Extending an Antiracism Lens to the Implementation of Precision Public Health Interventions

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See also Choate, p. 1141.

Precision public health holds promise to improve disease prevention and health promotion strategies, allowing the right intervention to be delivered to the right population at the right time.

Growing concerns underscore the potential for precision-based approaches to exacerbate health disparities by relying on biased data inputs and recapitulating existing access inequities. To achieve its full potential, precision public health must focus on addressing social and structural drivers of health and prominently incorporate equity-related concerns, particularly with respect to race and ethnicity.

In this article, we discuss how an antiracism lens could be applied to reduce health disparities and health inequities through equity-informed research, implementation, and evaluation of precision public health interventions. (*Am J Public Health*. 2023;113(11):1210–1218. https://doi.org/10.2105/AJPH.2023.307386)

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Precision public health (PPH) has emerged as a population-level approach that seeks to tailor disease prevention and health promotion strategies to provide the right intervention to the right populations or subpopulations at the right time.[1–3] PPH interventions are defined here as any product, program, or policy delivered to a population to improve its health that includes components tailored to specific biological, social-behavioral, or environmental characteristics of the individuals in the population. Considering heterogeneity both within and across populations, PPH interventions may be more effective for disease prevention and health promotion than its preceding "one size fits all" approach.

Despite its promise, concerns have been raised about whether PPH interventions may exacerbate health inequalities. For example, universal genetic screening for hereditary breast and ovarian cancer, Lynch syndrome, and familial hypercholesterolemia can help tailor disease prevention approaches and, if equitably implemented, has the potential to reduce health disparities and health inequities. However, implementation of screening programs for these conditions remains suboptimal, with significant challenges in uptake among racial and ethnic minority groups, rural communities, uninsured or underinsured people, and those with lower education and income.[4] The COVID-19 pandemic similarly highlighted equity challenges for public health caused by inequitable infrastructure for data collection and interventions. Data on infections, hospitalizations, COVID-19–related deaths, and vaccinations were essential to tailoring infection control efforts. Specifically, structural racism had a negative impact on data collection from racial and ethnic minority groups, exacerbating disparities as well as limiting the effectiveness of PPH in reducing disease burden.[5]

In discussions surrounding the risks and benefits of PPH, much of the literature has focused on approaches that may affect individual agency, with fewer explicit conversations to center other fundamental, structural drivers of health, including racism.[6] Race and ethnicity are social constructs and serve as proxies for numerous social determinants of health because of historic and ongoing structural and experienced racism.[7–9] Racism can be experienced

in many forms simultaneously, including internalized, interpersonal, cultural, and structural.[7–9] However, no matter the form, a vast literature confirms that racism is associated with poor physical and mental health, lower access to health interventions, and limited opportunities to participate in research.[8] Thus, without explicitly incorporating equity-related considerations prominently within PPH research, PPH interventions could exacerbate health inequities and the effects of racism.

Recently, Shelton et al.[10] outlined how an antiracism lens could be applied within the field of implementation science (Table A, available as a supplement to the online version of this article at http://www.ajph.org). Implementation science offers theoretical frameworks and strategies to promote the adoption and integration of evidence-based interventions by supporting the delivery of these interventions into various settings. The field of implementation science is thus deeply connected to PPH intervention delivery in that it comprises the key methodologies for implementing and sustaining tailored evidence-based practices, at scale. According to Shelton et al., selecting frameworks, methods, and interventions that are agnostic to the impacts of structural racism can inadvertently exacerbate inequities. Intentionally collecting and analyzing data related to racial and ethnic equity over the life course of a PPH intervention is essential for incorporating an antiracist lens into its implementation. Ongoing work incorporating health equity considerations into implementation science frameworks has examined how to contextualize implementation science evaluations by examining multilevel factors that are integral to successful, equitable implementation. In return, implementation science frameworks can help operationalize evidence-based practices to address health equity and racism within PPH.

Addressing structural drivers of health, including race and racism, must be fundamental to the implementation of PPH interventions. To facilitate PPH in achieving its goal of effective and equitable disease prevention, we focus this article on the intersection of the implementation of PPH interventions and the key social dimension of race and ethnicity. We consider a series of case studies that apply an antiracism lens to the implementation of PPH interventions in the following recommended focus areas:

1. stakeholder engagement;
2. conceptual frameworks and models;
3. development, selection, or adaptations of evidence-based interventions;
4. evaluation approaches;
5. implementation strategies; and
6. individual researcher and research context.[10]

We conclude by summarizing recommendations to guide researchers on how to address the impacts of racism at all stages of the research process, thereby moving the field of PPH in an explicitly equity-oriented direction (Box 1).

STAKEHOLDER ENGAGEMENT

Cocreation and the incorporation of representative stakeholder perspectives are critically important for addressing racism in PPH research and the implementation of PPH interventions.[10,11] Stakeholder engagement offers a process of cocreation to incorporate informed community perspectives on complex topics such as data privacy, novel interventions, emerging genomic discoveries, and allocation of limited resources. In turn, this approach can maximize the likelihood that programs and policies will be relevant, acceptable, and successful for diverse communities.[12] A recent review examining public involvement in genomics research underscored the need for sustainable stakeholder involvement throughout various stages of the project life cycle, given the potential long-term impact of certain genomics research studies.[13]

Democratic deliberation is one strategy to foster colearning among researchers and communities that could be applied to gain informed public input on the implementation of PPH interventions. Democratic deliberation refers to a collective stakeholder engagement process conducted rationally and fairly among a deliberation group that reflects the diversity of community views and life experiences.[14] As part of this process, participants are provided with nonpersuasive neutral information about a topic, after which they collaboratively generate and prioritize the pros and cons of the policy or program under discussion. Groups subsequently come to a consensus opinion that, in theory, would maximize the common good. This approach may be particularly useful when considering PPH interventions for marginalized groups whose perspectives may be missing from other decision processes. Enlisting members of marginalized groups to generate and thoughtfully consider potential pros and cons of health policies and programs through the lens of personally experienced inequities can be an act of empowerment. Previous literature has found that democratic deliberation methods could provide inclusive and informed stakeholder opinions.[15]

In many cases, little attention is given to the appropriateness and standards of the methods used to engage stakeholders in PPH interventions. As a result, approaches for public involvement proliferate with little systematic evidence regarding the quality of these approaches. Several recent studies suggest frameworks to evaluate the quality of public engagement. For example, the Findable, Accessible, Interoperable, Reproducible, Equitable, and Responsible (FAIRER) framework, specifically developed to guide genomic activities, uses 4 themes for deliberative reflection: fairness, context, heterogeneity, and recognizing tensions and conflict.[16] Another important quality consideration is the application of an antiracism lens to stakeholder recruitment. For a recent study with communities of African ancestry in Georgia, the research team partnered with local community organizations to identify characteristics specific to their area that would indicate viewpoint diversity and experiences that required consideration of the common good.[17] The research team used these indicators when considering potential participants through a structured interview process, to ensure that a diversity of views was captured that would encourage a well-rounded discussion centered on the common good.[17] Thoughtful and focused stakeholder recruitment would enable members of communities often excluded from PPH policy decision-making, such as racial and ethnic minorities, to participate in implementation research in accordance with their communities' values and priorities, enabling these values and priorities to be incorporated into the research and future policies.

As stakeholder engagement approaches become more sophisticated, researchers can address PPH implementation issues with more informed and considered community input. Innovative and effective public engagement methods warrant more attention. This can begin by researchers challenging themselves to operationalize higher-intensity strategies (e.g., democratic deliberation) to ensure that interventions and policies align with community perspectives.

CONCEPTUAL FRAMEWORKS AND MODELS

Implementation science theories, models, and frameworks can be used deliberately and in multiple ways in the design, implementation, and evaluation of PPH interventions to address and reduce inequities that disproportionately harm historically excluded and marginalized groups, such as racial and ethnic minorities.[10,18,19] In the preimplementation phase, determinant frameworks such as the Consolidated Framework for Implementation Research (CFIR) can help inform the design of responsive interventions and implementation strategies by identifying barriers and facilitators that affect implementation efforts. Other models and frameworks, such as Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM), can guide the planning and conduct of implementation as well as the evaluation of multilevel outcomes in implementation and maintenance phases. The following are 3 examples of implementation science frameworks with different approaches to incorporating health equity and how they could be used for PPH.[20]

The Health Equity Implementation Framework (HEIF) is a new determinants framework that modifies and combines components of the integrated-Promoting Action on Research Implementation in Health Services (i-PARIHS) framework and the Health Care Disparities Framework, allowing for the assessment of both implementation and health equity determinants simultaneously.[21] Researchers have used the HEIF to identify and address factors that stimulate or impair the equitable implementation of PPH interventions. For example, Harkness et al. used the HEIF to refine implementation strategies to equitably deliver PPH interventions such as preexposure prophylaxis and HIV treatment to marginalized groups most affected by HIV and AIDS.[22] This approach found that implementation of these programs should address culturally specific factors, leverage networks, tailor resources, and facilitate service navigation.

Another approach has been to incorporate health equity considerations into existing frameworks. For example, the updated CFIR 2.0 has been supplemented with new constructs and subconstructs highlighting barriers and facilitators to health equity. The authors also recommend broadening the lens beyond local determinants to identify and address upstream sources of health inequity that are embedded in the public policies, institutional practices, and cultural norms that sustain structural racism.[23]

Similarly, health equity considerations have been integrated into implementation science frameworks for planning and evaluation. The extended RE-AIM framework provides instructions for applying its health equity considerations to the development, implementation, and maintenance of a PPH intervention. Considering health equity in the planning and evaluation stages of implementation science contributes to long-term sustainability and successful adaptation of evidence-based

BOX 1— Recommendations for Implementing an Antiracist Framework in Precision Public Health Interventions

Implementation Science Components[10]	Recommendations
Stakeholder engagement	Obtain input from communities, particularly those from racial and ethnic minority groups.
	Ensure interventions and policies are aligned with community perspectives.
	Implement higher-engagement strategies for greater community involvement in decision-making.
Conceptual frameworks and models	Seek out and use implementation tools to advance antidiscrimination and antiracism efforts.
	Incorporate structural racism and other contextual factors into conceptual models.
	Measure perceived racism and racial discrimination and recognize their impact on implementation.
	Use transdisciplinary theories to understand the mechanisms that perpetuate health disparities.
Development, selection, or adaptations of evidence-based interventions	Involve communities in identifying and prioritizing evidence-based interventions.
	Include evidence-based strategies to address the impact of racism on implementation of precision public health programs.
Evaluation approaches	Assess the effectiveness of precision public health approaches by race and ethnicity.
	Use validated measures and self-report to assess racial equity and racism, including qualitative methods to amplify the voices of those with lived experiences of racism.
Implementation strategies	Focus on multilevel implementation strategies that address structural racism.
Individual research and research context	Ensure responsible training and engagement of researchers grounded in Public Health Critical Race Praxis.
	Support and advocate for policies, systems, and structures that promote and sustain diversity in precision public health teams.

interventions to diverse contexts. Health equity is therefore centered in each of the 5 recently extended dimensions of the RE-AIM framework.[24] Integrating equity-focused partnerships wherever possible at all stages of PPH implementation is crucial to developing and prioritizing outcomes and measures that reflect whether, how, and why an intervention is being equitably adopted and sustained.

As implementation science increasingly plays an integral role in the development, implementation, and sustainment of PPH interventions, researchers and practitioners must commit to seeking out and using available implementation tools to dismantle discrimination and racism at every opportunity.[4] Although structural racism continues to underpin pervasive inequities in access to preventative and diagnostic health care, multilevel consideration of health equity-oriented constructs remains a top priority and a moral imperative for implementation science. As Shelton et al. emphasize, structural discrimination and racism are deeply embedded contextual factors that must be considered throughout all aspects of implementation. Furthermore, transdisciplinary theories, such as intersectionality and structural violence, can offer insight into important and overlapping dimensions of inequity, such as racism, sexism, and classism. These complementary theoretical perspectives are not as commonly examined in implementation science but may serve to guide and enhance the pursuit of health equity goals for the implementation of PPH.[25]

DEVELOPMENT AND SELECTION OF EVIDENCE-BASED INTERVENTIONS

Shelton et al. emphasize that the development and selection of evidence-based interventions that are devoid of stakeholder involvement and engagement have limited applicability to specific contexts and settings and may reinforce structural barriers that have systematically perpetuated health inequities and will ultimately undermine efficacy and effectiveness in racial and ethnic minority groups. Of particular concern for PPH interventions that rely on large-scale data to inform intervention design is underreporting, inadequate reporting, and defective collection of data from racial and ethnic minority groups; if the underlying data used to tailor PPH approaches is biased, it may replicate existing discrimination. There are also concerns about the potential impact on the development and utility of the intervention itself.[5] These issues were manifested in the development of PPH interventions to address COVID-19 among racial and ethnic minority groups. Intentional integration of data sources and regular testing, refinement, and retesting of

COVID-19 prevention and treatment interventions among racial and ethnic minority groups would have allowed for modifications of interventions based on how participants responded.[26] Collaborating with health equity researchers in the use of qualitative methods, quasi-experimental designs, pragmatic trials, and hybrid effectiveness-implementation study designs is recommended as new PPH interventions are being developed and tested among racial and ethnic minority groups.

Context-specific adaptations to PPH interventions may help enhance health equity. Much of the premise of PPH is to adapt interventions to the specific individual and population to help increase the uptake and effectiveness of these approaches. Further tailoring of these interventions to ensure they are inclusive of the local culture, history, and strengths of the community can support antiracism in the implementation of PPH interventions. By working alongside community partners, researchers could study the impact of adapting a PPH intervention to meet the needs of racial and ethnic minority groups on the acceptability, practicality, feasibility, and integrability of PPH interventions.[27]

EVALUATION APPROACHES

Another tenet of Shelton et al.'s framework is the explicit inclusion of measures that assess health equity. Several implementation evaluation frameworks have already been adapted to consider health equity.[28,29] These frameworks can inform the evaluation of the implementation of PPH interventions as well as guide the selection of key effectiveness, implementation, and health equity outcomes across stages of implementation. Additionally, the use of mixed methods data collection in evaluation of PPH initiatives allows for both breadth and depth in our understanding of the complexities in operationalizing implementation science measures to understand the implementation of PPH across representation populations.[30,31]

The extended RE-AIM framework expands beyond measures of reach and representativeness by explicitly examining whether race and ethnicity—as well as individual, social, and structural determinants for which race is a proxy—influence willingness to participate in a PPH intervention. It can also assess whether participants reflect the catchment area and national population in terms of race and ethnicity, socioeconomic position, educational attainment, primary language, rurality, and other known contributors to health care utilization.

Although measuring race-related outcomes is important for dismantling racial inequity, any studies capturing race should specify the reason within a sociopolitical framework that explicitly acknowledges the relevant social, environmental, and structural factors for which race may serve as a proxy measure.[9] Understanding why individuals decline to participate in a PPH intervention can provide a better understanding of barriers to reaching a representative population. These data can then inform new outreach and enrollment strategies to improve the representativeness of PPH interventions, which can be tested and optimized iteratively.

Key implementation measures, such as tracking of adaptations of PPH, can help to contextualize differential site-level adoption and patient representativeness (Table B, available as a supplement to the online version of this article at https://www.ajph.org). Adoption could be measured to identify potential inequities in the adoption of PPH interventions by key site characteristics (e.g., low-resourced settings) that may affect representative access to PPH. In addition, measuring fidelity can help determine the quality of implementation of a PPH intervention's core components by site characteristics to understand whether variable fidelity could contribute to inequities among patient populations served by these sites. Understanding how PPH interventions are implemented with fidelity and adaptation can provide insights into needed resources and support (e.g., to promote fidelity to core components) as well as the development of local strategies (e.g., to attend to the local context and promote equitable implementation across settings and participant populations). Determinant frameworks such as the HEIF or CFIR 2.0 can provide an understanding of contextual factors that may be associated with implementation outcomes across phases of implementation, pointing to effective strategies for implementation improvement, discussed in the next section. Further, determinant frameworks such as the HEIF or CFIR 2.0 can guide the assessment of important contextual factors that may be associated with implementation outcomes across phases of adoption, implementation, and maintenance by social determinants of health, including site characteristics and patient sociodemographics. Collecting these data can inform implementation strategies and resources (costs, effort, infrastructure) to optimize and sustain equitable delivery of PPH interventions, as discussed in the next section.

Finally, evaluation frameworks demonstrate the importance of collecting both effectiveness and implementation

outcomes. As evidence is generated for PPH interventions, understanding not only implementation but also effectiveness at a population level will be critical. Examining key short- and long-term effectiveness outcomes may require pooling data across implementation sites to have the power needed to more fully understand important differences in delivery of PPH interventions and outcomes by race and ethnicity in the United States. Sustained evaluation and iteration are necessary as implementation barriers may change over time.

IMPLEMENTATION STRATEGIES

Shelton et al. highlight the connection between existing implementation strategies and promoting equity and antiracist policies and practices.[32] Implementation science and PPH researchers infrequently focus on and explicitly test the influence of implementation strategies on reversing health disparities caused by racism. Furthermore, implementation science and PPH researchers often do not highlight their use of equity-focused implementation strategies in searchable ways, leaving strategies buried in the literature. Consequently, there is little information to guide researchers on which strategies will be most effective at increasing health equity (Table B).[10]

Health equity suggests that implementation strategies should be selected with community members identifying underlying assumptions and identifying potential barriers faced by vulnerable populations, and adapting the intervention and implementation strategies accordingly.[21,33,34] PPH researchers commonly evaluate disparities, frequently using big data to identify disparities in health outcomes (e.g., opioid use, vaccination) by geography, socioeconomic factors, and health characteristics.[26,35] Less commonly, researchers have used this information to adapt their strategies. For example, upon recognizing that their genetic screening programs were primarily reaching White, wealthier, and urban families, researchers engaged community stakeholders to adapt their strategies to address differential barriers experienced by vulnerable populations.[36]

Shelton et al. note the need for research to compare implementation strategies by their impact on health equity.[10] Comparing 2 PPH studies highlights the potential impact of the level of stakeholder involvement on equitable implementation. First, researchers in 1 PPH study who engaged stakeholders by having a community advisory board review recruitment materials and recontact strategies reported substantial difficulty in implementation and inequity in recontacting participants.[37] By contrast, PPH researchers who involved stakeholders in all study aspects to create patient-centered approaches (e.g., creation of materials by community members) and minimize logistic barriers (e.g., flexible hours) had equitable participant recontact across underrepresented groups.[38]

Another evidence-based implementation strategy, using community health workers to implement interventions, is suggested to identify procedures that limit the effects of inequities on research participation, create and disseminate health information that is culturally and linguistically tailored, and build community trust.[39,40] A model PPH study used community health workers and stakeholder interviews with cancer patients, caregivers, community leaders, and clinicians to identify opportunities to enhance health equity, including tailoring the strategies by allowing multiple modes of interaction (e.g., in-person, telehealth, or telephone), incorporating education, and integrating Spanish language materials.[41] Although research is needed to evaluate the best implementation strategies to increase health equity, 3 traditional implementation strategies—evaluating disparities, stakeholder engagement, and community health workers—stand out as the most promising approaches.[10]

INDIVIDUAL RESEARCHER AND RESEARCH CONTEXT

Equitable implementation of PPH interventions is inextricable from individual perspectives, team diversity, and research infrastructures. It is also threatened by systemic racism, which remains ingrained in science and therefore in the PPH research enterprise.[42] Within individual researcher and research contexts, this appears through the ongoing use of "Whites" as a reference group to which others are compared, by implying that racial groups map to discrete genetic groups, by overemphasizing the role of genetics and genomics as the major explanatory factor in health disparities, or by focusing on recruitment as the end point for community engagement. Some of these racist legacies are current topics of discussion in the PPH field. For example, PPH should move away from the crude racial, ethnic, or ancestral labels it still uses, to embrace all human diversity.[43] Shelton et al.'s antiracism framework includes self-reflection among researchers to ensure the employment of antiracist approaches.

A well-voiced consequence of structural racism is the inequities in representation across the research workforce,

which limit scientific innovation.[44,45] Increasing diversity and inclusion across the biomedical research enterprise is an imperative of the US National Institutes of Health.[46] Given that PPH is a field of multidisciplinary collaboration aiming to target diverse individuals, equitable diversification of PPH teams is important. A recent study focused on precision medicine research teams found that (1) existing hierarchies and power structures in the research ecosystem compound challenges for equitable diversification, (2) tokenism and instrumental diversity jeopardize goals to diversify research teams and risk merely transient and superficial diversification, and (3) the siloing of the expertise of underrepresented team members to frontline and diversity-only activities may also perpetuate a turnstile effect. Because diversification of patient populations is interconnected with the diversification of the research workforce, who conducts the research, and how it is implemented, commitments to equity and structural reform are needed to increase the diversity of research teams.[44] Collectively, researchers should adopt an antiracism approach to build diverse teams by (1) being intentional, (2) being critically introspective, and (3) sitting with discomfort. This includes, for example, listening to the experiences of the many scientists who are directly and indirectly affected by structural racism, and creating space for all team members to speak (and reflect) on how race and racism in the research enterprise affect their lived experiences.[45] Commitments to equity and structural reform are needed. Without considering an ecosystem framework that addresses the conditions that structure power within research teams, tokenism can be misrecognized as inclusion.[44]

To mitigate disparities in the implementation of PPH interventions, the responsible training and engagement of researchers is also imperative. Key topics for individual researchers to focus on include the history of the eugenics movements and race-based medicine, the health consequences of the multiple forms of individual and structural racism (e.g., residential segregation, redlining, environmental injustice, police violence), researcher's harms to communities (e.g., the Havasupai Native Americans), and best approaches to transition from transactional community engagement and toward community empowerment when partnering with community members in research.[47]

NEXT STEPS

Looking ahead, the implementation of PPH interventions should incorporate an antiracism lens to address health equity through stakeholder engagement, conceptual models and frameworks, development and selection of evidence-based interventions, evaluation approaches, implementation strategies, and our own individual researcher contexts. Conversations around antiracism at each step of implementation, dissemination, and evaluation can help support the next generation of PPH interventions focused on increasing racial and ethnic health equity (Table B). To support these priorities in the context of a dynamic, evolving research field, we suggest that funders and research institutions aiming to invest in equitable PPH should create new initiatives to advance the study and methods development of best practices for outcomes evaluation with an eye toward structural drivers of health and racism. Multidisciplinary advisory groups could be assembled to lead the periodic reevaluation of these frameworks and best practices. Explicitly addressing racism and ongoing evaluation of the extent to which PPH studies are improving population health is critical to the successful, equitable implementation of PPH interventions to achieve the promise of PPH for all. AJPH

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