A Policy Analysis for the Integration of Primary Care, Public Health, and Community-Based Organizations in Public Health Emergencies: Interim Report

May 12, 2023

Johns Hopkins Center for Health Security Project Team

Tener Goodwin Veenema, PhD, MPH, MS, RN, FAAN
Senior Scholar, Johns Hopkins Center for Health Security

Eric Toner, MD
Senior Scholar, Johns Hopkins Center for Health Security

Richard E. Waldhorn, MD
Contributing Scholar, Johns Hopkins Center for Health Security

Sarah S. Firestone, MSW
Research Program Manager, Johns Hopkins Center for Health Security

Amanda Kobokovich, MPH
Managing Senior Analyst, Johns Hopkins Center for Health Security

Christina Potter, MSPH
Senior Analyst, Johns Hopkins Center for Health Security

Aishwarya Nagar, MPH
Analyst, Johns Hopkins Center for Health Security

Elena Martin, MPH
Analyst, Johns Hopkins Center for Health Security

Project Sponsor

The Commonwealth Fund

Suggested citation: Veenema TG, Toner E, Waldhorn RE, et al. *A Policy Analysis for the Integration of Primary Care, Public Health, and Community-Based Organizations in Public Health Emergencies: Interim Report*. Baltimore, MD: Johns Hopkins Center for Health Security; 2023.

Contents

Introduction

The uniquely fragmented healthcare system of the United States is currently unable to adequately respond in a national emergency. *Lessons From the COVID War: An Investigative Report*[1] documents how the US "met the 21st century COVID pandemic with structures mainly built for 19th century problems," acknowledging that a new national health security enterprise is urgently needed. These findings are consistent with an earlier report, *Integrating Primary Care and Public Health to Save Lives and Improve Practice During Public Health Crises: Lessons from COVID-19*, in which the Johns Hopkins Center for Health Security at the Bloomberg School of Public Health (CHS) detailed the challenges encountered during the pandemic and presented potential pathways for effectively addressing them.[2] Experts and frontline workers interviewed for the report indicated that better integration of primary care (PC), public health (PH), and community-based organizations (CBOs) could have eased the burden on overstretched PH personnel and significantly leveraged PC's trusted position and reach to amplify PH messaging, including information to support ill individuals and bolster testing and vaccination campaigns. If these coordinated activities had been effectively prepared for and implemented, they would have saved lives and reduced the pandemic's health, economic, and societal impacts in the US.

Recognizing that high-quality PC is the foundation of a healthcare system, that a robust PH system is the bedrock for healthy communities, and that both depend on active community engagement, transformational change is needed to methodically break down the barriers, such as payment incentives, that exist among PC, PH, and CBOs to correct misalignment across systems and establish a cohesive, more unified approach during normal times and future epidemics and pandemics. Complicating the ability to achieve this transformational change are entrenched barriers to better cross-sector collaboration, knowledge sharing, new incentive models, and interoperable data systems. Numerous stakeholders, regulations, market dynamics, and governance silos also contribute to the current fragmented systems.

As specified within the US Constitution, states are designated with the responsibility for the protection of the public's health. The federal government also holds a vested interest in assuring these protections, as public health emergencies (PHEs) are not constrained by geographic borders. The Commonwealth Fund Commission on a National Public Health System has called for "urgent, necessary, and realistic reforms," including the development of a national public health system to promote and protect the health of all people, implement effective prevention and response strategies with partners within the public and private sectors, and earn public trust.[3] Specifically, the report calls for the establishment of a Secretary-level position for PC along with the allocation of congressional funding to rebuild and sustain PH infrastructure, including provisions for modernizing PH information technology systems, creating requirements for healthcare and PH to work together to support the achievement of critical health goals, and actively engaging with communities in decisions regarding PH priorities.[3]

Contemporaneously, previous reports have called out the urgent need to strengthen and build resilience in PC whilst building cross-sector collaboration between PH and communities. In a position paper published in December 2020, the American Academy of Family Physicians (AAFP) urged its members to become more aware of the value, importance, and movement toward integrating PC with PH. Recognizing the role that family physicians play in this integration, AAFP urged all national, state, federal, and private sector institutions to partner with PC and PH entities to ensure a more integrated

care delivery system that improves population health. AAFP stated that "bold initiatives throughout the health sector are necessary for successful integration."[4] In May 2021, the National Academy of Sciences, Engineering, and Medicine (NASEM) released a report, *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care*, the findings of which described 5 implementation objectives to strengthen and make high-quality PC available to all people living in the United States.[5] These objectives include: (1) ensuring payment reform for PC teams to care for people, as opposed to physicians to deliver services; (2) ensuring access to high-quality PC is available to every individual and family in every community; (3) training PC teams where people live and work; (4) designing information technology that serves the patient, family, and the interprofessional care team; and (5) ensuring that high-quality PC is implemented in the United States.[5]

The purpose of this project is to identify and prioritize realistic and concrete changes to federal law, policy, or programs and to identify the key stakeholders responsible to improve coordination and integration of PC, PH, and CBOs in the US with the goal of improving healthcare services during everyday use and public health emergency responses.

Methodology

The project team employed a mixed-methods, rapid-cycle approach, including a detailed review of the existing literature, environmental policy scan, and key informant interviews with primary care and public health leaders and practitioners. This interim report characterizes work accomplished as of May 2023 and presents our preliminary findings.

Review of Existing Literature

Methods

We conducted a review of the published literature to identify articles addressing barriers and facilitators of integration between PH and PC. The search was conducted in 3 databases: PubMed, Web of Knowledge, and Google Scholar. The literature search strategy, including search terms, a priori inclusion and exclusion criteria, and desired publication time range, is detailed in *Appendix I*. A subsequent snowball review was conducted using relevant selected papers to ensure all notable articles were included in the search. Ultimately, 63 articles were included in the final review. Four articles were excluded due to their discussion of programs outside of the United States, and 11 were excluded due to their discussion of only PC or PH without mention of collaboration. In this review of the literature, 3 primary themes emerged that play a pivotal role in determining the extent to which integration will be successful: data system integration, payment reform, and workforce expansion and development.[6]

Next, we conducted a scoping review of the grey literature to specifically identify landmark reports that have been key contributors to the overall conceptualization and ideals of PC and PH integration. Reports were considered landmark if they were significant in making a key contribution in advancing our understanding of PC and PH integration (ie, provided a conceptual model of PC and PH integration). Initial search terms of "public health," "primary care," "community-based organizations," and "integration" were utilized to identify potential landmark reports but yielded large numbers of irrelevant papers. Ultimately, a combination of purposive and snowball sampling strategies provided the best results. Purposive sampling entailed targeted searches for relevant documents on websites of health policy centers, organizations dedicated to the provision of PC and other initiatives exploring PC and PH

integration. Snowball sampling from citations of other landmark reports as well as from key informant interviews (see below) yielded additional landmark reports. The full set of landmark reports were reviewed with data extracted and summarized in the table below.

Findings

Landmark Reports on PC-PH Integration

Nine reports are included in this review to demonstrate the landscape of thinking around PC and PH integration (see Table 1). Across these reports, the majority touched on the benefits to PC, PH, and population health resulting from integration. Overall, the reports generally:

- Are written for a PC or policymaker audience, with only 1 offering a PH practitioner-targeted argument.
- Agree that the greatest benefits of integration would be mainly felt at the community level (ie, "communities of solution"), although they do center implementation of integration variably at the federal, local institutional, and individual practitioner levels.
- Agree that numerous stakeholders may be involved in integration efforts beyond only PH authorities and PC providers, including private entities, multiple levels of government, other sectors, and consumers of services/community members.

Furthermore, though multiple reports highlighted how integration activities may aid in addressing inequities or disproportionate adverse outcomes among vulnerable populations, many failed to clarify how integration will do so beyond improving overall community access to health services and increasing the efficiency of using the limited resources of involved sectors. Finally, the reports generally centered implementation of integration activities around 1 of 2 goals: (1) addressing a population health issue via collaboration between PH and PC within one-off partnerships or greater so-called "communities of solution" and/or (2) combining resources so that overlaps in services between PC and PH may be planned, managed, and executed collaboratively to ideally provide a continuum of comprehensive health services.

Table 1. Landmark Reports for PC and PH Integration

Publication Name & Year	PC and PH Integration Definition	Key Recommendations to Support Integration
Health is a Community Affair—Report of the National Commission on Community Health Services (aka "The Folsom Report"), 1966[1]	Drawing upon any and every service needed to solve health issues impacting populations within "communities of solution," wherein the boundaries of the community are those within which a problem can be defined, dealt with, and solved	• Organize and deliver comprehensive personal health services around "communities of solution," wherein every individual has a personal physician who is the central point for integration and continuity of all high-quality medical and related services • Address and transcend bureaucratic, political, and other service delivery boundaries (eg, public-private care delivery) • Involve service providers and consumers in planning processes to ensure acceptability and accessibility to a well-informed and motivated citizenry • Remove economic, racial, organizational, residential, and other barriers to services • Prioritize and address key areas of environmental health services, accident prevention, family planning, health education, health workforce shortages, rising hospital care costs, built environment • Ensure every state has a single, strong, well-financed, professionally staffed, official health agency with sufficient authority and funds to carry out its responsibilities and assure every community of coverage by an official health agency and access to a complete range of community health services
Integration of Primary Care and Public Health (Position Paper), 2020[2]	Alignment between family medicine and the public health sector to promote "community-oriented primary care"—focused on upstream (eg, governance, culture, and societal values) and downstream (eg, morbidity, mortality, access to health care, behavioral risk factors, living conditions) factors—to create a whole-person concept of health that promotes a continuum of care wherein overlapping services are managed collaboratively rather than in duplicate	• At the individual physician level: better understand the role of PH and integration • At the practice level: collaborate and communicate with PH, redefine population of interest to the geographic area, identify and collect data regarding social determinants of health, ensure community voices take part in planning and decision-making for community health • At the education level: prepare future physicians to take part in community-oriented primary care • At the advocacy level: promote payment reform; improve data interoperability among PC, PH, and CBOs; ensure government policies foster integration; advocate for regulatory and economic frameworks that make PH and population health critical to private sector health efforts

Integrating Public Health and Health Care: Getting Beyond the Theory, 2016[3]	Relationship(s) between public health officials and healthcare organizations that aim(s) to strengthen the connection between clinical processes or the delivery of healthcare and public health prevention efforts—combining efforts, resources, and expertise to achieve a shared goal of improving the health of populations; however, prescribing specific models or templates for how integration should look is not possible because interactions between healthcare and public health sectors are varied and dependent on local circumstances (eg, availability of resources, differences in health challenges)	• Enter into informal or formal written agreements to broadly coordinate efforts • Create a shared governance structure (eg, public health representative on a governing board) • Healthcare providers or health plans invest financially in PH infrastructure (eg, direct payment to health department) • Implement processes for sharing population health information and analyses with providers • Public health agencies certify, recognize, or otherwise promote providers who deliver high-quality care, either for select services or to targeted groups of individuals • State, local, or municipal public health authorities work with providers to support them in achieving prevention and quality improvement goals for their patients and communities, including via development of tools, customized programs, or standards • State purchasers leverage their managed care contracts to compel health plans to formally coordinate with PH agencies on prevention and health promotion activities
Practical Playbook I & II, 2015 & 2019[4,5]	A collaborative partnership between primary care and public health actors to address a specific health issue, leveraging the strengths and perspectives of both	Partners should: • Focus on the shared goal of population health • Engage community members early and throughout the planning process to benefit from insights and support in choosing problems and selecting effective solutions • Agree about the core aspects of shared work including goals, values, and key competencies needed to achieve the goals • Develop a shared infrastructure and foundation for demonstrating enduring value and impact that may be evaluated and adjusted over time (ie, sustainability) • Share data and analysis

Communities of Solution: The Folsom Report Revisited, 2012[6]	Combine the approaches of "community-oriented primary care" and "communities of solution" to provide integrated and effective comprehensive health services via large scale reforms to replace the current fragmented US healthcare structure with community-centered health systems	• Create a national network of community partnerships that engages and activates the citizenry to self-define communities of solution to develop and sustain community-tailored health programs at the local level aimed at matching local health needs with integrated health services • Foster the ongoing development of integrated, comprehensive care practices (patient-centered medical homes), accessible to all groups in a community, through the creation of explicit partnerships with PH professionals and communities of solution • Provide every individual in the United States the opportunity to form a partnership with a personal physician and a team of health professionals utilizing integrated community health services in communities of solution • Engage communities of solution in priority areas of environmental health, injuries, family planning, built environment, and health literacy • Create a health workforce to serve the needs of US communities, including community health workers • Integrate health services—aligning hospital, ambulatory, and community care—across settings to promote quality and create value • Transform the roles of the relevant federal, state, and local agencies by bridging PH and medicine to be effective partners in communities of solution • Engage and support a citizen volunteer network formed by communities of solutions to educate, motivate, and collaborate for strategic local, regional, and national resource allocation informed by credible and actionable data • Utilize health information technology and emerging data-sharing innovative networks that enable the flow of relevant knowledge (public health, environmental, educational, legal, etc.) to the communities of solution
Uniting Public Health and Primary Care for Health Communities in the COVID-19 Era and Beyond, 2021[7]	A comprehensive, collaborative system of community care integrating primary care, public health, oral health, behavioral health, CBOs, and other stakeholders that simultaneously responds to the challenges exposed by COVID-19 and positions the United States to address future epidemics while	• Utilize the community of solution approach: identify the problem-shed—that region, population, group of people with a common experience, suffering from a health problem—and then engage and activate the local asset-shed—the PC, PH, and community organizations available to address the problem. In addition, local communities must have access to state and national assets as well. • Expand the workforce by recruiting and training a new Community Health Worker Corps comprised of PH workers, PC practice staff, and members of the community • Cross-train PH and PC workforces

	producing health, containing costs, and relieving inequities	• Enhance collaboration across multiple platforms: funding, data sharing, branding/planning/execution of activities, federal agency supervision, task forces, etc. • Evaluate integration efforts via multiple avenues
Primary Care and Public Health: Exploring Integration to Improve Population Health, 2012[8]	Link primary care and public health programs and activities to promote overall efficiency and effectiveness and achieve gains in population health	Federal agency level recommendations: • Link staff, funds, and data at the regional, state, and local levels • Create common research and learning networks to foster and support the integration of PC and PH to improve population health • Develop the workforce needed to support the integration of PC and PH • Improve the integration of PC and PH through existing US Department of Health and Human Services (HHS) programs • HHS secretary should work with all agencies within the department as a first step in the development of a national strategy and investment plan for the creation of a PC and PH infrastructure strong enough and appropriately integrated to enable the agencies to play their appropriate roles in furthering the nation's population health goals
Integrating Primary Care and Public Health to Save Lives and Improve Practice During Public Health Crises: Lessons from COVID-19, 2021[9]	Focus on public health in the delivery of healthcare in the US and strengthen and expand local primary care, public health, and community networks to build and sustain thriving, resilient, integrated primary care, public health, and community sectors capable of optimizing health outcomes during future pandemics and large-scale public health emergencies	• Co-locate PC and PH services to benefit population-level health and facilitate active collaboration • Align PC society efforts with PH in a unified voice to drive congressional action in order to ensure that the disastrous response to the COVID-19 pandemic is not repeated • Craft efforts to support, protect, and sustain the PC and PH workforces to drive integration across disciplines • Public health "moves at the speed of trust" and people trust their PC providers and CBOs; therefore, use PC and PH collaborative partnerships with strong ties to community organizations to enhance health systems surge capacity, extend PH disease containment interventions, and position the United States for improved response to future pandemic

The Seven Vital Conditions for Well-Being[10]	While this report does not explicitly define PC-PH integration, it provides an oft-cited framework for conceptualizing holistic wellbeing and the distinct, indispensable vital conditions (ie, determinants of health) that give rise to it; identifies levers for community change and improvement; advances a collaborative, cross-sector approach to improving community health and wellbeing; and helps identify where and how to invest in communities to yield better results over time	Foster the following vital conditions across institutions and activities to support community health: • Humane Housing: access to secure, consistent places to live, homes, and neighborhoods that are safe from hazards, and neighborhoods that provide access to food and other basic needs, opportunity, and resources that promote healthy living • Meaningful Work & Wealth: access to good paying, fulfilling jobs and careers, and financial security that extends across the life span • Belonging & Civic Muscle: building fulfilling relationships and social support that people need to thrive • Basic Needs for Health & Safety: access to fresh air and water, nutritious food, and the security of a stable home as well as healthy relationships—with freedom to express gender and sexuality—and a life free from violence, injury, and toxic stress in addition to access to routine and critical healthcare • Lifelong Learning: providing educational opportunities that ensure all people, regardless of age, background, or ability, are set up for success and have the chance to reach their full potential • Reliable Transportation: reliable means to get to work, home, and any other necessary destinations • Thriving Natural World: a healthy environment that is free from environmental hazards, one that is resilient to future changes and threats, and one that fulfills our needs to connect with nature, including clean air, clean water, clean land, and well-functioning ecosystems

Table 1 References

1. Roberts DW. Health Is a Community Affair: Preview of the Final Report of the National Commission on Community Health Services. *JAMA.* 1966;196(4):332–333. doi:10.1001/jama.1966.03100170074022
2. American Academy of Family Physicians. *Integration of Primary Care and Public Health (Position Paper).* Updated December 2020. Accessed April 1, 2023. https://www.aafp.org/about/policies/all/integration-primary-care.html
3. Taylor E, Bailit M, Dyer MB (Bailit Health Purchasing LLC), Hacker K. Integrating Public Health and Health Care: Getting Beyond the Theory. State Health & Value Strategies. Published March 30, 2016. Accessed April 1, 2023. https://www.shvs.org/resource/integrating-public-health-and-health-care-getting-beyond-the-theory/
4. Michener JL, Koo D, Castrucci BC, Sprague JB, eds. *The Practical Playbook: Public Health and Primary Care Together.* 1st ed. Oxford: Oxford University Press; 2015. doi:10.1093/med/9780190222147.001.0001.
5. Michener JL, Castrucci, BC, Bradley DW, et al., eds. *The Practical Playbook II: Building Multisector Partnerships That Work*, 1st ed. Oxford: Oxford University Press; 2019. doi:10.1093/med/9780190936013.001.0001
6. Folsom Group. Communities of solution: the Folsom Report revisited. *Ann Fam Med.* 2012;10(3):250–260. Published correction appears in *Ann Fam Med*. 2012 Jul-Aug;10(4):365. doi:10.1370/afm.1350
7. Westfall JM, Liaw W, Kim Griswold K, et al. Uniting Public Health and Primary Care for Healthy Communities in the COVID-19 Era and Beyond. *J Am Board Fam Med*. 2021;34(Suppl):S203-S209. doi:10.3122/jabfm.2021.S1.200458
8. Institute of Medicine. *Primary Care and Public Health: Exploring Integration to Improve Population Health*. Washington, DC: The National Academies Press; 2012. Accessed April 1, 2023. https://doi.org/10.17226/13381
9. Veenema TG, Waldhorn R, Toner E, Kobokovich A, Cicero A. *Integrating Primary Care and Public Health to Save Lives and Improve Practice During Public Health Crises: Lessons from COVID-19.* Baltimore, MD: Johns Hopkins Center for Health Security; 2021. https://centerforhealthsecurity.org/sites/default/files/2023-02/211214-primaryhealthcare-publichealthcovidreport.pdf
10. Community Commons. The Seven Vital Conditions for Well-Being. Accessed April 1, 2023. https://www.communitycommons.org/collections/Seven-Vital-Conditions-for-Health-and-Well-Being

Data Systems

Central to the discussion of integration of PC and PH activities is the use of data systems, which serve as both a facilitator of and barrier to successful collaboration. When properly designed and implemented, timely and reliable data systems can enhance situational awareness to improve decision making.[7] Klompas et al describe an electronic medical record (EMR)-based PH surveillance platform called Electronic Medical Record Support for PH (ESP) that provides real-time information to PH departments on notifiable diseases, influenza-like illnesses, and diabetes prevalence, care, and complications.[8] At the time of publication, the system was implemented in the states of Massachusetts, Ohio, and Texas. Under this system, automated EMR reporting enhances transfer of information between clinicians and PH departments.[8] The exchange of information can be bidirectional as well; for example, Lurio et al discuss the incorporation of an electronic health record (EHR)-based notification tool implemented by the New York City Department of Health and Mental Hygiene (NYC DOHMH).[9] The program provided notifications to clinicians if their patient met certain clinical criteria. The notifications included dedicated order sets, infection control guidance, and contact information for appropriate parties at NYC DOHMH.[9]

However, data systems can also serve as a barrier to successful integration of PH and PC activities.[10] Limitations that impede optimal exchange of data among PC providers, PH departments, and community organizations include lack of data standardization and interoperability and questions about privacy and the protection of health information.[11] Another limitation is the cost of implementing high-quality EMR systems. Systems that offer data systems integration and advanced analysis features come with a greater price tag.[12] In addition, implementation of advanced data systems requires technical expertise that may not be available.[12]

Integrated data systems could positively affect social determinants of health (SDOHs). The ability to integrate clinical data with neighborhood-level data on housing, food insecurity, etc., can provide an enhanced understanding of how community-level factors might be influencing patient outcomes and guide the provision of better care for patients. Bambekova et al provide an example of utility via the Population Health Assessment Engine (PHATE), which promotes community-oriented PC by integrating neighborhood and EHR data to allow for connection with community organizations, identification of neighborhood-based health signals, and assessment of patients in the context of neighborhood-based risk factors.[13] The utilization of community vital signs capitalizes on geospatially linked data via a patient's zip code to integrate community-level data into a patient's record to provide a greater awareness to clinicians of social factors impacting their patients' health.[14,15]

Health information exchanges (HIEs) are repeatedly cited as a solution to data fragmentation across healthcare and PH organizations.[16,17,18] The Office of the National Coordinator for Health Information Technology (ONC) notes that HIEs involving the access and sharing of EMRs can increase the effectiveness of and efficiency in the healthcare services provision.[19] Yeung et al analyzed health departments across 433 counties in the US and found that utilization of EMRs by local health departments translated into improved population health outcomes.[20] Barriers to effective HIE utilization include the lack of availability of complete data, arduous workflows, and misalignment between the data available and needs of the end user.[16] Completeness of information available within HIEs is often driven by the voluntary nature of patient and provider participation in the exchange.[16]

Interoperability of EHR systems continues to be a major challenge to coordination not only across different areas of the healthcare system but also within PH departments. One possible explanation is the

misalignment of incentives, with emphasis placed on mandating adoption of an EHR without requiring participation in an HIE.[21] In an effort to promote information technology, the HITECH (Health Information Technology Economic and Clinical Health) Act of 2009 provided financial incentive, primarily through Centers for Medicare and Medicaid Services (CMS), to physicians and institutions who implemented "Meaningful Use" of EHR systems. Meaningful use is defined based on criteria related to clinical decision support, patient access of health data, and medication management.[22] The program facilitated the nationwide uptake of EHR but had the unintended consequences of creating siloes of inaccessible data and increased burden on healthcare workers, both of which hinder collaboration between PC and PH.[23,24] Adding requirements for comprehensive standards of interoperability provides an opportunity to enhance activities vital to PC and PH, such as disease prevention and surveillance, while overcoming challenges, such as missing data or loss of productivity due to the inability to efficiently access data.[25]

Innovative work is being undertaken to address how data systems can serve as a facilitator rather than a hindrance to the delivery of community-centered healthcare.[26] The intention of the Fast Health Interoperability Resource (FHIR) program, launched in 2012, was to overcome challenges in interoperability and enable better utilization of EHR systems.[27] FHIR sets standards for internet-based real-time data exchange between different healthcare entities.[28] One example of an outcome of this initiative is the emergence of third-party vendors that integrate pre-existing EHR systems and provide platforms for exchange of health data across entities.[23] ONC led a multidisciplinary initiative to identify opportunities to improve alignment between the needs of the users of EHR systems and the capabilities of the systems.[27,29] One identified priority is the automation of systems to facilitate timely PH reporting through extraction of data and, with approval, submission of relevant forms on behalf of the clinician to appropriate PH stakeholders.[29]

Payment Reform

Funding and payment reform is a recurring theme in the literature addressing integration of PC, PH, and CBOs. Financial constrictions are often a barrier to collaboration between PH and PC and restrict the ability to work with CBOs.[30] At the level of PH and community organizations, financial support often comes in the form of term-based grants. These funds, while important, are not sustainable and limit the scope of work undertaken due to time constraints. Timebound grants typically support short-term projects rather than long-term solutions to improve community health and prevent meaningful and consistent collaboration among PC, PH, and CBOs.[31]

The fee-for-service (FFS) payment model continues to be a barrier to successful PC-PH integration due its promotion of volume-based care. FFS reimbursement disincentivizes innovative practice models which, while they may benefit the community, will not achieve the level of reimbursement necessary to keep a practice in operation.[32] Aside from FFS reimbursement, additional funding streams are available, such as global payment models, capitation, patient-centered medical homes, and Medicaid reimbursement for Federally Qualified Health Centers (FQHCs).

In a cross-sectional analysis of 3,012 US hospitals, Hearld and Karabukayeva found that bundled payment models were associated with increased partnering between healthcare organizations and CBOs.[33] This idea is echoed in other studies suggesting that bundled payment programs incentivize healthcare organizations to engage in behaviors promoting integration, such as implementing data-sharing systems and embedding CBOs or PH within healthcare organizations.[34-36] The Maryland Total

Cost of Care Model serves as an example of a policy-driven innovative payment model that provides additional financial resources beyond FFS payments to promote improvement of community health outcomes and to support cross-sectoral collaboration.[37,38] (see Case Study #3) Under a traditional FFS model, PC practices would receive no financial resources to support community-based activities, such as partnering with food banks, despite their positive impact on health outcomes.

Section 1115 Medicaid demonstration waivers are cited as opportunities to promote better integration among PC, PH, and CBOs. These waivers can provide funding for services not normally reimbursed by Medicaid, such as referral for housing services.[39,40] As of March 2, 2023, the Kaiser Family Foundation reports 67 approved waivers across 48 states with an additional 32 pending across 28 states.[41] While the largest portion of the waivers focus on expanding eligibility and benefits, there are 18 approved waivers across 18 states (AZ, AR, CA, DE, FL, HI, IL, KS, MD, MA, NM, NC, OR, RI, UT, VT, VA, WA) and 11 pending (DE, ME, MT, NJ, NM, NY, NC, OR, RI, WA, WV) related to addressing health-related social needs, defined as social conditions (lack of food or housing) that contribute to an increased risk for poor health outcomes.[41,42] Oregon, for example, built partnerships with CBOs to provide services such as food support, air purifiers, and access to short-term housing to individuals at high social risk. Under this system, health-related social needs are treated as a Medicaid benefit, which allows for clear guidelines on service coverage and reduction of administrative burden to determine qualification for the program.[42] Similar programs exist in Arkansas, Arizona, and Massachusetts to offer housing programs to individuals at high risk of experiencing homelessness.[42]

Thompson et al describe the design of 4 states' programs (CA, IL, MD, WA) to address homelessness as a driver of poor health outcomes and increased health expenditure through utilization of Medicaid's Section 1115 waiver. All 4 programs included provisions addressing the needs of individuals transitioning back into the community who are at risk of experiencing homelessness, such as individuals transitioning out of inpatient behavioral health facilities or those who were previously incarcerated, individuals with repeated utilization of emergency departments for avoidable conditions, unsheltered individuals with significant chronic health conditions, and individuals in need of potential placement into a long-term care institution for physical or behavioral health conditions. The 4 programs also showed commonality in enhancing the integration of services among healthcare professionals, PH departments, and CBOs providing services for people experiencing homelessness.[43]

Utilization of the waiver overcomes the challenge of fragmentation of care and unsustainable streams of funding to enable interdisciplinary partnership.[44] California's Whole Person Care Section 1115 demonstration project focused on patients with the greatest medical and social complexity. The program utilized funding to provide care coordination services and develop infrastructure to promote cross-sector care for individuals experiencing homelessness, substance use, and/or incarceration, resulting in improved health outcomes for enrolled beneficiaries.[39] Also in California, the waiver was used in a project led by the University of California San Diego Health System to fund informatic tools to improve EHR-based registries for collection of data related to health disparities.[45] The program focused on improving documentation of patient self-reported demographics and translating the information into more directed outreach activities and implementation of screening programs.[45]

Community-Based Organizations and Workforce Development

The COVID-19 pandemic had a significant impact on the PC and PH workforce. Recruitment and retention of staff continues to be a challenge and prevents robust recovery from the COVID-19

response.[46] Studies of barriers to collaboration between community health and healthcare organizations frequently cite staffing limitations as a significant obstacle.[30,47,48]

Data from the 2021 Public Health Workforce Interests and Needs Survey (PH WINS) show that approximately half of respondents' representative state and local PH organizations noted staff capacity to be a significant limitation to response activities. The results highlight the dire state of the healthcare workforce in the wake of the COVID-19 pandemic; for example, 44% of PH workers said they are considering leaving their positions within the next 5 years.[47] Similar sentiments are described at the level of PC and CBOs, suggesting lack of a workforce as a central barrier to effective integration.[49]

In order to actualize improved collaboration, investment in workforce development across and between PC, PH, and CBOs will be required. An example of such investment is the Maryland Sharing the Cure project, which simultaneously invested in PC and PH infrastructure with the goal of improving care for individuals living with chronic hepatitis C virus (HCV) infection.[50] The program was developed with the intention of synergizing rather than siloing prevention, screening, and treatment services for HCV. The interdisciplinary training of healthcare and PH workers alongside CBOs improved continuity of care and led to improved outcomes for patients.[50]

A growing area of investment is the utilization of community health workers (CHWs) to support integration of individual and community health services. Several models propose shifting toward a community-centered rather than individually focused healthcare system, and CHWs can improve care coordination and connection of patients to CBOs.[51-53] During the COVID-19 pandemic response, CHWs played various roles, working in contact tracing, community-based testing, and case management for behavioral health and substance use in Washington state. In Arizona, where vast disparities in COVID-19 vaccine uptake were emerging, CHWs, as trusted members of the community, were able to address structural barriers for individuals to obtain vaccines and overcome misinformation present in the community.[53] Unfortunately, at present, there is limited upward career mobility and limited reimbursement for CHW services resulting in high turnover in the field due to low compensation.[54]

Environmental Policy Scan

Methods

We used two policy databases, ProQuest Congressional and GovInfo, to execute an environmental policy scan for federal laws, legislation, and regulations with relevance to the integration of PH, PC, and CBOs. Searches were conducted between December 1, 2022, and February 28, 2023. "Public health," "primary care," "community-based organizations," and "integration" were key terms used to find relevant policies introduced, passed, or codified after March 23, 2010, the passage date of the Affordable Care Act, a landmark enabling policy for these issues. Policies including the following keywords were excluded: "military," "addition," "cancer," "energy," "defense," and "allergy." With these exclusions, the search was narrowed to 94 unique results on GovInfo and 78 unique results on ProQuest Congressional. Duplicates were manually eliminated, and a final review conducted to identify and exclude nonrelevant content.

Findings

Overall, 131 results were identified, with the search ultimately identifying 24 bills passed by the US Congress and 37 pieces of relevant legislation not passed by Congress between March 23, 2010, and

January 3, 2023, when the 118th session of Congress began. Therefore, the results of this scan only include relevant measures presented during the 110th Congress through the 117th Congress. Reasons for exclusion of the other 70 laws included non-healthcare topics, policies solely oriented to defense, condition-specific legislation with no integration of PH-PC-CBOs, non-domestic policies, and appropriations acts from completed fiscal years. The resulting 61 pieces of legislation, chosen because they are the most relevant to the topic under investigation, are included in Table 2 below.

Few laws exist that specifically aid in the integration of PC, PH, and CBOs; however, there are a few cornerstone pieces of enabling legislation in this area, including the Pandemic and All-Hazards Preparedness Act (PAHPA), due for reauthorization this year, and the recent CARES Act. Congressional interest in passing enabling legislation on these subjects is evident, first in 2010 with the passage of the Affordable Care Act (ACA) and again in the wake of the COVID-19 pandemic. In recent years, the US Senate and House of Representatives have considered relevant proposals, some of which are still under review. Mental and behavioral health is an area of focus for recent legislation, and it appears that the concept of whole-person and whole-community health is permeating into wider circles. Mental health has been thrown into sharper focus as the US continues to experience fallout from COVID-19, including a crisis of loneliness, isolation, and lack of connection and trauma from the loss of life experienced by many American families. The value of integrating mental health into established healthcare services and funding streams is becoming increasingly apparent to policymakers and should be reinforced by practitioners and researchers whenever possible.

Table 2. Environmental Policy Scan Results

Name of Legislation	Most Recent Status	Introduction Date	Resolution Number
Supporting Children's Mental Health Care Access Act of 2022	Referred to committee	2022	H.R.7076
Primary and Behavioral Health Care Access Act of 2022	Referred to committee	2022	S.4905
Coordinating Substance Use and Homelessness Care Act of 2022	Policy introduced	2022	S.4482
Building a Sustainable Workforce for Healthy Communities Act	Referred to committee	2022	H.R.8151
Improving Access to Behavioral Health Integration Act	Policy introduced	2022	S.4306
Medicare for All Act of 2022	Policy introduced	2022	S.4204
Restoring Hope for Mental Health and Well Being Act of 2022	Sent for Senate vote	2022	H.R.7666
Reauthorizing Evidence-based And Crisis Help Initiatives Needed to Generate Improved Mental Health Outcomes for Patients Act of 2022	Referred to committee	2022	H.R.7237
Public Law 117-323 – Justice and Mental Health Collaboration Reauthorization Act of 2022	Public law	2022	S.3846
Collaborate in an Orderly and Cohesive Manner Act	Referred to committee	2021	H.R.5218

Maximizing Outcomes through Better Investments in Lifesaving Equipment for (MOBILE) Health Care Act	Sent for Senate vote	2021	H.R.5141
Rural Health Innovation Act of 2021	Referred to committee	2021	S.2450
Ensuring Access to Primary Care for Women & Children Act	Referred to committee	2021	S.1833
Direct Primary Care Accessibility Act of 2021	Referred to committee	2021	H.R.3436
Access to TESTs Act	Referred to committee	2021	S.1018
Leveraging Integrated Networks in Communities to Address Social Needs Act of 2021; LINC to Address Social Needs Act of 2021	Policy introduced	2021	S.509
Protecting Moms and Babies Against Climate Change Act	Policy introduced	2021	S.423
Mothers and Offspring Mortality and Morbidity Awareness Act; MOMMA's Act	Policy introduced	2021	S.411
Full-Service Community School Expansion Act of 2021	Policy introduced	2021	S.385
Medicare-X Choice Act of 2021	Policy introduced	2021	S.386
Health Force, Resilience Force, and Jobs to Fight COVID-19 Act of 2021	Policy introduced	2021	S.32
Public Law 117-4 – Strengthening and Amplifying Vaccination Efforts to Locally Immunize All Veterans and Every Spouse Act or the SAVE LIVES Act	Public law	2021	H.R.1276
Public Law 117-79 – Accelerating Access to Critical Therapies for ALS Act	Public law	2021	H.R.3537
Helping Emergency Responders Overcome Act; HERO Act	Referred to committee	2020	H.R.1646
Health Force and Resilience Force Act of 2020	Policy introduced	2020	S.3606
Coronavirus Relief for Seniors and People with Disabilities Act of 2020	Policy introduced	2020	S.3544
HERO Act of 2020	Policy introduced	2020	S.3244
Public Law 116-127 – Families First Coronavirus Response Act; Emergency Family and Medical Leave Expansion Act; Emergency Paid Sick Leave Act; Maintaining Essential Access to Lunch for Students Act; MEALS Act; COVID–19 Child Nutrition Response Act; Emergency Unemployment Insurance Stabilization and Access Act of 2020	Public law	2020	H.R.6201
Community Health Center and Primary Care Workforce Expansion Act of 2019	Referred to committee	2019	S.962 (IS)
Geriatrics Workforce Improvement Act	Policy introduced	2018	S.2888

Public Law 115-327 – Sickle Cell Disease and Other Heritable Blood Disorders Research, Surveillance, Prevention, and Treatment Act of 2018	Public law	2018	S.2465
Public Law 115-328 – Prematurity Research Expansion and Education for Mothers who deliver Infants Early Reauthorization Act of 2018 or the PREEMIE Reauthorization Act of 2018	Public law	2018	S.3029
Public Law 115-80 – National Clinical Care Commission Act.	Public law	2017	S.920
Public Law 115-92 – An act to amend the Federal Food, Drug, and Cosmetic Act to authorize additional emergency uses for medical products to reduce deaths and severity of injuries caused by agents of war, and for other purposes	Public law	2017	H.R.4374
Public Law 114-268 – First Responder Anthrax Preparedness Act	Public law	2016	S.1915
Public Law 114-270 – Expanding Capacity for Health Outcomes Act or the ECHO Act	Public law	2016	S.2873
Public Law 114-315 - Jeff Miller and Richard Blumenthal Veterans Health Care and Benefits Improvement Act of 2016	Public law	2016	H.R.6416
ACE Kids Act of 2015	Policy introduced	2015	S.298
Safe Food Act of 2015	Policy introduced	2015	S.287
Public Law 114-89 – Improving Regulatory Transparency for New Medical Therapies Act	Public law	2015	H.R.639
Public Law 114-41 – Surface Transportation and Veterans Health Care Choice Improvement Act of 2015	Public law	2015	H.R.3236
Better Care, Lower Cost Act	Policy introduced	2014	S.1932
Public Law 113-166 – Paul D. Wellstone Muscular Dystrophy Community Assistance, Research and Education Amendments of 2014	Public law	2014	H.R.594
Public Law 113-168 – Tribal General Welfare Exclusion Act of 2014	Public law	2014	H.R.3043
Public Law 113-146 – Veterans Access, Choice, and Accountability Act of 2014.	Public law	2014	H.R.3230
Public Law 113-185 – Improving Medicare Post-Acute Care Transformation Act of 2014 or the IMPACT Act of 2014	Public law	2014	H.R.4994
Building a Health Care Workforce for the Future Act	Policy introduced	2013	S.1152
Older Americans Act Amendments of 2013	Policy introduced	2013	S.1028
Public Law 113-5 – Pandemic and All-Hazards Preparedness Reauthorization Act of 2013	Public law	2013	H.R.307

Public Law 113-55 – An act to reduce preterm labor and delivery and the risk of pregnancy-related deaths and complications due to pregnancy, and to reduce infant mortality caused by prematurity, and for other purposes	Public law	2013	S.252
Public Law 112-202 – Taking Essential Steps for Testing Act of 2012	Public law	2012	H.R.6118
Consolidation of Grants to Strengthen the Healthcare System's Response to Domestic Violence, Dating Violence, Sexual Assault, and Stalking Act	Policy introduced	2011	S.1765
American Health Security Act of 2011	Policy introduced	2011	S.915
Supporting Child Maltreatment Prevention Efforts in Community Health Centers Act of 2011	Policy introduced	2011	S.54
Public Law 112-56 – An act to amend the Internal Revenue Code of 1986 to repeal the imposition of 3 percent withholding on certain payments made to vendors by government entities, to modify the calculation of modified adjusted gross income for purposes of determining eligibility for certain healthcare-related programs, and for other purposes	Public law	2011	H.R.674
Public Law 112-37 – Veterans Health Care Facilities Capital Improvement Act of 2011	Public law	2011	H.R.2646
Public Law 111-375 – National Alzheimer's Project Act	Public law	2011	S.3036
Community Health Improvement Councils Act of 2010	Policy introduced	2010	S.3796
Positive Aging Act of 2010	Policy introduced	2010	S.3698
Public Law 111-275 – Veterans' Benefits Act of 2010	Public law	2010	H.R.3219

Key Informant Interviews

Methods

From November 2022 to March 2023, we conducted 22 semi-structured, remote key informant interviews with subject matter experts to discuss the integration of PC, PH, and CBOs. Participants were purposively identified and invited based on their experience and expertise in the PC and PH sectors. Snowball sampling was used to identify additional interviewees. A full list of interviewees along with their respective titles and credentials is available in *Appendix II*. Recruitment is ongoing for additional interviewees but is expected to conclude when thematic saturation is reached.

A semi-structured interview guide was utilized for each interview. Interviews focused on interviewee experience regarding the implementation of PH and PC integration as well as associated facilitators and barriers. Interest was paid to federal and state policies and programs, payment models and associated reforms, and data-sharing initiatives that could be leveraged to aid integration efforts. Interviews were conducted via the Zoom videoconferencing platform for a duration of approximately 45-60 minutes. Interviews were semi-structured in nature, allowing interviewees to direct the conversation based on

their knowledge and experience. All interviews were attended by at least 2 research team members. The number of interviewees per interview varied, with some discussions including a single participating individual while others included multiple members from the same organization. All interviews were conducted on a not-for-attribution basis to promote transparency. Interview notes, audio transcription, and audio and video recordings were collected for each interview with participants' consent.

Audio transcripts of key informant interviews underwent qualitative analysis. An initial codebook was developed based on topics discussed during interviews and revised internally by consensus to create the final coding framework. Three team members applied the final coding framework to 20 out of 22 audio transcripts with new codes added iteratively when additional themes arose. All coding was reviewed by a coding team lead for quality assurance, and coding discrepancies and concerns were discussed and resolved by consensus among the coders. The final 2 audio transcripts underwent thematic analysis but not yet qualitative coding due to scheduling constraints of later interviewees.

Johns Hopkins Bloomberg School of PH Institutional Review Board determined that this study did not constitute human subjects research (IRB00022819).

Preliminary Thematic Analysis of Key Informant Interviews

Overarching Barriers to Integration

Key informants (KIs) agreed that PH, PC, and CBO integration and communication is important and has potential benefits for public health and preparedness for everyday and catastrophic events. Several informants discussed that effective integration requires dedicated human resources focused on coordination, dedicated administration/bureaucratic operations, and relationship-building across sectors and agencies, which is not always attainable. Three overarching barriers to PC-PH-CBO integration repeatedly surfaced during the interviews.

1. Informants discussed how **policy**-related barriers prevented data exchanges for PH purposes, imposed heavy financial barriers for obtaining deidentified EMR data for PH purposes, prevented funds from directly reaching PC, posed burdensome reporting requirements on PC, disqualified nonprofit organizations who were unable to conduct rigorous evaluations from accessing federal grants, and made it difficult to address health-related social needs driven by racial inequities without subjecting these policies to legal challenges. Informants from professional organizations that had tried to advance better payment models through policy initiatives lamented that it was difficult to do so without external pressure on Congress or working directly with agencies. Tension between federal and state governments' authority also hindered action, as the federal government is limited in its ability to compel state governments to make changes to their Medicaid programs.

2. Challenges related to **funding** were also frequently discussed, with most informants noting that PC and PH are both chronically underfunded, which restricts base operations and hinders integration efforts. As one informant said, "*It's kind of like taking the 2 least powerful parts of the healthcare system and telling them to play in a corner together*." Grants drive most PH transformation but, without other revenue streams, the funding expires and does not cover enough; as a result, the lack of funding has made PC and PH territorial and unable to connect more intentionally with CBOs. Current fee-for-service models do not provide financial support for integration due to their lack of a population focus, and inconsistent and restrictive reimbursement schemes also limit integration.

3. Informants also mentioned barriers related to **information technology** (IT) and data systems. Health data is even more difficult for CBOs to access, and relatedly, important social service data collected by CBOs is not easily linked to the health data of their target populations, further limiting integration. The Medicaid Promoting Interoperability Program has sunset, which paves the way for higher-level strategic thinking on federal programming to address improvements in health IT. Restrictive policies, cumbersome logistics, differences in reporting guidelines, and infrastructural barriers limit data sharing between PC clinics and PH services, especially between state and local health departments, which depend on PC data for health surveillance and tracking of key pandemic measures. Informants also stressed that PH data systems are difficult to maintain, fix, and build due to a dwindling PH workforce.

Data Systems

Many informants shared that the lack of interconnectivity and current setup of EHRs impeded integration among PH, PC, and CBOs. They discussed how difficult it is for EHR systems to communicate with each other and for health data to be extracted from EHRs and used for PH purposes. Enabling EHR interconnectivity would allow PC practices to better visualize and obtain broader assessments of their patients' health, such as with admission-discharge-transfer (ADT) systems, and it would allow PH entities to have access to deidentified, real-time, population-level health data. Further connecting EHRs with social services and health equity measures through a dashboard could provide a more detailed picture of how outcomes vary by race, ethnicity, payer type, geography, etc. Informants recommended connecting social service data feeds to EHRs to ensure closed-loop referrals at the community level. The lack of a national dashboard posed challenges during the COVID-19 pandemic, when the absence of adequate linkages among EHRs provided an incomplete picture of the problem. Several informants noted that the US has the technological capability to connect EHRs, but regulations do not push large health systems, which often have their own disparate and disconnected data systems, and entities that profit from creating competitive, best-of-breed health exchanges to make investments in connectivity.

Furthermore, best-of-breed, disparate, company-based platforms were seen as reflective of a profit-focused mindset toward health care. One informant noted that EHR vendors' user fees are cost prohibitive for smaller PC institutions, but ONC permits them to charge a "reasonable fee," which is defined vaguely. However, a few EHR vendors, such as Epic, Cerner, and eClinicalWorks, have established collaborations through national networks outside of state-level health information exchanges to bolster data-sharing efforts. Though third-party aggregation of EHR data is sometimes recommended, one informant was skeptical of the effectiveness of doing so. Another informant recommended shifting the data systems conversation away from a focus on EHR integration to collecting live data from laboratories for PH purposes, as they could better monitor changes in various health outcomes.

Informants recommended learning from creative data systems innovations, such as:

- CRISP, a regional HIE serving Maryland and 5 other states through shared services partnerships, facilitates the electronic transfer of clinical information between disparate health information systems and was widely regarded by informants as one of the most sophisticated regional information exchanges in the country.
- North Carolina Care 360 is a network of health and social service providers who are connected through Unite Us's shared technology platform to send and receive electronic referrals and address people's social needs.

- Surescripts, a national prescription hub, conducts widespread tracking of prescriptions, and informants recommended a similar hub for imaging and EHRs.
- Individuals' medical records are available everywhere in the UK through the National Health Service, which could be adapted to US settings.
- Past policies such as the Health Information Technology for Economic and Clinical Health (HITECH) Act and the Medicaid Promoting Interoperability Program paved the way for improvements in EHRs across the US.
- ONC published the Trusted Exchange Framework Common Agreement (TEFCA) to establish a universal floor for interoperability across the US and governance for users to securely share clinical information with each other per commonly agreed-to expectations and rules.
- The Patient Unified Lookup System for Emergencies (PULSE) is a state/local approach to accessing health information during disasters.
- CHWs in Costa Rica can collect detailed geotagged community-level health and social determinants data, even in the most rural areas, and connect it with health system data.
- The Centers for Disease Control and Prevention's (CDC) Data Modernization Initiative is an effort to modernize core data and surveillance infrastructure across the federal and state PH landscape.
- Fast Healthcare Interoperability Resources provide standards for using secure application programming interfaces for exchanging EHRs, which could be further leveraged for integration. They are a feature of the 21st Century Cures Act.
- The Protocol for Responding to & Assessing Patients' Assets, Risks & Experiences (PRAPARE) helps healthcare workers and community partners better understand social drivers of health and empowers users to leverage data to improve health equity at the individual, community, and systems levels.
- Some PH departments have triangulated Medicaid claims data with social service departments' beneficiaries to identify the PH needs of vulnerable communities.

One informant noted that several competing initiatives are underway in the US to enable data exchanges; however, the increasing popularity of market-oriented initiatives among providers may need to be accompanied with a parallel push for greater PH functionality of HIEs.

Several informants were eager to learn from the challenges and successes of the COVID-19 pandemic. Health data were largely unreliable because measures were unreliable; for example, it was possible to measure how much Paxlovid was dispensed through the federal reporting system but there was no way to know to whom it was prescribed and their health outcomes. However, informants lauded how point-of-care and grassroots testing, vaccinations, and treatments drove PC, PH, and community-based entities to exchange data, create collaborative databases, and integrate actions in a multidirectional manner, thereby increasing linkages and interoperability among data systems. Pairing health data (including data from laboratories) with social determinants data allowed PC, PH, and community-based entities to observe patterns in disparities and outcomes and respond to them accordingly. This was even more effective at FQHCs, where PH, PC, and CBO objectives were heavily intertwined. Informants noted that real-time data sharing related to vaccination status, health outcomes, social determinants, and other measures could provide Medicaid managed care organizations and providers—or Medicaid enrollees at large—with valuable information to guide how they could amend their patient support processes on a state level.

Some informants suggested that providing Medicaid and Medicare incentives for IT expansion could help PC practices screen people for SDOH needs and to create referrals to CBOs, thereby promoting a

more integrated health system. Additionally, they suggested identifying shared health IT priorities between health departments, community groups, and PC practices as a starting point. One informant noted that the burden of engaging with cumbersome data systems disproportionately impacts PC providers, who "*repeatedly express that they feel overwhelmed and burnt out by the number of administrative tasks they have to perform in patient care, and I think providers want to engage with PH; they want to engage with the IT systems in ways that are beneficial for everybody but there's just so much on their plate already*."

Informants also recommended accounting for numerous logistical barriers that prevent data systems from supporting integration of PC, PH, and CBOs. For instance, every state's HIE was created with its own legal agreements, which prevented effective data exchanges across states. While PH and PC entities might be able to exchange data under the right conditions, it is more difficult for them to easily transfer this information to CBOs that could connect patients and populations in need to social services. Moreover, even when regional HIEs are implemented, their uptake is not consistent across healthcare entities. The PH workforce, which is already overburdened and constrained, may not be able to dedicate its limited time and resources to quality control, maintenance, and operation of PH IT systems and linked data sets. Additional funding and human resources need to be devoted to developing more integrated data systems; as one informant said, "*We still need that major capacity-building effort on the PH side for PH to be a true data partner with the healthcare system*."

Successful Integration

Informants identified several approaches and characteristics that have previously bolstered the of efforts promoting integration of PH, PC, and CBOs:

- Physical co-location and co-funding of PC and PH activities, as well as cross-pollination of their staff, at a local level and within their beneficiary communities.
- Building state and local capacity for CHWs to connect vulnerable communities with PC and PH services, especially through sustained funding and policy-driven support. For healthcare services related to certain chronic conditions and reproductive health, CHWs have provided wraparound and clinical care during home visits and sustained this work through a value-based payment model to target and follow-up with high-risk patients.
- Conducting PH activities and data collection in tandem with care transformation groups and integrative health and wellbeing teams at FQHCs, while ensuring a continuum of care for all patients. Shared governance models where CHWs work closely with PC entities and receive training, resources, and support from PH departments could advance these efforts. Integration efforts could draw on lessons learned from integration of behavioral health into PC.
- Leveraging Section 1115 waivers to intentionally address social needs, usually by establishing close partnerships between CBOs and the healthcare system, as well as incentivizing health systems to move toward value-based care.
- Enabling PH and PC entities' access to HIE and health data portals, such as ImmuNet and CRISP, as well as clinical composites so they can track, observe, and respond to population-level trends across a region.
- Identifying people and populations with high disease burdens using PH data, providing PC providers with incentives to provide targeted support to these populations, and encouraging referrals to CBOs to address unmet social and care management needs.
- Using key technologies like Master Person Index to link health, social needs, service uptake, core PH, and other available kinds of data, enabling PC providers to access cross-cutting information

about their patients and recommend key PH and PC actions like vaccinations, screening, follow-ups, etc.
- Incentivizing greater communication among PC, PH, and CBOs on key health issues impacting local communities, especially with tracking early warnings and progress on collaborative action. Accountable Communities for Health, for instance, leverage Medicaid funding to bring PH, healthcare, social services, and CBOs together to think about upstream needs of various communities.

A majority of informants emphasized that integration efforts must center around health equity in order to bolster their success, particularly by adopting sustainable models that improve health equity and community resilience. As one informant said, "*It would be crazy to have a patient with uncontrolled diabetes who's experiencing food insecurity come into a doctor's appointment and not at least have the question asked of…getting food to eat…you know, if you don't have that, everything you do on the medication front, pharmacological front, every other intervention is going to be running uphill*." Several informants recommended starting with improving resources and support for PC entities, as "*it is actually the only part of the healthcare system in the US that can predictably, regularly, and with certitude know that investments in strengthening produce not only improvements, but improvements with equity*." The HHS Initiative to Strengthen Primary Health Care, for instance, recognizes that it is crucial to strengthen PC in order to improve the health of all people, particularly because PC is most patients' entry into the health system and has a documented impact on improving health outcomes and equity. This counters current funding patterns where PH and PC entities are chronically underfunded, even though they could equitably improve health outcomes, and more funding is directed to large health centers, where equitable outcomes are more difficult to observe without value-driven payment models. For this reason, informants suggested that Medicaid could allocate funding for health systems to integrate value-based care into their structure in order to promote health equity.

Furthermore, informants suggested partnering with organizations for whom health equity is the primary agenda and prioritizing CBOs that provide social support services to high-risk patients through closed loop referrals. Some informants were skeptical about health equity being a priority for private sector solutions to integrate PC, PH, and CBOs, and therefore encouraged public sector equity-driven innovations, particularly in partnership with federal- and state-level publicly driven housing, food security, and financing entities. Moreover, informants noted that health equity must be an integral part of health IT, data systems, and reporting. Looking at health data and EHRs through the lens of equity could help PC, PH, and CBOs target populations that are chronically disenfranchised. Integrating information around SDOHs into health IT could reveal where outcomes might be inherently inequitable, and practices could be incentivized to use these data to address needs on a granular level. Mandates to use equity measures, quality reporting programs, and health equity analysis tools for reporting may allow health systems to track variations and disparities in health outcomes, and they could use this information to connect with managed care organizations or state-based entities for follow-ups and to develop action plans.

Policies at the Federal, State, and Local Levels

Key informants spoke at length about the role of policy in supporting PC, PH, and CBO integration, including current policies that have enabled successful integration to date. One informant outlined 4 main policy windows that can support these efforts: payment, measurement, workforce, and integration. Within these 4 policy windows, data sharing and technological innovations are major enablers for breaking down and establishing linkages between PC, PH, and CBOs. There is a clear need to

bring the health data infrastructure into the 21st century through careful standardization, system improvement, and system integration. Current or proposed policy changes include:

1. The decision to authorize FQHCs to utilize and bill for telehealth services to increase access to care during the COVID-19 pandemic. On the federal level, some of these flexibilities will extend beyond the end of the national public health emergency on May 11, 2023, with variability between telehealth and mental health services, and other flexibilities will continue based on state legislation.
2. Congress is exploring ways to increase the value of collaborative care codes within existing payment systems and connect those codes to Medicare so that other services, aside from strictly primary healthcare, can be covered.
3. States have introduced policies to streamline and standardize data collection and data sharing practices from healthcare settings to PH authorities. One such example is Maryland's recent House Bill 1127, which mandates data sharing for the dispensing of certain medications of PH importance. Recalling the 4 policy windows, the ability to measure and track health conditions at the population level through key medications is a novel means of integrating PC interventions into PH actions.

All levels of government, from federal to state to local, play important and somewhat distinct roles in improving health outcomes via the integration of PH, PC, and CBOs. At the federal level, the role appears to be in setting standards for how funding should be allocated to certain initiatives and in performing critical oversight into how well the US is performing against key health metrics. CMS, the Health Resources and Services Administration (HRSA), and the CDC are some of the major federal players in this space. However, minor players or less-involved agencies can also explore potential collaborations to improve SDOHs. One such example is work being explored with the Department of Housing and Urban Development (HUD) to find areas of collaboration with CBOs to improve living conditions for those moving through community health center services. There were several key enabling policies in this space that key informants named, including the Affordable Care Act; Public Health Service Act, particularly sections 330 and 747; the 21st Century Cures Act; and Section 1115 waivers within Medicaid. These were commonly cited as policies drawn upon by states and organizations to receive funding and support for PC innovation and integration.

Throughout the interview process, KIs reinforced the key role that CMS plays in this arena. From creating codes to allow for broader care and integrated care teams to providing funding opportunities to fuel innovation, CMS occupies a unique space within the federal landscape. In addition to its large amount of funding for healthcare for millions of Americans, there are many potential levels within Medicare and Medicaid to fund innovations into how PC can be utilized by community members and PH authorities. For example, starting in 2024, new Accountable Care Organizations will be able to qualify for advanced investment payments through the Medicare Shared Savings Program. This initiative will be important in linking PC with accountable care and local CBOs. On the Medicaid side, CMS is beginning to lay the foundation for direct work and funding for CBOs, particularly for health equity work. However, Medicaid implementation and funding are quite different across state governments, so more work will need to be done in this area.

In addition to CMS, HHS has been leading research and initiatives surrounding PC. HHS's Initiative to Strengthen Primary Health Care is developing an action plan to strengthen all aspects of PC across the

nation and in 2022 opened a Request for Information on barriers, successes, and proposed ideas to improve PC. Building on NASEM's call to establish a secretary-level position for PC, there are efforts underway to establish an office within the Administration for Strategic Preparedness and Response (ASPR) on PC. The vision would be to fund and build upon PC's natural position as a central hub to CBOs, PH, hospital systems, etc., to create more connections between all partners involved in health.

At the state level, there are efforts to increase the money spent on PC. Informants spoke of New Jersey as an example where large health organizations have utilized federal dollars to award subgrants to CBOs and faith-based organizations to address primary healthcare needs. Additionally, New Jersey's Horizon BlueCross BlueShield has created a program called Neighbors in Health wherein 60 CHWs are trained and shared among several different organizations, including 2 FQHCs and 3 or 4 health systems. The program aims to address SDOHs, particularly in the wake of COVID-19, within vulnerable communities across the state. In its pilot year, Neighbors in Health recorded a 25% reduction in total care costs and a 60% increase in utilization of behavioral health resources. However, policies at the state level can be patchwork and vary significantly from state to state. HHS's work to create an office for PC may help emphasize certain standards of PC funding and integration that all states should follow.

Local and community-based efforts can also make a difference in improving healthcare and PH outcomes. It is important for policies at the local level to account for individual factors that a community faces to implement the most helpful measures. Local policymakers should also explore creative ways to utilize state and federal funding to enhance connections between PC and CBOs. Policymakers are in a position to reinforce through policy and stable funding streams that relationships between local PH and healthcare providers should be standard practice. This change in systems and culture will better prepare the nation to respond to the next health emergency as well as day-to-day health needs.

Payment Reform Models

There was a consensus among key informants that the fee-for-service (FFS) model does not allow for integration or innovation, and hybrid models appear to be more cost-effective and better at improving overall population health. Efforts are being made by policymakers to improve integrated care within the FFS model. Congress has been exploring ways to increase the value of collaborative care Current Procedural Terminology (CPT®) codes that would incentivize providers to engage in integrated behavioral healthcare. Clinical social workers (CSWs), for example, represent the largest group of mental health providers who provide psychotherapy services for Medicare Part B beneficiaries. Currently, Medicare reimburses CSWs at only 75% of the physician fee schedule, a rate even lower than the 85% rate at which other non-physician practitioners (nurse practitioners, physician assistants, clinical nurse specialists, occupational therapists, physical therapists, speech language pathologists, registered dieticians) are reimbursed. The Improving Access to Mental Health Act of 2023 (S.838/H.R.1638) attempts to mitigate this reimbursement inequity by increasing CSW rates to 85% of the physician fee schedule in order to increase recruitment and retention of CSWs in the Medicare workforce, thereby expanding provider options for beneficiaries. Such efforts to increase billing opportunities for nontraditional providers increase opportunities for integrated care.

There are many forms that hybrid models could take and still resemble FFS in order to support non-billing providers, such as CHWs or PH practitioners. Several informants highlighted the Maryland Primary Care Program (MDPCP) as a value-based hybrid model with strong success in its served communities. With built-in risk adjustments based on the community served by the recipient practice, MDPCP is a

combination of fee-for-service and prospective payment models. Informants suggested other possibilities for hybrid models, including the concept of a capitulated monthly payment to support population-health work within PC offices. Such an approach might be less burdensome than developing and deploying new collaborative care codes to fit within current FFS systems.

Informants highlighted CMS as the most influential steady-stream funder of healthcare practices. Grants play an important role in piloting programs, but Medicare and Medicaid funds make up the next largest portion of revenue for PC behind private insurance. As such, for large-scale changes in payment structures to occur, Medicare and Medicaid will need to be in alignment with new models. CMS has shown interest and energy in adjusting payment models, but the amount of flexibility that the agency is able to allow for recipient providers varies from administration to administration. Currently, Medicare and Medicaid have less flexibility to offer hybrid payment models under its budget neutrality policy. However, Section 1115 waivers are being utilized by state Medicaid programs to increase their flexibility in providing integrated care in addressing social needs. Key informants described the successful utilization of 1115 waivers in California, Massachusetts, Oregon, North Carolina, and Arizona, among others. Private healthcare systems are also beginning to adopt changes to their payment systems and increase the amount of integrated care in their practices. In one example, Duke Health has funded CBOs for around 20 years because they found the initial CBO investment resulted in overall reductions in cost and emergency department admissions.

Another area of federal payment model innovation is in CMS's Accountable Care Organizations (ACOs) and Medicare Shared Savings Program. The Medicare Shared Saving Program, rolling out major reforms in 2024, provides newly established ACOs with access to a hybrid funding model to receive Medicare dollars. Within the program, ACOs serving areas with a higher area deprivation index would be eligible to receive more funding, thus incorporating a risk-adjusted model as well. Some informants also suggested flexing Medicare to allow some services to be performed by licensed counselors, freeing up physician time and workforce requirements while integrating a higher level of whole-person care. While it will be difficult to move away from the deeply entrenched FFS model, it will be easier to create and maintain payment schemes that both support PC practices and incorporate CBOs and PH into integrated care as more case studies emerge of successful hybrid models.

PH and PC Communication and Interaction

Key informants commented on the enabling factors and barriers to effective communication between PH, PC, and CBOs. To echo the common finding throughout this project, there are not many examples of true integration among these different entities, but those that do exist have some commonalities. First, successful and robust communication relies on foundations of personal relationships and network building. Second, creative uses of data integration or technological applications provide clear roles for each partner to report, interpret, and utilize data to improve community health. Informants spoke of examples where PH departments were able to visualize gaps in vaccine coverage using deidentified EMR data and then perform targeted initiatives in conjunction with community health partners.

For the first theme, the personal aspect to communications and interactions was underscored by multiple informants. PH departments can appear as difficult-to-reach institutions with a network of various departments and expertise. Making one-on-one connections between PH officials and PC practices or CBOs facilities the flow of information among people who otherwise might not encounter one another in the daily execution of their duties. These connections are easier to establish in rural

communities—where the local PH officer may also be the lead family medicine physician—than in large cities or at the state level, but there are examples of success. One state health official made their personal cellphone available to practices and other organizations to reach out to them in emergencies or when more information on a health situation was needed. This type of interaction also builds trust between PH authorities and PC providers, who themselves are often more trusted distributors of health information within their communities.

In this way, PH has a clear role to act as a purveyor of information to PC providers and community leaders who in turn brief their constituent groups in ways that are culturally sensitive and easy to understand. According to informants, this framework was employed across many different contexts during the beginning of COVID-19, when information was arriving rapidly and subject to change. In one example, the state PH department set up daily webinars with healthcare providers to inform them of the latest information coming from the CDC. The success of these daily webinars has carried through to the present day; while the frequency has decreased, the platform is still used to discuss emergent health issues such as mpox and behavioral health. In another example, PH authorities utilized their emergency management knowledge to set up personal protective equipment (PPE) training workshops for PC providers to keep themselves and their patients safe when donning and doffing PPE.

A shortfall of interactions between PC and PH was in the initial rollout of vaccines, wherein PC locations were not prioritized to receive doses. However, once this gap was assessed and filled, PC vaccination programs have seen much success in vaccinating underserved communities due to their established trust and on-the-ground access. In one example, one state's PH department noted a significant disparity in vaccination rates for the Latino population through data monitoring. Through coordinated outreach with community organizations and PC groups, vaccination thresholds were not only met but also exceeded. This specific example relates to the common oversight of the vital role that PC providers perform in their communities. Some informants pointed out that FQHCs are uniquely positioned to facilitate some crossover between PC, PH, community members, and federal agencies. With majority community boards, FQHCs fulfill an important role in the communities they serve and could be utilized to create further linkages between the disparate entities. Some informants commented on the existence and successes of medical training courses on how to interact with PH, but they are not fully standard across the nation. Institutionalized training on how, when, and with whom to interact can facilitate future successful collaborations between PH and PC. Ultimately, it appears from the informants that there is no one-size-fits-all strategy to communication and integration between PH and PC, but making personal connections and getting involved with community groups is a common theme among successful integrations.

Workforce

Key informants reinforced the clear reality that PH and PC workforces are significantly depleted coming out of the COVID-19 pandemic due to myriad factors including burnout, lack of support, and lack of funding. PH officers reported experiencing personal threats to their safety due to mis- and disinformation, which further confounded efforts at sowing trust in communities. For PC providers, many have reported experiencing symptoms of post-traumatic stress disorder (PTSD) following the height of COVID-19, when large numbers of their patients were falling seriously ill or succumbing to the disease. As the peak of the crisis appears to be passing, we are left in an environment with an overworked and burned-out workforce and cuts made to funding that could have been used to supplement their numbers. In particularly dire shape is the PH nursing workforce, many of whom have

quit the profession altogether. Informants commented that not enough has been done to look back at the conditions faced by today's workforce and implement solutions to ameliorate some of the worst impacts.

There is a need to find creative ways to support workforce improvement in PH, PC, and CBOs rather than encouraging each entity to push harder. One example of potential workforce support and integration is CDC's Data Modernization Initiative. Improving the health data infrastructure could remove some burden from PH workers who often must interpret and analyze data coming from different streams and in different formats. Still, informants pointed out there needs to be trained PH workers at the receiving end of a new system who can interpret and make actionable decisions based on the information they receive. Work is being done to train PH officers in health departments for these purposes through a collaboration between the CDC and HRSA.

Informants emphasized the importance of CHWs as a trusted intermediary between PH, the healthcare system, and community members, particularly in underserved populations. CHWs have been critical components of successful community-based health initiatives in the US and abroad in large part because of their deep connections with the communities they serve. CHWs have also been utilized as care navigators for individuals to ensure that resources flow from the prescriber to the patient's home without interruption. However, informants pointed out that CHWs are often funded through grants rather than yearly appropriations or medically reimbursable means and such funding often ends once the grant period is over. Aside from the obvious issue with abruptly ending community services, the cycle of hiring and loss of employment for CHWs themselves results in an alienation of previously willing community members to participate as CHWs a second time. One informant recalled that Medicare recently sought public comment on ways for Medicare to create coded payments relating to CHW services. While this avenue for CHW funding is not yet available for healthcare providers, it does provide a signal that the federal government is interested in making CHW services accessible and sustainable to more of the population.

Workforce training was also a common theme among key informants. At the beginning of COVID-19, many healthcare providers and community health centers participated in training on PPE and other infection control measures from PH authorities. These and other examples of interaction between PH and PC entities underscore a need to regularly interact and train together on PH emergency best practices. One program that stands out to bring PC providers into CBOs is HRSA's Teaching Health Center Graduate Medical Education (THCGME) Program. THCGME supports PC medical and dental programs in community health centers and helps to fund and place resident physicians into these programs. The primary recipients of the grant are FQHCs, rural health clinics, and tribal health clinics. In the 2022-2023 academic year, THCGME awarded more than $155 million to 72 Teaching Health Centers. The gap in this program is that it does not involve the training or integration of PH practitioners into these settings, but this is perhaps an area for future expansion. A trained, supported, and protected workforce is one that will withstand future disruptions to the system.

Critical Players: The Roles of and Interactions Between Government and Other Stakeholders

Key informants discussed numerous critical players and stakeholders whose involvement is necessary to coordinate, fund, and implement PH and PC integration activities. Federal agencies, state government, PC providers, CBOs, and private organizations all have a part to play. Below, we outline some of the most frequently cited stakeholders and what key informants had to say about their roles.

Centers for Medicare and Medicaid Services (CMS)

The Centers for Medicare and Medicaid Services (CMS)—including the Center for Medicare and Medicaid Innovation (CMMI) and the Center for Medicaid and CHIP Services (CMCS)—was one of the most frequently cited stakeholders by key informants. Largely, key informants emphasized the importance of CMS for its ability to manipulate levers attached to Medicaid funding, and to a lesser extent Medicare funding, to better fund and incentivize integration activities sustainably long-term. Examples of initiatives to encourage integration with the involvement of CMS that could potentially be brought to fruition (marked with *) or have already been leveraged (marked with ^) include:

- Adjusting the physician fee schedule to allow for Medicare reimbursement for CHWs*
- Allowing states or health systems to use Medicaid funding for community health workers,^ community violence interrupters,* or other integration initiatives
- Requiring certain integration activities as a condition of contracts with Medicaid Managed Care Plans such as PH competency requirements for leadership, screening for social determinants of health among patients, or having a standing CHW team in place, some of which is already encouraged to an extent with the new In Lieu of Services guidance*
- Expanding Medicaid coverage to vulnerable populations that are common target populations of PH interventions, such as non-citizen people who are pregnant and up to one year after pregnancy^ or undocumented children*
- Provide advanced interest payments for PC practices participating in the Medicare Shared Savings Program that can be utilized by Accountable Care Organizations (ACOs) to hire staff, build infrastructure for accountable care, and address social needs of beneficiaries, such as food, housing, transportation, or other factors that affect vulnerability during a PH crisis*
- Allow ACOs participating in the Medicare Shared Savings Program to utilize a hybrid payment option on the condition of implementing integration activities, similar to an existing lever used to integrate behavioral health services*
- Require integration activities, such as funding CHWs, as a condition of 1115 waivers*
- Require CLIA laboratories to report test results for infectious diseases to PH authorities during PH emergencies*
- Expand Medicaid reimbursement related to collaborative care codes, the Diabetes Prevention Program, and other integration activities that could be reimbursed beyond the 16 states that already accomplish this^

One key informant emphasized that Medicaid reimbursement levers may prove helpful for small, independent PC providers in resource-constrained areas engaging in integration work, as they do not benefit from some of the incentives provided to FQHCs. Multiple key informants noted that it is important for CMS and states to better understand statutory permissions and potential legal challenges to levers for PC-PH integration, so CMS can better characterize the potential bounds of these types of initiatives. Key informants also noted that CMS has a key role to play in terms of data sharing and data integration, which may be better incentivized through levers. Finally, key informants expressed that it is important for CMS to use a "stick and carrot" approach so that levers do not only incentivize integration activities but also help provide additional monies to fund those activities.

Health Resources and Services Administration (HRSA)

The Health Resources and Services Administration (HRSA) was another key federal stakeholder frequently mentioned by key informants. Examples of initiatives to encourage integration with the involvement of HRSA that could potentially be brought to fruition* or have already been leveraged^ include:

- Utilize PH service awards to fund community health workers^
- Utilize innovation grants to incentivize development of meaningful partnerships with CBOs to carry out integration activities together^
- Require and incentivize medical residency programs to include a component related to working with CBOs (eg, Teaching Health Center Graduate Medical Education Program, which also incentivizes CBOs to work with residency programs in turn) or state authorities, familiarizing the physician workforce with other PC-PH integration stakeholders^
- Grant FQHC status via Public Health Service Act Section 330 grants, which then allows for higher rates of reimbursement for Medicaid patients as compared to typical fee-for-service,^ and then require integration activities as a condition of that grant funding*

Centers for Disease Control and Prevention (CDC)

The CDC was a third federal agency frequently mentioned in our interviews, particularly as the public health agency has a vested interest in ensuring that PC can collaborate successfully with PH, especially during PH emergencies. Key informants noted that CDC provides funding to states that can then be allocated with the help of CBOs and foundations to implement PC-PH integration activities, including capacity building or hiring for integration activities. Informants also noted that, like HRSA, CDC now often requires a letter of commitment or partnership with a CBO as a condition of grants, documenting a plan for meaningful impact to come out of the collaboration.

Office of the National Coordinator for Health Information Technology (ONC)

Key informants frequently mentioned the Office of the National Coordinator for Health Information Technology (ONC) as an important stakeholder related to data integration and data sharing needed to support PC-PH integration. Interviewees stated that, as of now, there are numerous barriers to data integration and data sharing that would require the involvement of ONC to overcome. For example, ONC could support data sharing by reducing the financial barriers for obtaining deidentified data from EMRs for PH purposes, such as electronic clinical quality measure (eCQM) data. This would go beyond the reporting ONC already mandates from EHR developers on how well their systems exchange health information to and from PH agencies.

Key informants did applaud ongoing work by ONC related to the Trusted Exchange Framework and Common Agreement (TEFCA), which is creating technology standards (the Qualified Technical Framework, or QTF) and a common legal framework for data sharing, relying on national networks or Qualified Health Information Networks (QHINs). For this work, ONC may emphasize PH as a permitted purpose for data usage and create working groups on how TEFCA can support PH work. ONC is also looking at integrating health information networks from local levels to the national level and ensuring that these networks can communicate and share data across systems. One potential exciting addition to this initiative suggested by key informants would be to allow CBOs to also participate in TEFCA, allowing for greater data sharing and integration for PC-PH integration. Key informants also noted that work

related to the US Core Data for Interoperability (USCDI) managed by the Interoperability Standards Advisory (ISA) within ONC may aid data sharing and integration related to PC-PH integration.

An additional initiative that key informants applauded was the Patient Unified Lookup System for Emergencies (PULSE), which was developed to allow first responders during disasters to look up clinical information of patients when outside their normal care setting. An open-source version is available for states that can be further developed in-house or with a technical vendor. Key informants noted this system may provide an interesting template for data sharing related to PC-PH integration.

State Governments

Key informants also frequently referenced state governments and affiliated agencies as other key stakeholders. States are often responsible for soliciting and allocating funding for PC-PH integration activities, even if the funding originally stems from federal government sources, as outlined in previous sections. For example, many PC-PH integration activities are currently supported by federally authorized but state-allocated American Rescue Plan Act stimulus funds, which are quickly expiring. Another example of state-mediated PC-PH integration is PC vaccination programs, wherein COVID-19 vaccines were administered by PC providers to help reach hesitant populations that may not have felt comfortable getting vaccinated at health department vaccination clinics. Interviewees also cited state health departments' participation in frequent communications with PC providers to deliver trusted information on health threats. To facilitate state governments' roles in PC-PH integration, interviewees noted that it may be easier to adapt and leverage existing programs and policies that already involve state engagement rather than create whole new processes. State governments should be involved in planning processes to ensure that statutory limitations are considered and legal challenges avoided. Finally, health departments may need to be better funded if they are expected to engage in additional work related to integration activities.

Other Stakeholders

The above entities are far from the only stakeholders and actors involved in PC-PH integration activities. Key informants highlighted the following additional examples of stakeholders and their roles in integration:

- Non-health-focused state and federal agencies whose main mandate is intertwined with SDOHs, such as the Department of Housing and Urban Development (HUD), which assists with housing needs, or the Department of Agriculture (USDA) because of its close ties to rural populations.
- Colleges and universities that can aid in the training of workforces that participate in integration activities, such as CHWs.
- Private health systems and value-based PC groups, which have financially supported integration work (eg, CHWs) to improve cost-effectiveness (eg, reduce emergency department visits).
- CBOs, PH nurses, and other similar groups and providers, which are key participants in PC-PH integration activities already, should be incorporated into decision-making processes rather than just expected to carry out implementation.
- Other HHS offices and divisions that are interested and involved in integration work, including the Administration for Community Living (ACL), which offers grants for Community Care Hubs that can act as bridge organizations between larger CBOs and PC providers; the Office of the Assistant Secretary for Health (OASH), which has an ongoing Initiative to Strengthen Primary Health Care; the Office of the Assistant Secretary for Planning and Evaluation (ASPE), which

could award a higher Federal Medical Assistance Percentage to states to support PC-PH integration activities, similar to an existing initiative with the Families First Coronavirus Response Act that authorized a temporary increase to states for meeting specific Medicaid program requirements; and the Administration for Children and Families (ACS), which is interested in linkages between CBOs and PC providers.

- EHR developers, such as Epic, which should be involved in any policymaking regarding data sharing and integration.
- Philanthropic organizations that may be able to provide grant funding to financially support PC-PH integration work.

Case Study Highlights from Environmental Policy Scan

As noted, stakeholders across various sectors can play important roles in PC-PH-CBO integration. Public health can more effectively realize its goal of community health promotion by taking the initiative to organize, establish, and maintain partnerships across sectors. Advanced PC transformation requirements fall into 5 categories: care management, access and continuity of care, comprehensive care and care coordination, beneficiary and caregiver experience, and planned care for health outcomes. In addressing these issues, PC can more effectively provide more equitable care to patients while advancing the SDOHs, grounded within a community-centric focus. The following 4 case studies are presented as evidence of what can be accomplished in healthcare transformation through innovative application of policies that drive cross-sector collaboration and communication, strengthen the PC-PH workforce, and ultimately foster better integration of PC-PH-CBOs.

Case Study #1: California CHWs

CHWs, also known by the Spanish term *promotores de salud*, or *promotores* (CHW/Ps), play a critical role in integrating PH and PC in California. As trusted members of their communities, they connect people who are often excluded by traditional healthcare systems to localized PH, PC, and social services, such as preventive and social support services, screenings and check-ups, culturally and linguistically appropriate health education, care management and coordination, referrals to community resources, and more.

Several state and federal policies have enabled funding, training, and support for CHW/Ps. The Affordable Care Act includes provisions to integrate CHWs into healthcare delivery systems by funding training and education programs. In 2022, the Biden administration awarded $225 million in American Rescue Plan funding to train CHWs, and the 2023 Consolidated Appropriations Act committed $50 million annually to build CHW workforce capacity between fiscal years 2023–2027. Also in 2022, CMS approved State Plan Amendment (SPA) 22-0001, adding CHWs as a preventive service and enabling California's Medi-Cal program to reimburse for services provided by CHWs. Governor Gavin Newsom allocated $16.3 million for the Medi-Cal CHW benefit in the 2021–2022 budget, increasing to $201 million by 2026–2027. California's Medi-Cal program has a history of leveraging the state's Section 1115 waiver to support preventive programs. On a local level, health departments have established partnerships with CBOs and CHWs to promote PC-PH integration. Moreover, the California Advancing and Innovating Medi-Cal (CalAIM) initiative creates financial imperatives for some managed care plans to contract with organizations that employ CHW/Ps for nonclinical interventions.

A few programs have successfully integrated PH and PC at the community level by leveraging CHW/Ps and capitalizing on incentives from the aforementioned policies:

- CommunityConnect's CHW program in Contra Costa County was implemented to improve health outcomes for low-income patients with chronic diseases through health education, self-management support, and care coordination, leading to improvements in patient self-management skills and health behaviors.
- Inland Empire Health Plan's Health Navigator CHWs conduct home visits, follow-up phone calls, and education on disease prevention and management and provide other health-related assistance to connect plan members to appropriate community resources.
- The Los Angeles County Department of Health Services employs more than 200 CHWs in its Whole Person Care program to provide outreach, engagement, assessment, peer support, accompaniment to appointments, and other care coordination activities.
- *Promotores de Salud* programs throughout California leverage CHW/Ps to improve outcomes for Latino populations, focusing on enrollment into insurance programs, receipt of preventive care services, and establishment of care services, and improvement of self-efficacy.

These cases demonstrate the important role that CHWs play in integrating PH and PC at the community level in California. Organizations like California Association of CHWs, CHW/P Policy Coalition, California Health Workforce Alliance, California Future Health Workforce Commission, California Health Care Foundation, and others continue to advocate for the expansion of CHW/P benefits and will be pivotal in determining how Medi-Cal benefits redefine CHW/P roles, promote their recruitment, and provide providers with resources to engage CHW/Ps.

Case Study #2: Southcentral Foundation Nuka System of Care

The Southcentral Foundation (SCF) provides a revolutionary example of how community members can be involved in all aspects of their own care and care systems. An Alaska Native-owned healthcare organization, the foundation serves about 65,000 Alaska Native and American Indian peoples located in the Anchorage region. With a mission to achieve physical, mental, emotional, and spiritual wellness, SCF created its Nuka System of Care, which necessitated a complete redesign of how they organize, fund, and conceptualize healthcare. The Nuka System involves members of the community as customer-owners, providing a system that empowers individuals to take control of their own healthcare and the healthcare system that serves them. The change of title from "patients" to "customer-owners" places authority and decision-making power back into the hands of those receiving services. With empowered recipients of care and culturally respectful caregivers, the Nuka System has helped individuals manage chronic diseases and control health care costs, as well as improved the overall wellness of the community served. This whole-person care approach has had measurable impacts on the health of the community: from 2000 to 2004, the Southcentral Foundation reported a 44% decrease in emergency department visits and a 63% decrease in inpatient discharges. The Nuka System has sustained these achievements, with a 31% overall decrease in inpatient discharges from 2000 through 2019.

Structurally, this system was created following the 1975 Indian Self-Determination and Education Assistance Act, which allowed Alaska Native and American Indian peoples to transition from government-led healthcare to appropriated healthcare dollars. This authority was further supported by Public Law 105-83, passed in 1997, which provided authority over ownership and management of all Alaska Native health care services. The US government took the funds it would have otherwise invested in the old Indian Health Service (IHS) facilities and let Alaska Native and American Indian peoples

develop their own models of care. In fiscal year 2015, 49% of SCF's income was obtained through third-party payments from programs such as Medicare and Medicaid, 43% was gained through a grant with the IHS, and 5% came from other grants. SCF's services are provided "prepaid" and care delivery mechanisms include ambulatory office visits, home visits, email and telephone visits, health information and education via classes and mixed media, inpatient hospital services, day and residential treatment, and consultation with and referral to higher levels of care. When advanced and complex care is required, SCF engages a seamless continuum of care by working in partnership with the tertiary and specialty Medical Services Division of the Alaska Native Tribal Health Consortium (ANTHC).

Integrated PC teams provide services to customer-owners and comprise several healthcare and behavioral health specialists. Additional support services external to the integrated PC team are available to customer-owners, such as certified nurse midwives, community resource specialists, registered dietitians, pharmacists, and behavioral health consultants. Specialty resources that are outside the SCF PC organization are available to customer-owners through pre-established relationships and referral processes. With all these components integrated under one whole-person care system, SCF was able to nimbly react to the COVID-19 pandemic in culturally appropriate ways that increased the compliance of the community with COVID-19 mitigation measures. The Anchorage municipality reports that 70% of all residents are fully vaccinated, with 95% of residents 65 and older fully vaccinated. In addition to cultivating an environment of trust with residents, the SCF also has an integrated data system that allows for robust data collection and reporting, a capability that is vital for PH response. SCF also shifted its capabilities to relieve emergency department capacity by designating 2 respiratory clinics where all suspected cases of COVID-19 were referred. The underlying integrated structure and trust in the organization were important components in responding to the COVID-19 emergency and should be further studied by other organizations to incorporate lessons learned.

Case Study #3: Maryland Department of Health Primary Care Program

Beginning in 2019, the Maryland Department of Health (MDH), in collaboration with Centers for Medicare and Medicaid Services (CMS), established the Maryland Primary Care Program (MPCP) as a component of the Total Cost of Care All-Payer Model contract between the federal government and the State of Maryland. The program, which is voluntary and available to PC providers throughout Maryland, offers funding to facilitate the provision of advanced care inclusive of medical, behavioral, and social needs. The program seeks to coordinate care across clinical settings and curb healthcare expenditures by enabling participating providers to improve preventative care, manage chronic medical conditions, and as a result, reduce inappropriate inpatient and emergency department utilization. The program is supported by the Program Management Office (PMO) within the MDH's Public Health Services and the Center for Medicare and Medicaid Innovation (CMMI). As of January 1, 2022, there were 545 practices and 7 FQHC participating in the program, which employs 2,150 PC providers and represents 374,000 patients.

The responses to the opioid epidemic and the COVID-19 pandemic provide 2 notable examples illustrating the synergy that has occurred between the MDPCP and the field of PH. In the case of the opioid epidemic, the PMO provided resources and technical assistance to allow the implementation of the Screening, Brief Intervention, and Referral to Treatment (SBIRT) into 157 PC practices as of the end of 2020. In the case of the COVID-19 pandemic, the PMO held webinars several times per week to provide data, technical assistance, and resources that allowed participating practices to serve as agents of care and intervention at the community level. When a practice is in the MDPCP, they are assigned an

MDH practice coach who facilitates the relationship between the practice and the state PH department, furthering the integration of PC and PH.

MDPCP is innovative in its utilization of population-based payments, which are risk stratified and integrate complexity-adjusted care management fees, performance-based incentive payments, and partially capitated comprehensive PC payments. Participation in the MDPCP transitions a practice's Medicare FFS payments to a value-based payment scheme, including non-visit-based population payments that better support the health needs of individuals. In exchange for implementing changes and services, participating practices receive prospective, non-visit-based Care Management Fees (CMFs) per attributed Medicare patient. PC practices are paid on the basis of a risk-stratified, per beneficiary per month (PBPM) CMF, based on acuity using the CMS Hierarchical Condition Category (HCC) risk adjustment model. Unlike traditional FFS reimbursement schemes in which practices are paid a fixed amount for provision of a particular service, PC providers under MDPCP receive visit-independent payments that promote flexibility to practice in a way that best supports the health of their patients, rather than functioning within the financial constraints of reimbursable services.

In addition to financial supports, participating practices receive reports, dashboards, and outreach staff support from the state-designated Health Information Exchange (CRISP) to conduct advanced analytics. MDPCP practices are required to screen for and address their patients' social determinants of care. The state and CRISP developed a bidirectional referral tool available through the CRISP platform that can help practices provide simple, secure referrals to connect patients with organizations to meet their food security, housing, and other needs.

Case Study #4: Salud Family Health

Salud Family Health is a FQHC and 501I3 nonprofit that has operated in northeast and southeast Colorado since 1970. Salud operates 13 clinic locations in Aurora, Brighton, Commerce City, Estes Park, Fort Collins, Fort Lupton, Fort Morgan, Frederick, Longmont, Sterling, and Trinidad, in addition to a mobile unit that serves migratory and seasonal agricultural populations. Salud also operates at 10 community locations, including 9 schools in Fort Morgan, Brighton, and Commerce City, as well as a location at the Northern Colorado AIDS Project in Fort Collins. Salud's mission is centered around providing quality, integrated healthcare to Colorado communities with a focus on low-income, medically underserved populations, including migrant and seasonal farmworker populations. Uniquely, Salud is governed by a patient-consumer Board of Directors to ensure that the organization stays true to these values while being best informed of community needs.

Salud Family Health delivers on the integration of PC and PH through a variety of avenues. Their evening mobile clinic provides screenings for diabetes, hypertension, cervical cancer, and anemia, as well as diagnostics for flu and tetanus. The clinic also provides health education and referrals for further direct care at other Salud Family Health clinic locations. In addition to traditional PC services, Salud Family Health provides dental, behavioral, pediatric, and pharmacy services at clinic locations, integrating PC with other needed health services. To encourage health-seeking at clinic locations, Salud provides translation services, transportation services, and shared medical appointments for diabetes and prenatal care.

Beyond these direct services, Salud provides more PH-oriented services through Care Managers who link patients to external resources that aid with food, clothing, financial assistance, transportation services, public benefits, housing resources, and more. Salud Family Health also partners with the Colorado

Department of Public Health and Environment to provide a women's wellness program. Additionally, Salud's community location at the Northern Colorado AIDS Project provides PC services to people living with HIV, facilitating patients' abilities to continue HIV treatment, which might help lower HIV transmission in the community, a major PH concern. In a similar model, SaludSchools locations provide medical, dental, and behavioral care to children while at school to reduce classroom absence and promote education, an important SDOH.

Salud receives operational funding through HRSA and also relies on donations and grants. Community advocate volunteers at Salud focus on communicating the value of Salud's services to the broader community, including elected officials and government representatives, which promotes public funding. In terms of fee structure, payment for services occurs on a sliding scale based on patient family size and income, with clinics accepting Medicaid, Medicare, Child Health Plan Plus (CHP+), and most private insurance plans. Salud also provides insurance enrollment assistance for patients. Salud Family Health is also a Health Center Program grantee under 42 U.S.C. 254b, which rewards PC health centers that engage in PC-PH integration activities and focus on working with specific vulnerable populations, particularly in high-poverty areas. Salud also qualifies as a PH Service employee under 42 U.S.C. 233(g)-(n).

Next Steps

Next steps for our project involve completion of our key informant interviews, monitoring of the 118th legislative session of Congress for policy actions, and final data analysis. We will convene a small working group of subject matter experts and providers to inform the policy analysis, review the findings from the key informant interviews, and help to determine priority action steps.

Appendix I. Literature Review Search Strategy

Time Frame 2010–2023

[tiab] limits to articles containing the search term in the title or in the abstract

United States:

MESH: "United States" [Mesh]

Public Health:

Terms: "Public Health Practice*"[tiab] OR "Public Health Administration*"[tiab] OR "Public Health Systems Research"[tiab] OR "Community Health Service*"[tiab] OR "Community Health Care"[tiab] OR "Community Healthcare*"[tiab]

MeSH: "Public Health"[Mesh] OR "Public Health Practice" [Mesh] OR "Public Health Administration"[Mesh] OR "Public Health Systems Research"[Mesh] OR "Community Health Services"[Mesh]

Primary Care:

Terms: "Primary Healthcare"[tiab] OR "Primary Care"[tiab]

MeSH: "Primary Health Care"[Mesh] OR "Access to Primary Care"[Mesh]

Data Systems:

Terms: "Data"[tiab] AND "Interoperability"[tiab]

MeS": "Data Syst"ms"[Mesh] OR "Medical Records"[Mesh] OR "Electronic Health Records"[Mesh] OR "Medical Informatics"[Mesh]

Funding and Payment Reform:

Terms: "Value Based Payment"[tiab] OR "1115 Waiver"[tiab] OR "Fina"c*"[tiab] "R "Fu"d*"[tiab] "R "Paym"nt"[tiab] OR "Payment Reform"[tiab] OR "Reimburse*"[tiab] OR "Fee-for-Service"[tiab]

MeSH: "Medic"id"[Mesh] "R "Centers for Medicare and Medicaid Services, U"S."[Mesh] OR "Prospective Payment System"[Mesh] OR "Insurance, Health, Reimbursement" [Mesh] OR "Reimbursement Mechanisms" [Mesh] OR "Fee-for-Service Plans" [Mesh]

Workforce:

Term": "Community Organizat"on"[tiab] "R "Community Based Organizat"on"[tiab] OR "Workforce"[tiab]

MeSH: "Health Workforce"[Mesh] "R "Community Health Work"rs"[Mesh] OR "Organization, Nonprofit"[Mesh]

Appendix II. Key Informant Interviewees

Rachel Abbey, MPH	Office of National Coordinator for Health IT, U.S. Department of Health and Human Services
Scott Afzal	Audacious Inquiry
Asaf Bitton, MD, MPH	Ariadne Labs, Brigham and Women's Hospital and Harvard University
Fredric Blavin, PhD	Urban Institute
Nadine Chan, PhD, MPH	Seattle and King County Public Health Department
Eric Chow, MD, MPH	Seattle and King County Public Health Department
Vazaskia Crockrell, MBA	Seattle and King County Public Health Department
Jeff Duchin, MD	Seattle and King County Public Health Department
Rebecca Etz, PhD	Larry A. Green Center for the Advancement of Primary Health Care for the Public Good, Virginia Commonwealth University
Margaret Flinter, PhD, APRN, FAAN, c-FNP	The Community Health Center, Inc.
Howard Haft, MD	Maryland Primary Care Program
Yalda Jabbarpour, MD	Robert Graham Center for Policy Studies in Family Medicine and Primary Care, American Academy of Family Physicians
Doug Jacobs, MD, MPH	Centers for Medicare & Medicaid Services
Jessica Jeavons, JD, MA	Seattle and King County Public Health Department
Joann Kang, JD	Rippel Foundation
Steven Kravet, MD, MBA	Johns Hopkins Community Physicians
Jeffrey Levi, PhD	The George Washington University
Alan Lieber, MBA	Rippel Foundation
Nicole Lurie, MD, MSPH	Coalition for Epidemic Preparedness Innovations
Sharon McDevitt, MD	Office of the Assistant Secretary for Health, U.S. Department of Health and Human Services
Larry McNeely, MPA	Primary Care Collaborative
Wendy McWeeny, MPA	The Community Health Acceleration Partnership

Lloyd Michener, MD	Duke University
Bobby Milstein, PhD, MPH	Rippel Foundation
Tiona Moore, MSW	Rippel Foundation
Becky Payne, MPH	Rippel Foundation
Anne Morris Reid, MPH	Protect Our Care
Joshua Sharfstein, MD	Johns Hopkins Bloomberg School of Public Health
Adele Shartzer, PhD	Urban Institute
Mia Shim, MD	Seattle and King County Public Health Department
Laura Smith, PhD	Urban Institute
Judith Steinberg, MD	Office of the Assistant Secretary for Health, U.S. Department of Health and Human Services
Julie Wood, MD	American Academy of Family Physicians
Stephen Zuckerman, PhD	Urban Institute

References

1. COVID Crisis Group. *Lessons from the Covid War: An Investigative Report*. New York: PublicAffairs; 2023.
2. Veenema TG, Waldhorn R, Toner E, Kobokovich A, Cicero A. *Integrating Primary Care and Public Health to Save Lives and Improve Practice During Public Health Crises: Lessons from COVID-19.* Baltimore, MD: Johns Hopkins Center for Health Security; 2021. https://centerforhealthsecurity.org/sites/default/files/2023-02/211214-primaryhealthcare-publichealthcovidreport.pdf
3. Hamburg MA, Cohen M, DeSalvo K, et al. Building a national public health system in the United States. *N Engl J Med*. 2022; 387:385-388.
4. American Academy of Family Physicians. *Integration of Primary Care and Public Health (Position Paper).* Updated December 2020. Accessed April 1, 2023. https://www.aafp.org/about/policies/all/integration-primary-care.html
5. National Academies of Sciences, Engineering, and Medicine. *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care.* Washington, DC: The National Academies Press; 2021. Accessed April 1, 2023. https://doi.org/10.17226/25983
6. Lebrun LA, Shi L, Chowdhury J, et al. Primary care and public health activities in select US health centers: documenting successes, barriers, and lessons learned. *Am J Prev Med*. 2012;42(6 Suppl 2):S191-S202. doi:10.1016/j.amepre.2012.03.011
7. Calman N, Hauser D, Lurio J, et al. Strengthening public health and primary care collaboration through electronic health records. *Am J Public Health*. October 10, 2012. doi:10.2105/AJPH.2012.301000
8. Klompas M, McVetta J, Lazarus R, et al. Integrating clinical practice and public health surveillance using electronic medical record systems. *Am J Prev Med*. 2012;42(6 Suppl 2):S154-S162. doi:10.1016/j.amepre.2012.04.005
9. Lurio J, Morrison FP, Pichardo M, et al. Using electronic health record alerts to provide public health situational awareness to clinicians. *J Am Med Inform Assoc*. 2010;17(2):217-219. doi:10.1136/jamia.2009.000539
10. Gyllstrom E, Gearin K, Nease D Jr, Bekemeier B, Pratt R. Measuring local public health and primary care collaboration: a practice-based research approach. *J Public Health Manag Pract*. 2019;25(4):382-389. doi:10.1097/PHH.0000000000000809
11. Demski H, Hildebrand C, Brass A, Jedamzik S, Engelbrecht R. Improvement of cross-sector communication in the integrated health environment. *Stud Health Technol Inform*. 2010;155:95-100.
12. Bazemore A, Phillips RL, Miyoshi T. Harnessing Geographic Information Systems (GIS) to enable community-oriented primary care. *J Am Board Fam Med.* 2010;23(1):22-31. doi:10.3122/jabfm.2010.01.090097
13. Bambekova PG, Liaw W, Phillips RL Jr, Bazemore A. Integrating community and clinical data to assess patient risks with a Population Health Assessment Engine (PHATE). *J Am Board Fam Med.* 2020;33(3):463-467. doi:10.3122/jabfm.2020.03.190206
14. Hughes LS, Phillips RL Jr, DeVoe JE, Bazemore AW. Community Vital Signs: Taking the pulse of the community while caring for patients. *J Am Board Fam Med*. 2016;29(3):419-422. doi:10.3122/jabfm.2016.03.150172

15. Hatef E, Weiner JP, Kharrazi H. A public health perspective on using electronic health records to address social determinants of health: the potential for a national system of local community health records in the United States. *Int J Med Inform.* January 24, 2019. doi:10.1016/j.ijmedinf.2019.01.012
16. Eden KB, Totten AM, Kassakian SZ, et al. Barriers and facilitators to exchanging health information: a systematic review. *Int J Med Inform.* January 24, 2016. doi:10.1016/j.ijmedinf.2016.01.004
17. Akhlaq A, Sheikh A, Pagliari C. Health Information Exchange as a complex and adaptive construct: scoping review. *J Innov Health Inform*. January 25, 2017. doi:10.14236/jhi.v23i4.889
18. Herwehe J, Wilbright W, Abrams A, et al. Implementation of an innovative, integrated electronic medical record (EMR) and public health information exchange for HIV/AIDS. *J Am Med Inform Assoc.* October 28, 2011. doi:10.1136/amiajnl-2011-000412
19. Menachemi N, Rahurkar S, Harle CA, Vest JR. The benefits of health information exchange: an updated systematic review. *J Am Med Inform Assoc.* 2018;25(9):1259-1265. doi:10.1093/jamia/ocy035
20. Yeung T. Local health department adoption of electronic health records and health information exchanges and its impact on population health. *Int J Med Inform.* May 2, 2019. doi:10.1016/j.ijmedinf.2019.04.011
21. Reisman M. EHRs: The challenge of making electronic data usable and interoperable. *P T*. 2017;42(9):572-575.
22. Burde H. The HITECH act: an overview. *AMA Journal of Ethics.* March 21, 2011. doi:10.1001/virtualmentor.2011.13.3.hlaw1-1103
23. Colicchio TK, Cimino JJ, Del Fiol G. Unintended consequences of nationwide electronic health record adoption: challenges and opportunities in the post-meaningful use era. *J Med Internet Res.* June 3, 2019. doi:10.2196/13313
24. Gold M, McLaughlin C. Assessing HITECH implementation and lessons: 5 years later. *Milbank Q*. 2016;94(3):654-687. doi:10.1111/1468-0009.12214
25. Kruse CS, Stein A, Thomas H, Kaur H. The use of electronic health records to support population health: a systematic review of the literature. *J Med Syst.* September 29, 2018. doi:10.1007/s10916-018-1075-6
26. Bakken S, Baker C. Measurement and automation of workflows for improved clinician interaction: upgrading EHRs for 21st century healthcare value. *J Am Med Inform Assoc*. 2022;30(1):1-2. doi:10.1093/jamia/ocac217
27. Saripalle, Rishi Kanth. "Fast Health Interoperability Resources (FHIR): current status in the healthcare system." *International Journal of E-Health and Medical Communications (IJEHMC)* 10.1 (2019): 76-93. Ayaz M, Pasha MF, Alzahrani MY, Budiarto R, Stiawan D. The Fast Health Interoperability Resources (FHIR) standard: systematic literature review of implementations, applications, challenges and opportunities. *JMIR Med Inform*. July 30, 2021. doi: 10.2196/21929.
28. Zayas-Cabán T, Okubo TH, Posnack S. Priorities to accelerate workflow automation in health care. *J Am Med Inform Assoc*. 2022;30(1):195-201. doi:10.1093/jamia/ocac197
29. McVicar KL, Ivanitskaya LV, Bradley DW, Montero JT. Primary care and public health collaboration reports: a qualitative review of integration aims, participants, and success determinants. *Popul Health Manag*. December 18, 2018. doi:10.1089/pop.2018.0160

30. Sun X, Palm D, Grimm B, Chen LW. Strengthening linkages between public health and health care in Nebraska. *Prev Chronic Dis*. August 1, 2019. doi:10.5888/pcd16.180600
31. Goroll AH, Greiner AC, Schoenbaum SC. Reform of payment for primary care—from evolution to revolution. *N Engl J Med*. 2021;384(9):788-791. doi:10.1056/NEJMp2031640
32. Hearld LR, Karabukayeva A. Participation in value-based payment programs and US acute care hospital population health partnerships. *J Healthc Manag*. 2022;67(2):103-119. doi:10.1097/JHM-D-20-00338
33. Agarwal R, Liao JM, Gupta A, Navathe AS. The impact of bundled payment on health care spending, utilization, and quality: a systematic review. *Health Aff (Millwood)*. 2020;39(1):50-57. doi:10.1377/hlthaff.2019.00784
34. Guerrazzi Young C, Feldman SS, Hernandez SR. Inter-organizational information sharing and bundled payment reimbursement: Do hospitals in the US use health information exchange to collaborate? *Int. J. Med*. 2021;145:104298. doi:10.1016/j.ijmedinf.2020.104298
35. Zhu JM, Patel V, Shea JA, Neuman MD, Werner RM. Hospitals using bundled payment report reducing skilled nursing facility use and improving care integration. *Health Aff (Millwood)*. 2018;37(8):1282-1289. doi:10.1377/hlthaff.2018.0257
36. Sapra KJ, Wunderlich K, Haft H. Maryland total cost of care model: transforming health and health care. *JAMA*. 2019;321(10):939-940. doi:10.1001/jama.2019.0895
37. Morrison M, Haber S, Beil H, Giuriceo K, Sapra K. Impacts of Maryland's global budgets on Medicare and commercial spending and utilization. *Med Care Res Rev*. September 13, 2020. doi:10.1177/1077558720954693
38. Chuang E, Pourat N, Haley LA, O'Masta B, Albertson E, Lu C. Integrating health and human services in California's Whole Person Care Medicaid 1115 waiver demonstration. *Health Aff (Millwood)*. 2020;39(4):639-648. doi:10.1377/hlthaff.2019.01617
39. Revere L, Semaan A, Lievsay N, Hall J, Wang ZM, Begley C. Collaborative learning in the Texas Medicaid 1115 waiver program. *J Healthc Qual*. 2016;38(6):e52-e63. doi:10.1097/JHQ.0000000000000058
40. Kaiser Family Foundation. (2023). Medicaid Waiver Tracker: Approved and Pending Section 1115 Waivers by State. Updated April 20, 2023. Accessed April 23, 2023. https://www.kff.org/medicaid/issue-brief/medicaid-waiver-tracker-approved-and-pending-section-1115-waivers-by-state/
41. McConnell KJ, Rowland R, Nevola A. A Medicaid benefit for health-related social needs. *JAMA Health Forum*. February 3, 2023. doi:10.1001/jamahealthforum.2022.5407
42. Thompson FJ, Farnham J, Tiderington E, Gusmano MK, Cantor JC. Medicaid waivers and tenancy supports for individuals experiencing homelessness: implementation challenges in four states. *Milbank Q*. April 27, 2021. doi:10.1111/1468-0009.12514
43. Crable E, Jones DK, Walley AY, Hicks JM, Benintendi A, Drainoni ML. How do Medicaid agencies improve substance use treatment benefits? Lessons from three states' 1115 waiver experiences. *J Health Polit Policy Law.* 2022;47(4):497-518. doi:10.1215/03616878-9716740
44. Sitapati AM, Berkovich B, Arellano AM, et al. A case study of the 1115 waiver using population health informatics to address disparities. *JAMIA Open*. June 28, 2020. doi:10.1093/jamiaopen/ooaa019

45. Sirkin JT, Flanagan E, Tong ST, et al. Primary care's challenges and responses in the face of the COVID-19 pandemic: insights from AHRQ's learning community. *Ann Fam Med.* 2023;21(1):76-82. doi:10.1370/afm.2904
46. Bork RH, Robins M, Schaffer K, Leider JP, Castrucci BC. Workplace Perceptions and Experiences Related to COVID-19 Response Efforts Among PH Workers - PH Workforce Interests and Needs Survey, United States, September 2021-January 2022. *MMWR Morb Mortal Wkly Rep.* 2022;71(29):920-924. Published 2022 Jul 22. doi:10.15585/mmwr.mm7129a3
47. Miller WL. The Impending Collapse of Primary Care: When is Someone Going to Notice? *J Am Board Fam Med.* November 17, 2022. doi:10.3122/jabfm.2022.220145R2
48. Willard-Grace R, Knox M, Huang B, Hammer H, Kivlahan C, Grumbach K. Burnout and health care workforce turnover. *Ann Fam Med.* 2019;17(1):36-41. doi:10.1370/afm.2338
49. Irvin R, Ntiri-Reid B, Kleinman M, et al. Sharing the cure: building primary care and public health infrastructure to improve the hepatitis C care continuum in Maryland. *J Viral Hepat*. August 5, 2020. doi:10.1111/jvh.13360
50. Barker SL, Maguire N, Gearing RE, et al. Community-engaged healthcare model for currently under-served individuals involved in the healthcare system. *SSM Popul Health*. 2021;15:100905. doi:10.1016/j.ssmph.2021.100905
51. Goldfield NI, Crittenden R, Fox D, McDonough J, Nichols L, Lee Rosenthal E. COVID-19 crisis creates opportunities for community-centered population health: community health workers at the center. *J Ambul Care Manage*. 2020;43(3):184-190. doi:10.1097/JAC.0000000000000337
52. Butkus R, Rapp K, Cooney TG, Engel LS; Health and Public Policy Committee of the American College of Physicians. Envisioning a better US health care system for all: reducing barriers to care and addressing social determinants of health. *Ann Intern Med*. 2020;172(2 Suppl):S50-S59. doi:10.7326/M19-2410
53. Nuño T, Sierra LA, Wilkinson-Lee A, et al. The Arizona Prevention Research Center partnerships in Arizona to promote COVID-19 vaccine health equity. *Front Public Health*. 2022;10:944887. doi:10.3389/fpubh.2022.944887. Published correction appears in *Front Public Health*. 2022 Sep 14;10:1031760
54. Smithwick J, Nance J, Covington-Kolb S, Rodriguez A, Young M. "Community health workers bring value and deserve to be valued too:" Key considerations in improving CHW career advancement opportunities. *Front Public Health.* 2023;11:1036481. doi:10.3389/fpubh.2023.1036481