Person-Centered Preventive Healthcare: Gathering Stakeholder Input on Evidence and Implementation

AHRQ
Agency for Healthcare Research and Quality

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Contents

1. Introduction 1

1.1 Clinical Preventive Services Defined 1

1.2 Current State of Clinical Preventive Service Delivery 2

1.2.1 Disparities in the Delivery of Clinical Preventive Services 2

1.3 Person-Centered Care 3

1.4 Project Objective 3

2. Methods 6

2.1 Project Scope 6

2.2 Methods 6

2.2.1 Stakeholder Panel 6

2.2.2 Environmental Scans 7

2.2.3 Technical Expert Panels and Key Informants 7

2.3 Synthesis of Information 7

3. Results 9

3.1 Transition to Holistic Healthcare Delivery and Financing Models 9

3.1.1 Expand Perspective on Preventive Services 10

3.1.2 Focus on Person-Centered Delivery 11

3.1.3 Address Social Drivers of Health and Social Needs 12

3.1.4 Restructure Fee-for-Service Financing Models 13

3.1.5 Identify Opportunities for System Redesign 13

3.1.6 Invest in Social and Community Infrastructure 14

3.2 Include Community and Patient Voice in Healthcare System Design 16

3.2.1 Consideration of Community Priorities and Context 16

3.2.2 Cocreation of Care Delivery and Funding Models 17

3.2.3 Design Care Delivery—Where and Who Matters 20

3.2.4 Engage Patients and Communities in De-implementation Decisions 22

3.3 Leverage Technology to Improve Preventive Service Delivery 23

3.3.1 Technology to Support the Delivery of Preventive Services 23

3.3.2 Centering Equity in Use of Technology 26

3.3.3 Technology Implementation Challenges 27

3.3.4 Structural Health Information Technology Issues 27

4. Discussion **28**

4.1 Reflections on Findings 28

4.2 Reflections in Context 30

4.3 Opportunities for AHRQ 31

4.3.1 AHRQ-Aligned Opportunities 31

4.3.2 Broader Opportunities 33

4.4 Report Limitations 34

4.5 Conclusions 34

References **R-1**

Appendixes

Methods Appendix **M-1**

Topic-Specific Appendices **T-1**

Figures

Number **Page**

1. Widely Used Categories of Clinical Preventive Services.....2

Tables

Number **Page**

1. Topics Within the Person-Centered Preventive Healthcare Project 6
2. Strategies to Address Social Drivers of Clinical Preventive Services Receipt 12

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Public Availability Notice

List of Acronyms

ACIP	Advisory Committee on Immunization Practices
AHRQ	Agency for Healthcare Research and Quality
AI	artificial intelligence
CBO	community-based organizations
CHW	community health worker
CPS	clinical preventive services
EHR	electronic health record
FQHC	Federally Qualified Health Center
KII	key informant interview
NASEM	National Academies of Sciences, Engineering, and Medicine
PCPHC	Person-Centered Preventive Health Care
TEP	technical expert panel
USPSTF	U.S. Preventive Services Task Force

Section 1: Introduction

1. Introduction

Public health achievements in the 20th century, including improved sanitation, cleaner air and water, more abundant and nutritious food, and mass childhood vaccination, contributed far more to gains in life expectancy than medical care provided to individuals.[1] Whereas public health measures were directed at populations, the concept of clinicians providing preventive services to individuals in clinical settings emerged later. Several key developments enabled this: new clinical tests, medications, and vaccinations; the transition from infections to chronic diseases as the leading causes of mortality; and changes in healthcare financing. Individually directed preventive services can reduce morbidity and mortality, helping people live longer, healthier lives.[2] However, most individuals do not receive all of the services recommended for them and some do not receive any. Moreover, disparities exist in the receipt of services and related follow-up care.

The Agency for Healthcare Research and Quality (AHRQ) produces evidence to improve the safety, quality, and accessibility of healthcare. To fulfill this mission, AHRQ funds work to evaluate the effectiveness and safety of preventive services and to enhance implementation of evidence-based healthcare. Further, AHRQ also supports equitable and person-centered approaches in healthcare. AHRQ commissioned this project, Person-Centered Preventive Health Care (PCPHC), to gather evidence and input from stakeholders to advance equitable, person-centered implementation of preventive services.

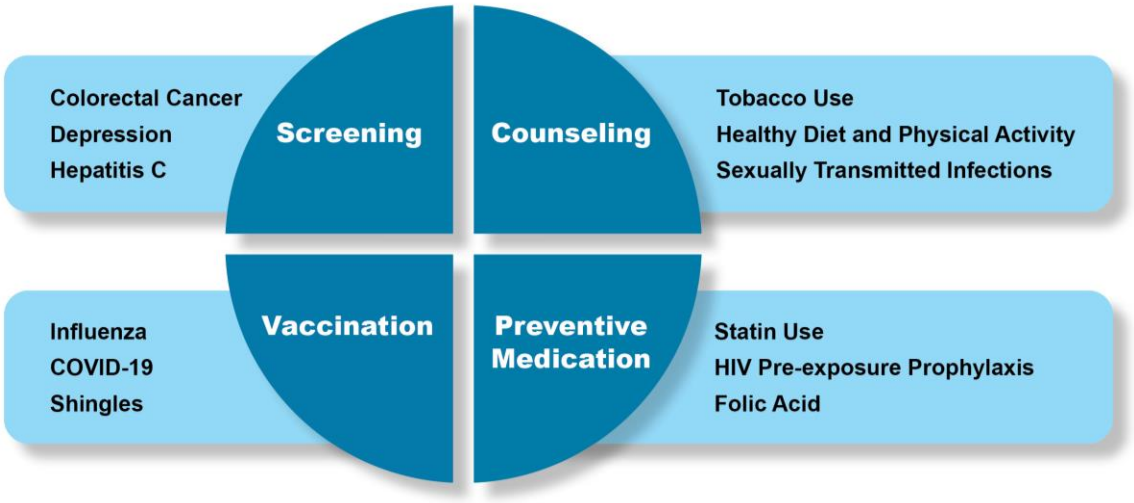
In this section, we offer context for this project with respect to the clinical preventive services within the project's scope, the current state of receipt of these services and equity concerns, and the transformation of healthcare toward using person-centered approaches.

1.1 Clinical Preventive Services Defined

Clinical preventive services (CPS) are traditionally defined as preventive services provided in or referred to from primary care settings. They are specific services offered to most people, based on age, sex, health behaviors, or clinical risk factors. Importantly, CPS are not a response to symptoms or treatments; they are services provided to prevent future disease, detect early disease that can be effectively treated, or mitigate the impact of unhealthy behaviors on future health. Primary care clinicians—physicians, physician assistants, nurse practitioners, and nurses—provide most CPS or refer people to specialty providers when relevant. **Figure 1** depicts widely used categories of CPS with examples within each category.

In the United States, numerous professional and scientific organizations provide guidance to healthcare providers and consumers on which CPS to recommend or receive. Some of these organizations focus on recommendations for preventing a specific disease (or disease category such as cancer), while others recommend CPS relevant to the constituency they represent (e.g., children and adolescents, women). For this project, our focus was on the evidence-based CPS recommendations relevant to adults aged 35 years and older from the U.S. Preventive Services Task Force (USPSTF)[2] and the Advisory Committee on Immunization Practices (ACIP).[3]

Figure 1. Widely Used Categories of Clinical Preventive Services



1.2 Current State of Clinical Preventive Service Delivery

Realizing the anticipated benefits from CPS requires widespread and equitable provision of services across all people who are candidates for these services. However, studies have documented suboptimal delivery of CPS.[4-7] Using data collected with the Preventive Services Self-Administered Questionnaire of the Medical Expenditure Panel Survey in 2015, researchers calculated receipt of 15 high-priority CPS among over 2,000 U.S. adults aged 35 years and older.[6] Using a composite measure of whether an individual received high-priority CPS recommended based on their age or sex, researchers reported that just 8 percent received all recommended services, and nearly 5 percent received none.[6] Other nationally representative surveys offer data on selected CPS and include oversampling for select underrepresented populations, but changes in survey questions and content and different sampling frames create challenges for accurate estimates of CPS receipt over time and between different populations.[8]

The reasons for suboptimal receipt of CPS are multifactorial and complex and vary according to type of service, individual factors, and system-level priorities.[9] Research suggests that myriad barriers result in missed opportunities. These include lack of access to primary care, competing healthcare needs, lagging interoperability of health data systems, lack of support and time for busy clinicians to discuss all preventive services, and inadequate clinician and patient knowledge of frequently updated recommendations.

1.2.1 Disparities in the Delivery of Clinical Preventive Services

Existing disparities in health status, disease burden, and community resources may contribute to gaps in equitable delivery of CPS.[9-11] Historically, marginalized racial and ethnic groups, rural populations, sexual and gender minority populations, people with disabilities, people with serious mental illness, and individuals living in poverty experience a disproportionate burden of poor health outcomes and reduced access to care.[9] Understanding the drivers and mechanisms of health disparities is imperative to achieve sustainable, effective solutions. Inadequate delivery

of any given CPS is just one step along the care continuum that contributes to observed disparities in incidence, morbidity, and mortality from a specific condition.[9, 12] For example, a systematic review published in 2020 to support the USPSTF colorectal cancer screening recommendation identified disparities across the "screening-to-treatment continuum," including screening access and quality, time from diagnosis to treatment, and treatment quality.[13, 14]

Currently, most CPS are provided in a clinical setting. Factors upstream of the clinical encounter, such as barriers to structural and economic resources, create conditions that lead to poor health (e.g., food deserts, poor air and water quality) while simultaneously making it difficult for the most vulnerable to access good quality healthcare. Downstream of the delivery of CPS, delays in follow-up diagnostic testing and treatment (e.g., delays in receipt of a breast biopsy following an abnormal mammogram) are especially detrimental to individuals who are vulnerable such as people with disabilities, English language learners, and individuals from underserved communities who may lack additional supports to ensure that individuals progress through the continuum of care. Other barriers to the receipt of CPS and necessary downstream care vary and may include patient characteristics (e.g., beliefs/attitudes, health literacy), clinician bias and knowledge, as well as a myriad of health system, environmental, and societal factors.

1.3 Person-Centered Care

Increased receipt of evidence-based CPS with appropriate downstream diagnostic evaluation and treatment will have benefits at the population level; however, it is critical that person-centered approaches are used to deliver this care. Most primary care settings are designed such that care providers lack the context in which a patient lives.[15] A person-centered approach to care is recommended to ensure equity, quality, responsiveness and participation, efficiency, and resilience.[16] Although CPS has the potential to improve the health and well-being of individuals and populations, a person-centered approach to providing CPS means providing those services in the context of people's overall preferences and values and considering their individual risk factors, health status, and needs.

Person-Centered Care Defined

"Patient-centered and person-centered are often used interchangeably but are conceptually different. Moving from patient-centered to person-centered care represents an evolution of primary care to focus on individual people in the context of their lived experiences, family, social worlds, and community."

Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care. National Academies of Sciences, Engineering, and Medicine. 2021.[15]

1.4 Project Objective

Given the context of suboptimal and inequitable receipt of CPS among adults, AHRQ commissioned the PCPHC project to gather evidence and stakeholder input through multiple

lenses including technology, innovative delivery models, public health linkages, disparities, and de-implementation of low-value or harmful services to identify opportunities to increase the use of person-centered approaches and improve the equitable delivery of CPS.

Section 2: Methods

2. Methods

In this section, we briefly describe the methods used to conduct this project. We provide a detailed description in the **Methods Appendix**

2.1 Project Scope

This project sought to explore new ways to deliver equitable, person-centered clinical preventive services (CPS), and identify strategies to reduce disparities. Agency for Healthcare Research and Quality (AHRQ) identified five topic areas of focus for this project (**Table 1**). We assembled teams of three to four people for each topic to conduct an environmental scan, facilitate a technical expert panel (TEP) meeting, and conduct key informant interviews (KIIs). This project was also supported by a Stakeholder Panel that provided overall input to the project.

Table 1. Topics Within the Person-Centered Preventive Healthcare Project

Short Topic Title	Topic Description
Technology	Identify how technology can be leveraged or developed to deliver equitable clinical preventive services including personal health records and patient portals, mobile device applications, telehealth, and tools for facilitating shared decision making.
Innovative Delivery Models	Identify emerging and innovative models, interventions, and /or programs that are implemented within healthcare organizations to ensure delivery of relevant preventive care in a way that incorporates patient values and preferences.
Public Health and Community Linkages	Identify how linkages between primary care and public health or community-based organizations can be further developed and leveraged to optimize the delivery of person-centered CPS.
Disparities	Identify causes as well as identified person-centered strategies to mitigate health disparities related to CPS. The scope included, but was not limited to, strategies to improve the uptake of CPS across different populations.
Low-value and Harmful Services	Identify strategies for de-implementation of low-value or harmful services.

Abbreviations: CPS, clinical preventive services.

2.2 Methods

2.2.1 Stakeholder Panel

During the 18-month project, we virtually convened a 30-member Stakeholder Panel three times to provide guidance including suggestions for scoping of the individual topics, suggestions for TEP members and key informants (KIs), and feedback on our findings. The Stakeholder Panel included representatives from healthcare systems, academia, public health agencies, nonprofit organizations, payers, federal agencies, and patient/consumer organizations (see the **Methods Appendix**

for names and affiliations). Three Stakeholder Panel members and one patient/consumer representative were invited to review a draft version of this report.

2.2.2 Environmental Scans

The goal of the environmental scan was to provide the TEP members for each topic with the background to launch TEP discussions. Scans were not full systematic reviews; rather, they were intended to provide a broad overview of the existing literature and exemplar programs, as well as identify salient questions for the TEP. Each scan began with the development of a scope and guiding questions to focus the search strategy. We searched two or three bibliographic databases from 2012 to the present along with focused grey literature and website searches. Search terms included those related to CPS and patient- and person-centered care, as well as topic-specific terms. Full-text articles prioritized for selection included systematic evidence reviews, narrative reviews, case studies, reports, and commentaries that placed evidence of effectiveness into a historical and present-day real-world context, as well as primary studies describing quality improvement efforts and multistate demonstration projects to inform understanding of implementation barriers and facilitators. Teams gathered information relevant to guiding questions and synthesized the major findings into themes with examples and highlighted evidence gaps. Topic-specific search strategies and a summary of each topic's scan findings are detailed in the **Topic-Specific Appendices**

2.2.3 Technical Expert Panels and Key Informants

For each topic, we convened a TEP composed of at least 10 experts and two patient representatives, striving for diversity with respect to discipline, race/ethnicity, geography, and organization type. We conducted each TEP meeting virtually for 2 to 3 hours using Zoom. We also used the XLeap virtual meeting platform in most TEP meetings to capture written responses to discussion questions and provide an additional forum to ensure that all TEP members had an opportunity to share their thoughts. For each topic, we also conducted three to four key KIIs, either before or after the TEP meeting, to gather additional information about the topic. We selected KIs based on TEP, Stakeholder Panel, or AHRQ recommendations, or based on information we identified in the scan. We conducted KIIs via Zoom using a semi-structured interview guide that consisted of four to six questions. We summarized findings from the TEP and KIIs for each topic in a summary document. The TEPs and KIIs were conducted between January 2023 and June 2023 and the names and affiliations of persons who participated are provided in the **Topic-Specific Appendices**.

2.3 Synthesis of Information

For each topic, we used information collected from the environmental scan and KIIs conducted prior to the TEP meeting to formulate discussion questions for the TEP meeting. However, we did not limit TEP discussions to these guiding questions. Following each TEP meeting and KII, we used inductive reasoning to identify themes from the TEP and KII discussions for each topic.[17] Finally, we identified cross-cutting overarching themes and subthemes.[17]

Section 3: Results

3. Results

The results section is organized around three overarching themes:

1. **Transitioning to holistic healthcare models**
2. **Including community and patient voice healthcare system design**
3. **Leveraging technology to improve preventive care delivery**

Within each overarching theme, we identify subthemes supported by specific statements, examples, and in some cases illustrative quotes. We acknowledge upfront the interrelatedness of the overarching themes (and their corresponding subthemes) and some redundancy that readers may encounter as a result. We view this redundancy as reinforcing the key suggestions that came from technical expert panel (TEP) members and key informants (KIs). For clarity, we refer to stakeholder panel members, TEP members, and key informants, including those representing the patient/consumer perspective, as "experts" in the sections that follow.

3.1 Transition to Holistic Healthcare Delivery and Financing Models

To deliver more person-centered preventive care, experts proposed transforming the current system to use more holistic models. They identified the following critical components for a holistic care model:

- Putting a patient's values, preferences, and context at the center of all care
- Utilizing multilevel interventions and transdisciplinary teams
- Building and engaging public health and community partnerships
- Expanding beyond clinical expertise (i.e., medicine, nursing, social work, public health) to include vital perspectives from law, economics, and engineering
- Hiring a workforce that is reflective of the community
- Being vigilant about improving and rethinking access to care
- Improving health literacy

Experts discussed examples of holistic healthcare using two existing models. First, the Veterans Health Administration's Whole Health initiative,[18] which uses a person-centered approach to healthcare and considers the impact that personal beliefs and values, experiences, and community can have on health and well-being. Second, Federally Qualified Health Centers (FQHCs) serve as a potential model for holistic care, as these centers address social needs and provide comprehensive services (often including dental, vision, and mental health services) to people in underserved communities and include community representation in their governance.

In the rest of this section, we describe expert's perspectives related to a transition to holistic models of healthcare. The discussion on this topic was not restricted to clinical preventive services (CPS). The experts voiced concern with considering CPS delivery in isolation, without considering overall healthcare and social needs. TEP members viewed isolated attempts to improve CPS receipt without addressing the larger structural barriers to providing holistic care

as a missed opportunity.

3.1.1 Expand Perspective on Preventive Services

Adopt a more inclusive definition of preventive services. Some experts recommended adopting a more broad and inclusive perspective on prevention than what was included as the scope for the Person-Centered Preventive Health Care (PCPHC) project (i.e., U.S. Preventive Services Task Force [USPSTF] and Advisory Committee on Immunization Practices [ACIP] recommendations in adults aged 35 years and older). Several experts also noted that vital preventive services had been excluded from the scope of the scans, namely, mental health, dental, vision and hearing screenings, and maternal healthcare. They suggested that future work in this area may benefit from expanding the idea of prevention to encompass other areas of public health and clinical prevention.

> "We've got to start thinking about how we develop these individualized, personalized approaches so that we can address this for the broader population that will allow us to become much more equitable in our approach."
>
> —TEP Member; Innovative Delivery Models

Use a life course approach. Experts also advocated for a life course approach (see callout box) to preventive services, as opposed to a limited focus on healthy adults as designed in the PCPHC project. A life course approach takes a temporal and societal perspective on the health and well-being of individuals and generations, recognizing that all stages of a person's life are intricately intertwined with each other, with the lives of others born in the same period, and with the lives of past and future generations. Adopting a life course approach involves acting early in the life course, during life's transitions, and acting collectively as a whole society. Several experts questioned the exclusion of certain populations—such as children and young adults, pregnant persons, older adults, and populations with special healthcare needs—from the scans and the scope of the PCHPH project. Specifically, they emphasized the importance of screenings and vaccinations to address child and maternal health disparities.

Life Course Approach

"A life course approach to health aims to ensure people's well-being at all ages by addressing people's needs, ensuring access to health services, and safeguarding the human right to health throughout their life time."

—World Health Organization[19]

3.1.2 Focus on Person-Centered Delivery

Incorporate patient preferences into CPS delivery. Although experts acknowledged the importance of evidence-based CPS, particularly from a population-health perspective, many recommended placing more focus on person-centered approaches (i.e., promoting patient engagement and shared decision making in the prioritization and receipt of CPS). They noted challenges associated with a one-size-fits-all approach to preventive care that is often driven by CPS-related quality measures. Experts advocated for a care team that incorporates patient preferences, culture, and values into all aspects of care, including but not limited to, CPS.

Use shared decision making. To facilitate shared decision making about CPS, TEP members discussed the need for improved communication with patients about the benefits, risks, and potential harms associated with the receipt of a service. For people to make an informed decision, they must be presented with relevant information in a format that is easy to understand. Decision aids were recommended to help people both understand their options and clarify their preferences. One TEP member recommended using decision aids to promote shared decision making, especially around low-value services (i.e., services with minimal to no evidence of effectiveness).

Redefine successful CPS delivery. Experts recommended a reconceptualization of how success is defined with respect to CPS. Typically, "success" is measured by whether a patient has received screenings, vaccinations, medications, or counseling. However, experts discussed the potential for shifting focus to additional outcomes, such as patient satisfaction, patient empowerment, health equity, and quality of life. A traditional evaluation paradigm for success on such measures might set too high of an evidence threshold (i.e., requiring trial designs) when it comes to evaluating the impact on equity issues. They noted that different evidence frameworks, such as those from quality improvement, patient safety and engagement, and implementation science could be used for evaluation. This would require a fundamental shift in the types of evidence used to demonstrate success and a transformation in incentivization structures and quality measures. Experts championed moving away from quality measures that incentivize the delivery of CPS without consideration of patient preferences and values. They called for a holistic approach to quality measurement, using new indicators of success, as described above. Additionally, experts suggested linking healthcare executive performance incentives to improvements in the delivery of equitable care and ultimately health equity.

> "I worry that the inherent message in quality measure benchmarking/performance goals is that the receipt of the service is the 'right' choice for the patient."
>
> —TEP Member; Innovative Delivery Models

3.1.3 Address Social Drivers of Health and Social Needs

Consider that socioeconomic factors impact the ability to engage in preventive care.

Social Drivers of Health

Refers to population and individual social risk factors and social needs that individuals identify needing help with.

Experts described how social or economic factors—such as transportation, education, income, and housing—can impact health behaviors and the ability to engage in care, including preventive care. Several experts suggested that although interventions with the potential to increase receipt of CPS exist (in both research settings and in real-world clinical settings), without broader, transformative change (i.e., interventions addressing social drivers of health), the ability to impact health outcomes may be limited. They identified strategies at the policy, healthcare system, and provider level (**Table 2**) to address social needs. However, some cautioned that implementing some of these strategies without proper planning and resources could lead to distrust between patients and providers. For instance, screening patients for social needs without the availability of services to address needs identified would be frustrating for both patients and providers. Effective social needs screening requires accessible local resources and care teams who are aware of and can refer patients to services. Finally, experts expressed interest in integrating medical and nonmedical care to address social needs. For instance, patients could benefit from tighter linkages between primary care and behavioral health teams, specialists, social service providers, or community-based resources to meet social needs as is typical in FQHC models.

Table 2. Strategies to Address Social Drivers of Clinical Preventive Services Receipt

Potential Strategies
▪ Partner with communities to develop implementation plans to address social needs of the community
▪ Consider/improve the safety of the communities surrounding clinical services
▪ Address local and state policies aimed at reducing rights, freedom, access to care for marginalized populations, and the need for supporting good social policy overall
▪ Hold health systems and other systems (e.g., schools) accountable for strategies to improve health literacy in tandem with strategies to improve healthcare consumerism (i.e., patients as healthcare consumers)
▪ Screen for social needs during appointments
▪ Expand the provision of services beyond the traditional primary care settings (e.g., trustworthy and accessible community sites, homes, or mobile sites)
▪ Deliver services through paraprofessionals (e.g., patient navigators, community health workers) by formally recognizing and reimbursing the scope of work for these professions
▪ Ensure that the clinical workforce—from administrative staff to executive leadership—reflects the community
▪ Extend the hours of clinical sites (evening and weekend hours) and offer home-based tests or products
▪ Consider patients' childcare needs
▪ Provide culturally sensitive care teams and multilingual forms
▪ Provide travel vouchers to appointments
▪ Provide free or low-cost preventive services

3.1.4 Restructure Fee-for-Service Financing Models

Restructure financing to facilitate more holistic care models. Experts suggested that a restructuring of existing fee-for-service models could facilitate a more holistic model for providing healthcare. Although they discussed the benefits of a team-based care model, they identified myriad challenges with current funding models to support such care. First, decades-long chronic underinvestment in primary care and public health infrastructure challenges implementation efforts. Experts described the ways in which this underinvestment affects equitable service provision. For example, the lack of resources can limit the capacity of both primary care and public health entities to partner with communities (e.g., limited workforce, time, and finances to engage community perspectives). Additionally, even when preventive care gaps are known, there is no specific funding for preventive services and money is often redistributed or reallocated from other existing projects.

Change incentives. Incentives for clinics and hospitals that are part of large healthcare systems can serve as drivers of health system-public health partnerships, because requirements for nonprofit hospitals include provisions to direct funding annually toward community benefit projects. Ultimately, to accomplish changes to current payment models, experts underscored the importance of policy change at federal, state, and local levels to facilitate integration between primary care, public health, and community organizations.

> "Policies that reimburse for teams to deliver care are critical—there are not enough primary care providers to support the demand—the only way we can promote person-centered care and clinical preventive services is through team- based care. Without resources, the primary care provider cannot afford to hire support teams."
>
> —TEP Member, Technology

3.1.5 Identify Opportunities for System Redesign

Use Teaching Health Center models. Beyond the restructuring of healthcare financing models, experts proposed several system-level redesigns. Some suggested using more Teaching Health Center models, such as the model developed by the Health Resources and Services Administration that embeds primary medical, dental, and psychiatric residency training programs in community health centers, rural health clinics, and tribal health centers, often in underserved communities.[20] This model could encourage providers to continue working in primary care, even after their training has concluded. Experts also noted that this approach could be particularly effective in equipping providers with the competencies and skills to meet the needs of the community. Ultimately, a Teaching Health Center model has the potential to decrease health disparities by increasing the number of trained providers in underresourced or historically marginalized communities.

Consider other types of system redesign possibilities. Experts posed other system-level changes, including team-based care, group models for care delivery, and patient navigators. They pointed to the healthcare changes implemented because of the COVID-19 pandemic, wherein services were provided outside of typical clinical spaces (e.g., telemedicine, pharmacies, and urgent care). They suggested health systems could use similar approaches for the delivery of CPS. In fact, experts commented that expanding service locations may align with public expectations, as the pandemic has shifted ideas about how and where people can access care. Some also suggested group models for care delivery, particularly for those that require education or counseling activities. Experts also advocated for the use of patient navigators, though they acknowledged that such programs are heterogenous with no single model to implement. Finally, one key informant suggested that Kaiser Permanente's newly launched efforts around a "whole enterprise" approach to address health disparities may offer lessons on redesign for health equity. This includes common definitions and measures across the enterprise, clear benchmarks for success, data resources to monitor (e.g., health system and clinical data, patient-reported outcomes, patient and care delivery experience, and private sector data), and standardizing interventions without squashing local innovation.

> "It isn't enough to refer our patients out to underfunded social service agencies. We must step up and invest in the systems that directly support the social needs that our patients have."
>
> —TEP Member, Disparities

3.1.6 Invest in Social and Community Infrastructure

Determinants of Successful Community Partnerships

- Infrastructure supporting local CBOs
- Electronic platforms to facilitate linkages and partnerships
- Primary care engagement and mission-driven practices
- Longevity of partnerships between primary care practices and communities
- Delivery sites within communities
- Openness to providing care in "new" locations (e.g., COVID-19 vaccinations and testing in pharmacies)

Strengthen infrastructure to build and sustain public health and community partnerships. Experts identified the need for greater investment, with the goal of enabling more partnerships and sustaining services between healthcare systems and community entities. They described various models for partnerships with community-based organizations (CBOs), which could be selected or adapted based on community needs. They also described determinants of successful clinical-community partnerships (see callout box).

Expand telehealth and community health worker services. Experts proposed infrastructure investments to support expanding telehealth options and phone-based services to increase access for individuals in rural areas or without broadband.

Another suggestion included better support for the integration of paraprofessionals (e.g., community health workers, patient navigators) to address preventive care needs in the context of broader healthcare needs. Ultimately, additional funding, improved infrastructure, and strengthened community partnerships could increase the availability of social services and, consequently, improve access to CPS.

> "Current Diabetes Prevention Program payments do not account for the ongoing costs of community engagement, recruiting and enrolling participants, and the infrastructure needed to comply with payer and federal policies."
>
> —TEP Member, Public Health and Community Linkages

Address the need for long-term solutions. Current funding models and payment structures were cited frequently by experts as a problem for sustaining partnerships between health systems and public health or CBOs. Short-term funding to public health and CBOs poses a barrier to improving community infrastructure, developing a workforce, and sustaining programs. CBOs often rely on time-limited grants and face time constraints when undertaking large-scale changes to infrastructure. Instead, longer-term, reliable funding streams are needed to build infrastructure (e.g., technology) and sustain CBO workforces and programs. One TEP member cited the National Diabetes Prevention Program (National DPP) delivery for Medicare patients as an example; however, challenges with sustaining the ongoing costs for this program remain. Experts also identified several facilitators for successful CBO funding (see callout box).Finally, some offered a potential solution to address the issue of time-limited, short-term funding—a direct investment of capital for education, housing, and food—from large healthcare systems that serve as anchor institutions in their communities, as well as payers.

Facilitators of Community-based Organization Funding

- Multiple funding streams for collaboratives and CBOs
- Demonstrated cost savings from programs
- Working with payers that will allow invoices to be processed rather than claims
- Payers recognizing that CBOs are not clinical organizations but organizations providing services that impact health
- Funding that supports infrastructure for collaborations across stakeholders in primary care, public health, and CBOs (e.g., funding for Ryan White HIV/AIDS Program)

3.2 Include Community and Patient Voice in Healthcare System Design

Experts suggested that implementing person-centered care requires shifting the focus in healthcare systems from diagnosis and treatment of disease to meeting the health needs of people within the specific communities where they live and access healthcare. This shift aligns with the importance of understanding and considering health-related social needs and what matters most to people and their communities. Experts specifically noted that existing frameworks and models for primary care and public health integration identified from the scan seemed outdated and do not directly consider equity, patient voice, and community engagement/partnership.

In this section, we will explore expert's comments on the importance of community and patient voice in the design of healthcare systems and models of care delivery, though their comments were not restricted to preventive care or CPS specifically. They conveyed that integrating patient and community voice includes understanding a community and an individual's priorities in the context of their community and available resources and the cocreation of care delivery efforts. This section also discusses the importance of who is delivering care and where it is delivered, the impact of cocreation of care on providers, and the specific challenges of patient and community engagement in decisions about the de-implementation of services.

3.2.1 Consider Community Priorities and Context

Consider the underrepresentation of communities in decision making. Communities have traditionally been defined as geographic areas where people live. Experts shared that communities are more accurately characterized as active and diverse systems composed of many different cultures, needs, resources, and priorities. Community priorities have the potential to shape current and future healthcare systems and models. Experts shared that communities remain largely underrepresented in the health-related structures that exist today, including funding mechanisms, public health, primary care organizations, and healthcare systems. They shared that communities should be front and center of—if not leading and convening—partnerships and processes to inform health promotion models, including CPS delivery. Additionally, although community involvement is desirable to inform community needs, it is equally important to consider when community priorities may not align with commonly accepted processes and practices for CPS delivery. One TEP member discussed the pioneering work of Arthur Kauffman, who conducted listening sessions in New Mexico to understand key issues around community priorities and context.

Understand the need for trust. Experts shared that trust is both critical and central to any effort to successfully engage and partner with communities and understand their priorities and important contextual considerations. This trust must be earned, which can take time, but can be facilitated through trusted messengers. Additionally, trust must extend beyond those discussing priorities to those who are delivering care to community members. It is important that care be delivered in settings that are both trustworthy and accessible to community members. To ensure that communities and context are integrated into care delivery, the active engagement of community members must be included in the creation of care delivery, funding models, and interventions.

> "The NIH CTSA program and NCI have been particularly useful for studying/developing the science of effective community engagement and trust building that leads to improved health equity."
>
> —TEP Member, Public Health and Community Linkages

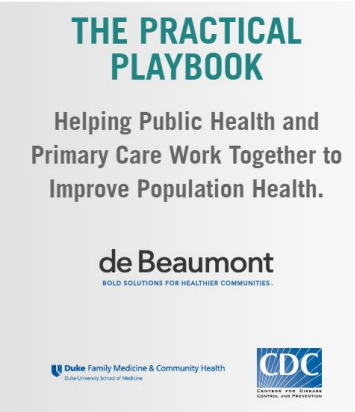
Avoid after-the-fact and disease-specific community engagement. Engaging community organizations in healthcare discussions is relatively commonplace, as are transdisciplinary teams that include representation from various community organizations and individuals. The environmental scans and experts discussed several examples of transdisciplinary teams, but when examined more deeply, many of these efforts often focused on improving delivery of existing care to individuals or on disease-specific care and not specifically on care related to the provision of CPS. Experts discussed how funding that is tied to a single disease/single condition, which is common for preventive services, is often based on funder priorities and that community representatives are engaged for their input on already designed interventions," which may or may not reflect the actual needs and priorities of the community.

3.2.2 Cocreate Care Delivery and Funding Models

Experts shared that although it may be easier to integrate feedback from community members into existing systems of care delivery, funding models, and interventions, **there is a need for systemic redesign using a process of cocreation with community members, patients, families, and caregivers.** They suggested that community partners should be treated as equal members of any team to ensure the development of health interventions is grounded in priorities. The involvement of community representatives will also elevate diverse community leaders, reflecting the communities served, and integrate patient perspectives into care delivery. Experts identified the Practical Playbook (see box) as a useful resource for establishing partnerships between public health, CBOs, and healthcare systems to increase access to CPS.

> "It's more than [integrating] 'programs'—it's a redesign."
>
> —TEP Member, Public Health and Community Linkages

Consider several examples of community engagement. Although it is not clear if these were a result of cocreation practices, the examples that follow were suggested for further examination. Although some of these examples may include preventive service delivery, they were not focused exclusively on preventive care.



https://www.practicalplaybook.org/

- Ongoing work within the State of California[21] that includes a broad set of community partnerships between local health departments, community-based organizations, and FQHCs to share and coordinate activities. This work builds on relationships established as a result of the COVID-19 pandemic and includes the use of contracts between health departments and community partners to formalize and compensate community partners for their engagement and contributions.
- The refugee resettlement program in Minnesota, implemented through the Minnesota Department of Human Services,[22] includes regional resettlement networks to support individuals and families during their transition. This includes access to Minnesota healthcare programs, if individuals are eligible; a healthcare navigator directory; health screenings; and other resources outside of healthcare that include employment, transportation, food, and education.
- The Pathways Community HUB model,[23, 24] which provides infrastructure for CBOs and allows them to work together to implement evidence-based interventions across populations or priorities. However, experts acknowledged that this approach would require infrastructure investments, and they were not aware of current funding for this work. It was reported that some foundations are supporting and implementing the Community Hub model in places like North Carolina. There are also examples of this approach incorporated into Medicaid demonstration projects to address health equity.
- The Diabetes Prevention Program (DPP), adapted by the YMCA of the USA and implemented locally to encourage weight loss and physical activity to prevent diabetes, uses a bidirectional relationship between the YMCA and providers.[25] The DPP received a Centers for Medicare and Medicaid Services Healthcare Innovation Award, and is now covered by Medicare.

Identify conveners for the cocreation of care delivery. Experts discussed that a critical component of cocreation is the identification of conveners within communities, sometimes referred to as the "community hub" model. They discussed the need for an intermediary organization or an anchor institution; these entities could serve as conveners and take on the task of listening to the community, coordinating the stakeholders, helping to write grants, facilitating data sharing, and providing infrastructure for smaller CBOs. They also suggested that it is important that these organizations be trusted by CBOs and the community yet able to work with federal and state organizations and healthcare systems. Securing sustainable funding from an organization to take on these responsibilities is often a significant challenge. Finally, experts suggested some key lessons learned about community engagement (see callout box).

Community Engagement Key Lessons Learned

- Understand that relationships between communities, stakeholders, and clinical partners at all levels are critical and require intentional planning, financial investments, and ongoing management support.
- Before taking action, work with community members to ensure that the need you seek to address exists and is a priority for that community. Even better, work with communities proactively to identify key issues and priorities that are important to them and then work to address those priorities.
- Identify local resources and strengths within the community, and leverage those resources and strengths, rather than focusing on resource limitations or challenges.
- Apply a systems-level approach to share resources brought by diverse stakeholders.
- Ensure diversity in teams so they are reflective of the entire community. This extends beyond race and ethnicity to include things like age, gender, geography, sociodemographic status, and education.
- Work with communities to find and engage with a trusted messenger who can help navigate the discussions and actions needed to cocreate a system that meets the mutual needs of community members and the health systems in place.
- Bring care delivery into the community to reduce common barriers related to access. This may include care delivery outside of primary care or other traditional healthcare offices to include places like pharmacies. The COVID-19 pandemic showed us that this is possible and beneficial to communities.
- Acknowledge prior errors by the medical community and recognize that community forgiveness for those errors may be necessary.

3.2.3 Design Care Delivery—Where and Who Matters

When considering the design of care delivery, experts shared that a one-size-fits-all approach may negatively impact the engagement of community members, community organizations and care providers. They highlighted key considerations about where care is delivered and who is delivering it.

> "I think we need to balance both the need for a relationship with a trusted person/provider, which is critical, but also not deny the health equity implications of having care and services convenient and nearby, particularly for marginalized communities. Imagine if we had not been able to get our COVID vaccines at our local pharmacy."
>
> —TEP Member, Innovative Delivery Models

Provide convenient access to care in one's community. Experts shared the importance of an ongoing, trusted relationship with a primary care clinician or team; however, the patient/consumer TEP representatives prioritized having affordable services that are based in the communities where individuals live. This allows people to access care more conveniently without barriers, including time and expenses related transportation. Experts shared that when services are offered in familiar or comfortable settings, people will be more likely to access them, increasing the uptake of CPS and other healthcare resources. They emphasized that this also contributes to the achievement of goals related to equity in the provision of such care. The COVID-19 pandemic demonstrated that care can be delivered in a variety of innovative places and under a variety of circumstances and that many community members are as comfortable accessing critical CPS, like vaccines, at their local pharmacy as they are at their local primary care provider's office. Some experts emphasized that offering appropriate CPS through places like pharmacies can also help to address the fact that many individuals do not have primary care providers.

> "Building out the CHW workforce. It is way too small to take on the task of integrating medical and social care as currently designed. Yet it has the capacity to offer real employment opportunities to many marginalized communities that are in need of work. There need to be more training programs/certification programs and ways to incorporate CHWs into the healthcare workforce as employees in order to do this work effectively and with the respect that these positions and populations deserve."
>
> —TEP Member, Disparities

Have a healthcare workforce that matches the community. Experts discussed the value and importance of having a healthcare workforce that reflects the community it serves, from those providing frontline services to patients to those in executive leadership positions. They emphasized the need for changes in

executive positions and that both governance and financial resources are needed to improve this critical representation in medicine and healthcare. They noted a growing body of evidence confirming that there is better patient health when marginalized groups are cared for by people with shared backgrounds and that it is important to have provider-patient dyads with shared lived experience.

Develop the community health worker labor force. Experts highlighted the importance and need for a strong and sustained community health worker (CHW) labor force to enable closer linkages with the community served by healthcare systems. CHWs may go by different names, including doulas, peer support specialists, patient navigators, health coaches, lay workers, and promotoras, and serve in a variety of roles such as conducting outreach to make connections with individuals and communities who are vulnerable, offering informal counseling or guidance on health behaviors, providing care coordination, advocating for individual and community health needs, and assisting people with enrollment in programs and benefits for which they are eligible. Given the variety of roles and responsibilities individuals in these positions are often asked to perform, experts had concerns that the current CHW labor force is too small to fully address patient's social needs because of their other responsibilities. They emphasized the need for more CHW training and certification programs, as well as the need for the work of CHWs to be considered as reimbursable services and not add-on, temporary positions often provided through external grants or funding.[i] Until such investments can be made, sexperts discussed the benefits of having family care partners and peer volunteers play a bigger role in both messaging and outreach specific to preventive service delivery.

Consider the impact of health system redesign on clinicians. Although experts emphasized the need for the community to contribute to the redesign of healthcare delivery systems, some were concerned that the resulting changes might impose an additional unintended burden on clinicians. This is especially true for primary care clinicians, who are reported to already be overwhelmed and underresourced to meet both the complex needs of today's patient population and the administrative burden created by existing payment systems. The utilization of technology (see section 3.3) was often discussed as a key area for potential innovation; however, there were complementary concerns about the burden that overlaying additional tools, resources, and systems could have on care delivery, especially if it could result in more fragmented care.

[i] In November 2023, the Centers for Medicare & Medicaid Services finalized the 2024 Medicare Physician Fee Schedule, which among other things includes new coverage for services involving community health workers to address health-related social needs that impact care.[26]

3.2.4 Engage Patients and Communities in De-implementation Decisions

Acknowledge historical context surrounding de-implementation. Discontinuing medical care and health services that are low value optimizes patient care and reduces healthcare waste. One of the environmental scans that we conducted to support this project found that the literature on de-implementation theories and frameworks is general and not specific to preventive services. Further, most are taxonomies and do not tell providers what to do or how to talk with their patients about services that they may have received at one time but will no longer receive due to changing circumstances (e.g., changes in guidelines or changes in a patient's health status that alters their net benefit). De-implementing CPS is not distinct from other low-value services, though experts commented that withdrawing preventive care is often viewed differently because it can be perceived as taking away something of value.

De-implementation

Defined as the abandonment of ineffective or harmful medical practices to mitigate risk, improve patient health, and contain healthcare costs.[27]

Although there is both scientific and practical value associated with de-implementation, the notion and language of "de-implementation" remains a scientific one, and experts suggested that it does not resonate with patients. Historical dissatisfaction with and mistrust of medical authorities has generated misconceptions that equate de-implementation with withholding necessary care. Public trust is further eroded by "medical reversals," the term that describes changes in recommendations that evolve based on new research or information. Experts shared that this mistrust could affect the physician-patient relationship and negatively impact a patient's willingness to come in for services they may need and the efforts they make to obtain them, further risking widening inequities in access to high-value services.

Avoid the perception of rationing. Relatedly, experts discussed challenges that may arise if patient messaging around de-implementation is interpreted as rationing or attempts at cost savings. Research in this area suggests that efforts to curb the use of low-value services result in less high-value care for some individuals and communities. Further, the definition of "low-value" service needs context. The medical community should consider what it means when it discusses the harms, benefits, and value of a service and what role communities play in those discussions. Experts suggested the work of the Value-Based Insurance Design Center at the University of Michigan[28] as one example of work occurring in this area that considers the impact of de-implementation on health equity.

> "[There are racial disparities with prostate cancer incidence.] When screening for prostate cancer is called a "low-value" service, for whom is it low value?"
>
> —TEP Member, Low-value and Harmful Services

Use alternative terms for communicating about de-implementation. Experts suggested that changing the language around de-implementation may be one critical first step. Alternative terminology that may be more person centered, such as "unnecessary treatment or care" or "harm reduction," may be beneficial. They suggested that the messaging around de-implementation is important and needs to be cocreated with communities (see section 3.2). The messenger of these concepts is also just as important as the message itself, and having a healthcare workforce that reflects the community (see section 3.2.3) may be one way to mitigate any confusion or concern. Experts strongly suggested that families and communities be authentically engaged in the codesign of tools and messages related to de-implementation.

Implement provider training for communicating about de-implementation. Similarly, experts suggested that providers would benefit from better training on and guidance about how to approach de-implementation with communities and patients. This includes the importance of discussing characteristics of individual, specific clinical preventive services as part of the context for de-implementation and why de-implementation might vary for different services. They discussed that there is a difference between harmful services and low-value services and that these should not be considered similar foci for de-implementation. Broader system approaches to validate with communities include disincentivizing routine, age-based screening and removing monetary and time pressures to do testing instead of having conversations about not doing testing.

3.3 Leverage Technology to Improve Preventive Service Delivery

Used effectively, technology has the potential to strengthen relationships between patients and care teams and to facilitate the delivery of CPS. Experts offered details about contextual and structural issues that impact how technology can be used to deliver CPS and important equity considerations that must be addressed to improve care.

3.3.1 Provide Technology to Support the Delivery of Preventive Services

Personalize individual care.

Experts suggested that technology can support delivery of CPS by helping individuals realize when a given recommendation might apply to them, assess the personal risks and benefits of the CPS, or aid in the delivery of a CPS. Broadly speaking, technology can facilitate greater personalization of guidelines, recommendations, and identification of patient needs and facilitate outreach to proactively

> "There is this idea of like semiautomatic personalization. We all ignore a spam email or a mass email, [but] it's a lot of work to handwrite or personalize something. How do we use technology to get us 80% of the way there and then personalize that last bit to be able to reach a patient where they are at?"
>
> —TEP Member, Technology

engage and empower patients to seek care when they are "due" for services. They also suggested that using technology to remind people that they are due for services may serve a dual purpose of enabling clinicians to spend time focusing on more in-depth conversations that support delivery of CPS. Several examples of such tools were described, including the colorectal cancer app from the American Gastroenterological Association[29] and health risk assessments such as the Health***e***Living Assessment from the Veterans Health Administration, which is integrated within its electronic health record (EHR).[ii] However, there are some limitations with these tools, which often require a computer or tablet to access and may only be available in English. Further, many were not developed with representation from diverse populations.

Experts noted that the next generation of technology has the potential to create personalized risk assessment tools that identify individuals in need of intervention. Going beyond current methods that rely solely on demographic factors like age and sex, these new tools could incorporate a wider range of predictive factors to personalize CPS more effectively. Such tools could personalize counseling and advice related to what matters to patients, their specific habits and lifestyles, their biochemistry, and their social needs. They also noted that when technology is used to help guide decisions about CPS, very clear risk/benefit information should be provided about the recommendations that follow from a health risk assessment. In addition, they stated that health risk assessments should incorporate social influences on health. Technology could be used to better understand what matters to patients and then help them to prioritize and personalize their preventive care. However, developing equitable and unbiased assessments requires unbiased data, which is currently difficult to obtain because of biases and inequities baked into current systems. If such assessments are not based on unbiased data, there is a risk of perpetuating or exacerbating disparities.

Improve coordination and communication. Experts pointed to several places where technology could support closed loop communication, reinforce team-based care, and support integration across multiple sites of care. More specifically, technology could facilitate asynchronous communication between care teams that are not physically in the same location and available at the same time to talk to each other. Tools like chatbots, which elicit information from people via simulated conversation, could be used to address some specific patient needs. In addition, they suggested that technology can support the receipt of CPS by providing patient education prior to service, facilitating transportation to appointments, or directing patients to nontraditional screening sites. CommunityRx was identified as an example of a technology designed for clinicians to connect patients with community resources for

> "We need to think about who the stakeholders are and then how is this technology allowing us to empower those stakeholders to be able to deliver the care?"
>
> —TEP Member, Technology

[ii] As of October 2022, the VA's Health***e***Living Assessment is no longer operational.

health and social needs like food and housing.[30] However, they noted that technology tools must be able to integrate into EHRs to support service coordination, including documentation and communication within and across sites.

Use technology to support population health management. In addition to supporting care for individual patients, experts suggested that technology could be a tool to support population health management and facilitate CPS delivery outside of clinical settings and at the community level. They cited several examples of technology platforms that could be leveraged to improve delivery of CPS, including Epic System's population health platforms,[31] Aledade's advanced analytics supporting an Accountable Care Organization model,[32] and b.well's consumer-facing platform that integrates data across platforms.[33] These examples all include CPS but are not specific to CPS. Despite these examples, experts suggested that to truly drive change and assess outcomes, there is a need for more data on community context and social data for use by clinicians. In addition, digital standards and architecture are needed to capture and understand an individual's preferences and values and document them in the EHR so that it is available to all providers that may see that patient.

Consider future technology directions. Experts described several promising uses of technology, including wearable health monitors and patient-generated data, as well as the use of machine learning and artificial intelligence (AI) to curate existing data. This would avoid manual data entry and reconciliation and enable the identification of signals from existing platforms and data. However, they noted that regulation and protections around AI and other technologies are critical to protect against racial, gender, and other biases that may be amplified through use of AI and machine learning on biased data. AI, machine learning, and other technologies have the potential to perpetuate and exacerbate existing disparities when used to identify individuals for resources (e.g., case management).

Although there is the potential for technology to streamline and create efficiencies in some areas, experts identified a new role for digital health navigators—someone within the health system who would help to manage the potential trove of patient-generated data that would result from some of these technological advancements. They raised the concern that if information isn't standardized within the EHR and if there are no protocols for reviewing the information, the information will likely not be used by the healthcare team.

Experts were optimistic about the potential of technology to improve access to and delivery of CPS and in the delivery of healthcare more generally. In the future, technology could be used to support care integration, apply advanced analytics to support data curation and analysis, and support the free flow of information across settings. There was optimism about the national deployment of Fast Healthcare Interoperability Resources standards, although there is a steep learning curve, and the benefits of the standards currently remain more of a promise than a practice.

3.3.2 Center Equity in Use of Technology

Be aware that technology could exacerbate or ameliorate disparities depending on how it is used. Experts suggested that current technology tools are not created with the needs of all patients in mind. Tools may be inaccessible to people with limited English proficiency, lower health and/or digital literacy, limited access to technology, or communication challenges. Although racial equity was a key concern across panels, they also noted that older adults and persons with disabilities may have special needs that should be considered to ensure equity. Furthermore, some tools may not be appropriate for a person's cultural context or may be insensitive to a person's social needs, resulting in more harm than benefit. For example, the requirement to have an email address or a Social Security number or other patient identifier to sign up to use an application or tool could be prohibitive for some individuals. Experts emphasized that the use of technology could worsen disparities if the needs of diverse populations are not considered in the technology's design and implementation or if there is an overreliance on electronic means to keep patients informed. Similarly, not all patients want to receive care through technology; patient preferences and values must be collected and understood to best meet needs.

> "The more fancy and advanced we become in the use of technologic tools to deliver healthcare, the higher the risk of creating or exacerbating health inequities and disparities."
>
> —TEP Member, Technology

The "digital divide" also poses challenges—individuals may be unable to access data sharing, apps, or telemedicine due to the lack of broadband or a desktop or tablet computer. Requiring access to certain types of technology or connectivity speeds can be problematic in advancing technology to support the delivery of CPS.

Be aware that digital health literacy is an important issue related to equity. Many patients may need considerable guidance on how to use and engage with their healthcare through technology. One patient/consumer TEP member suggested that classes or training to teach patients how to utilize the technology would be helpful. However, the clinician TEP members noted that teaching patients digital literacy skills is not reimbursable under current payment models and that provider payment for this work would be needed given the time it may take to educate patients. Despite these challenges, experts noted that health and digital literacy challenges can be bridged through training, patient decision aids, media, and other tools.

> **Digital Health Literacy**
>
> The knowledge and skills individuals need to successfully navigate digital health resources and electronic health records.

3.3.3 Address Technology Implementation Challenges

Experts emphasized that for technology to deliver on its promise, it needs to be effectively integrated into patient care so that it supports care delivery rather than distracting from it. A lack of effective technology integration could create an additional burden for providers and care teams rather than alleviating time and resource pressures. They gave examples of how two types of technology with the potential to support primary care, mobile apps and EHRs, faced several implementation challenges that may hinder progress.

Mobile device apps and technology tools have proliferated but often have little evidence supporting their use, are too numerous for patients or providers to sort through and may not be free or low cost to the patient. For apps and tools that are developed under grant funding, ongoing maintenance and updates require sustainable business models when funding ends to adapt to updates to hardware or software, or changes in the evidence base. Experts also pointed to the workforce challenge of integrating apps and tools into patient care in a timely way, as well as the need for staff skilled in data analysis, report development and generation, and dashboard development to monitor care.

> "The incorporation of these types of solutions into clinical practice is really quite hard, both from a workflow and a technical perspective."
>
> —TEP Member, Technology

For technology to be effectively integrated into primary care, experts noted that it must be linked to workflow, payment, and EHRs. Although the delivery of CPS can seem straightforward, patients and providers must finish multiple steps to complete a CPS. One TEP member cited the example of work to improve screening for colorectal cancer by offering the screening in alignment with USPSTF recommendations. Only a fraction of eligible patients were offered the screening, and at each step, only a small number completed the necessary following steps: obtaining an order for the test, scheduling the test, keeping the appointment, and adequately preparing for testing. Technology could be deployed to improve each step of this process to mitigate the risk of a step being missed rendering the service delivery ineffective.

3.3.4 Address Structural Health Information Technology Issues

The health IT infrastructure in the United States has evolved significantly in the last two decades. However, experts identified many health IT infrastructure and data needs that, while not necessarily specific to CPS, must be addressed to improve delivery of CPS, including governance, data integration across healthcare systems, and alignment of payment with desired clinician behaviors and outcomes.

Recognize the need for health IT governance. Across health systems and jurisdictions, there are challenges to data sharing and interoperability due to complex governance and regulatory

structures and requirements, including federal law (such as Health Insurance Portability and Accountability Act and 42 CFR Part 2, Confidentiality of Substance Use Disorder Patient Records), state law, and health system policies. Similarly, privacy and security are foundational requirements for any system that handles patient data. Within the context of person-centered care, experts discussed the need and value of clinical-community partnerships to deliver critical health and social support services. Through this bidirectional relationship, they noted the need for more real-time data sharing and solutions to navigate legal requirements around sharing patient information with community organizations.

> "The greatest challenge is not IT but capacity building. Some of that is with primary care, which is not funded nor accustomed to this side of the work, while local health depts are vastly underfunded and understaffed. CBOs likewise are thinly funded and staffed. The biggest need is building capacity—together."
>
> —TEP Member, Public Health and Community Linkages

Experts identified several other issues. Security, information management, and liability concerns remain whenever technology is being used to deliver care. Apps may be developed by start-ups that do not have the time, resources, or experience to recognize what types of data protections are needed or what legal requirements their app must comply with to be used in a clinical setting. Healthcare systems may also be reluctant to add too many outside apps or services because of the liability concerns that it can introduce. However, once an organization chooses to collect patient information, there is an ethical obligation for those organizations to have a process to ensure that information is seen, reviewed, and used by only those approved to access that information.

Integrate data across the care delivery spectrum. Experts commented that although technology has the potential to present a holistic picture of a person's health and care, the U.S. care delivery system is fragmented, and patients often receive care across multiple locations, providers, and health systems. Each system will usually have its own patient portal, which may or may not be interoperable with another health system's, even if the systems use the same EHR platform. The result is that patients often need to register for, manage, and access multiple portals across their healthcare, which increases burden and ultimately reduces the benefits of this technology. Experts suggested that streamlining patient portals to enable patients to have a single patient view to reduce the need for multiple portals and potentially increase the use of this technology. Further, alignment is needed to ensure patient-reported information is more easily ported from one care provider to another or from a CBO to a healthcare provider. Reducing fragmentation of healthcare data from both the person and the system perspective is needed.

Align payment models and incentives. Payment challenges were cited by experts as a barrier to provider use of technology for delivering CPS. In some instances, financial incentives are well aligned (e.g., cancer screenings) and it is easy to improve screening rates because the health systems have a financial incentive to do so (e.g., follow-up diagnostic evaluation and treatment for patients who are diagnosed with cancer). In other circumstances, financial incentives are not well aligned. For example, only certain providers can bill for telehealth services and how these services are reimbursed depends on licensing, state and federal policy, and an institution's own policies. Providers are not reimbursed for time spent dealing with technology, accessing and reviewing patient-generated health data, or supporting patients with limited digital health literacy. TEP members cited the example of using two-way SMS to triage patient needs or one-way SMS to get responses to specific questions to feed into the EHR. Depending on how the encounter is structured, these activities may or may not be reimbursable. Experts commented that changes to payment models would be needed to reimburse providers for this work, but that process is slow moving and can take multiple years to accomplish.

> "If we're going to move to virtual and value-based care models, they need to be redesigned. We can't just continue hanging things off fee-for-service models … especially in preventive care and expect that we're going to suddenly get better outcomes."
>
> —TEP Member, Technology

Section 4: Discussion

4. Discussion

This section includes our reflections on the relationships among the three organizing themes and broader efforts to strengthen primary care. In addition, this section describes opportunities for the Agency for Healthcare Research and Quality (AHRQ) in several areas, including the digital health domain, supporting federal and community partnerships, supporting research on the individualization of preventive care, de-implementation of low-value clinical preventive services (CPS), and measurement and evaluation approaches for person-centered delivery of CPS.

4.1 Reflections on Findings

AHRQ designed this project to collect information from experts through the lenses of five different topics: technology, innovative delivery models, public health linkages, disparities, and de-implementation of low-value or harmful services. We heard common sentiments across these topics that we were able to broadly categorize into the three organizing themes discussed in the previous section.

- Transition to holistic healthcare delivery and financing models
- Include community and patient voice in healthcare system design
- Leverage technology solutions to improve preventive service delivery

Although we planned each technical expert panel (TEP) and related key informant interview (KII) to focus specifically on the delivery of CPS in adults, experts suggested that preventive care should encompass services beyond those defined by U.S. Preventive Services Task Force and Advisory Committee on Immunization Practices recommendations. They also contended that challenges with the equitable provision of CPS are simply a reflection of larger, pervasive challenges in the primary care and healthcare systems in many communities.

Experts emphasized the importance of ensuring community and patient voice in the design of models intended to improve CPS delivery, but such models may not be successful or sustainable in the absence of an infrastructure that supports healthcare and social needs for all. Health equity must be a conscious and concerted effort by clinicians and healthcare systems and that necessitates a holistic approach—across care continuum and across sectors of society (e.g., community and other partnerships)—to address the social drivers of inequities. Further, leveraging technology solutions to improve equitable CPS delivery must be done carefully to avoid worsening disparities among communities or individuals. Data driven approaches in healthcare should ensure unbiased, representative data,

Key Recommendation

Addressing equity should be a stronger focus of integration between primary care, public health, and communities for all aspects of healthcare, including clinical preventive services.

and technologies explicitly used to address disparities must not perpetuate or exacerbate existing disparities (e.g., ensuring digital health literacy and general health literacy).

Much of what we heard from the TEPs is aligned with the concept of proportionate universalism.[34] Proportionate universalism is the concept that to reduce inequalities in health and well-being, universal services must be provided at a scale and intensity proportionate to the degree of need. This often means that those most disadvantaged will require more effort and resources because of differences in environmental and individual resources. Equal receipt of services and equal care are necessary but not sufficient to address health inequities. Equity involves going beyond equality in care delivery.[35]

Experts highlighted a tension between federal agency goals of maximizing population health through the delivery of all recommended CPS to all eligible adults and the principles of person-centered care, which focus on helping people determine which CPS to receive based on their values, preferences, and personal risk factors. This tension is the result of our current system and policies, which do not address individual needs and priorities. Person-centered approaches to the delivery of CPS challenge current quality measurement and health system accountability paradigms that incentivize the provision of selected preventive services (typically the ones easiest to measure) regardless of whether those services are what matter most to a person. To paraphrase one TEP member, engaging in preventive care is a luxury for many people—it only happens when other basic needs are met and if it doesn't require undue hardship. Holistic healthcare delivery and financing models that leverage the use of technology and paraprofessionals within health systems, communities, or both may offer a way to ensure that all persons are offered the information they need to make decisions about receiving CPS and the assistance they need to conveniently access those services, thus maximizing population health goals.

Key Recommendation

The goal of person-centered preventive healthcare should be to help people determine which clinical preventive services to receive based on their values, preferences, and personal risk factors.

Given the increasing demands on healthcare providers and a pressing need to treat acute conditions and manage chronic disease, alternative CPS delivery settings (e.g., pharmacies), providers (e.g., community health workers), and technology (e.g., mobile health applications, telehealth) may offer opportunities to bridge existing gaps in delivery as well as bolster person-centered preventive care by providing CPS at the right time and place of need. Although providers and systems could continue to seek ways to strengthen their capacity to deliver CPS to individuals in the context of an ongoing, longitudinal relationship, an expanded view of delivery settings and collaborative opportunities, especially if these are identified in tandem with the close examination of social and ecological drivers of and barriers to the uptake of CPS, may constitute a more efficient and effective solution.

4.2 Reflections in Context

Many of the expert's comments align with recommendations in the National Academies of Sciences, Engineering, and Medicine (NASEM) report on Implementing High-Quality Primary Care.[15] For example, the NASEM report calls for a wider variety of settings and modalities for care delivery and a stronger community orientation for providing primary care. We heard many TEP suggestions for broadening the types of settings and staff that can provide CPS, either in whole or as part of a collaboration with primary care systems. And the themes we identified regarding the need to leverage technology solutions to make CPS more accessible and convenient to more persons are consistent with the NASEM report's identification of digital health as a facilitator for high-quality primary care.[15] Several implementation objectives identified in the NASEM report are also highly relevant to the delivery of CPS, including paying for primary care teams to care for people rather than paying doctors to deliver services, ensuring that high-quality care is available to every individual and family in every community, and designing information technology that serves the patient, family, and care team.[15] A retrospective analysis published in November 2023 (after our TEPs were completed) examining primary care visits over the period 2001–2019 demonstrated an increased focus on preventive services during that time frame.[36] The study found the greatest increases occurred among Medicare beneficiaries and in the years following passage of the Affordable Care Act in 2010, which authorized annual wellness visits for Medicare beneficiaries.[36] This demonstrates the significant impact that changes in reimbursement policy can have on clinical priorities and preventive care delivery.

Regardless of setting or provider, care delivery strategies must be grounded in a shared vision that is informed by current evidence and person centeredness. There is a need to identify innovations and efforts that have been successful in real-world settings, even if they have not been evaluated or disseminated broadly (e.g., quality improvement activities, clinical-community collaborations). The broad range of conditions covered by existing evidence-based CPS and the numerous factors that characterize the current U.S. healthcare system, as well as the different priorities and roles among those who are crucial to effective CPS delivery (e.g., clinician, health system, payer), contribute to the complexity of the topic. Although data from rigorously designed and conducted research studies can be useful, such studies are not always feasible to conduct. To ensure that recommended services are offered to every person at the right time and that resources are available to support downstream needs, a systems approach may need to include a variety of strategies to address different contexts of service, individual needs, and system demands.

Lastly, as this report was being finalized in late fall 2023, the Biden-Harris Administration's Domestic Policy Council released the *U.S. Playbook to Address Social Determinants of Health*.[37] This document lays out actions for federal agencies to improve social drivers of health and increase coordination and reduce separation of health services from other types of services. The three pillars of the playbook include (1) expansion of data gathering and sharing, (2) support for flexible social needs funding, and (3) support for backbone organizations. The feedback from across the TEPs we engaged was very much aligned with these pillars.

4.3 Opportunities for AHRQ

In this section, we describe opportunities for AHRQ identified by experts with respect to supporting the equitable delivery of person-centered preventive healthcare. We first focus on opportunities that are most aligned with AHRQ's core competencies in the areas of health system research, practice improvement, and data and analytics. We then describe opportunities that build on existing partnerships or that may require new collaborations with other entities, such as other federal agencies, state or local governments, health systems, and communities.

4.3.1 AHRQ-Aligned Opportunities

In this section, we discuss opportunities that most align with AHRQ's core competencies. These include advancing digital healthcare, measurement and evaluation; and research in personalizing preventive care, including research specific to the de-implementation of low-value services.

Advance digital healthcare. AHRQ can support health technology projects to enable the hallmark of person-centered care—the individualization of care and patient priorities in the context of an overall healthcare plan. First, AHRQ could consider funding projects focused on promoting patient understanding of and engagement in CPS delivery through the emerging technology of artificial intelligence–assisted chatbots and the vetting of health apps designed to facilitate decision making about receiving CPS and facilitate the delivery of CPS where applicable. Second, AHRQ could consider research on risk assessment instruments with tools for risk communication in electronic health records (EHRs) to facilitate shared decision making to determine appropriate care, including de-implementation of low-value CPS. Third, AHRQ could consider additional research on approaches for collecting standardized data related to patient values, preferences, satisfaction, and technology to facilitate the inclusion of these data into individual patient care, panel management, and a new generation of quality measures. This could build on existing work AHRQ has recently supported related to developing a framework for the incorporation of patient preferences into the person-centered clinical decision support tools.[38]

AHRQ-supported projects could also examine how technology may fortify healthcare system and community linkages, highlighting the processes that best enable data sharing between these foci of preventive care. Projects could also refine and evaluate a new staff role suggested by TEP members—digital health navigator—who would provide patient-focused guidance on navigating the multitude of digital health tools and help care teams to integrate patient-generated data into existing EHRs or clinical decision support tools.

Finally, AHRQ could connect with additional organizations that use technology to improve health outcomes, such as the Connected Health Initiative, NODE.Health, and the Health Equity Consortium.

Evolve measurement and evaluation frameworks. AHRQ could fund work and collaborate with other organizations on new measurement strategies and alternative evaluation frameworks for preventive service delivery, particularly through the lens of health equity (e.g., National

Committee for Quality Assurance's work to standardize health equity quality measurement[39]). As the lead of the annual National Healthcare Quality and Disparities Report,[40] AHRQ has an opportunity to evolve the measures used to monitor healthcare quality across diverse populations. Research on person-centered delivery of preventive care requires advancing quality measurement beyond the receipt of CPS alone. Experts suggested developing quality measures that are related to the use of shared decision making, reducing racial disparities, addressing the social determinants of health, and focusing on person-centered outcomes like values-concordant decisions, patient empowerment, and satisfaction. Such measures may reduce the incentive to focus only on the delivery of services to meet current quality measures.

Furthermore, AHRQ could continue to support projects that use alternative evaluation frameworks other than trial designs may result in data that are more relevant to delivering person-centered care. Quality improvement, patient safety, implementation science, and shared decision making frameworks may serve as more useful study designs for advancing work in this area. For example, building on the EvidenceNOW initiative to help small- and medium-sized practices implement CPS related to cardiovascular health.[41] Similarly, further exploration of the current rudimentary de-implementation frameworks may facilitate research on how to approach de-implementation strategies specific to preventive services.

Advance person-centered care research. Experts identified several research opportunities for advancing person-centered care. One area for research is on models emerging from the disruption of service delivery introduced by the COVID-19 pandemic. During this time, several alternatives to traditional models of care emerged, such as public health and community-driven testing and vaccination, the development of registries and attempts to integrate with EHRs, and the incorporation of telemedicine into daily practice. AHRQ could learn from this growing research base and replicate these models with respect to preventive services, adapting models with the input of local communities.

More broadly, evaluating and comparing new, person-centered models of preventive care with traditional care could help AHRQ determine the effectiveness of interventions that increase community engagement, involve family, and utilize transdisciplinary teams. Adapting such models to different populations and settings with the input of community and patient stakeholders will be critical to reducing health disparities.

The recruitment of individuals who are more representative of the race and ethnicity, disabilities, gender identify, geography, and economic diversity found in the United States is critical to generating useful person-centered care research. One strategy for individualization of preventive care mentioned by the experts, the use of risk assessment tools, particularly requires unbiased data from representative populations to ensure that these tools are validated and calibrated for different populations.

Develop implementation and de-implementation research. AHRQ (and others working in this space) could consider implementation factors based on the resources of a setting using the World Health Organization guidelines for implementation research in the prevention of noncommunicable diseases as a model.[42] These guidelines offer recommendations for how to

make implementation research applicable to the way healthcare is delivered in various settings. In particular, experts emphasized the need for dissemination of evidence-based strategies to underresourced communities that includes collaborating with community members to build the supports needed to provide services.

AHRQ also has an opportunity to further the field of de-implementation research, particularly with respect to CPS, including identifying appropriate terminology for discussing de-implementation and low-value care that does not alienate communities or disrupt the patient-provider relationship. Identifying specific services for de-implementation and developing robust quality performance measures for overuse could mature the field of de-implementation research. However, careful consideration is needed to understand how de-implementation interacts with health equity. Some communities may not perceive low-value services as such, and efforts to curb use might result in less engagement with the healthcare system overall, including for necessary care. A thorough evaluation of how de-implementation impacts care on marginalized communities is warranted. Lastly, research into patient incentives and disincentives could improve the receipt of high-value CPS and reduce the use of low-value services.

4.3.2 Broader Opportunities

Broader opportunities for AHRQ include supporting collaboration and partnerships with other entities, such as federal agencies, state and local governments, health systems, or community organizations. This may include building shared data infrastructures or playing a leading role in centering health equity in cross-agency and cross-sector initiatives.

Support federal partnerships. Transformation to person-centered preventive healthcare requires collaboration with federal partners. Collaboration with CMS (and other payers) could address funding models to continue to develop infrastructure and reimbursement strategies for providing holistic healthcare that includes preventive services. The recent addition of patient navigation and community health worker services to the 2024 Medicare Physician Fee Schedule is an example of a policy that moves the system toward a more holistic model.[26] Continued support for the Department of Health and Human Services Health Literacy Workgroup in coordination with the Office of Disease Prevention and Health Promotion can continue to advance the science of health literacy to support engaged health consumers.[43] Collaboration with other federal partners on national health objectives (i.e., Healthy People 2030).[44]

Support community partnerships. Involving community members in decision making about agency investments may result in healthcare systems that can provide more person-centered care. AHRQ could increase use of existing models for community engagement and trust building and continue its support for community listening sessions, such as the one supported in 2022 on the topic of patient safety,[45] to better understand how to adapt successful strategies to different communities. Additionally, sustainable funding models for engaging and enhancing community partnerships are necessary, particularly for smaller organizations that may have less ability to access traditional funding and for developing evaluation approaches for rapid cycle processes.

4.4 Report Limitations

This report has several limitations. The environmental scans that we conducted to inform TEP discussions were focused on U.S. settings and were not comprehensive systematic reviews of the literature. Publication delays from the disruption caused by the COVID-19 pandemic may mean that newer strategies and models for CPS borne out of necessity during the pandemic may not be represented in the literature we identified. We also note that the published literature may be biased toward work that receives dedicated research funding, uses specific study designs, has positive findings, or focuses on disease-specific outcomes.

By design, TEPs for each topic were limited to 12 to 15 people and we conducted an average of four key informant interviews per topic. Although we aimed for a diverse panel in terms of occupation, organizational affiliation, geographic location, gender, and racial/ethnic group, the input from these TEPs and interviews cannot fully represent the diversity of opinions for clinicians, researchers, policymakers, payers, patients, or caregivers in the United States. We strove to elicit the widest spectrum of input from participants, and as such, the comments expressed were not necessarily consensus views.

4.5 Conclusions

Although we identified some interventions aimed at increasing the delivery of clinical preventive services, experts stressed the need for more holistic approaches to address health disparities that include addressing social drivers of health. It is necessary to transition to holistic models of healthcare delivery and financing that incorporate community and patient voices in system design and that leverage technology-based solutions. Promoting equity requires expanding focus beyond clinical settings to encompass public health infrastructure and community engagement. Ultimately, the experts recommended that person-centered preventive care should empower patients to make informed decisions about preventive services based on their values, risks, and preferences—not apply one-size-fits-all standards. This more individualized approach tailored to individual needs and context is essential for reducing gaps in preventive services across diverse populations to maximize population health.

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Appendices

Methods Appendix

In this appendix, we provide additional details regarding the methods we used to convene the Stakeholder Panel, conduct five environmental scans, convene five technical expert panels (TEPs), and engage with key informants. The methods described in this appendix are overarching; please see the **Topic-Specific Appendices**

for methods specific to each topic.

M.1 Stakeholder Panel

The role of the Stakeholder Panel was to provide guidance to the Agency for Healthcare Research and Quality (AHRQ) and the RTI-led team throughout the course of the 18-month project. This included:

- Providing overall project guidance
- Responding to questions regarding the scope of the environmental scans
- Suggesting individuals who can serve as key informants for the various topics
- Serving as a resource when recruiting and convening the TEPs
- Serving as TEP members, when appropriate and feasible
- Reviewing and providing thoughtful feedback on the final report by a subset of Stakeholder Panel members

M.1.1 Stakeholder Panel Recruitment

We identified 138 potential Stakeholder Panel members from a core set of organizational types (**Table M-1**). We considered factors such as role, organization type, clinical or specialty area, gender, geography, and self-identified racial or ethnic minority when compiling the list of potential TEP candidates. After AHRQ approved the list of candidates, we recruited potential members via email over several weeks in waves until 30 people agreed to participate; the list of Stakeholder Panel members is provided in **Table M-2**. We offered Stakeholder Panel members a $400 honorarium for their participation on the panel.[‡]

Table M-1. Types of Organizations Represented on the Stakeholder Panel

Organizational Type	Number Represented on Panel
Federal agency	7
Health information technology	2
Healthcare system	5
Research/academia	0*
Nonprofit organization/patient or consumer organization	2
Healthcare payer	2

[‡] Federal employees who participated as Stakeholder Panel members were not eligible for the honorarium.

Organizational Type	Number Represented on Panel
State policy/public health agency	2
United State Preventive Services Task Force (current or former member)	2
Community Preventive Services Task Force (current or former member)	1
AHRQ Primary Care Learning Community	7

* Individuals selected often represented multiple types of organizations; we identified several people who represented both research and academia along with another organizational type. Therefore, we did not recruit anyone solely from research/academia.

Abbreviations: AHRQ=Agency for Healthcare Research and Quality.

Table M-2. Stakeholder Panel Participants

Name	Organization	Role	Type of Organization
Chethan Bachireddy, MD, MSc, FACP, AAHIVS	Harris Health	Chief Health Officer	Healthcare system
Nina Birnbaum, MD	Blue Cross Blue Shield Association of California	Medical Director, Health Transformation Acceleration	Payers
Maureen Boardman, MSN, FNP-C, FAANP	Little Rivers Health Care; Dartmouth Geisel School of Medicine	Director of Clinical Quality; Clinical Assistant Professor of Community and Family Medicine	AHRQ Primary Care Learning Community
Stacie Carney, MD	OCHIN—nonprofit innovation center providing health IT support services	Chief Medical Information Officer	Health information technology
Alison Cuellar, PhD	George Mason University	Vice Chair; Professor	Community Preventive Services Task Force (current/former member)
David Dietz, EdD, MSW, MHSA	Division of Healthcare Delivery, Innovation Center, Centers for Medicare & Medicaid Services	Director	Federal agency
Leslie Doroski McDowell, DNP, ANP-BC, RN	Wake Forest University/Northwest Area Health Education Center	Quality Improvement/Curriculum Development	AHRQ Primary Care Learning Community
Shannon Dowler, MD, FAAFP, CRE	State of North Carolina Department of Health and Human Services; Medicaid	Assistant Secretary for Health Access; Chief Medical Officer NC Medicaid	Payers
Stacy Garrett-Ray, MD, MPH, MBA	Ascension	Senior Vice President and Chief Community Impact Officer	Healthcare system
Howard Haft, MD, MMM, CPE, FACPE	American Heart Association Ambulatory Quality Committee, formerly with the Maryland Department of Health	Senior Advisor	State policy/public health agency

Name	Organization	Role	Type of Organization
R. Scott Hammond, MD, AAFP	Colorado Center for Primary Care Innovation	Board President and Co-Founder	AHRQ Primary Care Learning Community
Tom Keane, MD, MBA (1st meeting) **David Hunt, MD, FACS (2nd meeting)**	Office of the National Coordinator for Health Information Technology, Department of Health and Human Services	Senior Advisor (TK) Medical Director (DH)	Federal agency
Jane Kim, MD, MPH	Veterans Health Administration, National Center for Health Promotion and Disease Prevention	Executive Director of Preventive Medicine	Federal agency
Alex Krist, MD, MPH	Virginia Commonwealth University	Professor and Co-Director, Ambulatory Care Outcomes	USPSTF (current/former member)
Nivedita Mohanty, MD, MS	Alliance Chicago	Chief Research Officer	AHRQ Primary Care Learning Community
David M. Murray, PhD (1st meeting) **Robert McNellis, MPH, PA (2nd meeting)**	National Institutes of Health, Office of Disease Prevention	Associate Director for Prevention (DM) Senior Advisor (RM)	Federal agency
Shilpa Patel, PhD	Center for Health Care Strategies	Associate Director for Health Equity	State policy/public health agency
Deborah Porterfield, MD, MPH	Formerly, Department of Family Medicine, UNC-Chapel Hill and North Carolina Department of Health and Human Services; currently, Office of the Assistant Secretary for Planning and Evaluation	Associate Professor; Medical Consultant; Medical Officer	Research/academia; State policy/public health agency; Federal agency
Paul Reed, MD, RADML U.S. Public Health Service	Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services	Deputy Assistant Secretary for Health	Federal agency
Matthew Sakumoto, MD	Sutter Health	Chief Medical Information Officer, Virtual-First Primary Care Physician	AHRQ Primary Care Learning Community
Julie Schilz, BSN, MBA	Primary Care Development Corporation	Senior Director	AHRQ Primary Care Learning Community
Louise C. Walter, MD	University of California San Francisco	Professor and Chief of Division of Geriatrics	AHRQ Primary Care Learning Community
Scott Young, MD	Kaiser Permanent Care Management Institute	Executive Director	Healthcare system
Judy Zerzan-Thul, MD, MPH	Washington Health Care Authority	Chief Medical Officer	Healthcare system
Anonymous	Major U.S. payer	Chief Medical Officer	Healthcare payer
Anonymous	U.S. cloud solutions company	Solutions Architect	Health information technology

Name	Organization	Role	Type of Organization
Anonymous	U.S. health IT nonprofit organization	Medical Informaticist	Health information technology
Anonymous	Centers for Disease Control and Prevention	Public Health Policy Expert	Federal agency
Anonymous	Health Resources and Services Administration	Senior Advisor	Federal agency
Anonymous	Nonprofit organization focused on patient-centered care advocacy	Chief Operating Officer	Nonprofit organization
Anonymous	U.S. university	Associate Dean for Diversity, Equity, and Inclusion	USPSTF (current/former member)

Abbreviations: USPSTF=U.S. Preventive Services Task Force; U.S.=United States.

M.1.2 Stakeholder Panel Meetings

Prior to each Stakeholder Panel meeting, we worked with AHRQ to develop a detailed agenda, meeting pre-reads, and a presentation slide deck. The first Stakeholder Panel meeting was held in September 2022, the second meeting was held in June 2023, and the third meeting is planned for spring 2024. We conducted each meeting virtually using Zoom and each meeting lasted 2 hours. We offered Stakeholder Panel members a mechanism for providing additional feedback or suggestions for TEP members or key informants via an online form following each meeting. We developed meeting summaries from each Stakeholder Panel meeting**.** To provide updates between meetings, we developed and distributed a quarterly newsletter with brief project updates. Finally, we invited three Stakeholder Panel members and one patient/consumer representative to review and provide feedback on a draft version of the project's final report.

M.2 Environmental Scan Overarching Methods

The goal of the environmental scan for each topic was to provide TEP members with a broad overview of the existing literature and other relevant background information. Each scan was conducted over approximately 12 weeks by a team consisting of a scan lead, an information specialist, one or more research analysts, one or more topic-specific experts, an implementation science expert, and editors.

M.2.1 Scoping of the Scan

Each scan began with the development of the topic scope and guiding questions to focus the search strategy. We sought input from the Stakeholder Panel and AHRQ staff, and for some topics, we conducted one or more key informant interviews to provide input to assist with scoping.

M.2.2 Searches and Article Selection

For each scan, we conducted bibliographic database searches (in 2 or 3 databases) along with grey literature and website searches. Search terms included those related to clinical preventive services and person-centered care, as well as topic-specific terms. Searches were limited to English language materials only and to studies published after 2010 (the passage of the Affordable Care Act, which included coverage for certain clinical preventive services). With some topic-specific exceptions, searches and article selection were limited to U.S. settings, but information from settings outside of the United States was sometimes included if it appeared in the search and was considered highly relevant. (Specific search strategies can be found in the **Topic-Specific Appendices**

.)

We used a single person to screen titles and abstracts from our searches for relevant articles and information, with team discussions when needed. Full-text articles for relevant titles and abstracts were retrieved and reviewed. We prioritized the following article types for selection: systematic evidence reviews, narrative reviews and commentaries that placed evidence of effectiveness into a historical and present-day real-world context, as well as quality improvement studies and multistate demonstration projects to inform an understanding of implementation barriers and facilitators.

M.2.3 Information Gathering and Synthesis

From the selected articles and data sources, we gathered information relevant to each scan's guiding questions and synthesized the major findings into themes using narrative and tabular formats with specific examples wherever possible. We also highlighted evidence gaps. The environmental scan team then worked closely with the team leading the TEP to develop a discussion guide for the panel.

M.3 Technical Expert Panel Overarching Methods

We recruited participants and facilitated a TEP meeting for each of the five topics included in this project.

M.3.1 Technical Expert Panel Recruitment

We recruited at least 10 experts and 2 patient representatives for each TEP. We developed an initial list of about 30 potential TEP candidates for each topic based on recommendations from AHRQ, the Stakeholder Panel, information from the topic's environmental scan, and our own knowledge about experts in the topic area. We considered factors such as role, organization type, clinical or specialty area, gender, geography, and self-identified racial or ethnic minority when compiling the list of potential TEP candidates. After AHRQ approved the list of candidates, we recruited potential members via email over several weeks in waves. We offered participants

a $400 honorarium for their participation on the TEP.[§] A list of people who participated on each TEP is in the **Topic-Specific Appendices**

.

M.3.2 Technical Expert Panel Meetings

Prior to each TEP meeting, we worked with AHRQ to develop a detailed agenda, meeting pre-reads, and presentation slide deck. We conducted each meeting virtually using Zoom and each meeting lasted 2 to 3 hours. Each TEP meeting was 2 to 3 hours long and was conducted virtually using Zoom. Most of the meetings also utilized the XLeap virtual meeting platform, which allows meeting participants to respond to important discussion questions during and after the meeting. It also allows for a virtual dialogue between participants, who they can view and respond to what other members share in real time. This tool was used to ensure that all TEP members had an opportunity to share their thoughts and fully participate in the meeting. We recorded all TEP meetings via the Zoom platform and we developed meeting summaries based on the Zoom recording, Zoom chat transcript, and XLeap contributions (if the platform was used) to summarize the TEP discussion.

M.4 Key Informant Interviews

For each topic, we identified between three and four potential key informants. In some cases, key informants had originally been recruited for the TEP but had scheduling conflicts that precluded their participation on the panel. In other cases, key informants were consulted prior to the TEP meeting to inform the topic scope or scan. However, most commonly, key informants were interviewed after the TEP meeting to obtain additional information or details around an issue or specific example that surfaced at the TEP meeting. After AHRQ approved the list of key informant candidates, we invited potential key informants via email. We conducted key informant interviews (KIIs) via Zoom and each interview lasted no longer than 60 minutes. We developed a tailored, semi-structured interview guide that consisted of four to six questions with additional probes. Each KII was recorded, and key findings were added as an addendum to each TEP Meeting Summary at the completion of all KIIs.

[§] Federal employees who participated as TEP members were not eligible for the honorarium.

Topic-Specific Appendices

A. Technology

Short Topic Title	Topic Description
Technology	Identify how technology can be leveraged or developed to deliver equitable clinical preventive services (CPS), including personal health records and patient portals, telehealth, and tools for facilitating shared decision making.

A.1 Environmental Scan Data Sources and Searches

A search strategy was developed in consultation between the evidence scan lead and an information specialist by building upon a 2022 scoping review by Willis and colleagues[46] that focused on digital health interventions in primary care settings and by examining the indexing of known relevant articles. The information specialist searched PubMed from the years 2020 forward. Grey literature was identified through additional supplemental searches of PubMed and Google Scholar, HealthIT.gov, Agency for Healthcare Research and Quality's (AHRQ's) Digital Healthcare Research Program and Evidence-based Practice Center reports, and reference lists from recent review articles and editorials. All citations were managed and deduplicated using EndNote 20 (Clarivate Analytics).

Search Number	PubMed Query	Filters	Results
1	"primary health care"[MeSH] OR "Physicians, Primary Care"[MeSH] OR "primary care"[tiab] OR "Family Practice"[MeSH] OR "family practice"[tiab] OR "Physicians, Family"[MeSH] OR "family physician*"[tiab] OR "family medicine"[tiab]		343,256
2	"digital health"[tiab] OR "digital health intervention"[tiab] OR "digital behavior change"[tiab] OR "digital behaviour change"[tiab] OR "digital health technology"[tiab] OR "Electronic Health Records"[MeSH] OR "electronic health record*"[tiab] OR "personal health record*"[tiab] OR "electronic medical record*"[tiab] OR "EMR"[tiab] OR "EHR"[tiab] OR "Health Records, Personal"[MeSH] OR "Patient Portals"[Mesh] OR "patient web portal*"[tiab] OR "patient web-portal*"[tiab] OR "patient portal*"[tiab] OR "web portal*"[tiab] OR "mobile technolog*"[tiab] OR "Telemedicine"[Mesh] OR "telemedicine"[tiab] OR "telehealth*"[tiab] OR "mobile health"[tiab] OR "mHealth"[tiab] OR "eHealth"[tiab] OR "m-Health"[tiab] OR "mobile-health"[tiab] OR "telecommunication*"[tiab] OR ((app OR application*) n3 (smartphone* or smart-phone or mobile* or phone*)) OR "Decision Support Systems, Clinical"[Mesh] OR "clinical decision support"[tiab] OR "decision support system"[tiab] OR "Health Information Exchange"[MeSH] OR "health information exchange*"[tiab] OR "electronic health information"[tiab] OR "electronic health communication*"[tiab] OR "health information interoperability"[MeSH] OR "interoperability"[tw] OR "patient monitor*"[tiab] OR "wearables"[tiab] OR "activity monitor*"[tiab] OR "sensor*"[tiab] OR "Artificial Intelligence"[Mesh] OR "artificial intelligence"[tiab] OR "machine intelligence"[tiab] OR "computational intelligence"[tiab] OR "Machine Learning"[MeSH] OR "machine learning"[tiab] OR "machine-learning"[tiab] OR "natural language processing"[tiab] OR "neural network*"[tiab] OR "quantified self"[tiab] OR "connected health"[tiab] OR "big data"[tiab] OR "gamification"[tiab] OR "social media"[tiab] OR "health 2.0"[tiab] OR "internet of things"[tiab] OR "IoT"[tiab] OR "IOT"[tiab] OR (("social program*"[tiab] OR "care manage*"[tiab] OR "coordination care"[tiab:~2] OR "health benefit*"[tiab] OR insur*[tiab]) AND "digital"[tiab])		873,047

Search Number	PubMed Query	Filters	Results
3	#1 AND #2		19,238
4	"Medical Informatics"[Mesh] OR "Data Science"[Mesh] OR "data analytics"[tiab]		495,326
5	#1 AND #4		13,705
6	#3 OR #5		29,325
7	"Preventive Medicine"[Mesh] OR "prevention and control "[subheading] OR "prevention"[tiab] OR "preventive"[tiab] OR "mass screening"[MeSH] OR "screening"[tiab] OR "preventive health services"[MeSH] OR "Patient Care Management"[MeSH] OR "care management"[tiab] OR "care management"[tiab] OR "comprehensive care"[tiab] OR "care planning"[tiab] or "disease management"[tiab]		3,630,029
8	#6 AND #7		23,275
9	#6 AND #7		English
10	#9 NOT (address[pt] OR "autobiography"[pt] OR "bibliography"[pt] OR "biography"[pt] OR "case control"[tw] OR "case report"[tw] OR "case reports"[tw] OR "case series"[tw] OR "comment"[pt] OR "comment on"[All Fields] OR congress[pt] OR "dictionary"[pt] OR "directory"[pt] OR "editorial"[pt] OR "festschrift"[pt] OR "historical article"[pt] OR "interview"[pt] OR lecture[pt] OR "legal case"[pt] OR "legislation"[pt] OR letter[pt] OR "news"[pt] OR "newspaper article"[pt] OR "patient education handout"[pt] OR "periodical index"[pt] OR ("Animals"[Mesh] NOT "Humans"[Mesh]) OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep OR ovine OR murine OR murinae)		20,808
11	"diagnosis"[MeSH] OR "diagnos*"[tiab] OR "diagnosis"[subheading] or "diagnostic"[tiab]		11,501,547
12	#10 NOT #11		12,427
13	#1 AND #2	from 2020 - 2023	3,158
14	#13 AND ("Randomized Controlled Trial"[Publication Type] OR "Single-Blind Method"[MeSH] OR "Double-Blind Method"[MeSH] OR "Random Allocation"[MeSH] OR placebo[tiab] OR randomized[tiab] OR randomly[tiab] OR trial[tiab])		485
15	#13 AND (("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH] AND "systematic"[tiab]) OR "meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields] OR "scoping review"[tiab:~2])		152
16	#13 AND ("Cohort Studies"[Mesh] OR cohort OR (follow-up or followup) OR longitudinal OR "Research Design"[Mesh] OR "Evaluation Study" [Publication Type] OR "Comparative Study" [Publication Type] OR ((comparative or Intervention) AND study) OR pretest* OR posttest* OR prepost* OR "before and after" OR interrupted time* OR time serie* OR intervention* OR ((quasi-experiment* OR quasiexperiment* OR quasi or experimental) and (method or study or trial or design*)) OR (("real world" OR "real-world") AND (study or design)))		2,369
17	#14 OR #15		610
18	#14 OR #15 OR #16		2,406
19	#13 AND (access OR uptake OR understand* OR "patient physician"[tiab:~3] OR "patient education"[tiab:~3)		1,277
20	#18 AND #19		971

Search Number	PubMed Query	Filters	Results
21	#17 OR #20		1,341

Grey Literature Sources Searched

- AHRQ Digital Healthcare Research Program: https://digital.ahrq.gov/
- AHRQ Clinical Decision Support research program: https://cds.ahrq.gov/
- AHRQ: Health Assessments in Primary Care: A How-to Guide for Clinicians and Staff. 2014: https://www.researchgate.net/publication/268332041_Health_Assessments_in_Primary_Care_A_How-to_Guide_for_Clinicians_and_Staff
- AHRQ: Integrating Patient-Generated Health Data into Electronic Health Records in Ambulatory Care Settings: A Practical Guide: https://digital.ahrq.gov/sites/default/files/docs/citation/pghd-practical-guide.pdf
- AHRQ Question Builder: https://www.ahrq.gov/questions/question-builder/online.html
- Apple Health app: https://www.apple.com/healthcare/health-records/
- CDC: Goetzel RZ, Staley P, Ogden L, et al. A framework for patient-centered health risk assessments: providing health promotion and disease prevention services to Medicare beneficiaries. 2011: https://www.cdc.gov/policy/paeo/hra/frameworkforhra.pdf
- CommonHealth: https://www.commonhealth.org/
- Medicare Connected Apps Directory: https://www.medicare.gov/manage-your-health/medicares-blue-button-blue-button-20/blue-button-apps
- MyHealthfinder: https://health.gov/myhealthfinder
- Navigating Wellness: https://navigatingwellness.org/
- Office of the National Coordinator for Health Information Technology: HealthIT Playbook: https://www.healthit.gov/playbook/
- Prevention TaskForce: https://www.uspreventiveservicestaskforce.org/apps/

A.2 Environmental Scan Key Findings

- Although this environmental scan intended to focus on the use of technology in primary care settings, specifically around CPS, we found limited literature in this area. Most of the information in this report is derived from literature on the use of technology within broader health services. In general, more evidence is needed on the ability of these technologies to be applied outside of chronic disease management.
- Person-centered digital health records (including patient portals and personal health records) are increasingly being used by patients and providers; however, evidence related to their effect on health outcomes and healthcare quality are limited.
- Clinical decision support (CDS) tools are widely used in clinical care; however, existing evidence generally relates to their use in the management of chronic conditions. Evidence of CDS tools related to a single screening topic may be limited in their impact for advancing person-centered CPS. Few studies have sought to examine CDS in delivering a combination of multiple CPS.
- The use of telehealth and other remote delivery vehicles is relevant to almost every CPS, including providing preventive counseling interventions, encouraging and scheduling recommended in-person screenings, implementing some screening recommendations (questionnaire-based screening, self-collected samples), facilitating risk assessment, and implementing other aspects of preventive recommendations such as shared decision making.

A.3 Technical Expert Panel Participants and Key Informants

The list of people who participated in the technical expert panel (TEP) focused on technology is provided in **Table A-1**.

Table A-1. Technology Technical Expert Panel Members and Key Informants

Name	Organization	Role	Type of Organization
Benjamin Broder, MD, PhD	Kaiser Permanente, Southern California Permanente Medical Group	Senior Director of Research; Regional Assistant Medical Director	Healthcare system
Melony Burnett	Kaiser Permanente's Patient Partner Volunteer/Patient Advisory Council	Member	Patient/consumer representative
Stacie Carney, MD	OCHIN—nonprofit innovation center providing health IT support services	Chief Medical Information Officer	Health information technology
Shannon Dowler, MD, FAAFP, CRE	State of North Carolina Department of Health and Human Services; Medicaid	Assistant Secretary for Health Access; Chief Medical Officer NC Medicaid	Payers
Robert Jarrin, JD	The Omega Concern, LLC	Managing Member	Research/academia
Ryan Jelinek, DO	Hennepin Healthcare	Medical Director for Telehealth and Patient Access	Healthcare system

Name	Organization	Role	Type of Organization
Tom Keane, MD, MBA	Office of the National Coordinator for Health Information Technology (ONC)	Former Senior Advisor at ONC	Federal agency
Alex Krist, MD, MPH	Virginia Commonwealth University	Professor and Co-Director, Ambulator Care Outcomes	USPSTF (current/former member)
Edna Leed	Kaiser Permanente's Person and Family Centered Care Program	Member	Patient/consumer representative
Ed Lomotan, MD	Agency for Healthcare Research and Quality	Senior Advisor for Clinical Informatics	Federal agency
John Ruiz, PhD	University of Arizona, Department of Psychology	Professor and Director of Diversity, Equity, and Inclusion	USPSTF (current/former member)
Matthew Sakumoto, MD	Sutter Health	Virtualist Primary Care	AHRQ Primary Care Learning Community
Julia Skapik MD, MPH	National Association of Community Health Centers	Chief Medical Information Officer	Healthcare system
Glen Taksler, PhD	Cleveland Clinic Community Care	Associate Professor of Medicine	Research/academia
Anonymous	Academic Healthcare System	Chief Information and Digital Health Officer	Healthcare system
Anonymous	Major U.S. Technology Corporation	Vice President	Health information technology

B. Innovative Delivery Models

Short Topic Title	Topic Description
Innovative Delivery Models	Identify emerging and innovative models, interventions, and/or programs that are implemented within healthcare organizations to ensure delivery of relevant preventive care in a way that incorporates patient values and preferences.

B.1 Environmental Scan Data Sources and Searches

Searches of electronic databases were limited to PubMed, CINAHL, and the Cochrane Library. The searches covered the period from January 1, 2012, to February 7, 2023. Grey literature sources were also searched. All citations were managed and deduplicated using EndNote X9 (Clarivate Analytics). DistillerSR was used to manage the abstract and article screening and review process.

Search Number	PubMed Query	Filters	Results
1	Search: ("Primary Health Care"[Majr] OR "Physicians, Primary Care"[Majr] OR "primary care"[title] OR "primary health care"[title] OR PHC[title] OR "General Practice"[Majr] OR "Family Practice"[Majr] OR "general practice"[title] OR "family practice"[title] OR "Preventive Health Services"[Majr] OR "Preventive Medicine"[Majr] OR "General Practice"[Majr] OR "general practice"[title] OR "family practice"[title] OR "Preventive Health Services"[Majr] OR "Preventive Medicine"[Majr] OR "Community Health Centers"[Majr] OR "Federally Qualified Health Center"[title] OR "Federally Qualified Health Centers"[title] OR FQHC*[title])		569,947
2	Search: "Public Health"[Majr] OR "Public Health Administration"[Majr] OR "Public Health Nursing"[Majr] OR "Public Health Surveillance"[Majr] OR "public health"[title] OR "Population Health"[Majr] OR "population health"[title]		2,105,736
3	#1 AND #2		219,757
4	Search: "Community based organization*"[tiab] OR church*[title] OR "Faith-Based Organizations"[Majr] OR "community engagement"[title] OR "community-based organisation"[title] OR "community based organisations"[title] OR "Community-Based Participatory Research"[Majr] OR "community-based participatory research"[title] OR "Community-based program"[title] OR "community-based programs"[title] OR CBPR[tiab] OR "Clinic-community linkages"[tiab]		10,750
5	#1 AND #4		1,793
6	#3 OR #5		221,073
7	Search: "Models, Organizational"[Majr] OR "Organizational Innovation"[Majr] OR Collaboration[title] OR "Health Facility Merger"[Majr] OR "Systems Integration"[Majr] OR "Cooperative Behavior"[Majr] OR Integration[title] OR integrated[title] OR "organizational model*"[title] OR "collaborative"[title] OR Partnership[title] OR partner[title] OR partners[title] OR linkage*[title/abstract] OR cooperation[title] OR integration[title]		344,809

Search Number	PubMed Query	Filters	Results
8	#6 AND #7		3,924
9	Search: "Delivery of Health Care"[Majr] OR "Delivery of Health Care, Integrated"[Majr] OR "Patient Care Team"[Majr] OR "Continuity of Patient Care"[Majr] OR "Patient-Centered Care"[Mesh] OR "Patient Centered"[title] OR "Person centered"[title] OR "Care coordination"[title:~2] OR "coordinated care"[title:~2]		921,237
10	#8 AND #9		1,137
11	Search: "Preventive Health Services"[Mesh] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Mesh] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Mesh] OR counsel*[title] OR counseling[title] OR Immunization[Mesh] OR Vaccination[Mesh] OR "Immunization Programs"[Mesh] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] OR "Chronic Disease/prevention and control"[Mesh]		1,211,923
12	#8 AND #11		2,933
13	#10 OR #12		3,412
14	Search: Intervention*[tw] OR program[tiab] OR programs[tiab] OR "Evaluation Study"[PT] OR "Evaluation Studies as Topic"[Mesh] OR "Program Evaluation"[Mesh] OR Evaluation[ti] OR "Health Plan Implementation"[Mesh] OR "Health Impact Assessment"[Mesh] OR "Patient Outcome Assessment"[Mesh]		3,630,275
15	#13 AND #14		1,739
16	#13 AND #14	English	1,662
17	#13 AND #14	English, from 2012 - 2023	1,092
18	Search: ("Animals"[Mesh] NOT "Humans"[Mesh]) OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep[tw] OR ovine[tw] OR murine[tw] OR murinae[tw]		6,379,783
19	#17 NOT #18		1,085
20	#17 NOT #18	Systematic Review	31
21	Search: #17 NOT #18	Meta-Analysis, Systematic Review	35
22	Search: #19 AND ("scoping review"[tiab] OR "integrative review"[tiab] OR "rapid review"[tiab] OR "living review"[tiab] OR "environmental scan"[tiab])		14
23	Search: #22 NOT #21		11
24	Search: #19 NOT (#21 OR #23)		1,039
25	Search: toolkit[tw] OR toolkits[tw] OR "tool kit"[tw] OR "tool kits"[tw]		11,429
26	Search: #19 AND #25		4

Search Number	Cochrane Library Query	Filters	Results
1	[mh "Patient-Centered Care"] OR ((patient-centered:ti,ab OR patient-focused:ti,ab OR person-centered:ti,ab) AND care:ti,ab) OR [mh "Precision Medicine"] OR ((individual*:ti,ab OR Individualize*:ti,ab OR holistic:ti,ab OR "whole person":ti,ab OR personalized:ti,ab) AND care:ti,ab)		38,115
2	"patient needs":ti,ab OR "patient values":ti,ab OR [mh "Physician-Patient Relations"] OR ("Doctor-patient" NEXT relation*):ti,ab OR [mh "Professional-Patient Relations"] OR [mh "Patient Preference"] OR ("patient" NEXT preference*):ti,ab OR ("social" NEXT competenc*):ti,ab OR [mh "Decision Making, Shared"] OR "shared decision making":ti,ab OR [mh "Patient Self-Determination Act"] OR "patient decision making":ti,ab OR "patient engagement":ti,ab OR "patient involvement":ti,ab OR "patient empowerment":ti,ab OR "patient partnership":ti,ab OR "patient activation":ti,ab OR “patient-activated”:ti,ab OR [mh "Patient Acceptance of Health Care"] OR "consumer participation":ti OR "consumer engagement":ti,ab OR "consumer involvement":ti,ab OR "consumer empowerment":ti,ab OR "consumer partnership":ti,ab OR "consumer activation":ti,ab OR "patient context":ti,ab OR "integrated care":ti,ab OR "coordinated care":ti,ab OR "Care coordination":ti,ab OR "continuity of care":ti,ab OR "healthcare teams":ti,ab OR "team-based care":ti,ab OR teamwork:ti,ab		34,005
3	#1 OR #2		68,096
4	[mh "Preventive Health Services"] OR "clinical preventive services":ti,ab OR "clinical preventive service":ti,ab OR Preventive:ti OR Prevention:ti OR [mh “Mass Screening”] OR screening:ti OR screen*:ti OR screens:ti OR screened:ti OR [mh Counseling] OR counsel*:ti OR counseling:ti OR [mh Immunization] OR [mh Vaccination] OR [mh "Immunization Programs"] OR immunization:ti OR vaccine*:ti OR vaccination*:ti OR [mh "Primary Prevention"]		119,457
5	#3 AND #4		12,083
6	[mh "Primary Health Care"] OR [mh "Physicians, Primary Care"] OR "primary care":ti OR "primary health care":ti OR PHC:ti OR [mh "General Practice"] OR [mh "Family Practice"] OR "general practice":ti OR "family practice":ti OR [mh "Preventive Health Services"] OR [mh "Preventive Medicine"] OR [mh "Community Health Centers"] OR "Federally Qualified Health Center":ti OR "Federally Qualified Health Centers":ti OR FQHC*:ti OR "healthcare center":ti,ab OR "healthcare clinic":ti,ab OR "healthcare clinics":ti,ab OR ("healthcare" NEXT system*):ti,ab OR ("healthcare" NEXT organization*):ti,ab OR ("community health" NEXT worker*):ti,ab OR navigator*:ti,ab OR peers:ti,ab OR peer:ti,ab		72,509
7	[mh "Organizational Innovation"] OR [mh "Models, Organizational"] OR ("care" NEXT model*):ti,ab OR service:ti,ab OR ([mh "Delivery of Health Care"] AND model*:ti,ab,kw) OR program:ti,ab OR programmatic:ti,ab OR redesign:ti,ab OR transformation:ti,ab OR innovation:ti,ab OR innovative:ti,ab OR "new model":ti,ab OR reform:ti OR quality:ti OR "healthcare improvement":ti,ab OR "system improvement":ti,ab OR strategy:ti OR strategies:ti OR "improve care":ti OR "care improvement":ti OR "care delivery":ti OR [mh "Health Systems Agencies"] OR [mh "Social Determinants of Health"] OR [mh "Patient Care Bundles"] OR [mh "Patient Reported Outcome Measures"] OR ("Quality" NEXT Measure*):ti,ab OR [mh "Healthy People Programs"]		199,028
8	#6 AND #7		27,135
9	#5 AND #8		4,123
10	#9 NOT ([mh Animals] NOT [mh Humans])		4,123
11	#10 NOT (([mh Adolescent] OR [mh Child] OR [mh Infant]) NOT [mh Adult])		3,764

Search Number	Cochrane Library Query	Filters	Results
12	#11 NOT (framework*:ti,ab OR concept:ti,ab OR theoretical:ti,ab)		3,564
13	[mh "afghanistan"] OR [mh africa] OR [mh "africa, northern"] OR [mh "africa, central"] OR [mh "africa, eastern"] OR [mh "africa south of the sahara"] OR [mh "africa, southern"] OR [mh "africa, western"] OR [mh albania] OR [mh algeria] OR [mh andorra] OR [mh angola] OR [mh "antigua and barbuda"] OR [mh argentina] OR [mh armenia] OR [mh azerbaijan] OR [mh bahamas] OR [mh bahrain] OR [mh bangladesh] OR [mh barbados] OR [mh belize] OR [mh benin] OR [mh bhutan] OR [mh bolivia] OR [mh borneo] OR [mh "bosnia and herzegovina"] OR [mh botswana] OR [mh brazil] OR [mh brunei] OR [mh bulgaria] OR [mh "burkina faso"] OR [mh burundi] OR [mh "cabo verde"] OR [mh cambodia] OR [mh cameroon] OR [mh "central african republic"] OR [mh chad] OR [mh china] OR [mh comoros] OR [mh congo] OR [mh croatia] OR [mh cuba] OR [mh "democratic republic of the congo"] OR [mh cyprus] OR [mh djibouti] OR [mh dominica] OR [mh "dominican republic"] OR [mh ecuador] OR [mh egypt] OR [mh "el salvador"] OR [mh "equatorial guinea"] OR [mh eritrea] OR [mh eswatini] OR [mh ethiopia] OR [mh fiji] OR [mh gabon] OR [mh gambia] OR [mh "georgia (republic)"] OR [mh ghana] OR [mh grenada] OR [mh guatemala] OR [mh guinea] OR (guinea AND bissau) OR [mh guyana] OR [mh haiti] OR [mh honduras] OR [mh "independent state of samoa"] OR [mh india] OR [mh "indian ocean islands"] OR [mh indochina] OR [mh indonesia] OR [mh iran] OR [mh iraq] OR [mh jamaica] OR [mh jordan] OR [mh kazakhstan] OR [mh kenya] OR [mh kosovo] OR [mh kuwait] OR [mh kyrgyzstan] OR [mh laos] OR [mh lebanon] OR [mh liechtenstein] OR [mh lesotho] OR [mh liberia] OR [mh libya] OR [mh madagascar] OR [mh malaysia] OR [mh malawi] OR [mh mali] OR [mh malta] OR [mh mauritania] OR [mh mauritius] OR [mh "mekong valley"] OR [mh melanesia] OR [mh micronesia] OR [mh monaco] OR [mh mongolia] OR [mh montenegro] OR [mh morocco] OR [mh mozambique] OR [mh myanmar] OR [mh namibia] OR [mh nepal] OR [mh nicaragua] OR [mh niger] OR [mh nigeria] OR [mh oman] OR [mh pakistan] OR [mh palau] OR [mh panama] OR [mh "papua new guinea"] OR [mh paraguay] OR [mh peru] OR [mh philippines] OR [mh qatar] OR [mh "republic of belarus"] OR [mh "republic of north macedonia"] OR [mh romania] OR [mh russia] OR [mh rwanda] OR [mh "saint kitts and nevis"] OR [mh "saint lucia"] OR [mh "saint vincent and the grenadines"] OR [mh "sao tome and principe"] OR [mh "saudi arabia"] OR [mh serbia] OR [mh "sierra leone"] OR [mh senegal] OR [mh seychelles] OR [mh singapore] OR [mh somalia] OR [mh "south sudan"] OR [mh "sri lanka"] OR [mh sudan] OR [mh suriname] OR [mh syria] OR [mh taiwan] OR [mh tajikistan] OR [mh tanzania] OR [mh thailand] OR (timor AND leste) OR [mh togo] OR [mh tonga] OR [mh "trinidad and tobago"] OR [mh tunisia] OR [mh turkmenistan] OR [mh uganda] OR [mh ukraine] OR [mh "united arab emirates"] OR [mh uruguay] OR [mh uzbekistan] OR [mh vanuatu] OR [mh venezuela] OR [mh vietnam] OR [mh "west indies"] OR [mh yemen] OR [mh zambia] OR [mh zimbabwe]		34,570
14	(“Organisation for Economic” NEAR Development) OR [mh "European Union"] OR [mh "Developed Countries"] OR [mh australasia] OR [mh australia] OR [mh austria] OR [mh "baltic states"] OR [mh belgium] OR [mh canada] OR [mh chile] OR [mh colombia] OR [mh "costa rica"] OR [mh "czech republic"] OR [mh denmark] OR [mh estonia] OR [mh europe] OR [mh finland] OR [mh france] OR [mh germany] OR [mh greece] OR [mh hungary] OR [mh iceland] OR [mh ireland] OR [mh israel] OR [mh italy] OR [mh japan] OR [mh korea] OR [mh latvia] OR [mh lithuania] OR [mh luxembourg] OR [mh mexico] OR [mh netherlands] OR [mh "new zealand"] OR [mh "north america"] OR [mh norway] OR [mh poland] OR [mh portugal] OR [mh "republic of korea"] OR [mh "scandinavian and nordic countries"] OR [mh slovakia] OR [mh slovenia] OR [mh spain] OR [mh sweden] OR [mh switzerland] OR [mh turkey] OR [mh "united kingdom"] OR [mh "united states"]		80,484
15	#13 NOT #14		32,213

Search Number	Cochrane Library Query	Filters	Results
16	#12 NOT #15		3,221
17	#16 Limited to Cochrane Reviews published 2012-2023		61

Search Number	CINAHL Query	Limiters/ Expanders	Results
1	(MH "Patient-Centered Care+") OR (((TI patient-centered OR AB patient-centered) OR (TI patient-focused OR AB patient-focused) OR (TI person-centered OR AB person-centered)) AND (TI care OR AB care)) OR (MM "Precision Medicine+") OR (((TI individual* OR AB individual*) OR (TI Individualize* OR AB Individualize*) OR (TI holistic OR AB holistic) OR (TI "whole person" OR AB "whole person") OR (TI personalized OR AB personalized)) AND (TI care OR AB care))	Expanders - Apply equivalent subjects Search modes - Find all my search terms	130,614
2	(TI "Search: "patient needs" OR AB ""patient needs") OR (TI "patient values" OR AB "patient values") OR (MM "Physician-Patient Relations+") OR (TI "Doctor-patient relation*" OR AB "Doctor-patient relation*") OR (MM "Professional-Patient Relations+") OR (MM "Patient Preference+") OR (TI "patient preference*" OR AB "patient preference*") OR (TI "social competenc*" OR AB "social competenc*") OR (MM "Decision Making, Shared+") OR (TI "shared decision making" OR AB "shared decision making") OR (MM "Patient Self-Determination Act+") OR (TI "patient decision making" OR AB "patient decision making") OR (TI "patient engagement" OR AB "patient engagement") OR (TI "patient involvement" OR AB "patient involvement") OR (TI "patient empowerment" OR AB "patient empowerment") OR (TI "patient partnership" OR AB "patient partnership") OR (TI "patient activation" OR AB "patient activation") OR (TI patient-activated OR AB patient-activated) OR (MM "Patient Acceptance of Health Care+") OR (TI "consumer participation") OR (TI "consumer engagement" OR AB "consumer engagement") OR (TI "consumer involvement" OR AB "consumer involvement") OR (TI "consumer empowerment" OR AB "consumer empowerment") OR (TI "consumer partnership" OR AB "consumer partnership") OR (TI "consumer activation" OR AB "consumer activation") OR (TI "patient context" OR AB "patient context") OR (TI "integrated care" OR AB "integrated care") OR (TI "coordinated care" OR AB "coordinated care") OR (TI "Care coordination" OR AB "Care coordination") OR (TI "continuity of care" OR AB "continuity of care") OR (TI "healthcare teams" OR AB "healthcare teams") OR (TI "team-based care" OR AB "team-based care") OR (TI teamwork OR AB teamwork)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	95,133
3	S1 OR S2	Expanders - Apply equivalent subjects Search modes - Find all my search terms	215,213

Search Number	CINAHL Query	Limiters/ Expanders	Results
4	(MM "Preventive Health Services+") OR (TI "clinical preventive services" OR AB "clinical preventive services") OR (TI "clinical preventive service" OR AB "clinical preventive service") OR (TI Preventive) OR (TI Prevention) OR (MM “Mass Screening+”) OR (TI screening) OR (TI screen*) OR (TI screens) OR (TI screened) OR (MM Counseling+) OR (TI counsel*) OR (TI counseling) OR (MM Immunization+) OR (MM Vaccination+) OR (MM "Immunization Programs+") OR (TI immunization) OR (TI vaccine*) OR (TI vaccination*) OR (MM "Primary Prevention+")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	240,084
5	S3 AND S4	Expanders - Apply equivalent subjects Search modes - Find all my search terms	8,932
6	(MM "Primary Health Care+") OR (MM "Physicians, Primary Care+") OR (TI "primary care") OR (TI "primary health care") OR (TI PHC) OR (MM "General Practice+") OR (MM "Family Practice+") OR (TI "general practice") OR (TI "family practice") OR (MM "Preventive Health Services+") OR (MM "Preventive Medicine+") OR (MH "Community Health Centers+") OR (TI "Federally Qualified Health Center") OR (TI "Federally Qualified Health Centers") OR (TI FQHC*) OR (TI "healthcare center" OR AB "healthcare center") OR (TI "healthcare clinic" OR AB "healthcare clinic") OR (TI "healthcare clinics" OR AB "healthcare clinics") OR (TI "healthcare system*" OR AB "healthcare system*") OR (TI "healthcare organization*" OR AB "healthcare organization*") OR (TI "community health worker*" OR AB "community health worker*") OR (TI navigator* OR AB navigator*) OR (TI peers OR AB peers) OR (TI peer OR AB peer)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	182,117
7	(MM "Organizational Innovation+") OR (MM "Models, Organizational+") OR (TI "care model*" OR AB "care model*") OR (TI service OR AB service) OR ((MM "Delivery of Health Care+") AND model*) OR (TI program* OR AB program*) OR (TI programmatic OR AB programmatic) OR (TI redesign OR AB redesign) OR (TI transformation OR AB transformation) OR (TI innovation OR AB innovation) OR (TI innovative OR AB innovative) OR (TI "new model" OR AB "new model") OR (TI reform) OR (TI quality) OR (TI "healthcare improvement" OR AB "healthcare improvement") OR (TI "system improvement" OR AB "system improvement") OR (TI strategy) OR (TI strategies) OR (TI "improve care") OR (TI "care improvement") OR (TI "care delivery") OR (MM "Health Systems Agencies+") OR (MH "Social Determinants of Health+") OR (MH "Patient Care Bundles+") OR (MM "Patient Reported Outcome Measures+") OR (TI "Quality Measure*" OR AB "Quality Measure*") OR (MM "Healthy People Programs+")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	992,940
8	S6 AND S7	Expanders - Apply equivalent subjects Search modes - Find all my search terms	61,193
9	S5 AND S8	Expanders - Apply equivalent subjects Search modes - Find all my search terms	669

Search Number	CINAHL Query	Limiters/ Expanders	Results
10	S9	Limiters - English Language; Human Expanders - Apply equivalent subjects Search modes - Find all my search terms	468
11	S10	Limiters - Published Date: 20120101-20231231 Expanders - Apply equivalent subjects Search modes - Find all my search terms	358
12	(PT address) OR (PT autobiography) OR (PT bibliography) OR (PT biography) OR (PT congress) OR (PT dictionary) OR (PT directory) OR (PT festschrift) OR (PT "historical article") OR (PT lecture) OR (PT "legal case") OR (PT legislation) OR (PT "periodical index") OR rats OR cow OR cows OR chicken OR chickens OR horse OR horses OR mice OR mouse OR bovine OR sheep OR ovine OR murine OR murinae OR Self-management OR "disease management" OR protocol OR (TI hospital*) OR (TI discharge*) OR (TI transition*)	Limiters - Published Date: 20120101-20231231 Expanders - Apply equivalent subjects Search modes - Find all my search terms	411,067
13	S11 NOT S12	Limiters - Published Date: 20120101-20231231 Expanders - Apply equivalent subjects Search modes - Find all my search terms	310
14	S13 NOT (((MH Adolescent+) OR (MH Child+) OR (MH Infant+)) NOT (MH Adult+))	Limiters - Published Date: 20120101-20231231 Expanders - Apply equivalent subjects Search modes - Find all my search terms	294
15	S14	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	173
16	S15 NOT ((TI framework* OR AB framework*) OR (TI concept OR AB concept) OR (TI theoretical OR AB theoretical))	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	159

Search Number	CINAHL Query	Limiters/ Expanders	Results
17	(MH afghanistan) OR (MH africa) OR (MH "africa, northern") OR (MH "africa, central") OR (MH "africa, eastern") OR (MH "africa south of the sahara") OR (MH "africa, southern") OR (MH "africa, western") OR (MH albania) OR (MH algeria) OR (MH andorra) OR (MH angola) OR (MH "antigua and barbuda") OR (MH argentina) OR (MH armenia) OR (MH azerbaijan) OR (MH bahamas) OR (MH bahrain) OR (MH bangladesh) OR (MH barbados) OR (MH belize) OR (MH benin) OR (MH bhutan) OR (MH bolivia) OR (MH borneo) OR (MH "bosnia and herzegovina") OR (MH botswana) OR (MH brazil) OR (MH brunei) OR (MH bulgaria) OR (MH "burkina faso") OR (MH burundi) OR (MH "cabo verde") OR (MH cambodia) OR (MH cameroon) OR (MH "central african republic") OR (MH chad) OR (MH china+) OR (MH comoros) OR (MH congo) OR (MH croatia) OR (MH cuba) OR (MH "democratic republic of the congo") OR (MH cyprus) OR (MH djibouti) OR (MH dominica) OR (MH "dominican republic") OR (MH ecuador) OR (MH egypt) OR (MH "el salvador") OR (MH "equatorial guinea") OR (MH eritrea) OR (MH eswatini) OR (MH ethiopia) OR (MH fiji) OR (MH gabon) OR (MH gambia) OR (MH "georgia (republic)") OR (MH ghana) OR (MH grenada) OR (MH guatemala) OR (MH guinea) OR (MH guinea-bissau) OR (MH guyana) OR (MH haiti) OR (MH honduras) OR (MH "independent state of samoa") OR (MH india+) OR (MH "indian ocean islands") OR (MH indochina) OR (MH indonesia) OR (MH iran) OR (MH iraq) OR (MH jamaica) OR (MH jordan) OR (MH kazakhstan) OR (MH kenya) OR (MH kosovo) OR (MH kuwait) OR (MH kyrgyzstan) OR (MH laos) OR (MH lebanon) OR (MH liechtenstein) OR (MH lesotho) OR (MH liberia) OR (MH libya) OR (MH madagascar) OR (MH malaysia) OR (MH malawi) OR (MH mali) OR (MH malta) OR (MH mauritania) OR (MH mauritius) OR (MH "mekong valley") OR (MH melanesia) OR (MH micronesia) OR (MH monaco) OR (MH mongolia) OR (MH montenegro) OR (MH morocco) OR (MH mozambique) OR (MH myanmar) OR (MH namibia) OR (MH nepal) OR (MH nicaragua) OR (MH niger) OR (MH nigeria) OR (MH oman) OR (MH pakistan) OR (MH palau) OR (MH panama+) OR (MH "papua new guinea") OR (MH paraguay) OR (MH peru) OR (MH philippines) OR (MH qatar) OR (MH "republic of belarus") OR (MH "republic of north macedonia") OR (MH romania) OR (MH russia+) OR (MH rwanda) OR (MH "saint kitts and nevis") OR (MH "saint lucia") OR (MH "saint vincent and the grenadines") OR (MH "sao tome and principe") OR (MH "saudi arabia") OR (MH serbia) OR (MH "sierra leone") OR (MH senegal) OR (MH seychelles) OR (MH singapore) OR (MH somalia) OR (MH "south sudan") OR (MH "sri lanka") OR (MH sudan) OR (MH suriname) OR (MH syria) OR (MH taiwan) OR (MH tajikistan) OR (MH tanzania) OR (MH thailand) OR (MH timor-leste) OR (MH togo) OR (MH tonga) OR (MH "trinidad and tobago") OR (MH tunisia) OR (MH turkmenistan) OR (MH uganda) OR (MH ukraine) OR (MH "united arab emirates") OR (MH uruguay) OR (MH uzbekistan) OR (MH vanuatu) OR (MH venezuela) OR (MH vietnam) OR (MH "west indies") OR (MH yemen) OR (MH zambia) OR (MH zimbabwe)	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	158,197

Search Number	CINAHL Query	Limiters/ Expanders	Results
18	OECD OR (MH "European Union") OR (MH "Developed Countries") OR (MH australasia) OR (MH australia+) OR (MH austria) OR (MH "baltic states") OR (MH belgium) OR (MH canada+) OR (MH chile) OR (MH colombia) OR (MH "costa rica") OR (MH "czech republic") OR (MH denmark+) OR (MH estonia) OR (MH europe) OR (MH finland) OR (MH france+) OR (MH germany+) OR (MH greece) OR (MH hungary) OR (MH iceland) OR (MH ireland) OR (MH israel) OR (MH italy+) OR (MH japan+) OR (MH korea) OR (MH latvia) OR (MH lithuania) OR (MH luxembourg) OR (MH mexico) OR (MH netherlands) OR (MH "new zealand") OR (MH "north america") OR (MH norway+) OR (MH poland) OR (MH portugal) OR (MH "republic of korea+") OR (MH "scandinavian and nordic countries") OR (MH slovakia) OR (MH slovenia) OR (MH spain) OR (MH sweden) OR (MH switzerland) OR (MH turkey) OR (MH "united kingdom+") OR (MH "united states+")	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	526,098
19	S17 NOT S18	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	147,720
20	S16 NOT S19	Limiters - Age Groups: All Adult Expanders - Apply equivalent subjects Search modes - Find all my search terms	147
21	S20	Limiters - Publication Type: Meta Analysis, Meta Synthesis, Systematic Review Expanders - Apply equivalent subjects Search modes - Find all my search terms	3
22	S20 NOT S21	Expanders - Apply equivalent subjects Search modes - Find all my search terms	144

Grey Literature Sources Searched

Source	Website Link
U.S. Preventive Service Task Force (USPSTF)	https://www.uspreventiveservicestaskforce.org/uspstf/
Planetree	https://planetree.org/certification/
Mayo Clinic Shared Decision-Making National Resource Center	https://www.mayoclinic.org/
Agency for Healthcare Research and Quality (AHRQ)	https://www.ahrq.gov/
Centers for Disease Control and Prevention (CDC)	https://www.cdc.gov/
Institute for Patient- and Family-Centered Care	https://www.ipfcc.org/
Institute for Healthcare Improvement (IHI)	https://www.ihi.org/
National Academy of Medicine (NAM)	https://nam.edu/
Centers for Medicare & Medicaid Services (CMS) Innovation Center	https://innovation.cms.gov/
American College of Physicians (ACP)	https://www.acponline.org/
National Cancer Institute, Division of Cancer Control & Population Sciences (National Institutes of Health), Practice Tools	https://cancercontrol.cancer.gov/is/tools/practice-tools
National Institute for Health and Care Excellence	https://www.nice.org.uk/
Beryl Institute	https://www.theberylinstitute.org/
The Guide to Community Preventive Services	https://www.thecommunityguide.org/
The Pathways to Prevention (P2P) Program	https://prevention.nih.gov/research-priorities/research-needs-and-gaps/pathways-prevention
U.S. Department of Veterans Affairs Evidence Synthesis Program	https://www.hsrd.research.va.gov/publications/esp/
McMaster Health Systems Evidence	https://www.healthsystemsevidence.org/
Health Resources & Services Administration, Training and Technical Assistance Hub	https://www.hrsa.gov/library/performance-measurement-quality-improvement
Health Services: Cost Review Commission (HSCRC)	https://hscrc.maryland.gov/Pages/default.aspx
American Speech-Language-Hearing Association, Person- and Family-Centered Care	https://www.asha.org/practice-portal/clinical-topics/aphasia/person-and-family-centered-care/
Evaluating the Nation's Largest Primary Care Delivery Model: Comprehensive Primary Care Plus (CPC+)	https://www.mathematica.org/projects/evaluating-the-nations-largest-primary-care-delivery-initiative

B.2 Environmental Scan Key Findings

- Person-centered care strategies can promote the delivery of clinical preventive services by building partnerships between healthcare providers and people seeking services, facilitating shared decision making, and cocreating prevention and treatment plans that consider a patient's values, preferences, and goals.
- There are few person-centered models and interventions aimed at increasing the delivery of multiple clinical preventive services. Most interventions had a small effect on services delivery. Interventions used personalized risk assessment and recommendations, as well as practice improvement and transformation approaches.
- Personalized risk assessment interventions were most effective when they were paired with conversations about the recommended services with a provider or a health coach.
- The most frequently reported model for practice improvement and transformation was the patient-centered medical home model. The model's implementation was associated with increased clinical preventive services delivery.
- Other person-centered strategies used for delivery of multiple clinical preventive services included navigation and support services; patient reminders and recall; and patient decision aids.
- Person-centered interventions promoting the delivery of a single clinical preventive service often used multiple approaches including systematic identification of patients due for that service; personalized outreach with provision of materials that aid patients in decision making; navigation and support services; and structured lifestyle and behavioral change programs.

B.3 Technical Expert Panel Participants and Key Informants

Table B-1. Innovative Delivery Models Technical Expert Panel Members and Key Informants

Name	Organization	Role	Type of Organization
Mari-Lynn Drainoni, PhD, MEd	Boston University Chobanian & Avedisian School of Medicine	Research Professor	Research/academia
C. Annette DuBard, MD, MPH	Aledade	Senior Advisor and Vice President of Clinical Strategy	Other
Glyn Elwin, MD, MSc, PhD, FRCGP	The Dartmouth Institute for Health Policy & Clinical Practice	Professor	Research/academia
Susan B. Frampton, PhD, FPCC	Planetree International	President	Other
Ann Greiner, MCP	Primary Care Collaborative	President and CEO	Other
Scott Hammond, MD, FAAFP	Colorado Center for Primary Care Innovation	Clinical Professor of Family Medicine, Co-Chair CO Primary Care Collaborative	AHRQ Primary Care Learning Community
Jennifer Haas, MD, MSc	Massachusetts General Hospital	Professor of Medicine, Director of Research	Healthcare system

Name	Organization	Role	Type of Organization
Jane Kim, MD, MPH	Veterans Health Administration, National Center for Health Promotion and Disease Prevention	Executive Director of Preventive Medicine	Federal agency
Barbara Kivowitz, MSW	Independent Consultant	Patient and Family Advisor	Patient/consumer representative
Carol Mangione, MD, MSPH	UCLA Division of General Internal Medicine and Health Services Research	Distinguished Professor of Medicine and Public Health; Former Chair USPSTF	USPSTF (current/former member)
Anthony Olson, PhD, PharmD, MEd	Essentia Institute of Rural Health	Research Scientist	AHRQ Primary Care Learning Community
Charlene Rothkopf	Wellness Consulting Group	Founder and President	Patient/consumer representative
Karla Silverman, RN, CNM, MS	Center for Health Care Strategies	Associate Director, Complex Care Delivery	Other
Traci Solt, DNP, FACHE, NEA-BC, AMC-BC, CCM, CRRN	National Veterans Health Administration, Office of Primary Care	Director for Clinical Services	Federal agency
Glan Taksler, PhD	Cleveland Clinic	Associate Professor	Research/academia
Janice Tufte	Hassanah Consulting	Lived Experience Consultant	Patient/consumer Representative
Anthony Viera, MD, MPH	Duke University School of Medicine	Professor and Chair, Department of Family Medicine and Community Health	Healthcare system
Scott Young, MD	Kaiser Permanent Care Management Institute	Executive Director, Care Management Institute	Healthcare system
Anonymous	Academic Health Care System serving as an urban safety net	Family Medicine Nurse Practitioner	Healthcare system

C. Public Health and Community Linkages

Short Topic Title	Topic Description
Public Health and Community Linkages	Identify how linkages between primary care and public health or community-based organizations can be further developed and leveraged to optimize the delivery of person-centered clinical preventive services (CPS).

C.1 Environmental Scan Data Sources and Searches

Searches of electronic databases were limited to PubMed, CINAHL, and the Cochrane Library. The searches covered the period from January 1, 2012, to February 7, 2023. We did not limit our search to specific types of CPS. We also searched gray literature sources using variations of search terms related to primary care, public health, prevention, screening, and collaborate. In addition to electronic databases and websites, we manually searched reference lists from relevant review articles. All citations were managed and deduplicated using EndNote X9 (Clarivate Analytics). DistillerSR was used to manage the abstract and article screening and review process.

Search Number	PubMed Query	Filters	Results
1	Search: ("Primary Health Care"[Majr] OR "Physicians, Primary Care"[Majr] OR "primary care"[title] OR "primary health care"[title] OR PHC[title] OR "General Practice"[Majr] OR "Family Practice"[Majr] OR "general practice"[title] OR "family practice"[title] OR "Preventive Health Services"[Majr] OR "Preventive Medicine"[Majr] OR "General Practice"[Majr] OR "general practice"[title] OR "family practice"[title] OR "Preventive Health Services"[Majr] OR "Preventive Medicine"[Majr] OR "Community Health Centers"[Majr] OR "Federally Qualified Health Center"[title] OR "Federally Qualified Health Centers"[title] OR FQHC*[title])		569,947
2	Search: "Public Health"[Majr] OR "Public Health Administration"[Majr] OR "Public Health Nursing"[Majr] OR "Public Health Surveillance"[Majr] OR "public health"[title] OR "Population Health"[Majr] OR "population health"[title]		2,105,736
3	#1 AND #2		219,757
4	Search: "Community based organization*"[tiab] OR church*[title] OR "Faith-Based Organizations"[Majr] OR "community engagement"[title] OR "community-based organisation"[title] OR "community based organisations"[title] OR "Community-Based Participatory Research"[Majr] OR "community-based participatory research"[title] OR "Community-based program"[title] OR "community-based programs"[title] OR CBPR[tiab] OR "Clinic-community linkages"[tiab]		10,750
5	#1 AND #4		1,793
6	#3 OR #5		221,073

Search Number	PubMed Query	Filters	Results
7	Search: "Models, Organizational"[Majr] OR "Organizational Innovation"[Majr] OR Collaboration[title] OR "Health Facility Merger"[Majr] OR "Systems Integration"[Majr] OR "Cooperative Behavior"[Majr] OR Integration[title] OR integrated[title] OR "organizational model*"[title] OR "collaborative"[title] OR Partnership[title] OR partner[title] OR partners[title] OR linkage*[title/abstract] OR cooperation[title] OR integration[title]		344,809
8	#6 AND #7		3,924
9	Search: "Delivery of Health Care"[Majr] OR "Delivery of Health Care, Integrated"[Majr] OR "Patient Care Team"[Majr] OR "Continuity of Patient Care"[Majr] OR "Patient-Centered Care"[Mesh] OR "Patient Centered"[title] OR "Person centered"[title] OR "Care coordination"[title:~2] OR "coordinated care"[title:~2]		921,237
10	#8 AND #9		1,137
11	Search: "Preventive Health Services"[Mesh] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Mesh] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Mesh] OR counsel*[title] OR counseling[title] OR Immunization[Mesh] OR Vaccination[Mesh] OR "Immunization Programs"[Mesh] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] OR "Chronic Disease/prevention and control"[Mesh]		1,211,923
12	#8 AND #11		2,933
13	#10 OR #12		3,412
#14	Search: Intervention*[tw] OR program[tiab] OR programs[tiab] OR "Evaluation Study"[PT] OR "Evaluation Studies as Topic"[Mesh] OR "Program Evaluation"[Mesh] OR Evaluation[ti] OR "Health Plan Implementation"[Mesh] OR "Health Impact Assessment"[Mesh] OR "Patient Outcome Assessment"[Mesh]		3,630,275
15	#13 AND #14		1,739
16	#13 AND #14	English	1,662
17	#13 AND #14	English, from 2012 - 2023	1,092
18	Search: ("Animals"[Mesh] NOT "Humans"[Mesh]) OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep[tw] OR ovine[tw] OR murine[tw] OR murinae[tw]		6,379,783
19	#17 NOT #18		1,085
#20	#17 NOT #18	Systematic Review	31
21	Search: #17 NOT #18	Meta-Analysis, Systematic Review	35
22	Search: #19 AND ("scoping review"[tiab] OR "integrative review"[tiab] OR "rapid review"[tiab] OR "living review"[tiab] OR "environmental scan"[tiab])		14
23	Search: #22 NOT #21		11
24	Search: #19 NOT (#21 OR #23)		1,039

Search Number	PubMed Query	Filters	Results
25	Search: toolkit[tw] OR toolkits[tw] OR "tool kit"[tw] OR "tool kits"[tw]		11,429
26	Search: #19 AND #25		4

Search Number	Cochrane Library Query	Filters	Results
1	([mh "Primary Health Care"] OR [mh "Physicians, Primary Care"] OR "primary care":ti OR "primary health care":ti OR PHC:ti OR [mh "General Practice"] OR [mh "Family Practice"] OR "general practice":ti OR "family practice":ti OR [mh "Preventive Health Services"] OR [mh "Preventive Medicine"] OR [mh "General Practice"] OR "general practice":ti OR "family practice":ti OR [mh "Preventive Health Services"] OR [mh "Preventive Medicine"] OR [mh "Community Health Centers"] OR "Federally Qualified Health Center":ti OR "Federally Qualified Health Centers":ti OR FQHC*:ti)		55,876
2	[mh "Public Health"] OR [mh "Public Health Administration"] OR [mh "Public Health Nursing"] OR [mh "Public Health Surveillance"] OR "public health":ti OR [mh "Population Health"] OR "population health":ti		551,201
3	#1 AND #2		41,430
4	("Search: "Community based" NEXT organization*"):ti,ab OR church*:ti OR [mh "Faith-Based Organizations"] OR "community engagement":ti OR "community-based organisation":ti OR "community based organisations":ti OR [mh "Community-Based Participatory Research"] OR "community-based participatory research":ti OR "Community-based program":ti OR "community-based programs":ti OR CBPR:ti,ab OR "Clinic-community linkages":ti,ab		41,071
5	#1 AND #4		4,664
6	#3 OR #5		42,589
7	[mh "Models, Organizational"] OR [mh "Organizational Innovation"] OR Collaboration:ti OR [mh "Health Facility Merger"] OR [mh "Systems Integration"] OR [mh "Cooperative Behavior"] OR Integration:ti OR integrated:ti OR ("organizational" NEXT model*):ti OR collaborative:ti OR Partnership:ti OR partner:ti OR partners:ti OR linkage*:ti,ab OR cooperation:ti OR integration:ti		15,692
8	#6 AND #7		1,418
9	[mh "Delivery of Health Care"] OR [mh "Delivery of Health Care, Integrated"] OR [mh "Patient Care Team"] OR [mh "Continuity of Patient Care"] OR [mh "Patient-Centered Care"] OR "Patient Centered":ti OR "Person centered":ti OR "Care coordination":ti		88,238
10	#8 AND #9		765
11	[mh "Preventive Health Services"] OR "clinical preventive services":ti,ab OR "clinical preventive service":ti,ab OR Preventive:ti OR Prevention:ti OR [mh "Mass Screening"] OR screening:ti OR screen*:ti OR screens:ti OR screened:ti OR [mh Counseling] OR counsel*:ti OR counseling:ti OR [mh Immunization] OR [mh Vaccination] OR [mh "Immunization Programs"] OR immunization:ti OR vaccine*:ti OR vaccination*:ti OR [mh "Primary Prevention"] OR [mh "Chronic Disease"]		154,897
12	#8 AND #11		952

Search Number	Cochrane Library Query	Filters	Results
13	#10 OR #12		1,275
14	Intervention*:ti,ab,kw OR program:ti,ab OR programs:ti,ab OR "Evaluation Study":pt OR [mh "Evaluation Studies as Topic"] OR [mh "Program Evaluation"] OR Evaluation:ti OR [mh "Health Plan Implementation"] OR [mh "Health Impact Assessment"] OR [mh "Patient Outcome Assessment"]		658,798
15	#13 AND #14		1,052
16	([mh Animals] NOT [mh Humans]) OR rats:ti,ab,kw OR cow:ti,ab,kw OR cows:ti,ab,kw OR chicken:ti,ab,kw OR chickens:ti,ab,kw OR horse:ti,ab,kw OR horses:ti,ab,kw OR mice:ti,ab,kw OR mouse:ti,ab,kw OR bovine:ti,ab,kw OR sheep:ti,ab,kw OR ovine:ti,ab,kw OR murine:ti,ab,kw OR murinae:ti,ab,kw		18,476
17	#15 NOT #16		1,049
18	#17	Limited to Cochrane Reviews published 2012-2023	6
19	#17	Limited to Trials published 2012-2023	674
20	toolkit:ti,ab,kw OR toolkits:ti,ab,kw OR "tool kit":ti,ab,kw OR "tool kits":ti,ab,kw		776
21	#17 AND #20 (all are Trials)	Limited to Trials published 2012-2023	5

Search Number	CINAHL Query	Limiters/Expanders	Results
1	((MM "Primary Health Care+") OR (MM "Physicians, Primary Care+") OR (TI "primary care") OR (TI "primary health care") OR (TI PHC) OR (MM "General Practice+") OR (MM "Family Practice+") OR (TI "general practice") OR (TI "family practice") OR (MM "Preventive Health Services+") OR (MM "Preventive Medicine+") OR (MM "General Practice+") OR (TI "general practice") OR (TI "family practice") OR (MM "Preventive Health Services+") OR (MM "Preventive Medicine+") OR (MM "Community Health Centers+") OR (TI "Federally Qualified Health Center") OR (TI "Federally Qualified Health Centers") OR (TI FQHC*))	Expanders - Apply equivalent subjects Search modes - Find all my search terms	83,977
2	(MM "Public Health+") OR (MM "Public Health Administration+") OR (MM "Public Health Nursing+") OR (MM "Public Health Surveillance+") OR (TI "public health") OR (MM "Population Health+") OR (TI "population health")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	578,450
3	S1 AND S2	Expanders - Apply equivalent subjects Search modes - Find all my search terms	7,808

Search Number	CINAHL Query	Limiters/Expanders	Results
4	(TI "Community based organization*" OR AB "Community based organization*") OR (TI church*) OR (MM "Faith-Based Organizations+") OR (TI "community engagement") OR (TI "community-based organisation") OR (TI "community-based organisations") OR (MM "Community-Based Participatory Research+") OR (TI "community-based participatory research") OR (TI "Community-based program") OR (TI "community-based programs") OR (TI CBPR OR AB CBPR) OR (TI "Clinic-community linkages" OR AB "Clinic-community linkages")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	4,890
5	S1 AND S4	Expanders - Apply equivalent subjects Search modes - Find all my search terms	90
6	S3 OR S5	Expanders - Apply equivalent subjects Search modes - Find all my search terms	7,885
7	(MM "Models, Organizational+") OR (MM "Organizational Innovation+") OR (TI Collaboration) OR (MM "Health Facility Merger+") OR (MM "Systems Integration+") OR (MM "Cooperative Behavior+") OR (TI Integration) OR (TI integrated) OR (TI "organizational model*") OR (TI collaborative) OR (TI Partnership) OR (TI partner) OR (TI partners) OR (TI linkage* OR AB linkage*) OR (TI cooperation) OR (TI integration)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	102,338
8	S6 AND S7	Expanders - Apply equivalent subjects Search modes - Find all my search terms	347
9	(MM "Delivery of Health Care+") OR (MM "Delivery of Health Care, Integrated+") OR (MM "Patient Care Team+") OR (MM "Continuity of Patient Care+") OR (MH "Patient-Centered Care+") OR (TI "Patient Centered") OR (TI "Person centered") OR (TI "Care coordination") OR (TI "coordinated care")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	17,504
10	S8 AND S9	Expanders - Apply equivalent subjects Search modes - Find all my search terms	9
11	(MH "Search: "Preventive Health Services"+") OR (TI "clinical preventive services" OR AB "clinical preventive services") OR (TI "clinical preventive service" OR AB "clinical preventive service") OR (TI Preventive) OR (TI Prevention) OR (MH "Mass Screening+") OR (TI screening) OR (TI screen*) OR (TI screens) OR (TI screened) OR (MH Counseling+) OR (TI counsel*) OR (TI counseling) OR (MH Immunization+) OR (MH Vaccination+) OR (MH "Immunization Programs+") OR (TI immunization) OR (TI vaccine*) OR (TI vaccination*) OR (MM "Primary Prevention+") OR (MH "Chronic Disease/prevention and control+")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	338,523
12	S8 AND S11	Expanders - Apply equivalent subjects Search modes - Find all my search terms	116

Search Number	CINAHL Query	Limiters/Expanders	Results
13	S10 OR S12	Expanders - Apply equivalent subjects Search modes - Find all my search terms	124
14	Intervention* OR (TI program OR AB program) OR (TI programs OR AB programs) OR (PT "Evaluation Study") OR (MH "Evaluation Studies as Topic+") OR (MH "Program Evaluation+") OR (TI Evaluation) OR (MH "Health Plan Implementation+") OR (MH "Health Impact Assessment+") OR (MH "Patient Outcome Assessment+")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1,004,937
15	S13 AND S14	Expanders - Apply equivalent subjects Search modes - Find all my search terms	56
16	((MH Animals+) NOT (MH Humans+)) OR rats OR cow OR cows OR chicken OR chickens OR horse OR horses OR mice OR mouse OR bovine OR sheep OR ovine OR murine OR murinae	Expanders - Apply equivalent subjects Search modes - Find all my search terms	258,843
17	S15 NOT S16	Expanders - Apply equivalent subjects Search modes - Find all my search terms	56
18	S17	Limiters - Published Date: 20120101-20231231; English Language; Language: English Expanders - Apply equivalent subjects Search modes - Find all my search terms	42
19	S18	Limiters - Publication Type: Anecdote, Case Study Expanders - Apply equivalent subjects Search modes - Find all my search terms	1
20	S18	Limiters - Publication Type: Meta Analysis, Meta Synthesis, Systematic Review Expanders - Apply equivalent subjects Search modes - Find all my search terms	1
21	S18 AND ((TI "scoping review" OR AB "scoping review") OR (TI "integrative review" OR AB "integrative review") OR (TI "rapid review" OR AB "rapid review") OR (TI "living review" OR AB "living review") OR (TI "environmental scan" OR AB "environmental scan"))	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1

Search Number	CINAHL Query	Limiters/Expanders	Results
22	S21 NOT S20	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
23	S18 AND (toolkit" OR toolkits OR "tool kit" OR "tool kits")	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
24	S18 NOT (S19 OR S20 OR S21)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	40

Grey Literature Sources Searched

Source	Website Link
Google and Google Scholar	https://www.google.com/ and https://scholar.google.com/
AHRQ: Improving Primary Care Practice	https://www.ahrq.gov/ncepcr/tools/improve/index.html
AHRQ: Primary Care Practice-Based Research Networks	https://www.ahrq.gov/research/findings/factsheets/primary/pbrn/index.html
AHRQ: Health Care Innovation Exchange	https://www.ahrq.gov/innovations/index.html
American College of Physicians	https://www.acponline.org/
American Academy of Pediatrics	https://www.aap.org/
American Academy of Family Physicians	https://www.aafp.org/home.html
Centers for Disease Control and Prevention	https://www.cdc.gov/
Community Preventive Task Force: The Community Guide	https://www.thecommunityguide.org/
U.S. Preventive Services Task Force	https://www.uspreventiveservicestaskforce.org/uspstf/
American Public Health Association	https://www.apha.org/
National Association of Country and City Health Officials	https://www.naccho.org/
National Association of Community Health Centers	http://www.nachc.org
de Beaumont Foundation	https://debeaumont.org/programs/
Robert Wood Johnson Foundation	https://www.rwjf.org/
The Pathways to Prevention (P2P) Program	https://prevention.nih.gov/research-priorities/research-needs-and-gaps/pathways-prevention
Joanna Briggs Institute	https://jbi.global/
U.S. Department of Veterans Affairs Evidence Synthesis Program	https://www.hsrd.research.va.gov/publications/esp/

Source	Website Link
McMaster University Health System Evidence	https://library.mcmaster.ca/databases/health-systems-evidence
National Institute for Health and Care Excellence	https://www.nice.org.uk/

C.2 Environmental Scan Findings

- The integration of primary care, public health, and community-based organizations has been identified as essential to quality care and an important strategy for promoting individual and population health, especially in populations impacted by health disparities.
- Screening for HIV infection, hypertension and cardiovascular disease, cancer, and delivering vaccinations were the most common types of clinical preventive services delivered by programs included in our scan. Few programs addressed tobacco use, poor diet and inactivity, or excessive alcohol use. Few programs described bundled delivery of multiple CPS.
- Most programs promoted linkages from the community to primary care by using population-based strategies, such as community-wide screenings and outreach programs to direct patients toward primary care.
- Approximately half of programs promoted collaborations by improving access to care for underinsured populations, which are most affected by social determinants of health.
- Programs represented geographic diversity across the United States with most implemented in the Northeast, Southeast, Midwest, and western regions.
- Additional research is needed on bundled delivery of CPS, strategies for data sharing and integration, and evaluation of linkages.

C.3 Technical Expert Panel Participants and Key Informants

Table C-1. Public Health and Community Linkages Technical Expert Panel Members and Key Informants

Name	Organization	Role	Type of Organization
Toni Eyssallene, MD, PhD	New York City Department of Health and Mental Hygiene	Senior Medical Advisor to the Chief Medical Officer	State policy/public health
Karen Hacker, MD, MPH	Centers for Disease Control and Prevention	Director, National Center for Chronic Disease, Prevention and Health Promotion	Federal agency
Howard Haft, MD, MMM, CPE, FACPE	American Heart Association Ambulatory Quality Committee, formerly with the Maryland Department of Health	Senior Advisor	State policy/public health
Heather Hodge, MEd	YMCA of the USA	Senior Director, Community Health	Other
Mitchell Katz, MD	New York City Health + Hospitals	Chief Executive Officer	Healthcare system

Name	Organization	Role	Type of Organization
Kathryn G. Kietzman, PhD, MSW	University of California, Los Angeles, Center for Health Policy Research	Director, Health Equity Program	Research/academia
James Macrae, MA, MPP	Health Resources and Services Administration	Associate Administrator for Bureau of Primary Health Care	Federal agency
J. Lloyd Michener, MD	Duke University School of Medicine	Professor Emeritus, Department of Family Medicine & Community Health	Research/academia
Deborah Porterfield, MD, MPH	Formerly, Department of Family Medicine, UNC-Chapel Hill, and RTI International; currently, Office of the Assistant Secretary for Planning and Evaluation	Medical Officer	Federal agency
Shailey Prasad, MD, MPH	University of Minnesota Center for Global Health and Social Responsibility; Department of Family Medicine and Community Health	Executive Director; Vice Chair for Education	Research/academia
Melanie A. Reese, SME	Older Women Embracing Life	Executive Director	Patient/consumer representative
Alexis Snyder, BA	Independent consultant	Patient and stakeholder engagement specialist	Patient/consumer representative
Chelsy Winters, MS	YMCA of Greater Indianapolis	Executive Director of Healthy Living	Other
Janet S. Wright, MD, MACC, FPCNA	Centers for Disease Control and Prevention	Director, Division for Heart Disease and Stroke Prevention	Federal agency
Anonymous	U.S. university	Professor and Institute Director	USPSTF (current/former member)
Anonymous	U.S. university	Vice Chair for Research	Research/academia
Anonymous	U.S. Nonprofit organization representing primary care and community health centers	Chief Operating Officer	Other

D. Disparities in Clinical Preventive Services

Short Topic Title	Topic Description
Disparities	Identify causes as well as person-centered strategies to mitigate health disparities related to clinical preventive services (CPS). The scope included but was not limited to strategies to improve the uptake of CPS across different populations.

D.1 Environmental Scan Data Sources and Searches

The search for this scan was developed in collaboration with an information specialist based on keywords related to “clinical preventive services”, “equity”, and “disparities” within two bibliographic databases: PubMed and PsychInfo. The information specialist focused on two primary sets of literature: (1) synthesized literature (e.g., systematic and narrative reviews) published over the last 10 years and (2) randomized trials published between 2019 and 2023 to build upon a previous systematic review to support the Pathways to Prevention (P2P) Workshop on Achieving Health Equity in Preventive Services.

Search Number	PubMed Query	Results
1	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr]	929,204
2	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] Filters: English	801,094
3	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] Filters: English, from 2012 - 2023	388,820
4	Search: #3 NOT (("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]) NOT "Adult"[Mesh])	346,642
5	Search: address[pt] OR "autobiography"[pt] OR "bibliography"[pt] OR "biography"[pt] OR congress[pt] OR "dictionary"[pt] OR "directory"[pt] OR "festschrift"[pt] OR "historical article"[pt] OR lecture[pt] OR "legal case"[pt] OR "legislation"[pt] OR "periodical index"[pt] OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep[tw] OR ovine OR murine[tw] OR murinae[tw] OR "Self-management"[tw] OR "disease management"[tw] OR protocol[tw]	5,192,842

Search Number	PubMed Query	Results
6	Search: #4 NOT #5	301,424
7	Search: ("preventive service*"[tw] OR colonoscopy[tiab] OR lifestyle*[tiab] OR smoking[tiab] OR tobacco[tiab] OR obesity[tiab] OR cholesterol[tiab] OR alcohol*[tiab] OR aspirin[tiab] OR "blood pressure"[tiab] OR hypertension[tiab] OR "breast cancer"[tiab] OR "cervical cancer"[tiab] OR "colon cancer"[tiab] OR depression[tiab] OR diabetes[tiab] OR Falls[tiab] OR "substance abuse"[tiab] OR HIV[tiab] OR "intimate partner violence"[tiab] OR "domestic violence"[tiab] OR "healthy diet"[tiab] OR "physical activity"[tiab] OR exercise[tiab] OR "lung cancer"[tiab] OR osteoporosis[tiab])	3,996,862
8	Search: #6 AND #7	86,112
9	Search: "Health Equity"[Mesh:noexp] OR "Health Status Disparities"[Mesh:noexp] OR "Minority health"[Mesh:noexp] OR Prejudice[Mesh:noexp] OR "Psychosocial Deprivation"[Mesh:noexp] OR "Racial Groups"[Mesh] OR Racism[Mesh:noexp] OR "Social determinants of Health"[Mesh:noexp] OR "Social Discrimination"[Mesh:noexp] OR Xenophobia[Mesh:noexp] OR disparit*[tiab] OR equity[tiab] OR ethnic*[tw] OR ethnology[tw] OR inequit*[tiab] OR "foreign language"[tw] OR "health*care disparit*"[tw] OR "healthcare disparit*"[tw] OR "health status disparit*"[tw] OR "health disparit*"[tw] OR "health inequalit*"[tw] OR "health inequit*"[tw] OR "health equit*"[tw] OR "health equalit*"[tw]	536,364
10	Search: #8 AND #9	8,404
11	Search: #10 AND (incidence OR morbidity OR mortality)	5,563
12	Search: #10 AND (incidence OR morbidity OR mortality) Filters: Review	485
13	Search: #10 AND (incidence OR morbidity OR mortality) Filters: Meta-Analysis, Review, Systematic Review	559
14	Search: #10 AND (incidence OR morbidity OR mortality) Filters: Case Reports	8
15	Search: #10 AND (incidence OR morbidity OR mortality) Filters: Case Reports, Editorial	59
16	Search: #10 AND (incidence OR morbidity OR mortality) Filters: Case Reports, Editorial, Letter	92
17	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab]))	1,720
18	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab])) Filters: Review	163
19	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab])) Filters: Meta-Analysis, Review, Systematic Review	193
20	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab])) Filters: Case Reports	1
21	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab])) Filters: Editorial	6
22	Search: #10 AND (uptake[tiab] OR utilization[tiab] OR (access[tiab] AND screen*[tiab])) Filters: Editorial, Letter	8
23	Search: #10 AND Cause*[tw]	592
24	Search: #10 AND Cause*[tw] Filters: Review	108
25	Search: #10 AND Cause*[tw] Filters: Meta-Analysis, Review, Systematic Review	120
26	Search: #10 AND Cause*[tw] Filters: Case Reports	1
27	Search: #10 AND Cause*[tw] Filters: Editorial	10

Search Number	PubMed Query	Results
28	Search: #10 AND Cause*[tw] Filters: Editorial, Letter	11
29	Search: "Patient-Centered Care"[Mesh] OR (("patient-centered"[tiab] OR "patient-focused"[tiab] OR "person-centered"[tiab]) AND care[tiab]) OR "Precision Medicine"[Majr] OR ((individual*[tiab] OR Individualize*[tiab] OR holistic[tiab] OR "whole person"[tiab] OR personalized[tiab]) AND care[tiab]) OR "patient needs"[tiab] OR "patient values"[tiab] OR "Physician-Patient Relations"[Majr] OR "Doctor-patient relation*"[tiab] OR "Professional-Patient Relations"[Majr] OR "Patient Preference"[Majr] OR "patient preference*"[tiab] OR "social competenc*"[tiab] OR "Decision Making, Shared"[Majr] OR "shared decision making"[tiab] OR "Patient Self-Determination Act"[Majr] OR "patient decision making"[tiab] OR "patient engagement"[tiab] OR "patient involvement"[tiab] OR "patient empowerment"[tiab] OR "patient partnership"[tiab] OR "patient activation" [tiab] OR "patient-activated"[tiab] OR "Patient Acceptance of Health Care"[Majr] OR "consumer participation"[title] OR "consumer engagement"[tiab] OR "consumer involvement"[tiab] OR "consumer empowerment"[tiab] OR "consumer partnership"[tiab] OR "consumer activation"[tiab] OR "patient context"[tiab] OR "integrated care"[tiab] OR "coordinated care"[tiab] OR "Care coordination"[tiab] OR "continuity of care"[tiab] OR "healthcare teams"[tiab] OR "team-based care"[tiab] OR teamwork[tiab]	473,922
30	Search: #10 AND #29	1,569
31	Search: #10 AND #29 Filters: Review	133
32	Search: #10 AND #29 Filters: Meta-Analysis, Review, Systematic Review	158
33	Search: #10 AND #29 Filters: Case Reports	1
34	Search: #10 AND #29 Filters: Editorial	9
35	Search: #10 AND #29 Filters: Editorial, Letter	11
36	Search: ("Organizational Innovation"[Majr] OR "Models, Organizational"[Majr] OR "care model*"[tiab] OR "service"[tiab] OR ("Delivery of Health Care"[Majr] AND model*[tw]) OR program[tiab] OR programmatic[tiab] OR redesign[tiab] OR transformation[tiab] OR innovation[tiab] OR innovative[tiab] OR "new model"[tiab] OR reform[title] OR "quality"[title] OR "healthcare improvement"[tiab] OR "system improvement"[tiab] OR strategy[title] OR strategies[title] OR "improve care"[title] OR "care improvement"[title] OR "care delivery"[title] OR "Health Systems Agencies"[Majr] OR "Social Determinants of Health"[Mesh] OR "Patient Care Bundles"[Mesh] OR "Patient Reported Outcome Measures"[Majr] OR "Quality Measure*"[tiab] OR "Healthy People Programs"[Majr])	1,751,457
37	Search: #10 AND #36	2,885
38	Search:#10 AND #36 Filters: Review	213
39	Search: #10 AND #36 Filters: Review, Systematic Review	232
40	Search: #10 AND #36 Filters: Meta-Analysis, Review, Systematic Review	235
41	Search:#10 AND #36 Filters: Case Reports	4
42	Search#10 AND #36 Filters: Editorial	13
43	Search:#10 AND #36 Filters: Editorial, Letter	17
44	Search:#10 AND (policy[tw] AND intervention*[tw])	263
45	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Review	51
46	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Review, Systematic Review	56
47	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Meta-Analysis, Review, Systematic Review	56
48	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Case Reports	0

Search Number	PubMed Query	Results
49	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Editorial	9
50	Search:#10 AND (policy[tw] AND intervention*[tw]) Filters: Editorial, Letter	10

Search Number	PubMed Query (RCTs)	Results
1	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr]	929,247
2	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] Filters: English	801,136
3	Search: "Preventive Health Services"[Majr] OR "clinical preventive services"[tiab] OR "clinical preventive service"[tiab] OR Preventive[title] OR Prevention[title] OR Mass Screening[Majr] OR screening[title] OR screen*[title] OR screens[title] OR screened[title] OR Counseling[Majr] OR counsel*[title] OR counseling[title] OR Immunization[Majr] OR Vaccination[Majr] OR "Immunization Programs"[Majr] OR immunization[title] OR vaccine*[title] OR vaccination*[title] OR "Primary Prevention"[Majr] Filters: English, from 2012 - 2023	388,862
4	Search: #3 NOT (("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]) NOT "Adult"[Mesh])	346,684
5	Search: address[pt] OR "autobiography"[pt] OR "bibliography"[pt] OR "biography"[pt] OR congress[pt] OR "dictionary"[pt] OR "directory"[pt] OR "festschrift"[pt] OR "historical article"[pt] OR lecture[pt] OR "legal case"[pt] OR "legislation"[pt] OR "periodical index"[pt] OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep[tw] OR ovine OR murine[tw] OR murinae[tw] OR "Self-management"[tw] OR "disease management"[tw] OR protocol[tw]	5,192,897
6	Search: #4 NOT #5	301,462
7	Search: ("preventive service*"[tw] OR colonoscopy[tiab] OR lifestyle*[tiab] OR smoking[tiab] OR tobacco[tiab] OR obesity[tiab] OR cholesterol[tiab] OR alcohol*[tiab] OR aspirin[tiab] OR "blood pressure"[tiab] OR hypertension[tiab] OR "breast cancer"[tiab] OR "cervical cancer"[tiab] OR "colon cancer"[tiab] OR depression[tiab] OR diabetes[tiab] OR Falls[tiab] OR "substance abuse"[tiab] OR HIV[tiab] OR "intimate partner violence"[tiab] OR "domestic violence"[tiab] OR "healthy diet"[tiab] OR "physical activity"[tiab] OR exercise[tiab] OR "lung cancer"[tiab] OR osteoporosis[tiab])	3,996,980
8	Search: #6 AND #7	86,121

Search Number	PubMed Query (RCTs)	Results
9	Search: "Health Equity"[Mesh:noexp] OR "Health Status Disparities"[Mesh:noexp] OR "Minority health"[Mesh:noexp] OR Prejudice[Mesh:noexp] OR "Psychosocial Deprivation"[Mesh:noexp] OR "Racial Groups"[Mesh] OR Racism[Mesh:noexp] OR "Social determinants of Health"[Mesh:noexp] OR "Social Discrimination"[Mesh:noexp] OR Xenophobia[Mesh:noexp] OR disparit*[tiab] OR equity[tiab] OR ethnic*[tw] OR ethnology[tw] OR inequit*[tiab] OR "foreign language"[tw] OR "health*care disparit*"[tw] OR "healthcare disparit*"[tw] OR "health status disparit*"[tw] OR "health disparit*"[tw] OR "health inequalit*"[tw] OR "health inequit*"[tw] OR "health equit*"[tw] OR "health equalit*"[tw]	536,383
10	Search: #8 AND #9	8,405
11	Search: #8 AND #9 Filters: from 2019/1/1 - 2023/12/31	3,285
12	Search: #8 AND #9 Filters: Randomized Controlled Trial, from 2019/1/1 - 2023/12/31	194

Search Number	PsychInfo Query	Limiters/Expanders	Results
1	MM "Preventive Health Services" OR TI "clinical preventive services" OR AB "clinical preventive services" OR TI "clinical preventive service" OR AB "clinical preventive service" OR TI Preventive OR TI Prevention OR MM Screening OR TI screening OR TI screen* OR TI screens OR TI screened OR MM Counseling OR TI counsel* OR TI counseling OR MM Immunization OR MM Vaccination OR MM “Vaccination Attitudes” OR TI immunization OR TI vaccine* OR TI vaccination* OR TI "Primary Prevention" OR AB "Primary Prevention"	Expanders - Apply equivalent subjects Search modes - Find all my search terms	92,571
2	S1	Limiters - Publication Year: 2012-2023; English; Language: English; Age Groups: Adulthood (18 yrs & older); Population Group: Human Expanders - Apply equivalent subjects Search modes - Find all my search terms	20,412
3	TX (rats OR cow OR cows OR chicken OR chickens OR horse OR horses OR mice OR mouse.mp OR bovine OR sheep OR ovine OR murine OR murinae OR Self-management OR "disease management" OR protocol)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	358,829
4	S2 NOT S3	Expanders - Apply equivalent subjects Search modes - Find all my search terms	19,694

Search Number	PsychInfo Query	Limiters/Expanders	Results
5	S4	Limiters - Document Type: Abstract Collection, Bibliography, Chapter, Clarification, Dissertation, Encyclopedia Entry, Erratum/Correction, Interview, Obituary, Poetry, Publication Information, Review-Book, Review-Media, Review-Software & Other Expanders - Apply equivalent subjects Search modes - Find all my search terms	3,649
6	S4 NOT S5	Expanders - Apply equivalent subjects Search modes - Find all my search terms	16,045
7	TX preventive service* OR TX preventive health service* OR TI colonoscopy OR AB colonoscopy OR TI lifestyle* OR AB lifestyle* OR TI smoking OR AB smoking OR TI tobacco OR AB tobacco OR TI obesity OR AB obesity OR TI cholesterol OR AB cholesterol OR TI alcohol* OR AB alcohol* OR TI aspirin OR AB aspirin OR TI "blood pressure" OR AB “blood pressure” OR TI hypertension OR AB hypertension OR TI "breast cancer" OR AB “breast cancer” OR TI "cervical cancer" OR AB “cervical cancer” OR TI "colon cancer" OR AB “colon cancer” OR TI “colorectal cancer” OR AB “colorectal cancer” OR TI depression OR AB depression OR TI diabetes OR AB diabetes OR TI Falls OR AB Falls OR TI "substance abuse" OR AB “substance abuse” OR TI HIV OR AB HIV OR TI "intimate partner violence" OR AB “intimate partner violence” OR TI "domestic violence" OR AB “domestic violence” OR TI "healthy diet" OR AB “healthy diet” OR TI "physical activity” OR AB “physical activity” OR TI exercise OR AB exercise OR TI "lung cancer" OR AB “lung cancer” OR TI osteoporosis OR AB osteoporosis	Expanders - Apply equivalent subjects Search modes - Find all my search terms	768,104
8	S6 AND S7	Expanders - Apply equivalent subjects Search modes - Find all my search terms	6,323

Search Number	PsychInfo Query	Limiters/Expanders	Results
9	DE Equity OR DE "Health Disparities" OR DE "Mental Health Disparities" OR DE "Minority Stress" OR TX "Minority health" OR DE "Prejudice" OR TX "Psychosocial Deprivation" OR DE "Racial Identity" OR DE "Racism" OR DE "Internalized Racism" OR DE "Systemic Racism" OR TX "Social determinants of Health" OR DE "Socioeconomic Factors" OR DE "Economic Disadvantage" OR DE "Economic Resources" OR DE "Employment Status" OR DE "Income Level" OR DE "Social Class" OR DE "Social Disadvantage" OR DE "Socioeconomic Status" OR DE "Family Socioeconomic Status" OR DE "Income Level" OR DE "Social Class" OR DE "Social Discrimination" OR DE "Age Discrimination" OR DE "Disability Discrimination" OR DE "Employment Discrimination" OR DE "Intersectionality" OR DE "Race and Ethnic Discrimination" OR DE "Sex Discrimination" OR DE "Social Class Bias" OR DE "Stranger Reactions" OR TX Xenophobia OR TI disparit* OR AB disparit* OR TI equity OR AB equit* OR TX ethnic* OR TX ethnology OR TI inequit* OR AB inequit* OR TX "foreign language" OR TX "health*care disparit*" OR TX "healthcare disparit*" OR TX "health status disparit*" OR TX "health disparit*" OR TX "health inequalit*" OR TX "health inequit*" OR TX "health equit*" OR TX "health equalit*"	Expanders - Apply equivalent subjects Search modes - Find all my search terms	332,020
10	S8 AND S9	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1,170
11	TX (Incidence OR morbidity OR mortality)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	129,758
12	S10 AND S11	Expanders - Apply equivalent subjects Search modes - Find all my search terms	179
13		Limiters - Methodology: LITERATURE REVIEW, -Systematic Review, META ANALYSIS, METASYNTHESIS Expanders - Apply equivalent subjects Search modes - Find all my search terms	205,967
14		Limiters - Methodology: CLINICAL CASE STUDY, NONCLINICAL CASE STUDY Expanders - Apply equivalent subjects Search modes - Find all my search terms	125,138

Search Number	PsychInfo Query	Limiters/Expanders	Results
15		Limiters - Document Type: Editorial, Letter Expanders - Apply equivalent subjects Search modes - Find all my search terms	70,457
16	S12 AND S13	Expanders - Apply equivalent subjects Search modes - Find all my search terms	5
17	S12 AND S14	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
18	S12 AND S15	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
19	TI uptake OR AB uptake OR TI utilization OR AB utilization OR TI (access AND screen*) OR AB (access AND screen*)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	64,949
20	S10 AND S19	Expanders - Apply equivalent subjects Search modes - Find all my search terms	328
21	S13 AND S20	Expanders - Apply equivalent subjects Search modes - Find all my search terms	3
22	S14 AND S20	Expanders - Apply equivalent subjects Search modes - Find all my search terms	3
23	S15 AND S20	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
24	DE "Causality" OR TX cause*	Expanders - Apply equivalent subjects Search modes - Find all my search terms	252,235
25	S10 AND S24	Expanders - Apply equivalent subjects Search modes - Find all my search terms	101
26	S13 AND S25	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1

Search Number	PsychInfo Query	Limiters/Expanders	Results
27	S14 AND S25	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
28	S15 AND S25	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
29	TX "Patient-Centered Care" OR TI ((patient-centered OR patient-focused OR person-centered) AND care) OR AB ((patient-centered OR patient-focused OR person-centered) AND care) OR DE "Precision Medicine" OR TI ((individual* OR Individualize* OR holistic OR "whole person" OR personalized) AND care) OR AB ((individual* OR Individualize* OR holistic OR "whole person" OR personalized) AND care) OR TI "patient needs" OR AB “patient needs” OR TI "patient values" OR AB “patient values” OR TX "Physician-Patient Relations" OR TI "Doctor-patient relation*" OR AB “Doctor-patient relation*” OR TX "Professional-Patient Relations" OR TX "Patient Preference" OR DE "Social Skills" OR TX "social competenc*" OR exp *"Decision Making, Shared"/ OR (DE "Decision Making" AND TX shared) OR TX "shared decision making" OR TX "Patient Self-Determination Act" OR TX "patient decision making" OR TX "patient engagement" OR TX "patient involvement" OR TX "patient empowerment" OR TX "patient partnership" OR TX "patient activation" OR TX “patient-activated” OR TX "Patient Acceptance of Health Care" OR TX "consumer participation" OR TX "consumer engagement" OR TX "consumer involvement" OR TX "consumer empowerment" OR TX "consumer partnership" OR TX "consumer activation" OR TX "patient context" OR TX "integrated care" OR TX "coordinated care" OR TX "Care coordination" OR TX "continuity of care" OR TX "healthcare teams" OR TX "team-based care" OR TX teamwork	Expanders - Apply equivalent subjects Search modes - Find all my search terms	159,225
30	S10 AND S29	Expanders - Apply equivalent subjects Search modes - Find all my search terms	281
31	S13 AND S30	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1
32	S14 AND S30	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1
33	S15 AND S30	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0

Search Number	PsychInfo Query	Limiters/Expanders	Results
34	DE "Organizational Change" OR TX "Organizational Innovation" OR DE "Organizational Characteristics" OR TX “organizational model” OR TX "care model*" OR service.ti,ab. OR (exp DE "Health Care Delivery" AND model*) OR TX program OR TX programmatic OR TX redesign OR TX transformation OR TX innovation OR TX innovative OR TX "new model" OR TI reform OR TI quality OR TX "healthcare improvement" OR TX "system improvement" OR TI strategy OR TI strategies OR TI "improve care" OR TI "care improvement" OR TI "care delivery" OR TX "Health Systems Agencies" OR TX "Social Determinants of Health" OR TX "Patient Care Bundles" OR DE "Patient Reported Outcome Measures" OR TX "Quality Measure*" OR TX "Healthy People Programs"	Expanders - Apply equivalent subjects Search modes - Find all my search terms	876,809
35	S10 AND S34	Expanders - Apply equivalent subjects Search modes - Find all my search terms	469
36	S13 AND S35	Expanders - Apply equivalent subjects Search modes - Find all my search terms	4
37	S14 AND S35	Expanders - Apply equivalent subjects Search modes - Find all my search terms	3
38	S15 AND S35	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
39	TX policy AND intervention*	Expanders - Apply equivalent subjects Search modes - Find all my search terms	44,800
40	TX S10 AND S39	Expanders - Apply equivalent subjects Search modes - Find all my search terms	63
41	TX S13 AND S40	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
42	TX S14 AND S40	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0
43	TX S15 AND S40	Expanders - Apply equivalent subjects Search modes - Find all my search terms	0

Search	PsychInfo RCT Query	Limiters/Expanders	Results
1	MM "Preventive Health Services" OR TI "clinical preventive services" OR AB "clinical preventive services" OR TI "clinical preventive service" OR AB "clinical preventive service" OR TI Preventive OR TI Prevention OR MM Screening OR TI screening OR TI screen* OR TI screens OR TI screened OR MM Counseling OR TI counsel* OR TI counseling OR MM Immunization OR MM Vaccination OR MM “Vaccination Attitudes” OR TI immunization OR TI vaccine* OR TI vaccination* OR TI "Primary Prevention" OR AB "Primary Prevention"	Expanders - Apply equivalent subjects Search modes - Find all my search terms	92,571
2	S1	Limiters - Publication Year: 2012-2023; English; Language: English; Age Groups: Adulthood (18 yrs & older); Population Group: Human Expanders - Apply equivalent subjects Search modes - Find all my search terms	20,412
3	TX (rats OR cow OR cows OR chicken OR chickens OR horse OR horses OR mice OR mouse.mp OR bovine OR sheep OR ovine OR murine OR murinae OR Self-management OR "disease management" OR protocol)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	358,829
4	S2 NOT S3	Expanders - Apply equivalent subjects Search modes - Find all my search terms	19,694
5	S4	Limiters - Document Type: Abstract Collection, Bibliography, Chapter, Clarification, Dissertation, Encyclopedia Entry, Erratum/Correction, Interview, Obituary, Poetry, Publication Information, Review-Book, Review-Media, Review-Software & Other Expanders - Apply equivalent subjects Search modes - Find all my search terms	3,649
6	S4 NOT S5	Expanders - Apply equivalent subjects Search modes - Find all my search terms	16,045

Search	PsychInfo RCT Query	Limiters/Expanders	Results
7	TX preventive service* OR TX preventive health service* OR TI colonoscopy OR AB colonoscopy OR TI lifestyle* OR AB lifestyle* OR TI smoking OR AB smoking OR TI tobacco OR AB tobacco OR TI obesity OR AB obesity OR TI cholesterol OR AB cholesterol OR TI alcohol* OR AB alcohol* OR TI aspirin OR AB aspirin OR TI "blood pressure" OR AB “blood pressure” OR TI hypertension OR AB hypertension OR TI "breast cancer" OR AB “breast cancer” OR TI "cervical cancer" OR AB “cervical cancer” OR TI "colon cancer" OR AB “colon cancer” OR TI “colorectal cancer” OR AB “colorectal cancer” OR TI depression OR AB depression OR TI diabetes OR AB diabetes OR TI Falls OR AB Falls OR TI "substance abuse" OR AB “substance abuse” OR TI HIV OR AB HIV OR TI "intimate partner violence" OR AB “intimate partner violence” OR TI "domestic violence" OR AB “domestic violence” OR TI "healthy diet" OR AB “healthy diet” OR TI "physical activity” OR AB “physical activity” OR TI exercise OR AB exercise OR TI "lung cancer" OR AB “lung cancer” OR TI osteoporosis OR AB osteoporosis	Expanders - Apply equivalent subjects Search modes - Find all my search terms	768,104
8	S6 AND S7	Expanders - Apply equivalent subjects Search modes - Find all my search terms	6,323
9	DE Equity OR DE "Health Disparities" OR DE "Mental Health Disparities" OR DE "Minority Stress" OR TX "Minority health" OR DE "Prejudice" OR TX "Psychosocial Deprivation" OR DE "Racial Identity" OR DE "Racism" OR DE "Internalized Racism" OR DE "Systemic Racism" OR TX "Social determinants of Health" OR DE "Socioeconomic Factors" OR DE "Economic Disadvantage" OR DE "Economic Resources" OR DE "Employment Status" OR DE "Income Level" OR DE "Social Class" OR DE "Social Disadvantage" OR DE "Socioeconomic Status" OR DE "Family Socioeconomic Status" OR DE "Income Level" OR DE "Social Class" OR DE "Social Discrimination" OR DE "Age Discrimination" OR DE "Disability Discrimination" OR DE "Employment Discrimination" OR DE "Intersectionality" OR DE "Race and Ethnic Discrimination" OR DE "Sex Discrimination" OR DE "Social Class Bias" OR DE "Stranger Reactions" OR TX Xenophobia OR TI disparit* OR AB disparit* OR TI equity OR AB equit* OR TX ethnic* OR TX ethnology OR TI inequit* OR AB inequit* OR TX "foreign language" OR TX "health*care disparit*" OR TX "healthcare disparit*" OR TX "health status disparit*" OR TX "health disparit*" OR TX "health inequalit*" OR TX "health inequit*" OR TX "health equit*" OR TX "health equalit*"	Expanders - Apply equivalent subjects Search modes - Find all my search terms	332,020
10	S8 AND S9	Expanders - Apply equivalent subjects Search modes - Find all my search terms	1,170
11	S10	Limiters - Methodology: CLINICAL TRIAL Expanders - Apply equivalent subjects Search modes - Find all my search terms	20

Search	PsychInfo RCT Query	Limiters/Expanders	Results
12	S10 AND ((random* AND control*) OR single-blind OR double-blind OR triple-blind OR treble OR “random allocation”)	Expanders - Apply equivalent subjects Search modes - Find all my search terms	25
13	S11 OR S12	Expanders - Apply equivalent subjects Search modes - Find all my search terms	36

Grey Literature Sources Searched

Source	Website Link
Advisory Committee on Immunization Practices (ACIP)	https://www.cdc.gov/vaccines/acip/index.html
Agency for Healthcare Research and Quality (AHRQ)	https://www.ahrq.gov/
American Cancer Society (ACS)	www.cancer.org
American College of Cardiology (ACC)	www.acc.org
American College of Physicians (ACP)	www.acponline.org
American Heart Association (AHA)	www.heart.org
Centers for Disease Control and Prevention (CDC)	https://www.cdc.gov/
Centers for Medicare & Medicaid Services (CMS)	www.cms.gov
Commonwealth Fund	www.commonwealthfund.org
Evaluation Officer Counsel	www.evaluation.gov
Institute for Healthcare Improvement (IHI)	www.ihi.org
Kaiser Family Foundation (KFF)	www.kff.org
National Academy of Medicine (NAM)	https://nam.edu/
National Cancer Institute (NCI)	www.cancer.gov
National Colorectal Cancer Roundtable	https://nccrt.org/
National HPV Vaccination Roundtable	https://hpvroundtable.org/
National Institutes of Health Office of Disease Prevention (NIH ODP)	https://prevention.nih.gov
National Institutes on Minority Health and Health Disparities (NIMHD)	www.nimhd.nih.gov

Source	Website Link
National Lung Cancer Roundtable	https://nlcrt.org
National Navigation Roundtable	https://navigationroundtable.org/
Patient-Centered Outcomes Research Institute (PCORI)	www.pcori.org
The Guide to Community Preventive Services (CPSTF)	https://www.thecommunityguide.org/
The Pathways to Prevention (P2P) Program	https://prevention.nih.gov/research-priorities/research-needs-and-gaps/pathways-prevention
U.S. Preventive Service Task Force (USPSTF)	https://www.uspreventiveservicestaskforce.org/uspstf/

D.2 Environmental Scan Findings

- Data, as well as health equity metrics and analytics, are central to our ability to identify opportunities to address disparities related to CPS and the evaluation of intervention strategies to address these disparities.
- Understanding the causes underlying health disparities is requisite to addressing inequities. Low or differential receipt of any given CPS is only one—and often not the most important—driver of health disparities related to CPS. Causal frameworks to understand the relationship of various structural and social drivers of health underscore the importance of intervening at these more proximal causes for meaningful long-term improvements in an individual's or population's health.
- There are effective interventions (e.g., patient navigators, community health workers, proactive outreach) to increase the receipt of adult CPS, but their effects on bundling CPS or on receiving necessary downstream care is unknown. Reproducibility of their effectiveness in different populations experiencing disparities is needed, and in some cases is underway.
- Holistic strategies should include a multilevel approach to addressing barriers across the care continuum as well as social needs. These types of strategies will necessarily require community partnership.
- For holistic strategies addressing disparities in preventive care and health promotion to be successful, scalable, and sustainable, key financial reform and governance policies must be in place. Examples include provision of continuous insurance coverage, payment models incentivizing high-value equitable care, standards and protections around data, incentives around equity metrics, and requirements around core competencies for delivery of care to populations experiencing disparities.

D.3 Technical Expert Panel and Key Informants

Table D-1. Disparities in Clinical Preventive Services Technical Expert Panel Members and Key Informants

Name	Organization	Role	Type of Organization
Monica L. Baskin, PhD	University of Pittsburgh	Professor of Medicine; Associate Director for Community Outreach and Engagement and Health Equity Comprehensive Cancer Center	Research/academia
Mary Butler, PhD, MBA	University of Minnesota	Associate Professor, Division of Health Policy & Management; Co-Director Minnesota Evidence-based Practice Center	Research/academia
Loretta Christensen, MD, MBA, MSJ, FACS	Indian Health Service	Chief Medical Officer	Federal agency
Michael Currie, MPH, MBA	UnitedHealth Group	Senior Vice President and Chief Health Equity Officer	Payer
Esa Davis, MD, MPH, FAAFP	University of Maryland School of Medicine	Senior Associate Dean for Population Health and Community Medicine	USPSTF (current/ former member)
David Grossman, MD	Kaiser Foundation Health Plan	Senior Vice President of Social and Community Health	Healthcare system
Anjali Jain, MD	Evidence-Based Practice Center program, Agency for Healthcare Research and Quality	Health Scientist Administrator	Federal agency
Monica E. Peek, MD, MPH, MSc	University of Chicago, Section of General Internal Medicine	Ellen H. Block Professor of Health Justice	Research/academia
Rosemary Thomas, MPH, CHES	Penn Medicine	Director of Operations, Health Equity Advancement in Program for LGBTQ Health	Patient/consumer representative
Vivian L. Towe, PhD, MSc, MA	Patient-Centered Outcomes Research Institute	Senior Program Officer	Other
Michelle S. Williams, PhD, MSPH, MCHES	George Mason University	Associate Professor	Research/academia
Anonymous	National Institutes of Health	Division Director	Federal agency
Anonymous	Staff associate	Lived experience consultant	Patient/consumer representative
Anonymous	Multistate U.S. health care system	CEO	Healthcare system
Anonymous	U.S. university	Equity researcher	Research/academia

Name	Organization	Role	Type of Organization
Anonymous	Primary care specialty organization; nonprofit health system serving underserved populations	Board of Directors; Vice President	Healthcare system

E. De-Implementation of Low-Value and Harmful Preventive Services

Short Topic Title	Topic Description
Low-value and Harmful Services	Identify strategies for de-implementation of low-value or harmful services.

E.1 Environmental Scan Data Sources and Searches

Searches of electronic databases were limited to PubMed and the Cochrane Library (Wiley). The searches covered the period from January 2012 to October 2022. To identify grey literature, we also searched Google Scholar, Choosing Wisely, the Institute for Healthcare Improvement, National Academies (formerly the Institute of Medicine), Centers for Medicare & Medicaid Services Appropriate Use Criteria Program, and Smarter Care Virginia. In addition to electronic databases and websites, we manually searched reference lists from recent and relevant review articles and editorials. All citations were managed and deduplicated using EndNote X9 (Clarivate Analytics).

Search Number	PubMed Query	Filters	Results
1	"Choosing Wisely"[tw] OR CWDIF[tiab] OR "low-value care"[tw] OR "low-value service*"[tw] OR "low-value screening"[tiab]		1,527
2	De-adopt*[tw] OR deadopt*[tw] OR Deimplement*[tiab] OR "de-implement*"[tiab] OR "Health Plan Implementation/methods"[Mesh] OR "Implementation Science"[Mesh] OR "Program Evaluation/methods"[Mesh] OR (reduc*[tiab] AND overtreat*[tiab])		11,510
3	"Inappropriate Prescribing"[Mesh] OR "Medical Overuse"[Mesh] OR "Patient Harm"[Mesh] OR "Unnecessary Procedures"[Mesh] OR "Antimicrobial stewardship"[tiab] OR (inappropriate[tiab] AND (management[tiab] OR screening[tiab] OR use[tiab])) OR "harmful service*"[tiab] OR (harm*[tiab] AND care[tiab]) OR ("low-value"[tiab] AND decision*[tiab]) OR Overuse[tiab] OR (reduc*[tiab] AND (inappropriate[tiab] OR harm*[tiab] OR screening[tiab])) OR (unnecessary[tiab] AND (use[tiab] OR screening[tiab])) OR (wasteful[tiab] AND (use[tiab] OR screening[tiab]))		240,446
4	("Clinical Decision-Making/methods"[Mesh] OR "Guideline Adherence"[Mesh] OR "Mass Screening"[Mesh] OR screen*[tiab] OR "Preventive Health Services"[Mesh] OR "Preventive Medicine"[Mesh] OR "Preventive Psychiatry"[Mesh] OR "Primary Prevention"[Mesh] OR USPSTF[tw] OR "Practice Patterns, Physicians'/standards"[Mesh] OR "Primary Health Care"[Mesh] OR "Primary Care Nursing"[Mesh] OR "Physicians, Primary Care"[Mesh] OR "Family Practice"[Mesh] OR "Family Medicine"[tiab] OR "Internal Medicine"[tw] OR "federally qualified health center*"[tiab] OR FQHC*[tiab]) OR (Framework*[tw] OR Program*[tw] OR Intervention*[tw])		3,961,032
5	#2 AND #3		1,119
6	#4 AND #5		879
7	#1 OR #6		2,346

Search Number	PubMed Query	Filters	Results
8	#1 OR #6	English	2,189
9	address[pt] OR “autobiography”[pt] OR “bibliography”[pt] OR “biography”[pt] OR congress[pt] OR “dictionary”[pt] OR “directory”[pt] OR “festschrift”[pt] OR “historical article”[pt] OR lecture[pt] OR “legal case”[pt] OR “legislation”[pt] OR “periodical index”[pt] OR (“Animals”[Mesh] NOT “Humans”[Mesh]) OR rats[tw] OR cow[tw] OR cows[tw] OR chicken[tw] OR chickens[tw] OR horse[tw] OR horses[tw] OR mice[tw] OR mouse[tw] OR bovine[tw] OR sheep[tw] OR ovine OR murine[tw] OR murinae[tw]		6,837,355
10	#8 NOT #9		2,160
11	#8 NOT #9	in the last 10 years	1,965
12	#11 NOT ((“Adolescent”[Mesh] OR “Child”[Mesh] OR “Infant”[Mesh]) NOT “Adult”[Mesh])		1,862
13	#11 NOT (child*[tiab] OR children[tiab] kindergarten*[tiab] OR preschool*[tiab] OR teen[tiab] OR teens[tiab] OR teenage[tiab] OR teenaged[tiab] OR teenager*[tiab] OR adolescen*[tiab] OR pediatric[tiab] OR paediatric*[tiab] OR boys[tiab] OR girls[tiab] OR youth[tiab] OR youths[tiab]) NOT (Adult[Mesh] OR adult*[tiab] OR Aged[Mesh] OR patient*[tiab] OR senior*[tiab] OR elder*[tw] OR geriatric*[tw] OR women[tw] OR men[tw])		544
14	#12 OR #13		1,893
15	#1 OR #2		12,919
16	#15 AND #3 AND #4		1,317
17	#15 AND #3 AND #4	English	1,220
18	#17 NOT #9		1,211
19	#17 NOT #9	in the last 10 years	1,031
20	#19 NOT ((“Adolescent”[Mesh] OR “Child”[Mesh] OR “Infant”[Mesh]) NOT “Adult”[Mesh])		976
21	#19 NOT (child*[tiab] OR children[tiab] OR kindergarten*[tiab] OR preschool*[tiab] OR teen[tiab] OR teens[tiab] OR teenage[tiab] OR teenaged[tiab] OR teenager*[tiab] OR adolescen*[tiab] OR pediatric[tiab] OR paediatric*[tiab] OR boys[tiab] OR girls[tiab] OR youth[tiab] OR youths[tiab]) NOT (Adult[Mesh] OR adult*[tiab] OR Aged[Mesh] OR patient*[tiab] OR senior*[tiab] OR elder*[tw] OR geriatric*[tw] OR women[tw] OR men[tw])		184
22	#20 OR #21		988

Search Number	Cochrane Library Query	Filters	Results
1	De-adopt*[tiab] OR deadopt*[tiab] OR Deimplement*[tiab] OR "de-implement*"[tiab] OR "Health Plan Implementation/methods"[Majr] OR "Implementation Science"[Majr]		1,527
2	"Low-value care"[Mesh] OR "Low-value care"[tiab] OR "low-value service*"[tiab] OR "low-value screening"[tiab]		561
3	#1 AND #2		80
4	#1 AND #2	in the last 10 years	80
5	#1 AND #2	in the last 10 years, English	80
6	#5 NOT (("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]) NOT "Adult"[Mesh])		77

E.2 Environmental Scan Key Findings

- Several theories, models, and frameworks for the de-implementation of low-value care have been proposed, but none are specific to the de-implementation of low-value clinical preventive services (CPS).
- Studies addressing strategies for de-implementation of low-value care are abundant and adequately captured by a handful of recent systematic and scoping reviews. However, very few primary studies examine the effect of de-implementation strategies on the provision of low-value CPS.
- Based on the case examples found, de-implementation strategies were successful in reducing low-value CPS.
- More research from high-quality evaluation studies is needed to recommend strategies for reducing the use of low-value CPS.

E.3 Technical Expert Panel and Key Informants

Table E-1. De-implementation of Low-Value and Harmful Clinical Preventive Services Technical Expert Panel Members and Key Informants

Name	Organization	Role	Type of Organization
Howard Beckman, MD	University of Rochester School of Medicine and Dentistry	Clinical Professor of Medicine	Research/academia
Lesly Dossett, MD, MPH	Michigan Medicine	Associate Professor of Surgery	Research/academia
Hala Durrah, MTA	Independent consultant	Patient Family Engagement Advisor	Patient/consumer representative

Name	Organization	Role	Type of Organization
Mark Fendrick, MD	University of Michigan, Center for Value-Based Insurance Design	Professor, Division of General Medicine and Health Management and Policy	Research/academia
Christian Helfrich, PhD, MPH	VA Puget Sound Health Services Research & Development	Research Investigator	Research/academia
Wendy Levinson, MD, OC	University of Toronto/Choosing Wisely Canada	Professor of Medicine	Research/academia
John N. Mafi, MD, MPH	University of California at Los Angeles David Geffen School of Medicine	Associate Professor of Medicine, Division of General Internal Medicine and Health Services Research	Research/academia
Wynne E. Norton, PhD	National Cancer Institute	Program Director, Division of Cancer Control and Population Sciences	Federal agency
Byron J. Powell, PhD, LCSW	Washington University in St. Louis	Associate Professor	Research/ Academia
Scott Pugel, MD	Kaiser Permanente Georgia	Physician Program Director of Resource Stewardship	Health system
Janice Tufte	Hassanah Consulting	Lived Experience Consultant	Patient/consumer representative
H. Gilbert Welch, PhD, MPH	Brigham and Women's Hospital	Senior Researcher, Center for Surgery and Public Health	Health system
Daniel Wolfson, MHSA	American Board of Internal Medicine Foundation; Alliance of Community Health Plans	Executive Vice President and COO; President and CEO	Other
John Wong, MD	Tufts Medical Center	Vice Chair Academic Affairs, Department of Medicine	USPSTF (current/ former member)
Louise Walter, MD	The American Geriatrics Society/University of California San Francisco	Professor and Chief of Division of Geriatrics	AHRQ Primary Care Learning Community
Anonymous	Nonprofit organization supporting healthcare systems	President and CEO	Other

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