REPORT TO THE PRESIDENT

Supporting the U.S. Public Health Workforce

Executive Office of the President

President's Council of Advisors on Science and Technology

May 2023

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President Joseph R. Biden, Jr.
The White House
Washington, D.C.

Dear Mr. President,

All Americans should have abundant opportunities for a healthy life — to achieve aspirations for family, education, work, and more. None of these aspirations are possible unless we can function to our greatest potential, and we cannot reach our potential without health. More than ever before, our nation's health and economic stability rely on an effective public health system. Building a stronger, more efficient, and more equitable public health system is necessary to realizing a healthier, fairer, and more prosperous America. But creating this public health system will remain a dream without the people — the workforce — to support these efforts.

Public health saves lives. American public health improvements have been associated with generational gains in the health of our citizens. For example, administering vaccines and improving sanitation have reduced the spread of infectious diseases; placing restrictions on smoking has reduced heart disease and cancer; fortifying foods with folate has prevented birth defects; removing lead from gasoline has improved our air quality and reduced lead poisoning in children; and requiring the use of seatbelts and helmets has reduced deaths and injuries. Between the 1800s and the early years of the 21st century, U.S. life expectancy more than doubled.

On the other hand, negative shocks to public health have been associated with declines in life expectancy, including the 1918 flu pandemic, when life expectancy fell by 11 years. Alarmingly, CDC recently reported that all life expectancy gains made since 1996 have been erased, with an overall decrease to 76.1 years at birth in 2021.[1] This is 2.8 years below the peak reached in 2014, and represents the most significant decrease in life expectancy in the past century. As of December 2022, the per capita death rate from COVID-19 in the United States was notably worse than that of nations such as Germany, Canada, Costa Rica, and Japan.[2] Moreover, the death toll of over one million Americans has contributed to an estimated $3.57 trillion in economic losses.[3] Even before the emergence of COVID-19, and despite having the highest annual rate of per capita health expenditures when compared with other developed and many developing countries, the United States ranked 40th in life expectancy and is likely to sink further down the list when global statistics are updated again.[4] Inequities in health outcomes across racial, ethnic, and socioeconomic groups are major drivers of our nation's poor health rankings when compared with peer nations. American Indian/Alaskan

[1] Arias, E., Tejada-Vera B., Kochanek, K. D., & Ahmad, F. B. (2022). Provisional Life Expectancy Estimates for 2021. CDC. https://www.cdc.gov/nchs/data/vsrr/vsrr023.pdf
[2] Johns Hopkins University. (2021 March 10). Mortality Analyses. https://coronavirus.jhu.edu/data/mortality
[3] Beck, A. J. (2018). The Public Health Workforce: Revisions and Recommendations for Implementation. *Journal of Public Health Management and Practice.* 24(5): p E1-E11 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5932291/
[4] World Health Organization. (n.d.). Life expectancy at birth (years). https://www.who.int/data/gho/data/indicators/indicator-details/GHO/life-expectancy-at-birth-(years)

Native, Black, and Hispanic populations have been affected disparately by these declines in health status.[5,6]

There is much work to do. As 2023 begins, we have relied on our public health workers to navigate three years of the COVID-19 pandemic, manage an outbreak of monkeypox, and face a winter triple threat of COVID, influenza, and RSV, all against a backdrop of continued increases in social and economic inequities in health outcomes. In the face of these challenges, your Administration, in partnership with Congress, has gone to great lengths to provide support and funding for public health.[7,8] The investments, most notably the $7.4 billion commitment in May 2021 from the American Rescue Plan, include $225 million to train community health workers and partial funding for CDC's "Strengthening U.S. Public Health Infrastructure, Workforce and Data Systems" grant in November 2022, are an excellent start toward regaining some ground in the near term.

Beyond the immediate need to bolster our public health infrastructure to meet the continuing demands brought on by the pandemic, we believe the nation's approach to health requires fundamental changes. These changes include a shift in focus from treatment to prevention and health promotion, greater attention to the uptake and widespread use of scientific discoveries to benefit people in underserved communities, and an increased emphasis on improving social determinants of health and advancing equity — an approach that meets Americans where they are, rather than waiting for them to seek help, and considers all of the factors that shape their opportunities to be healthy. For while the United States has long been highly innovative in health research and development — including preventative practices, treatment protocols, pharmaceuticals, and medical devices — many Americans do not benefit from the fruits of this scientific and technological "hardware" due to long-standing inequities in access to education and employment opportunities, healthy living conditions, and health care. Our nation's world-leading health "hardware" will continue to be out of reach for too many of our fellow citizens unless we invest in and improve our "software" — a public health workforce that can implement innovative, scientifically-informed best practices for reaching Americans in every community. A well-trained, diverse, inclusive, and resilient public health workforce is essential to transforming our nation's approach to public health.

This report focuses on how to sustain and strengthen our public health workforce for the long term, building on the lessons learned, partnerships created, and solutions advanced during the pandemic.

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[5] Kaiser Family Foundation. (2023 March 15). Key Data on Health and Health Care by Race and Ethnicity. https://www.kff.org/racial-equity-and-health-policy/report/key-facts-on-health-and-health-care-by-race-and-ethnicity

[6] Mahajan, S. (2021). Trends in Differences in Health Status and Health Care Access and Affordability by Race and Ethnicity in the United States, 1999-2018. *Journal of the America Medical Association*. 326 (7):637-638 https://jamanetwork.com/journals/jama/fullarticle/2783069

[7] The White House. (2022 September 30). Fact Sheet: Biden-Harris Administration Announces American Rescue Plan's Historic Investments in Community Health Workforce. https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/30/fact-sheet-biden-harris-administration-announces-american-rescue-plans-historic-investments-in-community-health-workforce/

[8] The White House. (2022 September 1). Fact Sheet: American Pandemic Preparedness Plan Annual Report. https://www.whitehouse.gov/ostp/news-updates/2022/09/01/fact-sheet-american-pandemic-preparedness-plan-annual-report/

Our recommendations fall into three major categories: 1) establishing a common lexicon and standardized system for enumerating the public health workforce; 2) accelerating effective recruitment/retention and strengthening public health talent; and 3) advancing health equity by ensuring that the U.S. has a robust community health workforce and prioritizing capacity-building for community engagement.

Mr. President, we have a once in a generation opportunity to build a public health system that can realize a vision of equity. We cannot go back to the way things were before the COVID-19 pandemic. We must seize this moment to make long-needed permanent improvements to public health in America, including building a robust, well-trained, well-compensated public health workforce that is trusted by the communities they serve. Like you, we believe in people. And we are confident that people are the heart and soul of an effective public health system.

Sincerely,

The President's Council of Advisors on Science and Technology

The President's Council of Advisors on Science and Technology

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Executive Summary

The field of public health is remarkable in the sense that it has no boundaries. Public health finds its way into all of our lives. Yet what the public discovered during the COVID-19 pandemic is a truth that had long been known to many in the public health field: while our public health system has delivered great value in the past, it has been failing for decades. As we considered what is needed to rebuild our public health system into one that is worthy of the American people, PCAST has been guided by a conviction that the public health system should allow the nation to realize the vision of health equity — defined by the Centers for Disease Control and Prevention (CDC) as, "when every person has a fair opportunity to 'attain his or her full health potential' and no one is disadvantaged from achieving this potential because of social position or other socially determined circumstances."

In choosing where to focus our attention, it was important to us to follow the lead of this Administration in first investing in the hardworking American people. Without public health workers — a workforce that includes health professionals, community health workers, data analysts, laboratory personnel, educators, environmental health officers, and more — the innovations in prevention and treatment developed by our world-leading health research and development will not reach all of the many millions of people who need care, particularly those Americans in marginalized groups and disadvantaged communities who have long suffered disproportionately poor health outcomes. The recommendations in this report establish clear, actionable goals to support current public health workers and ensure that, in the future, the nation has the robust, well-trained, well-resourced, and trusted workforce needed to lead and coordinate public health efforts; control epidemics; conduct disease and injury surveillance; collect vital statistics; ensure good medical and dental care for socially marginalized groups; monitor environmental safety; and provide health education and laboratory services to improve the health of Americans in every community

Recommendations

Establish a common lexicon and standardized classification system for the public health workforce

1) The Bureau of Labor Statistics (BLS) and Office of Management and Budget (OMB), in consultation with the Department of Health and Human Services (HHS, particularly CDC and HRSA), should work together to create a new Standard Occupational Classification (SOC) for public health, and include the public health workforce in key surveys of the labor market as part of the next revision of the SOC manual.

Establishing a common lexicon and standardized system is the necessary foundation that will enable enumeration of the current public health workforce, including identification of workforce gaps, through regular and systematic data collection. A standardized categorization and description of public health jobs will help guide resource allocation, recruitment and hiring, training or retraining of existing staff, and educational program development.

Expand recruitment, retention, training, and personnel exchanges to strengthen public health talent

2a) Create an all-of-government campaign to recruit and retain people in public health careers. This campaign should include direct hiring authority, the creation of a new job series for public health, and expansion of loan repayment and forgiveness options for public health workers.

To rebuild the nation's public health workforce post-pandemic, it is critical to attract both students and existing skilled health workers into the field. A focused, inspiring recruitment effort that publicizes the importance of public health jobs, coupled with incentives such as clear career pathways and loan repayment and forgiveness options will elevate public health employment as desirable and help to fill available jobs. Equally vital to this campaign is retaining the skilled and educated individuals that already work within the public sector, especially given this workforce had already declined over the 15 years preceding the pandemic. Committed investment in retaining seasoned employees ensures that local, state, and federal health departments cultivate long-serving, knowledgeable leaders.

2b) Establish new pathways and increase existing opportunities for personnel exchanges between federal, state, tribal, and territorial health officials, as well as support exchanges with local health systems and other private sector organizations.

In establishing new pathways for federal, state, tribal, and territorial health officials to have supportive exchanges with each other and with private sector organizations, agencies can step out of their current silos to develop new practices and collaborations. New and expanded pathways can also reinforce data alignment and help ensure that the public health workforce is prepared for future emergencies. These exchanges can both introduce new ideas to participating agencies and help them understand their partners across government and industry better. HHS leadership will be needed to ensure expansion and implementation of pathways for exchanges across the public health workforce.

Advance health equity through strengthening public health capacity for community engagement

3a) To develop and sustain a robust public health workforce that is deeply rooted in and trusted by their communities, the Departments of Education and Labor, in consultation with HHS and leveraging the updated occupational classification of "community health workers" from BLS,[9] should develop sustainable and/or non-degree career pathways for these workers and ensure equitable workplaces that foster diversity and inclusion.

A public health workforce will only be effective if trusted by the communities served. Essential to that trust is the frontline role of Community Health Workers (CHWs). By supporting CHWs with strong ties to their local communities, state, local, tribal, and territorial health departments can establish relationships with communities across races, ethnicities, and cultures. Several temporary

[9] Bureau of Labor Statistics. (n.d.). Occupational Employment and Wage Statistics. https://www.bls.gov/oes/current/oes211094.htm

programs established through recent funding elevate CHWs. These programs should receive technical assistance and be rigorously evaluated. These efforts should include a broader assessment of the compensation of CHWs, the development and dissemination of best practices for organizations that employ CHWs, and the provision of guidelines related to program evaluation and accountability for organizations seeking CHW funding. For programs determined to be effective, we recommend the development of mechanisms to sustain or expand them beyond the recent emergency.

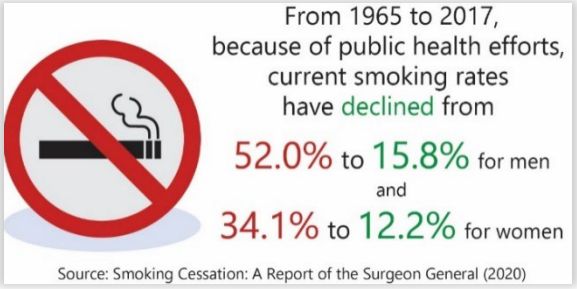
3b) Expand a national community of practice focused on scientifically informed, community-engaged practices for health equity that includes public health agencies.

Optimal health for everyone is the primary purpose of a functional public health system. A national community of practice would fuel innovation and research related to health equity, promote development of a holistic approach to addressing social determinants of health, and enhance communication and coordination across public health agencies and other sectors. Such efforts should lead to improved programs and policies, transformed systems, more effective and equitable public health delivery, and thriving communities where every American has the opportunity to live a full and healthy life. This can be effectively accomplished by expanding upon existing HHS efforts.

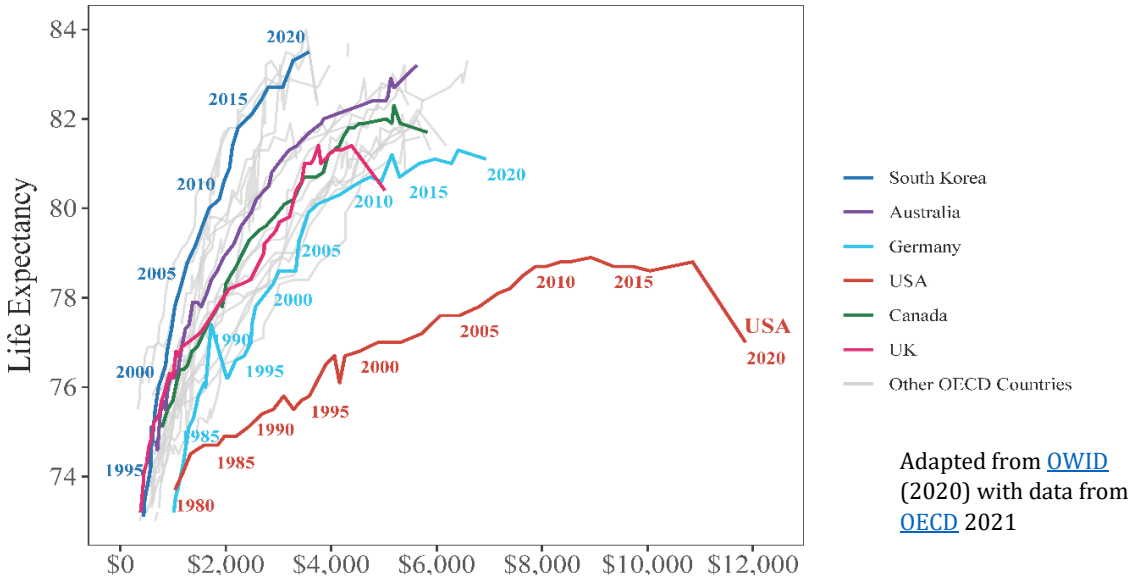
Supporting the U.S. Public Health Workforce

Challenges in U.S. Public Health

Public health is "what we as a society do collectively to assure the conditions in which people can be healthy."[10] In 1921, the life expectancy of Americans was around 60 years old.[11] Thanks in part to public health measures — such as improved water and sanitation, vaccine and antibiotic development, efforts to reduce smoking rates, and seat belt laws — U.S. life expectancy has increased, peaking at 78.9 years in 2014, before the most recent decline to 76.1 years in 2021.



Despite these improvements, health indicators and outcome increases have not been experienced equally by all Americans. Additionally, although the United States has by far the highest annual per capita health expenditures,[12] when compared with other developed and many developing countries, the U.S. continues to rank near the bottom in indicators of mortality and life expectancy,[13] and the trend over time has been deeply concerning. (Figure 1).



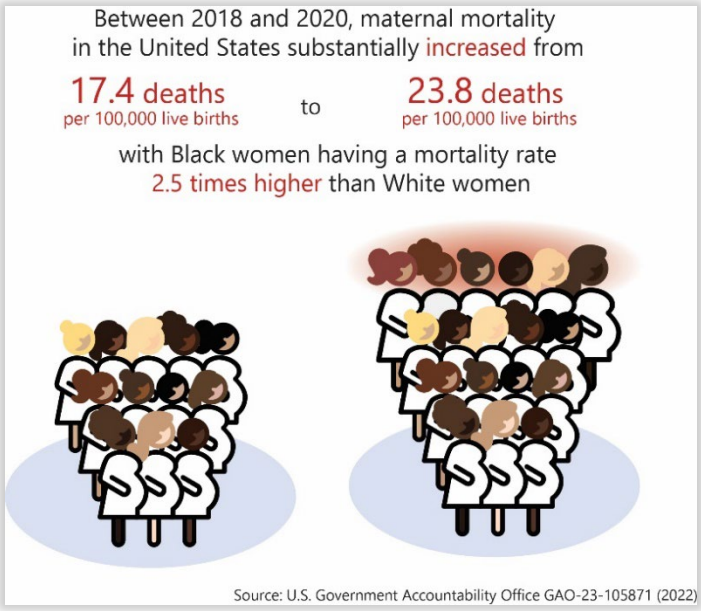
Adapted from OWID (2020) with data from OECD 2021

Figure 1: Life expectancy versus health expenditure for select OECD countries, 1980-2020. Grey lines indicate some of the top 25 OECD countries with the highest GDP per capita. Selected countries are highlighted and labeled at five-year increments. Health spending measures the consumption of health care goods and services, including personal health care (curative, rehabilitative, and long-term care; ancillary services; and medical goods) and collective services (prevention and public health services; and health administration) from public and private sources.

[10] Committee for the Study of the Future of Public Health, Division of Health Care Services, Institute of Medicine. (1998). *The Future of Public Health*. Washington, DC: National Academy Press.
[11] Tapia Granados J. A. & Diez Roux A. V. (2009). Life and death during the Great Depression. Proceedings of the National Academy of Sciences. 106(41): 17290-17295. https://www.pnas.org/doi/10.1073/pnas.0904491106
[12] OECD. (2021). OECD Health Expenditure Data. https://data.oecd.org/healthres/health-spending.htm
[13] OECD. (2021). OECD Life Expectancy Data. https://data.oecd.org/healthstat/life-expectancy-at-birth.htm

Indeed, in the past several decades, improvements in life expectancy have declined overall in the United States, reversing to the level seen in 1996 — the most significant decline in life expectancy in the modern era and the largest since the Great Influenza and World War I.[14,15] The failure of the U.S. public health system to equitably prevent disease, prolong life, and promote health in the population has been brought into sharp focus over the past three years. Alarmingly, between 2019 and 2021, life expectancy declined by 2.7 years for the overall population, with declines of 6.6 years for the non-Hispanic American Indian/Alaskan Native population, 4.2 years for the Hispanic population, 4.0 years for the non-Hispanic Black population, 2.4 years for the non-Hispanic White population, and 2.1 years for the non-Hispanic Asian population. While these staggering outcomes developed during the COVID era can be explained in large part by COVID-19 deaths, the declines in life expectancy were not due to COVID alone. Other causes of mortality that resulted in this decline include unintentional deaths from overdose and motor vehicle accidents, gun violence, heart disease, stroke, diabetes, and cancer—all of which disparately affect racial and ethnic groups that face systematic inequity.

Increasing overall maternal mortality rates are also concerning. In 2020, the maternal mortality rate in the U.S. was 24 deaths per 100,000 live births — more than three times the rate in most other high-income countries. Black women had the highest maternal mortality rates across racial and ethnic groups in 2020 (55.3/100,000) and experienced the largest increase in maternal mortality when compared to the previous year. Prior to the pandemic, the maternal mortality rate for Hispanic women was less than the rate for White women, but it increased significantly and was similar in 2020 (18.2/100,000) to the rate for White women (19.1/100,000).



Health inequities, "systematic differences in health status or the distribution of resources between different population groups," are some of the most pressing and pervasive global public health challenges, and the

[14] Tikkanen, R. (2020 January 30). Multinational Comparisons of Health Systems Data, 2019. The Commonwealth Fund. https://www.commonwealthfund.org/publications/other-publication/2020/jan/multinational-comparisons-health-systems-data-2019

[15] Johns Hopkins University. (2022). *Reversing the Decline: 10 Ideas to Improve Life Expectancy*. https://americanhealth.jhu.edu/sites/default/files/website-media/resources/LifeExpec_Report.pdf

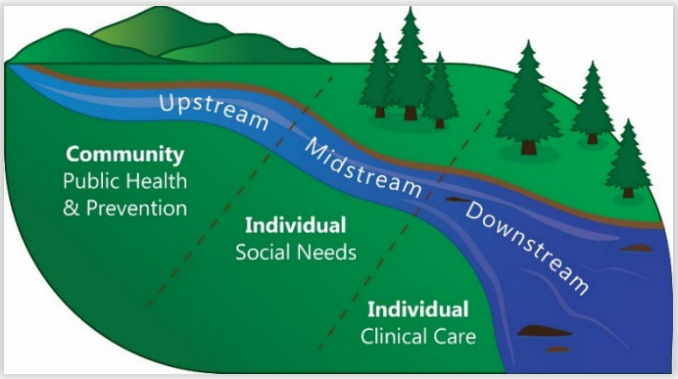
United States is no exception.[16,17] These inequities arise from disparate exposures to negative social determinants of health (SDOH), "the conditions in which people are born, live, grow, work, and age,"[18] that influence health outcomes. Although health care is important, it is estimated that these social conditions—ranging from institutional policies and practices to access to high quality education, gainful employment, safe housing, and healthy food—drive over 50% of health outcomes.[19]

In addition to significant impacts on life expectancy and individual well-being, health inequities are expensive.[20] Economic losses in the United States from COVID-19 alone has been estimated at $3.57 trillion in lost national income growth and life expectancy losses, and these costs were not born equally across populations.[21] A recent Gallup poll[22] suggests that many Americans put off health care during the pandemic, with women and those with lower incomes being more likely to delay care. Such delays in care will likely contribute to increased spending and increases in disease burdens and negative health outcomes far into the future, exacerbating the current, negative trends.[23] The scale of life expectancy and welfare losses underscores the pressing need to invest in health in the U.S. to prevent further economic shocks from future pandemic threats.

Many studies support the notion that clinical care or social services to modify individual risk factors — such as tobacco smoking, poor diet, physical inactivity, and drug use — "downstream" consequences of harmful social conditions — can have a large impact on mortality reduction and disease burden; yet these behaviors can only be modified by addressing the broader social and environmental determinants that shape them.[24,25] Addressing the latter "upstream" and "midstream" determinants that

[16] Braveman, P. (2006). Health disparities and health equity: Concepts and measurement. *Annual Review of Public Health*. 27:167–194. https://pubmed.ncbi.nlm.nih.gov/16533114/
[17] World Health Organization. (2018, February 22). Health Inequities and Their Causes. https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes
[18] World Health Organization. (n.d.). Social Determinants of Health. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1
[19] Hood, C. M., Gennuso, K. P., Swain, G. R., & Catlin B. B. (2016). County Health Rankings: relationships between determinant factors and health outcomes. *American Journal Preventative Med*. 50(2):129–135. https://www.sciencedirect.com/science/article/abs/pii/S0749379715005140
[20] Davis, A., Batra, N., Dhar, A., Bhatt, J. (2022). U.S. Healthcare Can't Afford Health Inequities. Deloitte. https://www2.deloitte.com/us/en/insights/industry/health-care/economic-cost-of-health-disparities.html
[21] Silva, S., Goosby, E, & Reid, M. J. A. (2023). Assessing the impact of one million COVID-19 deaths in America: economic and life expectancy losses. *Nature,* 13(3065). https://www.nature.com/articles/s41598-023-30077-1
[22] Brenan, M. (2023 January 17). Record High in U.S. Put Off Medical Care Due to Cost in 2022. Gallup. https://news.gallup.com/poll/468053/record-high-put-off-medical-care-due-cost-2022.aspx
[23] Gertz, A. H., Pollack, C. C., Schultheiss, M. D., & Brownstein, J. S. (2022). Delayed medical care and underlying health in the United States during the COVID-19 pandemic: A cross-sectional study. *Preventative Medicine Reports.* https://www.sciencedirect.com/journal/preventive-medicine-reports
[24] McGovern, L. (2014 August 21). The Relative Contribution of Multiple Determinants to Health. *Health Affairs.* https://www.healthaffairs.org/do/10.1377/hpb20140821.404487/
[25] Castrucci, B. C., & Auerbach, J. (2019 January 16). Meeting Individual Social Needs Falls Short of Addressing Social Determinants of Health. *Health Affairs.* https://www.healthaffairs.org/do/10.1377/forefront.20190115.234942/

contribute most to health requires individual and community-level interventions, supported by policies, across all sectors, public and private, and at the federal, state, and local level. Public health agencies can play a pivotal role in leading the implementation of these interventions, integrating health equity considerations into policy and programs, collaborating with other sectors and engaging with communities to support their efforts to address inequities, and strengthening knowledge development and exchange around issues related to health equity.[26] Effective public health infrastructure, including adequate human, organizational, informational, and financial systems, is critical for improving the health of the population as well as for preventing and addressing health crises.



Yet the services provided by the public health system (Figure 2) are often invisible to much of society, until that system fails. Public health has an essential role to play in addressing social and structural determinants of health.[27] Lack of funding for core public health programs slowed the response to the COVID-19 pandemic and exacerbated its effects on older Americans, those with low income, and racially and ethnically minoritized groups — populations already burdened by higher rates of chronic disease and fewer resources to cope with and recover from an emergency.[28,29] The COVID-19 pandemic also rapidly reversed the previous gains that had been made, at a slow and painful pace, in reducing racial and income gaps in all-cause mortality.[30] Basic responses such as data coalescence and synthesis, testing, contact tracing, and vaccine campaigns have been hindered by fundamental barriers including operational silos, insufficient capacity and training, absent or outmoded data and information systems, and limited workforce capacity.

[26] Pauly, B., MacDonald, M., Hancock, T., Martin, W., & Perkin, K. (2013). Reducing Health Inequities: The Contribution of Core Public Health Services in BC. *BMC Public Health*. Article number: 550. https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-13-550

[27] Magnan, S. (2017 October 9). Social Determinants of Health 101 for Health Care: Five plus Five. *National Academy of Medicine Perspectives* 7(10). https://nam.edu/social-determinants-of-health-101-for-health-care-five-plus-five/

[28] Shiels, M. S., Haque, A. T., de González, A. B., & Freedman, N. D. (2022). Leading Causes of Death in the U.S. During the COVID-19 Pandemic, March 2020 to October 2021. *JAMA Intern. Med*. 182(8):883–886. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2794043

[29] Woolf, S. H., Masters, R. K., & Aron, L. Y. (2022). Changes in Life Expectancy Between 2019 and 2020 in the U.S. and 21 Peer Countries. *JAMA Network Open*. 5(4):e227067. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2791004

[30] Commodore-Mensah, Y., & Cooper, L. A. (2021). Reversing the Tide of Racial and Ethnic Disparities in Excess Deaths During the COVID-19 Pandemic. *Annals of Internal Med*. 174(12):1755-1756. https://www.acpjournals.org/doi/full/10.7326/M21-3841

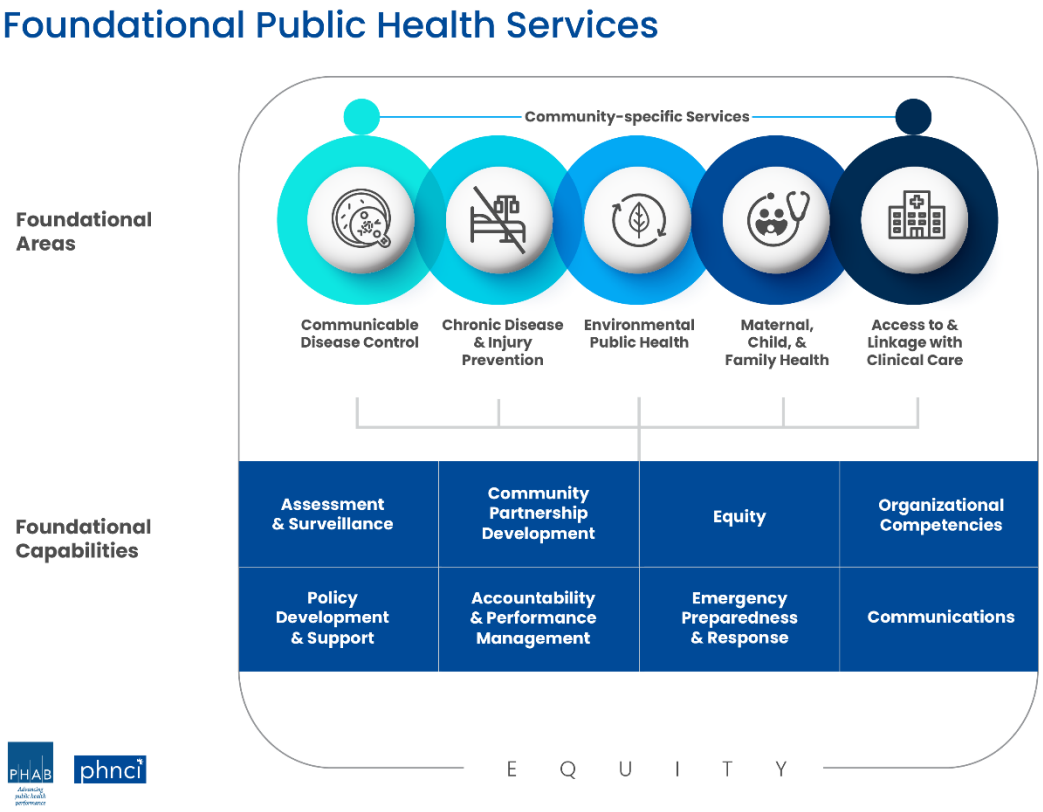


Figure 2: The Foundational Public Health Services (FPHS) framework outlines the responsibilities of governmental public health, defining a minimum package of public health capabilities and programs needed in every community. *Source:* The Public Health National Center for Innovations

What the public discovered in the early days of the COVID-19 pandemic had been known to many in the public health field for years.[31,32,33] While the invisible systems of public health have delivered great value over a century, they have been failing for decades, struggling with a declining workforce limited by inadequate training opportunities, resources, and authority, a lack of interoperability and outdated technology infrastructure, siloed state and local governance of public health, and insufficient resources to maintain cross-sector partnerships.[34,35,36]

[31] Balser, J., Ryu, J., Hood, M., Kaplan, G., Perlin, J., & Siegel, B. (2021 April 7). Care Systems COVID-19 Impact Assessment: Lessons Learned and Compelling Needs, National Academy of Medicine. https://nam.edu/public-health-covid-19-impact-assessment-lessons-learned-and-compelling-needs/
[32] Bipartisan Policy Commission. (2021 December). Public Health Forward: Modernizing the U.S. Public Health System. https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2021/12/BPC_Public-Health-Forward_R01_WEB.pdf
[33] ASTHO. (2020 September 24). New Data on State Health Agencies Shows Shrinking Workforce and Decreased Funding Leading up to the COVID-19 Pandemic. https://www.astho.org/Press-Room/New-Dataon-State-Health-Agencies-Shows-Shrinking-Workforce-and-Decreased-Funding-Leading-up-tothe-COVID-19-Pandemic/09-24-20/
[34] Ibid.

Public health agencies are currently in crisis, with numerous issues that must be addressed. One of the critical elements that needs urgent attention is the public health workforce. Data cannot be analyzed and services cannot be delivered without people; we cannot prevent disease, prolong life, and promote health in the population without skilled, motivated, and well-supported workers. A workforce that reflects the diversity of the communities served can help to build public trust and address health disparities. During a time when the number of aging Americans is growing at an unprecedented rate and racial and economic health disparities are widening, the nation has the prospect of creating a public health workforce that is prepared and engaged to tackle not only the immediate health problems of today, such as worsening maternal health and cardiovascular disease outcomes, but to ensure a healthy future for all Americans.

Despite its impacts on the public health workforce, there is some positive news as the COVID-19 pandemic recedes. In February 2022, a nationally representative survey of over 4,000 U.S. adults showed relatively high levels of trust in doctors and nurses (54% and 48%), followed by health scientists and pharmacists (44% and 40%). However, there was less trust in national and federal institutions (33% to 39%), and local and public health agencies (26% and 25%, respectively). Even so, respondents cited scientific expertise at the federal level, and perceptions of hard work, compassionate policy, and direct services at state and local levels as the most commonly reported reasons for "a great deal" of trust.[37] At the same time, young people have grown increasingly interested in careers in public health and in the intersections between public health and other disciplines in overcoming society's most complex challenges. There is a great opportunity to tap into this younger cohort who are committed to helping people, as well as to support the steadfast workers who served the nation throughout the pandemic, if we take action now to ensure that their skills are aligned with public health needs and provide clear pathways into stable, full-time jobs.

[35] Himmelstein, D. U., & Woolhandler, S. (2016). Public Health's Falling Share of U.S. Health Spending. *American Journal of Public Health.* 106;1:56-57. https://pubmed.ncbi.nlm.nih.gov/26562115/

[36] National Association of County Health Officials. (2018 November 20). The 2018 Forces of Change in America's Local Public Health System. https://www.naccho.org/blog/articles/the-2018-forcesof-change-in-americas-local-public-health-system.

[37] Steel Fisher, G. K., Findling, M. G., Caporello, H. L., Lubell, K. M., Vidoloff Melville, K. G., Lane, L., Boyea, A. A., Schafer, T. J., & Ben-Porath, E. N. (2023 March). Trust in U.S. Federal, State, and Local Public Health Agencies During COVID-19: Responses and Policy Implications. *Health Affairs.* 42:3, 328-337. https://www.healthaffairs.org/doi/10.1377/hlthaff.2022.01204

The Public Health Workforce

Who are they and why are they important?

Hundreds of thousands of Americans work to protect the health of their neighbors and communities as part of the public health workforce. The country relies on their efforts every single day. A quiet army fights infectious diseases, prevents injuries, stops foodborne illness, promotes healthy lifestyles, and keeps social and environmental hazards from causing harm. The national public health workforce includes workers in the nation's governmental and nongovernmental systems, including community-based and voluntary organizations, hospitals and health care systems, schools, and private sector organizations. These individuals work selflessly to provide a better, healthier future for the people around them.

Figure 3: Most public health workers do not deliver health care. Only public health workers who are also health professionals do that. Other public health workers collect, monitor, and analyze data; inspect and monitor the environments in which people live, work, and play; develop, administer, and evaluate programs and policies; and support people in living healthier lives by educating them and connecting them with resources and access to services.

These individuals reach out to their communities and provide connections to SNAP benefits, food banks and fresh produce to promote a healthy diet. They provide resources to their neighbors to inform them of their rights to habitable living conditions. They are the school nurses that children know they can come to for a comfortable, healing environment, and leave feeling more capable to

take on the school day. From community health workers (CHWs), contact tracers, and epidemiologists to midwives, health educators, nutritionists, and environmental health officers, the public health workforce is intertwined throughout the foundation of our nation, and is integral to the health and safety of communities throughout the country.

What challenges do they face?

The public health workforce has been declining for more than 15 years — losing 40,000 workers over the past 10 years.[38] Underinvestment coupled with low wages and lack of advancement opportunities has led to inadequate recruitment of new workers and to experienced workers vacating positions to join the competitive private sector. Workforce shortages were exacerbated by a range of factors during, the COVID-19 pandemic, including burnout, adverse workplace experiences including harassment, and retirements. The resultant gaping holes in vital public health infrastructure was one of many factors in the nation's struggle in responding to the COVID-19 pandemic.

> *"Public health professionals, meanwhile, always knew, based on long and bitter experience, that our jobs were precarious and insecure. The public health sector had already found various ways to lose workers, including systematic devaluation, before finally shedding the latest cohorts at the end of fixed-term contracts."*
>
> Katie D. Shenck, Former Senior Epidemiologist, CDC Foundation
> (In *Stat News*, February 3, 2023)

This newfound focus on the field from the pandemic has shown us that overall public health lacks the resources for sustaining, expanding, and modernizing the workforce for the long term. One study estimated that the country currently needs over 80,000 new workers to be able to provide the basic public health services at the federal, state, local, tribal, and territorial (FSLTT) governmental levels.[39] This estimate does not include the many individuals in the nongovernmental sector who support the governmental public health workforce, for instance, workers in public health institutes, non-profit associations and other community organizations, and academic partners. In full, the public health

[38] de Beaumont Foundation. (2021). Public Health Wins 2021: Rising Stress and Burnout in Public Health. https://debeaumont.org/phwins/2021-findings/stress-and-burnout/
[39] de Beaumont Foundation, & The National Center for Public Health Innovation. (2021). Staffing Up: Workforce Levels Needed to Provide Basic Public Health Services for All Americans. https://debeaumont.org/wp-content/uploads/2021/10/Staffing-Up-FINAL.pdf

workforce consists of individuals trained in over 30 different disciplines in the health and human services fields, not including a range of administrative, laboratory and technological jobs, and other support staff.

Numerous other studies and reports have documented these workforce shortages, identified some of their causes, and recommended a range of solutions.[40,41] The Council of State and Territorial Epidemiologists recently estimated that another 2,196 additional epidemiologists were needed to provide support for all of the ten essential services.[42] A study published in 2019 comparing the workforce from 2014 to 2017 found that 48% of staff were considering leaving their position during the next year or retiring within the next 5 years. It also found that 37% of the workforce surveyed were people of color, an increase of 8% over the same period.[43] A study published in March 2023 found that nearly half of all employees in state and local public health agencies left between 2017 and 2021. This study also predicted that if separation trends continue, this would lead to more than 100,000 staff, or as much as half of the governmental public health workforce in total, leaving their organizations by 2025.[44]

> *"While underappreciated before the pandemic, it is now clear that each health department needs adequate staff with requisite skills and training to ensure proper disease mitigation strategies, pandemic preparedness and response and recovery. They need leadership that can understand clinical needs and communicate with hospital and healthcare leaders to organize population approaches to disease mitigation. They also need physicians who represent and understand the communities they serve."*
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> Donna Grande, CEO, American College of Preventive Medicine
> (In *The Hill*, January 17, 2023)

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[40] Johns Hopkins Bloomberg School of Public Health & Association of State and Territorial Health Officials. (2020). A National Plan to Enable Comprehensive COVID-19 Case Finding and Contact Tracing in the US. www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2020/200410-national-plan-to-contact-tracing.pdf

[41] de Beaumont Foundation, & ASTHO. (2015). Public Health Wins: Public Health Workforce Interests and Needs Survey. https://debeaumont.org/wp-content/uploads/2021/09/Report.pdf

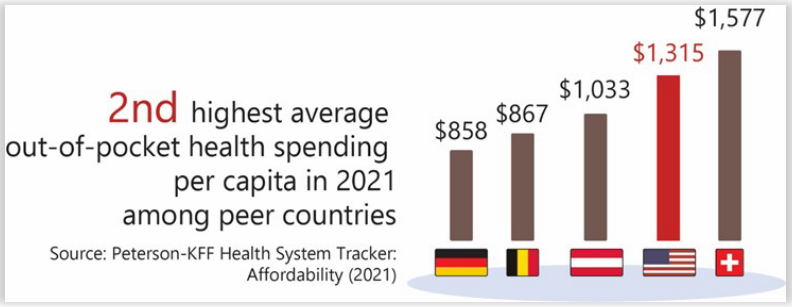
[42] Council of State and Territorial Epidemiologists. (2021). 2021 Epidemiology Capacity Assessment Report. https://cdn.ymaws.com/www.cste.org/resource/resmgr/eca/2021_ECA_Report_FINAL.pdf

[43] Bogaert, K., Castrucci, B. C., Gould, E., Sellers, K., & Leider, J. P. (2019). PhD Changes in the State Governmental Public Health Workforce: Demographics and Perceptions, 2014-2017. *Journal of Public Health Management and Practice*. 25():p S58-66. https://journals.lww.com/jphmp/fulltext/2019/03001/changes_in_the_state_governmental_public_health.10.aspx

[44] Leider, J. P., Castrucci, B. C., Robins, M., Bork, R. H., Fraser, M. R., Savoia, E., Piltch-Loeb, R., Koh, H. K. (2023). The Exodus of State and Local Public Health Employees: Separations Started Before and Continued Throughout COVID-19. *Health Affairs*. 42:3, 338-348. https://www.healthaffairs.org/doi/10.1377/hlthaff.2022.01251

These studies are not the first to enumerate the workforce or make suggestions for how to address the decline. The Robert Wood Johnson Foundation performed a systematic review in 2010 that looked at workforce data dating back to the 1980s, and a joint report from the University of Michigan and the University of Kentucky that reported strategies to address these systemic issues in the same year both painted a similar picture.[45,46] The relative invisibility of public health before the pandemic made it difficult to heed the warning signs about workforce shortages; with the consequences of public health stress so evident during COVID-19, now is the time for action.

Opportunities to Strengthen the Public Health Workforce



Over the past few decades, innovations in science have advanced our understanding of human health and disease. Yet the benefits of these discoveries have not been fully realized in better health outcomes, even though on average Americans pay higher out-of-pocket costs for health care than citizens of nearly all other high-income nations. Moreover, groups that have experienced social and economic marginalization are even less likely to benefit from these discoveries. To bridge the gap between what we know and our progress in improving health and advancing health equity, we must couple transdisciplinary research and community engagement with the implementation and dissemination of sustainable interventions.[47] The public health workforce is the "software" that enables the American people to benefit from our national investments in scientific and technical "hardware" — health-related research and development. Simply put, it is the public health workforce that will translate the advances made in research and development into life-saving and life-sustaining treatments and health practices for many communities across America.

Galvanized by lessons learned from the COVID-19 pandemic, the Biden Administration has already set in motion many new programs and directed resources to strengthen the nation's public health system, including the public health workforce (see Appendix B). PCAST believes that a well-defined, well-trained, well-resourced, and well-compensated workforce is the foundation of a truly robust U.S. public health system that can serve the needs of the American people. Our recommendations fall into three major categories: establishing a common lexicon by defining clearly the roles of each member

[45] Beck, A. J., & Boulton, M. L. (2012). Building an Effective Workforce: A Systematic Review of Public Health Workforce Literature. *American Journal of Preventive Medicine.* 42(5 Suppl 1):S6-16. https://www.sciencedirect.com/science/article/abs/pii/S0749379712000803?via%3Dihub

[46] University of Michigan Center of Excellence in Public Health Workforce Studies, & University of Kentucky Center of Excellence in Public Health Workforce Research and Policy. (2012 September). Strategies for Enumerating the U.S. Governmental Public Health Workforce. http://www.phf.org/resourcestools/Documents/Enumerating_the_Public_Health_Workforce_Revised_Sept_2012.pdf

[47] Cooper, L. A., Purnell, T. S., Engelgau, M., Weeks, K., & Marsteller, J. A. (2021). Using Implementation Science to Move from Knowledge of Disparities to Achievement of Equity. *The Science of Health Disparities Research.* https://doi.org/10.1002/9781119374855.ch17

of the public health workforce; accelerating effective recruiting, retaining, training, and personnel exchanges; and ensuring equity through a robust community health workforce and a scientifically grounded approach to community engagement. The aim of the proposed interventions is to cultivate a public health workforce that is appropriately sized, trained, and diverse, to meet both the current and emergent public health challenges of the communities that they serve. A recent national analysis conducted by researchers the HRSA Office of Planning, Analysis and Evaluation, and the Office of Health Equity has already shown the benefit of health professionals that represent marginalized groups on life expectancy—where counties in the United States with Black primary care physicians (regardless of patients seeing these doctors) were associated with higher life expectancy and improved population health measures for Black individuals.[48] As part of these efforts, the short-term programs established during COVID-19 should be made into long-term solutions.

The opportunity available to invest in the public health workforce is unique and singular—an assessment and investment in the public health workforce in this way is unprecedented. While national attention is still focused on health issues, it is critical for the Biden Administration to continue to reinforce the importance of public health in the lives of each and every American. Now is a moment for the President to bring these and other efforts together in support of a compelling vision for a diverse, inclusive, and resilient modern public health workforce.

Recommendations

Establish a common lexicon and standardized classification system for the public health workforce

There currently are no comprehensive, nationally representative surveys of the public health workforce. Enumeration efforts were undertaken in 2014, 2017, and 2021[49,50,51] by the de Beaumont foundation, the Association of State and Territorial Health Officials (ASTHO) & the National Association of County and City Health Officials (NACCHO). The Public Health Workforce Interests and Needs Survey (PH WINS) recorded needs in governmental public health, where 51% of responders reported needs for additional staff and where 40% cited intent to leave their position in the next five years[51,52] —as a reference point, annual turnover for most technical jobs is approximately 10.6%.[53] In addition, a recent survey by ASTHO during the early part of the COVID-19 pandemic estimated that 100,000 individuals, including community health workers, would be needed to provide adequate contact tracing capacity. The American Public Health Association and COVID Collaborative made

[48] Snyder, J.E., Upton, R.D., Hassett, T.C., Lee, H., Nouri, Z., Dill, M. Black Representation in the Primary Care Physician Workforce and Its Association With Population Life Expectancy and Mortality Rates in the US. JAMA Netw Open. 2023;6(4):e236687. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2803898
[49] de Beaumont Foundation. (n.d.). PH WINS 2014. https://debeaumont.org/phwins/2014-findings/
[50] de Beaumont Foundation. (n.d.). PH WINS 2017. https://debeaumont.org/phwins/findings/
[51] de Beaumont Foundation. (n.d.) PH WINS 2021. https://debeaumont.org/phwins/2021-findings/
[52] Bork, R. H., Robins, M., Schaffer, K., Leider, J. P., & Castrucci, B. C. (2022). Workplace Perceptions and Experiences Related to COVID-19 Response Efforts Among Public Health Workers — Public Health Workforce Interests and Needs Survey, United States, September 2021–January 2022. CDC. https://www.cdc.gov/mmwr/volumes/71/wr/mm7129a3.htm
[53] Lewis, G. (2022 June 30). The Jobs with the Highest Turnover Rates, According to LinkedIn Data. LinkedIn. https://www.linkedin.com/business/talent/blog/talent-analytics/types-of-jobs-with-most-turnover

recommendations for the U.S. Job Corps in response to Executive Order 13996[54] to expand the public health workforce with 100,000 new workers. Each of these surveys uses a different methodology to estimate the workforce needs and provides limited projections of the workforce needs in the future. While there is high-quality federal statistical data on the health care workforce overall, there is a lack of clear and consistent categorization and definition of roles within the *public health* workforce. This makes it difficult to comprehensively assess what workers are needed and where they are needed. To ensure we have the workforce required to meet the nation's public health challenges, we must have a reliable, consistent, federal-level accounting of the current public health workforce, including public health workers in non-clinical and clinical jobs. Enumeration and categorization will allow for future resources to be directed and programs to be developed to support and enhance the public health workforce, for example, through legislation or government programs at the federal, state, and local levels. This process is essential to adequately plan for system growth and development, identify critical workforce gaps, and address workforce training and professional development needs for the future.

Recommendation 1:

The Bureau of Labor Statistics (BLS) and Office of Management and Budget (OMB), in consultation with the Department of Health and Health Services (HHS, particularly CDC and HRSA), should work together to create a new Standard Occupational Classification (SOC) for public health, and include the public health workforce in key surveys of the labor market as part of the next revision of the SOC manual.

PCAST recommends using an existing taxonomy, for example the taxonomy developed by the University of Michigan,[55] to develop this SOC.[56] However, this process should not be completed without the input of state, local, and tribal governments. Professional organizations and academic organizations should also be engaged. The Public Health Workforce Research Center, established at the University of Minnesota of Public Health and co-funded by CDC and HRSA through HRSA's Workforce Research Center Cooperative Agreement Program, would also be a valuable contributor to the development of this SOC. The Research Center is leading a consortium of universities and partner organizations working to understand and address the public health workforce shortage.[57]

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[54] The White House. (2021 January 21). Executive Order on Establishing the COVID-19 Pandemic Testing Board and Ensuring a Sustainable Public Health Workforce for COVID-19 and Other Biological Threats. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/21/executive-order-establishing-the-covid-19-pandemic-testing-board-and-ensuring-a-sustainable-public-health-workforce-for-covid-19-and-other-biological-threats/

[55] Beck, A. J., Coronado, F., Boulton, M. L., & Merrill, J. A. (2018). The Public Health Workforce: Revisions and Recommendations for Implementation. *Journal of Public Health Management and Practice*. 24(5): p E1-E11. https://journals.lww.com/jphmp/Abstract/2018/09000/The_Public_Health_Workforce_Taxonomy__Revisions.17.aspx

[56] SOC revisions are a multi-year process involving collecting input from the public and Federal agencies and conducting research. The latest revision to the SOC, which was initiated in 2014 and adopted in 2018, was led by an interagency SOC Policy Committee consisting of eight workgroups. The Committee issued two requests for public comment through Federal Register notices and provided recommendations to the SOC to OMB. The final SOC adopted by OMB ultimately included a significant number of new occupations, titles, definitions, and categorizations.

[57] CDC. (2022). Public Health Workforce Research Center. https://www.cdc.gov/workforce/resources/research-center.html

In addition, CDC should provide a set of guidelines for standardizing public health workforce definitions across the states to promote consistent uptake of this taxonomy. Existing opportunities or training at CDC and within federal state, local, tribal, and territorial systems and academic program offerings should be aligned with this categorization to facilitate credentialing.

This effort will provide clarity on the size of the current workforce, a common lexicon of the various types of jobs that are included in the current public health workforce, and greater transparency that can lead to more clear expectations for the skills and credentials for each job. This systematic, nationally representative enumeration, spanning general to highly specialized roles over a wide range of educational levels, will provide critical information on the gaps in the existing public health workforce and will allow the identification of jobs in which greater ethnic, racial, gender, and geographic diversity is needed. An SOC for the public health workforce will also provide the long-term categorization and framework that will inform educational and training programs and organizational best practices for supporting public health workers. The new SOC will facilitate data-informed decision making to identify and address areas most in need of additional resources, personnel, and training. For example, enumeration of the public health nursing sector, facilitated by the 2015 National Nursing Workforce Survey, identified a link between nurses' experience and education to the reduction of premature mortality and health risk behaviors.[58]

PCAST emphasizes that this recommendation is foundational to building and sustaining a public health workforce that meets the needs of Americans in every community. Classifying and enumerating the public health workforce will help to ensure that future recruitment, personnel exchanges, communities of practice, and other efforts will be informed by up-to-date, accurate data.

Expand recruitment, retention, training, and personnel exchanges to strengthen public health talent

With morale in health departments at a low during the pandemic and thousands of public health workers leaving the field, health departments may have trouble hiring and retaining staff, even with new funding. Consequently, there is an urgent need to both identify where personnel are needed and to ensure that students, current public health workers looking for impactful careers with prospects for stable employment and long-term growth, and workers from other sectors looking to change their employment are excited about the opportunities in public health.

Growing the workforce in ways that supports diversity and inclusion will require changes to the strategies used to identify and train public health workers. The majority of employees in federal, state, and local health departments self-identify as non-Hispanic white, except in large city health departments. The current entry points and pathways often require access to training programs that may be costly, time-intensive, and highly selective; additionally, they may include jobs that pay low wages and offer limited health and well-being benefits and resources. This too often undermines the ability of people in racially and ethnically minoritized groups, people with low income, and people living in rural areas to enter, much less meaningfully advance, in careers in public health.

[58] Gwon, S. H., Cho, Y. I., Paek, S., & Ke, W. (2020). Public Health Nurses' Workforce Factors and Population Health Outcomes in the United States. *Public Health Nursing.* 37(6): p 819-945. https://onlinelibrary.wiley.com/doi/epdf/10.1111/phn.12793

Recommendation 2a:

Create an all-of-government campaign to recruit and retain people in public health careers. This campaign should include direct hiring authority, the creation of a new job series for public health, and expansion of loan repayment and forgiveness options for public health workers.

Executing an inspiring campaign to recruit a new generation of public health workers will require coordinated actions from several agencies as described below. The timing for this campaign should consider funding, capabilities of existing staff, and existing training programs.

- The Department of Health and Human Services (HHS), in collaboration with the Departments of Labor and Education, should create a robust and high-profile communication campaign to advertise value of public health careers and the federal programs available to support public health education and the workforce.

- The Office of Personnel Management (OPM) should lead a coalition of agencies in developing a government-wide hiring campaign for public health jobs, including data scientists, epidemiologists, policy analysts, clinical advisors, environmental health professionals, community engagement specialists, and frontline community health workers. This campaign should include fast-track hiring similar to the campaign used to attract data scientists.[59] OPM should also create a new job series for public health, to categorize these workers consistently across government agencies.

- The Department of Education and the Department of Treasury should be directed to expand student loan repayment and forgiveness options for public health workers (especially those who earn lower wages), include public health workers in current programs, and make these repayment and forgiveness options for public health workers in all sectors permanent. This expansion should also allow loan repayment credit for non-governmental organizations and extend the Public Service Loan Forgiveness Program (PSLF).[60]

With greater clarity regarding the size and nature of the current workforce (Recommendation 1), public health leaders will be better positioned to think strategically about both recruitment of new members and the retention of current members of the workforce. A focused recruitment effort that publicizes the importance of public health jobs, coupled with incentives such as clear career pathways and loan forgiveness and repayment options will elevate public health employment as desirable and help to fill the many available jobs. As part of this effort, public health agencies should have the capacity (including funding) to set up student loan repayment plans. This campaign should also prioritize recruiting and retaining a diverse workforce, including people from a variety of communities and demographics, with various life and educational experiences. This effort would align with the recommendation of the President's COVID-19 Health Equity Task Force to "invest in a

[59] Heckman, J. (2021 January 15). Data Scientist Hiring Campaign Maxes Out Applications in Less Than 2 Days. *Federal News Network*. https://federalnewsnetwork.com/hiring-retention/2021/01/data-scientist-hiring-campaign-maxes-out-applications-in-less-than-2-days/

[60] Federal Student Aid. (n.d.) Public Service Loan Forgiveness (PSLF). https://studentaid.gov/manage-loans/forgiveness-cancellation/public-service

representative health workforce."[61] A public health workforce that is built from and embedded within the communities they serve will help to address one of the most important priorities for public health in America: regaining trust.

Not only do we need new staff, but we need new opportunities for current staff. Training and skills enhancements are necessary so that the public health workforce will be prepared to meet ongoing and emerging threats to human health. For example, to improve information technology and data skills within the public health workforce, the Office of the National Coordinator for Health Information Technology (ONC) Public Health Informatics & Technology Workforce Development Program was awarded $75 million to 10 institutions of higher education to recruit and train more than 5,000 individuals in public health informatics and technology.[62] Such current initiatives could serve as a model for future efforts.

Recommendation 2b:

Establish new pathways and increase existing opportunities for personnel exchanges between federal, state, tribal, and territorial health officials, as well as support exchanges with local health systems and other private sector organizations.

We recommend establishing new programs as well as expanding existing ones to significantly increase the number of personnel exchanges between different levels of government and the private sector, to facilitate the sharing of expertise, community knowledge, lessons learned, and career opportunities among the many organizations that make up the nation's public health infrastructure. HHS leadership will be needed to ensure expansion and implementation of pathways for exchanges across the public health workforce.

Public health workers also need to develop and cultivate leadership. Investments in developing leadership skills within the workforce will facilitate and smooth operations when public health emergencies require surges of temporary workers, as happened during the pandemic. The newly established Public Health AmeriCorps is an example of such an investment in future public health leadership. During the pandemic, 36,000 AmeriCorps members assisted 11.5 million people with COVID-related efforts and provided 34.4 million meals to families in need.[63] In addition to offering more regular training opportunities, we recommend the development and implementation of clear educational, certification, and occupational pathways from the types of (often temporary) jobs through which members of socially marginalized groups may enter the public health workforce to more stable, full-time jobs and, ideally, meaningful public health careers.

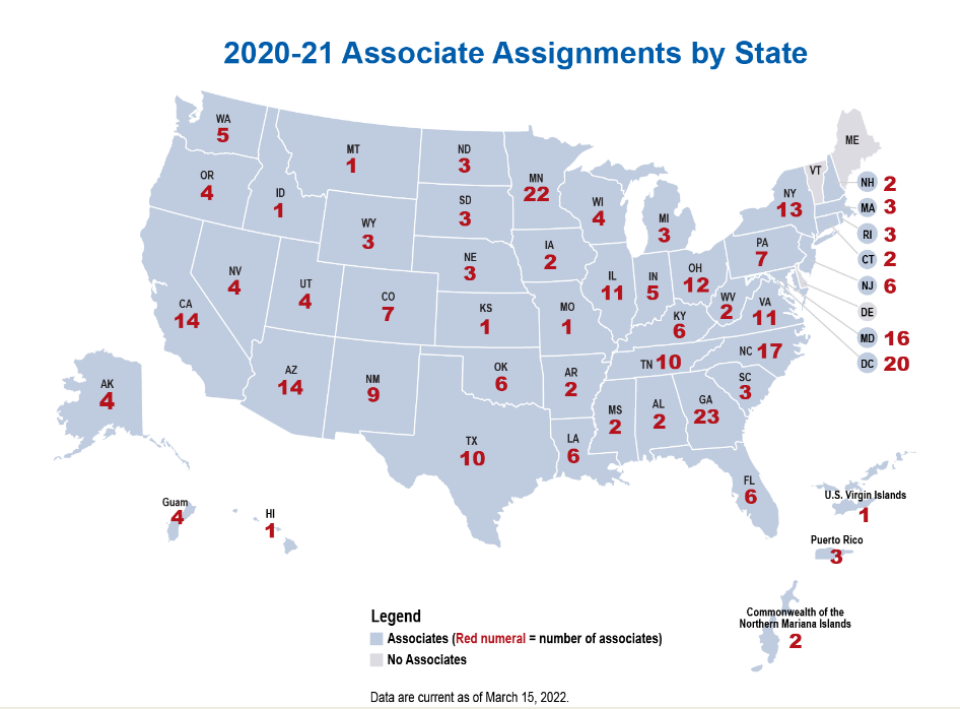
CDC should substantially expand their workforce programs to place more staff in state, local, tribal, and territorial health programs. OPM should identify mechanisms that authorize CDC to hire workers from the private sector for deployments in government, including rotational assignments similar to program officers at the National Science Foundation.[64] Further, the CDC Foundation should work

[61] Presidential COVID-19 Health Equity Task Force. (2021 October). Presidential COVID-19 Health Equity Task Force Final Report and Recommendations. https://www.hsdl.org/c/abstract/?docid=860626
[62] ONC Health IT (HITECH) programs (n.d.). https://www.healthit.gov/topic/onc-hitech-programs
[63] Public Health AmeriCorps (n.d). https://americorps.gov/about/what-we-do/public-health-americorps
[64] NSF. (n.d.). NSF Rotator Programs. https://beta.nsf.gov/careers/rotator-programs

with technology, diagnostics, and communication industry partners to develop, implement, and evaluate a fellowship program, with appropriate safeguards for conflict of interest, that can support short-term deployments from the private sector to government and vice versa. Finally, the Centers for Medicare and Medicaid Services (CMS) should support programs for exchanges between health system staff and health departments as part of local collaboration to improve population health.

CDC Preparedness Field Assignee Program

CDC offers the Public Health Associate Program (PHAP), a competitive, two-year, paid training program where associates are assigned to state, tribal, local, and territorial public health agencies and non-governmental organizations to work in various public health settings.[1] Graduates of the program can then be hired as Preparedness Field Assignees (PFAs).[2] As CDC employees, PFAs are assigned to state and local health departments in Public Health Emergency Preparedness (PHEP) recipient jurisdictions for three-year terms. Similar to the Career Epidemiology Field Officer program, PFAs are placed in state, local, or territorial health departments to work with public health officials and to develop skills in public health, program management and leadership, emergency preparedness and response, communications, and partnership development. PHEP recipients who are interested in hosting PFAs can submit a proposal to host two PFAs annually. Between 2020 and 2021, 340 PFAs were serving in 51 states and territories.[3]



PFA Assignments in 2020-2021 *Source: CDC*

[1] https://www.cdc.gov/phap/index.html

[2] https://www.cdc.gov/cpr/readiness/field-staff.htm

[3] https://www.cdc.gov/phap/meet_associates/assignments.html

The additional training that we recommend will prepare more members of the current workforce to serve as team or unit leaders. In these roles, they can utilize experience and knowledge to avoid the disarray, confusion, and distress that can occur during times of crisis and that promotes burnout. Further, training in leadership and other skills will better facilitate advancement of public health workers and who can ultimately serve as the Chief Health Strategist in their communities. We also believe that the establishment of new pathways of advancement from entry level jobs will contribute to meaningful advances toward a more diverse public health workforce.

Advance health equity through strengthening public health capacity for community engagement

The COVID-19 pandemic has been a magnifying glass for health inequities — but it has also revealed the value of community engagement in supporting public health. CDC defines community engagement as "the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people."[65] This collaboration includes a multitude of entities such as faith-based groups, fraternities and sororities, community health centers, and grassroots community-based organizations. The Biden Administration has prioritized empowering communities from day one of its leadership. Most recently, the administration acknowledged the critical role community engagement plays in health equity by issuing Executive Order 13985. The order mandates the establishment of Equity Action Teams in federal agencies with a mission to improve their community engagement efforts, and development of plans that require the consultation of constituents.[66,67] Communities will have the opportunity to inform the operations and projects of the federal agencies that directly impact them and their health. These efforts are fundamental to instituting community engagement in sustainable policy. To further strengthen community engagement, there must be support for the community health workforce and capacity building across disciplines within the overall public health workforce to enhance cooperative, collaborative engagement at scale.

Community health workers (CHWs) are essential members of the public health workforce. They are absolutely critical to both pandemic preparedness and public health services. The post-pandemic expansion of CHWs and new support for these workers can uniquely address workforce shortages; however, our recommendations are intended to maximize the opportunity to establish a robust, stable workforce that is connected to the community. This connection is the bedrock of trust. A CHW is defined as a "frontline public health worker who is a trusted member of and/or has an unusually

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[65] CDC ATSDR. (2015). *Clinical and Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, Principles of Community Engagement, 2nd edition*. https://www.atsdr.cdc.gov/communityengagement/index.html

[66] The White House. (2023 February 16). Executive Order on Further Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. https://www.whitehouse.gov/briefing-room/presidential-actions/2023/02/16/executive-order-on-further-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/

[67] The White House. (2023 February 16). Fact Sheet: President Biden Signs Executive Order to Strengthen Racial Equity and Support for Underserved Communities Across the Federal Government. https://www.whitehouse.gov/briefing-room/statements-releases/2023/02/16/fact-sheet-president-biden-signs-executive-order-to-strengthen-racial-equity-and-support-for-underserved-communities-across-the-federal-government/

close understanding of the community served."[68] Their unique trust relationship with community members allows them to provide health education, connections to necessary medical services, and social support. Sustainable funding mechanisms are vital to support their growth as a profession and to honor their contributions towards advancing health equity.[69] Along with their service, building necessary skills within the larger public health workforce to serve as active participants in the community would help combat the erosion of public trust in science.

In part, the challenge of public mistrust of science and health care reflects historic and present-day mistreatment of social groups already marginalized in the larger society by the health care and public health systems.[70] Recently, however, mistrust has been amplified, through a slew of rhetoric containing falsehoods and misinformation about the people, services, and activities of public health.[71] Thus, partnerships with community-based organizations and groups (many of whom employ community health workers and deliver services to support people in addressing negative social determinants of health) offer health departments (and other government agencies and institutions) the opportunity to build trust with the public, as well as improve scientific and public health communication.[72] Building trust through community engagement is also key to ensuring our country's capacity to respond to future pandemics by collecting more accurate and complete data to monitor health challenges and delivering life-saving health information to the public.

Recommendation 3a:

To develop and sustain a robust public health workforce that is deeply rooted in and trusted by their communities, the Departments of Education and Labor, in consultation with HHS and leveraging the updated occupational classification of "community health workers" from BLS,[73] should develop sustainable and/or non-degree career pathways for these workers in the field and ensure equitable workplaces that foster diversity and inclusion.

A robust community health workforce could bring thousands of people into public health work and fill critical gaps in community-driven care. For example, a study in the U.K. estimated that if there were enough CHWs to cover everyone in England registered under the National Health Service, an

[68] American Public Health Association. (n.d.) Community Health Workers. https://www.apha.org/apha-communities/member-sections/community-health-workers
[69] Ibe, C. A., Hickman, D., & Cooper, L. A. (2021). To Advance Health Equity During COVID-19 and Beyond, Elevate and Support Community Health Workers. *JAMA Health Forum*. 2(7):e212724. https://jamanetwork.com/journals/jama-health-forum/fullarticle/2782746
[70] Cooper, L. A., & Crews, D. C., (2020). COVID-19, racism, and the pursuit of health care and research worthy of trust. *Journal of Clin. Invest*. 130(10):5033-5035. https://www.jci.org/articles/view/141562
[71] Harvey, A. (2021 November 23). Combatting Health Misinformation and Disinformation: Building an Evidence Base. *Health Affairs*. https://www.healthaffairs.org/do/10.1377/forefront.20211118.932213
[72] Castrucci, B. C., Katz, R. J., & Kendall-Taylor, N. (2020). Misunderstood: How Public Health's Inability to Communicate Keeps Communities Unhealthy. *Health Affairs.* https://www.healthaffairs.org/do/10.1377/forefront.20201006.514216/full/
[73] Bureau of Labor Statistics. (2021 May). Occupational Employment and Wage Statistics. https://www.bls.gov/oes/current/oes211094.htm

additional 753,000 cervical, 365,000 breast cancer, and 482,000 bowel cancer screenings would be expected over 2.5 to 5.5 years.[74]

Sisters Together and Rising, Inc.: "Advocating and Providing Optimal Health and Wellness"

Sisters Together and Rising (STAR) was founded in 1991 as a non-profit Community-Based/Faith-Based Organization with a dedicated focus on supporting Black women and families living with HIV/AIDS in Baltimore City. Since they have served 40,000 people in Baltimore, with expanded services to men and women in low-income Black communities where sexually transmitted infections and HIV/AIDS are prevalent, and where individuals experience substance abuse, crime, substandard housing, and other social disadvantages.

To reach these communities and individuals that face a lack of access to resources across the board, STAR deploys community health workers to meet people where they are in order to reduce poor health outcomes and provide health education to their clients. They offer a multitude of services in collaboration with other organizations locally and nationally to provide comprehensive care and advocacy for their clients. The recommendations in this report to elevate community health workers will help facilitate more organizations like STAR to expand equitable, culturally-informed, and community-engaged practices to all Americans.

CMS and CDC should consider public health roles of CHWs in the larger discussion of nationwide reimbursement for these workers, using the successful implementation of models in several states throughout the country.[75,76] Currently, the way these vital workers are funded in Medicaid and Medicare includes: (1) direct fee-for-service payment as a traditional health worker under the state plan, (2) as a part of a collaborative care team funded by Medicaid, (3) as an expanded benefit provided by health plans in their managed care organization (MCO) contracts, or (4) through the direct employment of a health plan that participates as an MCO in Medicaid.[77]

While these mechanisms are a start, they do not recognize the full scope of CHWs and their capability to evoke change in health behaviors as well as the empowerment of the communities they live and serve in. Additionally, it does not acknowledge them for their work outside of healthcare settings,

[74] Hayhoe, B., Cowling, T. E., Pillutla, V., Garg, P., Azeem, M., and Harris, M. (2018). Integrating a national scaled workforce of community health workers in primary care: a modelling study. *Journal of the Royal Society of Med*. 111(12):453-461. https://journals.sagepub.com/doi/10.1177/0141076818803443

[75] National Academy for State Health Policy. (2021 December 10). State Community Health Worker Models. https://nashp.org/state-community-health-worker-models/

[76] Kaiser Family Foundation. (2021 January 23). State Policies for Expanding Medicaid Coverage of Community Health Worker (CHW) Services. https://www.kff.org/medicaid/issue-brief/state-policies-for-expanding-medicaid-coverage-of-community-health-worker-chw-services/

[77] The Medicaid and CHIP Payment and Access Commission (MACPAC). (2022 April). Medicaid Coverage of Community Health Worker Services. https://www.macpac.gov/wp-content/uploads/2022/04/Medicaid-coverage-of-community-health-worker-services-1.pdf

such as in public health agencies that are not checking insurance for their services. An alternate solution to adequately reimburse for these services would draw on techniques CMS has already employed—specifically in their tobacco quit lines. In this effort, CMS allows for the calculation of a Medicaid eligibility ratio to determine an approximate percentage of Medicaid recipients that utilized the service.[78] In promoting a Medicaid payment determination of this type, utilizing MCOs' ability to offer expanded benefits, public health agencies and CMS alike can properly fund cost-saving preventative services that engage communities in improving their own health outcomes.[79]

Based on the evaluation of programs funded by the American Rescue Plan and other COVID-19 emergency public health workforce programs (e.g., Public Health AmeriCorps and the Public Health Informatics & Technology Workforce Development Program[80]), CDC and CMS should expand and develop mechanisms for sustaining these programs on a long-term basis. These agencies should develop and disseminate organizational best practices (salary, promotion opportunities, training and professional development) for hiring and employment for organizations that employ CHWs. CMS and CDC should also provide guidelines related to program evaluation and accountability for organizations seeking CHW funding. Community-based organizations (CBOs) will be key to implementing these recommendations. To support these organizations, CDC could, for example, fund partnerships between CBOs and academic institutions to build capacity and to develop best practices for implementation and evaluation.

Recommendation 3b:

Expand a national community of practice focused on scientifically informed, community-engaged practices for health equity that includes public health agencies.

Public health agencies are innovating to advance health equity, but have not been a core part of national communities of practice with community-based organizations, faith leaders, business leaders, healthcare systems, and researchers. This lack of involvement lessens the ability of public health agencies to benefit from these partnerships and prevents evidence-based solutions from being implemented at scale to achieve improved and equitable impacts on community health.

[78] Centers for Medicaid Services. (2011 November 18). CMCS Informational Bulletin. https://downloads.cms.gov/cmsgov/archived-downloads/CMCSBulletins/downloads/CIB-11-18-11.pdf
[79] CDC. (n.d.). Quitlines and Other Cessation Support Resources. https://www.cdc.gov/tobacco/patient-care/quitlines-other/
[80] The White House. (2022 September 30). Fact Sheet: Biden-Harris Administration Announces American Rescue Plan's Historic Investments in Community Health Workforce. https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/30/fact-sheet-biden-harris-administration-announces-american-rescue-plans-historic-investments-in-community-health-workforce/

HHS can use the NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities (or a similar initiative) as a foundation, broadening its mission to include public health systems in leadership roles, leverage existing relationships and partnerships that were forged with communities during the pandemic, including for driving recruitment, and expand participation to include existing successful community partnerships at the state and local level. This platform should focus on needs identified by communities, activate assets and strengths of communities, establish a stable infrastructure for shared governance and building of new collaborations, foster co-learning, capacity building, and co-benefit for all partners, and focus on important and relevant health outcomes. New communities of practice could capitalize on existing resources such as CDC's Communities of Practice Resource Kit to jumpstart their efforts.[81] If additional resources are needed after initial expansion, the President should propose that Congress direct resources to HHS for the initiative.

CEALing the Deal on Vaccinations

Source: Brittany Taylor/NIH

During the COVID-19 pandemic, the National Institutes of Health (NIH) recognized the importance of connecting directly with community members to provide clear and accurate information about vaccination and to facilitate the inclusion and participation of diverse communities in COVID-19 vaccine and therapeutic clinical trials. To do so, NIH established the Community Engagement Alliance (CEAL) Against COVID-19 Disparities, which consisted of CEAL teams set up across 21 states, DC, and Puerto Rico. These teams work with community-based organizations such as local health care providers, schools, small businesses, and faith-based and civic community-based organizations to leverage their existing relationships with their local communities.

For example, the Georgia CEAL team worked with local religious leaders throughout the state to promote vaccination among their congregants. One event included close to 100 faith and community leaders that included leaders from Christian, Jewish, Islamic, and other denominations. In Arizona, the CEAL team held focus groups with members of the local indigenous communities to receive insight on how to more effectively communicate with their fellow community members to encourage vaccination. They used this insight to improve their public health messaging, meeting communities where they were. CEAL has proven to be particularly effective: by September 2022, CEAL teams had vaccinated nearly 200,000 people, held over 1,500 community events, and recruited more than 600 participants to clinical trials. CEAL has demonstrated the criticality of leveraging established community relations to reach those hit hardest by the COVID-19 pandemic and to ensure that future treatments work for these impacted communities.

[81] CDC. (2023 March 6). Communities of Practice Resource Kit. https://www.cdc.gov/publichealthgateway/phcommunities/resourcekit/welcome-to-the-communities-of-practice-resource-kit.html

Multiple reviews and reports note the importance of partnerships between public health agencies and private sector organizations to achieve more effective and equitable public health outcomes.[82,83,84] Strategic cross-sector partnerships support ongoing public health efforts and better position public health agencies to respond in times of health emergencies. Expansion of a national community of practice should fuel innovation and research related to health equity and promote greater communication and coordination across public health agencies, leading to improved programs and policies, transformed systems, more effective and equitable public health delivery, and thriving communities.

Conclusion

Every American deserves a public health system that helps to provide them with the opportunity to live a full and healthy life. And here is the good news—we can create the strong public health system our nation needs, *if* we invest in hardworking American people. Our recommendations complement and augment the Biden Administration's extensive efforts to reverse the current worsening of health outcomes and disparities and improve the health and lives of all Americans. PCAST proposes clear actions we can take *now* to support current public health workers, and to ensure that in the future, the United States has a robust, well-trained, well-resourced, and trusted workforce that can effectively support Americans in *every* community in realizing their full health potential.

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[82] DeSalvo, K. B., Wang, Y. C., Harris, A., Auerbach, J., Koo, D., & O'Carroll, P. (2017). Public Health 3.0: A Call to Action for Public Health to Meet the Challenges of the 21st Century. *Prev. Chronic Dis*. 14:E78. DOI: http://dx.doi.org/10.5888/pcd14.170017

[83] Clary, A., Riley, T., Rosenthal, J., & Kartika, T. (2017). *Blending, Braiding, and Block-Granting Funds for Public Health and Prevention: Implications for States*. National Academy of State Health Policy. https://nashp.org/wp-content/uploads/2017/12/deBeaumont.pdf

[84] Michener, J. L., Castrucci, B. C., Bradley, D. W., Hunter, E. L., Thomas, C. W., Patterson, C., & Corcoran, E. (2019). *The Practical Playbook II: Building Multisector Partnerships That Work*. Oxford University Press. https://academic.oup.com/book/36531

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Appendix A: External Experts Consulted

PCAST sought input from a diverse group of additional experts and stakeholders. PCAST expresses its gratitude to those listed here who shared their expertise. They did not review drafts of the report, and their willingness to engage with PCAST on specific points does not imply endorsement of the views expressed herein. Responsibility for the opinions, findings, and recommendations in this report and for any errors of fact or interpretation rests solely with PCAST.

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Kevin Klein
Director
Colorado Division of Homeland Security & Emergency Management

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Former Senior Advisor to OSTP Director for Pandemic Prevention
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Vice President for Partnerships & Impact
XPRIZE Foundation

Appendix B: Selected Biden Administration Public Health Initiatives

Food, agriculture, and water safety

- Delivering Results from President Biden's Bipartisan Infrastructure Law
    - Bipartisan Infrastructure Law invests $55 billion to "expand access to clean drinking water for households, businesses, schools, and child care centers all across the country" in addition to Tribal Nations
- FACT SHEET: President Biden's Bipartisan Infrastructure Law Advances Economic and Public Health Opportunities for Tribal Communities
    - Bipartisan Infrastructure Law invests $6 billion to support water infrastructure in Tribal communities
    - Bipartisan Infrastructure Law invests $21 billion in environmental remediation
    - Bipartisan Infrastructure Law invests $150 million in funding to remediate orphaned wells on Tribal lands

COVID-19

- FACT SHEET: Biden-Harris Administration to Invest $7 Billion from American Rescue Plan to Hire and Train Public Health Workers in Response to COVID-19
    - Invest $7.4 billion from the American Rescue Plan to recruit and hire public health workers to respond to the pandemic and future public health challenges
    - Efforts include grants to states and localities to increase public health staffing, launching the Public Health AmeriCorps, expanding the CDC Epidemic Intelligence Service, building laboratory workforce and infrastructure, and modernizing the public health workforce
- FACT SHEET: Biden Administration Announces New Investments to Support COVID-19 Response and Recovery Efforts in the Hardest-Hit and High-Risk Communities and Populations as COVID-19 Health Equity Task Force Submits Final Report
    - Invest $785 million in American Rescue Plan funding to support community-based organizations building vaccine confidence across communities of color, rural areas, low-income populations, and Tribal communities
    - Efforts expand public health systems' ability to respond to the needs of people with disabilities and older adults and build a more diverse and sustainable public health workforce, including a new apprenticeship program that will train thousands of our COVID-19 community health workers

- FACT SHEET: The Biden Administration's Commitment to Global Health in the FY 2023 President's Budget
    - Provides $1 billion in mandatory funding for State and USAID to support and protect the global health workforce as part of the Administration's increased prioritization and investments in human resources for health
- FACT SHEET: The Biden-Harris Administration Global Health Worker Initiative
    - Will contribute approximately $1.56 billion annually to support the health workforce across the globe
    - The Global Health Worker Initiative expands and defines "health workers" broadly to include a multidisciplinary workforce including clinicians, community health and care workers, and public health professionals

Mental health and suicide prevention

- FACT SHEET: President Biden to Announce Strategy to Address Our National Mental Health Crisis, As Part of Unity Agenda in his First State of the Union
    - Will invest $700 million in programs – like the National Health Service Corps, Behavioral Health Workforce Education and Training Program, and the Minority Fellowship Program
    - Awards over $225 million in training programs to increase the number of community health workers and other health support workers providing services, including behavioral health support, in underserved communities
    - Dedicates $103 million in American Rescue Plan funding to address burnout and strengthen resiliency among health care workers
- FACT SHEET: Biden-Harris Administration Actions to Prevent Suicide
    - Various actions to prevent suicide including plans to address the mental health crisis, launch of 988, improving suicide screening and risk detection, and enhancing community-based prevention efforts

Health Care Access

- FACT SHEET: Protecting Seniors by Improving Safety and Quality of Care in the Nation's Nursing Homes
    - Intends to propose minimum standards for staffing adequacy that nursing homes must meet
    - Calls on Congress to provide almost $500 million to CMS, a nearly 25% increase, to support health and safety inspections at nursing homes

- FACT SHEET: Biden-Harris Administration Announces Action on COVID-19 Pandemic Response and Improving Health Systems and Health Security in the Americas
    - Launched the Americas Health Corps — Fuerza de Salud de las Americas — which will provide basic and specialized training to 500,000 public health, health science, and medical professionals throughout Latin America and the Caribbean

Opioid/substance use crisis

- ONDCP Announces Report on Improving Telehealth Services for Substance Use Disorder
    - Report found that telehealth services can provide increased access to vulnerable individuals with substance use disorder, decrease costs, and reduce spread of communicable diseases

Pandemic preparedness

- FACT SHEET: American Pandemic Preparedness Plan Annual Report
    - Provided up to 1,000,000 free at-home rapid antigen COVID-19 diagnostic tests through online orders and community distribution; provides opportunity to evaluate the feasibility and impact of large-scale home test distribution
    - Strengthens early warning of emergent threats, so that the nation has the concrete capability to detect viral threats anywhere in the world within days or weeks of their emergence

Disabilities

- FACT SHEET: The Biden-Harris Administration Marks the Anniversary of the Americans with Disabilities Act
    - Will launch a technical assistance center to help states and communities leverage existing federal funding opportunities to increase the number of home care workers

Community partnerships

- FACT SHEET: Biden-Harris Administration Celebrates First Anniversary of the Reestablishment of the White House Office of Faith-Based and Neighborhood Partnerships
    - Signed an executive order reestablishing the White House Office of Faith-Based and Neighborhood Partnerships and urged the Office to "work with leaders of different faiths and backgrounds who are the frontlines of their communities in crisis and who can help us heal, unite, and rebuild"
    - Provided technical assistance to more than 7,000 faith-based and community leaders on taking action to protect places of worship, including by providing information on the Non-Profit Security Grant Program and the Mitigating Attacks on Places of Worship

- FACT SHEET: Biden-Harris Administration Announces American Rescue Plan's Historic Investments in Community Health Workforce
    - American Rescue Plan funds awarded to train over 13,000 Community Health Workers (CHWs)
- FACT SHEET: President Biden Signs Executive Order to Strengthen Racial Equity and Support for Underserved Communities Across the Federal Government
    - The Executive Order requires agencies to improve the quality, frequency, and accessibility of their community engagement

Maternal morbidity and mortality

- FACT SHEET: Vice President Kamala Harris Announces Call to Action to Reduce Maternal Mortality and Morbidity
    - Invest over $3 billion in new maternal health funding, with transformative new investments in growing and diversifying the perinatal workforce, improving data collection and maternal health risk monitoring, addressing the social factors that contribute to poor maternal health outcomes, addressing substance use disorders that impact maternal health, promoting increased maternal health research, improving postpartum coverage, and better coordinating care

Appendix C: Community-Based Partnerships

There is a strong evidence base for community collaboration. Public health initiatives that engage members of communities address negative social determinants of health and result in benefits for health behaviors and health consequences.[85] Thus, partnerships between public health systems and local community-based organizations may be especially well-equipped to address health inequities. These partnerships could also include health care systems, academic research and/or medical centers, governmental agencies from other sectors, such as housing or transportation, private industry including pharma and biotechnology firms, and K-12 school systems, all bringing their resources and commitment to work in support of health equity.

The U.S. Centers for Disease Control and Prevention define community engagement as "the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people."[86] Important attributes of successful community engagement include focusing efforts on needs identified by the affected communities, activating the assets and strengths of communities, establishing a stable infrastructure for, and sharing funding and authority over projects, and fostering mutual trust and respect among the members of partnering institutions and organizations.[87]

Multiple reviews and reports note the importance of partnerships between public health agencies and private sector organizations to achieve more effective and equitable public health outcome.[88,89,90] Strategic cross-sector partnerships support ongoing public health efforts and better position public health agencies to respond in times of health emergencies. For instance, a recent report[91] recommended that the Assistant Secretary for Preparedness and Response (ASPR) and the CDC partner with state and local health entities to ensure synchronization between health care practices, coalitions, and public health entities. These and similar partnerships should be developed in advance

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[85] O'Mara-Eves, A., Brunton, G., Oliver, S., Kavanagh, J., Jamal, F., & Thomas, J. (2015). The effectiveness of community engagement in public health interventions for disadvantaged groups: a meta-analysis. *BMC Public Health.* 15:129. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-1352-y

[86] Department of Health and Human Services (HHS). (2011). Principles of community engagement. NIH Publ. 11–7782. https://www.atsdr.cdc.gov/communityengagement/pdf/PCE_Report_508_FINAL.pdf

[87] O'Mara-Eves, A., Brunton, G., Oliver, S., Kavanagh, J., Jamal, F., & Thomas, J. (2015). The effectiveness of community engagement in public health interventions for disadvantaged groups: a meta-analysis. *BMC Public Health.* 15:129. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-1352-y

[88] DeSalvo K. B., Wang, Y. C., Harris, A., Auerbach, J., Koo, D., & O'Carroll, P. (2017). Public Health 3.0: A Call to Action for Public Health to Meet the Challenges of the 21st Century. *Prev. Chronic Dis*. 14:E78. DOI: http://dx.doi.org/10.5888/pcd14.170017

[89] Clary, A., Riley, T., Rosenthal, J., & Kartika, T. (2017). Blending, Braiding, and Block-Granting Funds for Public Health and Prevention: Implications for States. *National Academy of State Health Policy.* https://nashp.org/wp-content/uploads/2017/12/deBeaumont.pdf

[90] Michener, J. L., Castrucci, B. C., Bradley, D. W., Hunter, E. L., Thomas, C. W., Patterson, C., & Corcoran, E. (2019). The Practical Playbook II: Building Multisector Partnerships That Work. *Oxford University Press*. https://academic.oup.com/book/36531

[91] DeSalvo K. B., Wang, Y. C., Harris, A., Auerbach, J., Koo, D., & O'Carroll, P. (2017). Public Health 3.0: A Call to Action for Public Health to Meet the Challenges of the 21st Century. *Prev. Chronic Dis*. 14:E78. DOI: http://dx.doi.org/10.5888/pcd14.170017

of a crisis in order to cultivate the efficient sharing of limited resources, improve timely and accurate communication, and improve sharing of data relevant to preparedness planning and response. Ongoing partnerships between public health leaders, local officials, and community organizations are also critical to ensuring that population health is at the table, if not central, to any number of municipal initiatives, including community development.[92]

Echoing and building on past reports, we emphasize the role of community-engaged partnerships in enabling public health systems to promote effective and equitable health outcomes. Building effective partnerships that bridge communities with federal, state, and local public health capabilities and resources is a critical component of strengthening community engagement and, ultimately, health equity. We find the example of the NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities particularly compelling because of its very recent demonstration of improved outcomes during the pandemic when inequity was exacerbated by unclear decision making, decentralized resource allocation, and deep distrust of health authority. Key factors to its success include a) shared leadership by scientists and community-based leaders in the organizational structure of the Alliance, b) funding and technical support from a coordinating center and communications team, c) the development and dissemination of innovative resources by each of the funded community-academic teams, and d) Alliance-level initiatives such as the Community Engagement Alliance Consultative Resource and the Diversity in Science Scientific Pathway.

Collaboration and partnership with communities facing health challenges holds promise for improving the social and environmental conditions that influence health, reduce illness, save lives, and advance health equity. The Department of Health and Human Services is well-positioned to support a national community of practice/platform for the development and maintenance of partnerships to strengthen community engagement by the public health system. As part of such a community of practice, individual state, local, tribal, and territorial partnerships would be able to learn from one another, strengthen the body of evidence-based knowledge, and translate it into practice and policy to promote equitable public health outcomes. For instance, the U.S. Department of Health and Human Services (HHS) could commission a report defining the key characteristics of successful local public health models that address social determinants of health through cross-sector partnerships and recommending pathways to wide adoption.[93]

The example of the National Institutes of Health Community Engagement Alliance (CEAL) Against COVID-19 Disparities inform a national community of practice initiative. Developed in the wake of the COVID-19 pandemic, CEAL was established to support community engagement and outreach in underserved racial and ethnic minority communities disproportionately impacted by COVID. There are currently 21 CEAL teams, organized by state or region, within the larger alliance. With funding and infrastructure support provided by NIH, a large network of partnerships co-led by academic institutions and community organizations, and including partners from health care, government agencies, including public health departments, K-12 school systems, professional associations, advisory boards, and philanthropic foundations, businesses, and media and marketing organizations, was created to accomplish CEAL's objectives. Over 500 of the more than 1,000 partners in the Alliance are community-based organizations. These community-based organizations include

[92] Ibid.
[93] Ibid.

community service, community-based, faith-based, grassroots, non-profit, social service and civic organizations. These partnerships have been successful in conducting "real-time" community engaged research during the COVID crisis in order to better respond to the needs of the community. The partnerships have also increased the inclusion of racial/ethnic minority populations in clinical trials, facilitated access and collection of surveillance data to support and protect the health of the community, and led to the development of community-informed health promoting interventions. The individual teams have also developed tools, resources, and unique outreach approaches that can be used or adopted by other CEAL teams and other groups that aim to improve public health outcomes. Further, the partnerships have facilitated the recruitment of a diverse group of public health workers from the very communities that have been so overlooked, which is both critical for trust building, but also essential to changing some of the conditions in these communities (e.g., poverty) that undermine health.

There is an opportunity to leverage CEAL to strengthen the public health system's partnerships with communities. Indeed, the NIH has started to apply this model to other public health issues, such as maternal mortality and environmental impact. Three key steps could support this transition to broad, national community of practice. First, the Alliance's governance structure would need to elevate the roles of public health departments in the existing ecosystem, placing their members in leadership roles, along with academic research and community partners. Second, the platform could enhance the number and types of working groups focused on specific and pressing health conditions, research and evaluation methods, public health functions, or populations. Third, in addition to critical elements in the CEAL infrastructure like consultative services and primary care network support, the Alliance would benefit from a systematic approach to the early identification of, and development of clear strategies to combat, health-relevant misinformation and disinformation. Last, the Alliance could include a stronger focus on capacity-building for community members to engage in research and public health practice and to participate in public health workforce development. Building upon CEAL's foundation and broadening its mission to strengthening public health-community partnerships would bolster the public health system's community-engaged practices and help it address ongoing and emerging health challenges.