provide guidance on preventing tick bites and symptoms of tick-borne disease to help Jamie and Shay reduce risk of Lyme and other diseases.

Restaurant inspections

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Routine food safety inspections can identify policy violations that could result in foodborne illness.¹⁶⁴ By identifying violations, health departments can reduce Jamie's and Shay's risk of food poisoning.

Community health improvement plans

Health departments are charged with developing community health improvement plans to strategically address community needs.¹⁴⁵ If Jamie and Shay's community identified violence as a high priority, resources could be dedicated to actions such as establishing an office for neighborhood safety, which can reduce homicides, hospitalizations, and firearm-related crimes.¹⁴⁶

HPV vaccine

HPV vaccines, which are recommended for children, prevent cancer and save lives, regardless of gender.¹⁰⁷ School-based immunization programs and text message reminders to Jamie can help ensure that Shay gets vaccinated.¹⁰⁰

Wastewater surveillance

Samples from community wastewater are sent to public health laboratories for testing. These samples can show early indications of a COVID-19 surge or new variant,¹⁰⁴ enabling the local health department to take precautions to reduce Jamie's and Shay's risk of disease.

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Family planning services

Patient education and counseling, reproductive health screenings, access to contraceptives, and pregnancy testing all improve health.¹¹⁰ Through these services, health departments can help reduce risk of unintended pregnancy in families such as Jamie and Shay's.¹¹¹

Reduced underage tobacco sales

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Active monitoring of compliance with laws that prevent children and teens from buying cigarettes can help keep Shay from smoking initiation, reducing the risk of addiction and disease.¹¹¹

Preventive screenings

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Community health workers (CHWs) can conduct health screenings and connect community members with needed services and clinical care.¹¹¹ CHWs can help make sure that Jamie and Shay find a provider and get screenings to prevent illness and disease.

Advancements in economic justice and equity

Investing in public health infrastructure would not only improve health and reduce costs but also advance economic justice and equity.

State and local public health workers are largely women (77 percent). In fact, women's enrollment in public health degree programs outweighs that of men.¹¹⁴ Yet research shows that female-dominated occupations tend to have lower pay than male-dominated occupations, indicating a devaluation of work done by women.¹¹⁵ Given this fact, it should come as no surprise that gender disparities in pay are still persistent in the public health sector, especially among leadership positions.¹¹⁶ Men are also overrepresented in executive roles.¹¹⁷ These pay disparities and the lack of proportional representation at the very top put women in public health—and, subsequently, the whole field, given that they are the majority of workers—at a disadvantage.

In addition, the public health workforce is racially diverse: More than 40 percent of workers are nonwhite, and Black people have higher representation in public health than in the overall state and local government workforce.¹¹⁰

The demographic makeup of the workforce shows that public health can be a viable career option for women, people of color, and those living at the intersection of those identities. Therefore, economic equity can be advanced by improving wages, building education and training pathways into the profession, and providing opportunities for career advancement, thereby ensuring people with marginalized identities have access to competitive wages and opportunities for career growth.

The workforce shortages exacerbated by the pandemic are likely also to be compounded by an aging workforce: The median age for state and local public health workers is 48, while all other government workers have a median age of 45.¹¹¹ In a 2017 survey, nearly a quarter of the public health workforce responded that they planned to retire by 2022.¹²⁰ Investing in public health now presents an opportunity not only to strengthen the number of public health workers but also to bring those workers in at early stages of their careers.

Public health improves health and quality of life while effectively reducing health disparities.¹¹¹ By targeting interventions for low-income communities and communities of color, public health can help level the playing field of health and well-being. Additionally, because these communities tend to be underresourced, investments and workforce building efforts should target these communities first to advance health equity.

Urgent investment is needed to combat the increasing public health emergencies

The increasing frequency and severity of public health threats makes investment and preparedness all the more urgent. The COVID-19 pandemic is but one example of the vast impact that a public health emergency can have on society. The increasingly common and severe impacts of the climate crisis pose yet another significant threat to health and safety—one that the current U.S. public health infrastructure cannot sufficiently manage.¹¹² Indeed, the United States has battled a record-number of climate-related disasters over the past two years. In 2021 alone, the country experienced 20 different climate-related disasters, totaling \$145 billion in damages and nearly 700 related deaths.¹¹²

While the gaps in the current public health system leave everyone at risk, marginalized communities ultimately end up paying the highest price for this failure. For example, low-income areas and communities of color tend to be more vulnerable to severe weather events and more likely to be exposed to the environmental harms linked to accelerating climate change, such as pollution from the combustion and refining of fossil fuels, all while having fewer resources to recover.¹²⁴

Notably, a strong public health system is also key to ensuring national security. The 9/11 attacks highlighted public health's critical role in responding to security threats, and after the attack, billions of dollars in federal funding were invested in state and local public health departments.¹¹⁶ Emerging infectious diseases and environmental dangers that overwhelm the health system, weaken the economy, and even put the health and safety of key public health officials and military forces at risk threaten national security. Unfortunately, these threats are becoming increasingly more frequent.¹¹⁶ The U.S. National Intelligence Council has recognized the rising threat of infectious disease to political and economic

stability:¹²⁷ In 2000, for example, HIV/AIDS was deemed a national security threat given its ability to destabilize governments and economies and significantly increase death rates.¹²⁶ Ebola offers another example: The infectious disease posed such a threat such that the Obama administration incorporated a pandemic response team into the National Security Council; however, the Trump administration disbanded the team in 2018, a year before the first case of COVID-19 was discovered.¹²⁶

The COVID-19 pandemic has reinforced the connection between public health systems and national security. According to CNA, pandemics pose national security threats and embolden violent extremist organizations.¹¹⁰ For example, COVID-19 has been used to undermine state authority. In particular, vaccine misinformation promotes public distrust, which has adversely affected the goal of reaching herd immunity and has therefore prolonged the COVID-19 pandemic and further threatened national security.¹¹¹

These developments illustrate why ensuring the systems that detect, surveil, and report these diseases must be part of the country's strategy to remain safe and secure.¹¹² Beyond this, the growing threat of bioterrorism, such as the anthrax attacks of 2001, puts the nation's security at risk and requires a robust public health response.¹¹²

Furthermore, military resources and personnel are often called to support response efforts after public health emergencies—including extreme weather events—while backfilling local and regional public health and health care resources.¹⁴ Therefore, the number of recruits who meet standards of military readiness is negatively affected as the overall health of Americans declines, further emphasizing the connection between national security and public health.¹⁴

Public health emergencies are inevitable. Yet how the country invests in the system that manages them affects resiliency and the scope of harm that results. Both the human and economic costs of COVID-19 have already far exceeded those of 9/11, even without accounting for the long-term effects of the pandemic that are not yet known. Indeed, estimates place the cost of the 9/11 attacks between \$2 trillion and \$3.3 trillion,¹⁴⁶ while a 2020 study found that COVID-19 would cost the United States an estimated \$16 trillion.¹⁴⁷ Yet that projection was under the assumption that the pandemic would end by late 2021. It is now 2022, and the pandemic continues to rage on, with multiple surges that have led to significant disability and loss of life.

Yet the country has historically dedicated far more resources to defense priorities than the public health system.¹²⁴ The United States does not hesitate to spend hundreds of billions of dollars each year to defend against conventional military threats or to fund a comprehensive nuclear deterrent. It is time to apply these risk-mitigation approaches to the public health issues that pose massive and urgent risks and that have much larger effects on American and global life expectancy. Funding levels for public health infrastructure and interventions must align with the benefit produced by investing—and the risk of not taking action.

Recommendations to build a strong U.S. public health system

COVID-19 has exposed the weakened state of the U.S. public health infrastructure and the need for stable, sustained funding to better address

existing health threats and prepare for future emergencies. Investments must be made in strengthening the public health infrastructure, including bolstering the public health workforce; developing robust, modern, and interoperable data systems; and communicating clearly about the essential role of the public health system.

Policymakers must break the pattern of neglect and prioritize modernized public health data capabilities, workforce capacity, preparedness, and effective messaging strategies.

It is vital that the United States prioritize its public health system in order to strengthen the nation's health and economic security. In November 2021, the Federal Reserve stated that the COVID-19 pandemic remained one of the largest threats to the financial system, noting that the "path of the economy continues to depend on the course of the virus."¹⁴⁴ But the lessons learned from COVID-19 can also be leveraged to improve the public health system going forward.

Funding

The federal government and states must prioritize proper funding for public health in their policy decisions. Specifically, funding should be both stable and flexible in order to allow the public health system to adapt to immediate threats and long-standing local needs.

Prioritize stable, sustained public health system investments

At the beginning of 2022, many states had a budget surplus as a result of the rebound in tax revenue and federal pandemic aid from the CARES Act and ARPA.¹⁴⁰ According to data from the National Association of State Chief Budget Officers, state revenues rose steeply in FY 2021, increasing by an estimated 12.8 percent.¹⁴¹ The Infrastructure Investment and Jobs Act also provides additional investment opportunities that can be directed toward public health.

States can use ARPA funding in a variety of ways to support public health. As of November 2021, 30 states had spent ARPA funds on health-related services, including public health interventions. Eighteen states, meanwhile, had dedicated funding to water and sewer projects, such as drinking and wastewater maintenance and improvement.¹⁴² Other states are investing in broadband: Virginia, for example, appropriated \$8 million to the state Department of Health to address connectivity and infrastructure issues at local health departments.¹⁴⁴

Several states are also using ARPA funds to build lab and testing capacity, improve data systems, and develop workforce supports:¹¹⁴

 Nevada dedicated a portion of its public health emergency funding to operational needs and "expenses relating to establishing and enhancing public health data systems."

- North Dakota allocated \$15 million of its funds to building a public health laboratory.
- West Virginia allocated \$49.9 million to its Department of Health and Human Resources for "COVID epidemiology and lab capacity for prevention and control, for vaccinations and testing supplies, and the Hospital Preparedness Program & public emergency preparedness."
- Wisconsin dedicated \$58.4 million to "local and tribal health departments to continue their work responding to the COVID-19 pandemic and build a strong recovery. Potential uses for the funding include: measures to stop the spread of COVID-19 such as testing, contact tracing, and vaccination programs; staffing for public health and safety; enhancing public health programs through improvements like technology infrastructure or data analysis; and addressing disparities in health outcomes."

Replace siloed, disease-specific funding with comprehensive approaches to shoring up public health infrastructure

CDC funding, and the funding that flows from the CDC to state and local health departments, needs to be sustained and disease-agnostic in order to address gaps in capacity and detect and respond to emerging threats while meeting the existing demands of addressing infectious and chronic diseases and environmental hazards. In particular, health departments need funding to upgrade data systems; meet national quality standards; conduct performance improvement activities; increase communication, collaboration, and public health education campaigns; and meet changing conditions and needs.

More than 200 organizations have urged Congress to make a significant long-term investment in federal, state, local, tribal, and territorial public health infrastructure by adding \$4.5 billion in annual funding to pay for essential activities such as disease surveillance, epidemiology, laboratory capacity, and all-hazards preparedness and response, as well as policy development and support, communications, community partnership development, and organizational competencies.¹⁴⁵

The bipartisan PREVENT Pandemics Act—sponsored by Sens. Patty Murray (D-WA) and Richard Burr (R-NC)—aims to strengthen the nation's public health and medical preparedness and response systems in the wake of the COVID-19 pandemic. Funding would support public health and medical preparedness and response coordination; strengthen public health communication and health security; modernize biosurveillance capabilities and infectious disease data collection; improve recruitment and retention of the front-line public health workforce; and support research and accountability, among other provisions.¹¹⁶ Additionally, the White House FY 23 budget proposal includes \$10 billion for disease surveillance and forecasting, vaccination programs, data modernization, and research on the long-term effects of COVID-19—a \$2.8 billion increase from 2021 allocations.¹¹⁷ Yet funding remains insufficient; even supplemental funding for the most immediate COVID-19 response and recovery needs is currently being held up in Congress.¹¹⁴

Preparedness

Given the increasing effects of climate change and emerging infectious diseases, the public health system must be prepared to respond to a wide

range of health threats rapidly. This requires improvements in the surveillance and lab systems that monitor developing threats.

Upgrade and expand disease surveillance systems and lab capacity to identify unmet needs and emerging health threats

Improving testing and response capacity—including by expanding the number of state, local, federal, and other labs that participate in the Laboratory Response Network—would assist public health systems in responding quickly to biological and chemical terrorism, emerging infectious diseases, and other public health emergencies.¹¹⁹ For example, the state of Michigan is using \$220 million of its ARPA funds to build a new public health laboratory.¹²⁰

In addition to lab capacity, policymakers should fund improved data and predictive modeling on the health impacts of climate change. The Climate Change Health Protection and Promotion Act would mandate and provide funding for federal agencies to track environmental and infectious disease data and engage in forecasting and modeling. It would also provide technical support to state and local health departments, helping them develop climate preparedness plans and conduct community outreach.¹²¹

In addition, Congress must appropriate funds to strengthen adaptation interventions and their implementation, as well as to ensure that every state health department can prepare for climate change and track their progress through local-level monitoring. The CDC's Climate and Health program, for example, through its Climate-Ready States and Cities Initiative, provides funding and technical assistance to states and localities seeking to improve their resiliency to climate change.¹²¹ Additional funding for this program would allow more communities to improve their resilience to climate change.¹²²

Data from public health laboratories are a mostly untapped resource for identifying health threats, including climate change and its health implications—for instance, the impact of air and water quality changes on illness and death—as well as increasing death rates stemming from COVID-19. The California Department of Public Health's Environmental Health Laboratory, for its part, is assessing the impact of wildfire smoke on firefighters and residents, the spread of mosquitoes and ticks and its effect on vector-borne disease, and the presence of cyanotoxin in drinking water.¹²⁴

Wastewater surveillance is one promising infectious disease surveillance tool that can help scientists track how viruses evolve and mutate. This information can inform public health decisions, and in the case of COVID-19, it can inform the location of testing and vaccination sites as well as the distribution of resources to areas of need. The CDC is supporting states and localities in developing wastewater treatment surveillance programs and has initiated the National Wastewater Surveillance System to collect water samples from hundreds of wastewater treatment sites across the country.

Looking ahead, the United States should fund research to investigate the full range of viral families that threaten humans, with the goal of developing the diagnostics, vaccines, and therapeutics—and rapidly scalable manufacturing capacity—required for the next crisis. The Biden administration has committed to building capacity to develop and produce effective vaccines to protect the U.S. population within 130 days of a new biological threat before using surge production capacity on global needs.

This ambitious goal will require substantial additional funding but could save countless lives.

Data

Public health requires modernized data systems that both communicate with other data systems and include sufficiently detailed and actionable information. This ensures that accurate data is available in rapid response efforts and can help determine equitable resource allocation.

Improve and standardize public health data collection efforts, including by capturing data on vulnerable communities

Data reported by broad racial and ethnic categories often mask disparities among subgroups. Yet unfortunately, there is a lack of detailed demographic characteristics—such as race, ethnicity, disability status, sexual orientation, and gender identity—in public health data.¹⁵⁶ Collecting more disaggregated data would help public health experts understand the nuances in the lived experiences of these subgroups. This understanding could then guide policymakers in targeting resources and interventions to the communities disproportionately affected by health threats, reducing health disparities and improving health outcomes.

In response to the challenges posed by COVID-19, states have made efforts to improve the granularity of their data collection. For example, North Carolina's COVID-19 vaccination management system has a mandatory data entry field for patients' race and ethnicity. By training providers and offering incentives to ensure consistent collection of data, North Carolina has received race and ethnicity data for 94 percent of COVID-19 vaccinations, supporting the effective allocation of resources to communities in need.¹²⁷

Invest in modern public health data capabilities that are flexible, dynamic, and interoperable

Timely and accurate data are essential to quickly identifying and responding to new threats and trends. Public health authorities need the ability to gather and analyze timely testing and monitoring data in order to convince leaders to take necessary preventive steps both domestically and internationally. Unfortunately, during the COVID-19 pandemic, the federal government was left to rely on data from foreign countries with more sophisticated public health monitoring systems in order to determine U.S. policy; testing, disease surveillance, and data management systems require modernization to fill this gap.¹²⁰ This will, in turn, require large investments to institutionalize improved public health systems—for example, by supporting regular genome sequencing of unknown respiratory diseases at home and abroad in order to detect new pathogens early and feeding that data into a global early warning system and database.

During public health emergencies, it is vital to aggregate real-time actionable data across both public and private settings and systems. State, local, and federal public health agencies need detailed, patient-level data quickly—typically within 24 hours—so they can better understand the populations affected by and the burden of diseases, conduct case investigations, and implement proper prevention and control measures. Initial case notifications are largely lab-based; however, basic demographic information does not typically flow from the ordering electronic health record (EHR) to the laboratory information system. Data elements necessary to help initiate a case investigation are missing when the labs report their results to public health agencies.

Additionally, federal agencies such as the CDC lack the legal authority to standardize and coordinate data-sharing within and across localities— which complicates their ability to access key local data, such as hospital capacity, without relying on piecemeal data agreements.¹²⁴ This hinders public health's ability to respond in real time. Past CDC directors have likened this to the risk of "flying blind as health threats emerge."¹⁰⁰

Public health must be modernized to solve interoperability issues so that seamless data-sharing between public health agencies and health care providers can be achieved.¹⁴¹ Michigan, for instance, is improving interconnectivity by allocating \$115 million in health information technology systems, including its Michigan Care Improvement Registry, Disease Surveillance System, and Health Information Network.¹⁶⁴

The combined \$1 billion in funding for public health data modernization— \$500 million provided through the CARES Act and \$500 million provided through ARPA—has catalyzed efforts to create modern, interoperable, and real-time public health data and surveillance systems.¹⁴² This funding went to the CDC's Data Modernization Initiative (DMI), which focuses on enhancing the ability of public health data systems to track and predict health threats. In addition to providing funds directly to public health agencies for data improvement, the DMI's objectives include developing data standards to ensure cohesion and interoperability of data systems throughout the nation.¹⁶⁴ Among other objectives, the DMI is focused on leveraging new data sources and partnerships to support public health efforts, as well as on strengthening the critical and specialized workforce needed to work with public health data. Currently, only about 1 percent of health department roles specialize in data science and informatics.¹⁶⁶

Likewise, the CDC's newly created Center for Forecasting and Outbreak Analytics, funded through ARPA, will improve the government's ability to forecast and model emerging health threats, expand collaboration by increasing capacity for data-sharing and interoperability, and support policymakers by communicating forecasts to inform decisions.⁴⁴⁶

While these investments have facilitated improvements over the past two years, current systems are still far from sufficient, and ongoing funding beyond APRA will be needed to ensure continued, consistent development. Health departments need access to affordable, standardized software and data, as robust data systems allow public health departments to be more efficient so that workers can dedicate time to other needs.¹⁶⁷ If the country does not invest in scalable approaches based on modern web standards, public health will continue to suffer from lagging and incomplete data.

Workforce

More workers are needed to build a robust and responsive public health system. Therefore, it is necessary to provide additional pathways for entry into the field, prioritizing workers from underrepresented communities. Moreover, further support—such as loan repayment and wellness initiatives—is needed to retain current workers while securing avenues for surge capacity before the next public health emergency.

Build a diverse and culturally competent workforce with training in strategic and systems thinking, data science, communication, and

policy evaluation

The Biden administration invested \$7.4 billion of ARPA funds in recruiting and hiring public health workers to respond to the COVID-19 pandemic and prepare for future public health threats. This funding will assist state and local public health departments in hiring staff to respond to the pandemic, including efforts related to vaccine outreach and administration as well as coronavirus testing. For example, HRSA is using nearly \$48 million of ARPA funding to expand the public health workforce in rural and tribal communities, focusing specifically on roles such as community health support and health information technology.¹⁶⁰

In response to recommendations of the COVID-19 Health Equity Task Force, the Biden administration also is investing in building a more diverse and sustainable public health workforce. New investments support diversity, equity, and inclusion by raising awareness and interest among underrepresented groups, expanding recruitment for community health workers and other paraprofessionals, and creating pipeline programs in underserved communities.¹⁴⁴

Among other provisions, the American Rescue Plan included almost \$300 million for the Association of Public Health Laboratories to provide fellowships and internships to support the public health laboratory workforce. The investment also provides funding for the creation of a Public Health AmeriCorps and a new CDC grant program.¹¹⁰

Public Health AmeriCorps

The American Rescue Plan allocated \$400 million toward the creation and launch of Public Health AmeriCorps. The program, which launched in 2022, was jointly developed by AmeriCorps and the CDC to support the recruitment, training, and development of the next generation of public health leaders. It intends to build a diverse pipeline for the public health workforce and provide surge capacity to assist health departments in addressing the public health needs of communities.

Public Health AmeriCorps will fund up to 5,000 member positions over the next five years.¹⁷¹ It is a significant investment for AmeriCorps and leverages the public service, workforce development, and technical expertise of the two federal agencies. Nevertheless, AmeriCorps members are poorly compensated, and resources provided through the CARES act and ARPA to increase living allowances are not permanent.

Fortunately, the House-passed reconciliation package would increase the postservice educational benefits for all AmeriCorps members and raise the minimum AmeriCorps living allowances to 200 percent of the poverty line to help make national service a more equitable opportunity for all Americans.

There is also opportunity to invest in expanding apprenticeship pathways that train public health workers, often through union organizations. Several successful programs already exist for community health workers.¹⁷¹

Efforts in California, for instance, are seeking to expand the pool of nurses in congregate settings through apprenticeship.¹⁷² The U.S. Department of Labor (DOL) is already prioritizing expansion of registered apprenticeships

across all sectors, with a \$113 million investment in its "Apprenticeship Building America" program.¹⁷⁴ Additionally, the DOL's "Good Jobs" initiative seeks to improve job quality and support the unions that often train and advocate for workers.¹⁷⁵

Capitalizing on the benefits of unions and making training programs more accessible is key to addressing workforce issues for workers in less specialized roles, such as community health workers and contact tracers. Moreover, it enhances these job roles' competitiveness with the private sector, thus drawing in workers. Strategic cross-agency collaboration can be leveraged to ensure that public health roles are included in these efforts at the DOL and that more pathways are created to build up the public health workforce.

Provide incentives for public health service, such as loan repayment, bonus payments, pay equity, and opportunities for job growth

Through loan repayment programs, states repay or facilitate the repayment of student loans for qualifying health care providers. The National Health Service Corps' (NHSC) Loan Repayment Program, for example, supports physicians specializing in primary care, dental care, and behavioral or mental health care in rural communities. A public health loan repayment program, as proposed in the Public Health Workforce Loan Repayment Act of 2021, would assist health departments with recruitment and retention by providing incentives for a workforce whose salaries are not competitive with the private sector. Such a program would align with funding available from ARPA for public health staff hiring while providing an opportunity to build a career in governmental public health.¹¹⁴ Connecticut, for example, allocated \$1 million in ARPA funding to its Department of Public Health for loan repayment. It is important to consider recommendations for improving the NHSC, such as adequate and long-term funding as well as more straightforward participation requirements.¹¹⁷

Implementing professional development, training, and opportunities for advancement helps support and retain current workers. Moreover, improvements in workplace conditions are needed as the weight of the pandemic takes a toll on workers' mental health. A 2021 survey found that more than half of the public health workforce experiences symptoms of depression, anxiety, and post-traumatic stress disorder and that these symptoms become more pronounced as hours worked increase and time off decreases.¹¹⁰ Michigan, for its part, is investing \$20 million in workforce support to address these issues—\$10 million in trauma-informed management practices and \$10 million in employee wellness supports in response to pandemic-related stress and burnout.¹¹⁰

Despite increasing resignation rates and the challenges brought on by the pandemic, most public health workers have reported being committed to and satisfied with their work.¹⁶⁰ Many public health workers recognize the importance of their work and have a desire to put forth their best effort.¹⁶¹ This shows that public health is a potentially fulfilling career for workers long term—but only if the issues discussed above are addressed. With federal support, public health agencies must reevaluate their cultures and policies to ensure that workers' needs and well-being are being prioritized. Agency budgets should also prioritize training and professional development for the public health workforce, while also expanding available opportunities for job growth and increased salaries.

Build strategic partnerships and training pathways that can be leveraged during times of crisis to shore up the public health system's surge capacity Public health emergencies and threats develop rapidly and require timely responses from a workforce that is trained and prepared in a variety of areas. As demonstrated during the COVID-19 pandemic, a delayed response and lack of capacity can have disastrous consequences on health and safety.

Public health agencies can quickly ramp up their capacity by establishing partnerships with local institutions and professional associations whose membership can help meet workforce needs. For example, Florida state health officials recruited and temporarily hired 100 students and professors from local universities to perform contact tracing.¹⁴⁴ Several other state and local health departments relied on public health schools to increase their capacity.¹⁴⁴ Private sector partners can be particularly valuable during public health emergencies. Prima County in Arizona, for example, contracted with a private organization in 2020 to hire 150 contact tracers.¹⁴⁴

Building a reserve of retired public health workers who are willing to return during emergencies—especially for high-demand roles such as lab technicians—could also increase surge capacity.¹⁴² During non-emergencies, public health departments should cross-train staff so that their capabilities are flexible and adaptable.¹⁴⁴

Communications

The COVID-19 pandemic has highlighted the costs of a lack of national understanding of governmental public health. Moreover, it has shown the disastrous consequences of a failure to effectively communicate the critical role that public health systems play in creating conditions in which people can be healthy and thrive.

Develop, test, and disseminate clear and consistent messaging on what public health is and why it matters

Confusion and misinformation have dampened trust in science and government, led to harassment of public health officials, and provoked risky actions that can threaten the health of individuals and their communities.¹¹⁷ As a result, polling shows that most Americans (88 percent) believe that society is more divided now than it was before the pandemic—the highest percentage among the 16 countries polled.¹¹⁰

Yet public health measures are the road map to a faster and sustained recovery. To address this disconnect, the Public Health Communications Collaborative, formed in 2020, helps coordinate and amplify public health messaging on COVID-19 to increase Americans' confidence in public health guidance.

Generally, public health must rely more on trusted storytellers and spokespeople particularly skilled at communicating complex topics to the public in engaging and accessible ways, rather than just those with scientific backgrounds.¹⁴⁰ Doing so would not only reduce confusion but also build support for public health messages and measures.

Strengthen public-private partnerships to advocate for public health

Persuading lawmakers to increase spending on public health is hampered by a lack of understanding of public health functions and a lack of political clout, even as health care industry groups—such as hospitals, doctors, and pharmaceutical interests—lobby heavily. Unfortunately, organizations that advocate on behalf of health care coverage, access, and cost rarely include public health in their legislative agendas. Yet the health care system should be more oriented to the needs of communities, and in some instances, health care providers do have obligations tied to advance community health.¹⁶¹

The California Can't Wait Coalition—comprised of close to 100 trade groups of local health officials, organized labor, and public health advocates—advocated for ongoing investment from state general funds for local health department infrastructure and workforce support, as well as support for a statewide assessment of workforce and infrastructure needs of local health departments.¹¹² As a result, state policymakers agreed to fund state and local public health agencies at \$300 million annually starting in fiscal year 2022-2023.^{*141}

Strong partnerships are critical not only for achieving needed funding but also for accomplishing public health objectives. Health care systems, community-based organizations, and policymakers all play critical roles in ensuring community health and achieving equitable health outcomes. In particular, community-based organizations focused on social determinants such as housing or transportation have a stake in, and contribute to, public health systems.

Public-private partnerships must be leveraged to amplify public health messaging and support.

Standardization

Public health capabilities differ significantly across states and localities. Standardization is needed to assure continuity and equity across all states but with some flexibility to adapt to specific community needs. Improving state and local alignment with national initiatives would go far in improving standardization across the system.

Ensure that every community has access to a public health agency with fundamental public health services and capabilities

Currently, state and local public health agencies have the option to be accredited by the Public Health Accreditation Board. Yet only about 15 percent of local agencies and 73 percent of state agencies are accredited.¹⁴⁴ Healthy People 2030 has identified increasing the proportion of accredited public health agencies as a key objective. Accreditation helps to align public health agencies with national standards, strengthen partnerships, and improve the quality of work done within agencies.¹⁴⁵ Yet achieving accreditation can be difficult for some agencies, especially those in rural areas. Financial support, technical assistance, and incentives from federal decision-makers are all needed to ensure that more departments can seek and maintain accreditation.

States can also use ARPA funds to improve the consistency of essential services that public health departments offer within state lines. For instance, Massachusetts is investing \$200 million in transformation efforts that it hopes will improve equity across state health departments.¹⁴⁶

International risk

COVID-19 starkly illustrated the importance of international preparedness and coordination. Many of the challenges abroad mirror those in the United States: too few public health workers being paid too little; gaps in data gathering and sharing; vulnerable supply chains for PPE, testing reagents, oxygen, and vaccine delivery components; a lack of coordinated action when new threats emerge; and the need to harness the urgency of the pandemic to build lasting public health infrastructure.

Bolster public health preparedness globally

The United States should fully fund and staff the Biden administration's efforts to vaccinate the world against COVID-19 by donating vaccine doses and improving distribution and delivery systems. Likewise, the country must manage the transition to endemic disease and prepare for future pandemics and biological threats.¹⁴⁷ The need to strengthen global public health extends far beyond COVID-19, but given the virus's magnitude and mortality, it is essential to end the current pandemic so that more resources can be put toward the many other public health challenges facing the international community.

The United States has already provided \$19 billion in health and humanitarian assistance in response to COVID-19,¹⁴⁰ but the transition to broader, institutionalized investments in global public health will require reliable, sustained funding and follow-through. As part of this effort, President Joe Biden has requested \$10.6 billion in discretionary funding for the U.S. Department of State and U.S. Agency for International Development to "invest in cross-cutting health systems to prevent child and maternal deaths, combat infectious diseases, and control HIV/ AIDS."¹⁴⁴ Biden has also requested additional mandatory funding for domestic and international public health infrastructure.

Conclusion

COVID-19 has catalyzed action and highlighted the costs of the nation's crumbling public health infrastructure—for both health and economic wellbeing. From the increases in infectious disease and biological threats, to the growing impact of climate change on health, to the continued burden of chronic disease, now is the time to fully invest in sustainable public health infrastructure so that these threats to lives and livelihoods can be truly addressed.

Before the next inevitable public health emergency, policymakers must break the pattern of neglect and prioritize modernized public health data capabilities, workforce capacity, preparedness, and effective messaging strategies. The country would be making a critical error if it simply moved on without building on the progress made over the past two years.

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* Correction, May 25, 2022: This report has been updated to clarify when

California's additional annual investment of \$300 million for public health will take effect.

Endnotes

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