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The National Heart Lung and Blood Institute Disparities Elimination through Coordinated
Interventions to Prevent and Control Heart and Lung Disease Alliance

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Abstract

Objective: To describe the NHLBI sponsored Disparities Elimination through Coordinated Interventions to Prevent and Control Heart and Lung Disease (DECIPHeR) Alliance to support late-stage implementation research aimed at reducing disparities in communities with high burdens of cardiovascular and/or pulmonary disease.

Study Setting: NHLBI funded seven DECIPHeR studies and a Coordinating Center. Projects target high-risk diverse populations including racial and ethnic minorities, urban, rural and low-income communities, disadvantaged children, and persons with serious mental illness. Two projects address multiple cardiovascular risk factors, three focus on hypertension, one on tobacco use, and one on pediatric asthma.

Study Design: The initial phase supports planning activities for sustainable uptake of evidence-based interventions in targeted communities. The second phase tests late-stage evidence-based implementation strategies.

Data collection/extraction methods: not applicable.

Principal Findings: We provide an overview of the DECIPHeR Alliance and individual study designs, populations and settings, implementation strategies, interventions and outcomes. We describe the Alliance's organizational structure, designed to promote cross-center partnership and collaboration.

Conclusions: The DECIPHeR Alliance represents an ambitious national effort to develop sustainable implementation of interventions to achieve cardiovascular and pulmonary health equity.

Keywords: implementation science, health equity, cardiovascular disease, pulmonary disease, community participation

Callout box:

What is known on this topic:

- Marked disparities in heart and lung health exist and persist in the US across race, ethnicity, sex and/or gender, geography, socioeconomic status and disability status.
- To narrow these gaps and achieve health equity for heart and lung diseases, we need to understand barriers and facilitators to interventions that work and how to implement and sustain them in the community.
- The National Heart Lung and Blood Institute sponsored creation of the Disparities Elimination through Coordinated Interventions to Prevent and Control Heart and Lung Disease (DECIPHeR) Alliance to support research to reduce disparities in communities with high burdens of heart and /or lung disease.

What this study adds:

- We describe the DECIPHeR Alliance including the seven research projects and a coordinating center to bring the project teams together for highest impact to narrow health disparities.

Introduction:

Despite substantial improvements in cardiovascular and pulmonary health in the US over recent decades, marked disparities persist [1, 2]. Significant cardiopulmonary health inequities endure by race, ethnicity, sex and/or gender, geography, socioeconomic status and disability status, and contribute to the disproportionate burden of preventable mortality in these groups[3, 4].

Evidence supporting these disparities is compelling and consistent, and includes research based on epidemiologic cohorts, and spatial analyses illustrating geographic variation in rates and outcomes for cardiovascular and pulmonary diseases[5-13].

To achieve health equity, there is a pressing need to understand how to implement evidence-based interventions [14]. Dissemination and implementation research methods can tailor programs to address needs at multiple levels as health disparities develop due to complex determinants across individual, interpersonal, community, and environmental levels [15-19].

Late-stage (T4) implementation research identifies strategies to achieve sustainable uptake of proven-effective interventions into routine clinical practice and community-based settings and maximize impact on population health[20]. In 2020, the National Heart Lung and Blood

Institute (NHLBI) created and funded the Disparities Elimination through Coordinated Interventions to Prevent and Control Heart and Lung Disease Risk (DECIPHeR) Alliance to

support late-stage T4 implementation research strategies for optimal implementation and sustainment of evidence-based multi-level interventions to reduce disparities in communities

with a high burden of cardiovascular and/or pulmonary risk factors. DECIPHeR is funded as a cooperative agreement using the UG3/UH3 administrative mechanism. During an initial three-

year UG3 planning phase, project teams engage partner communities to identify programs and health areas of most importance for implementation strategies, and to identify strategies most

appropriate and effective in the community. If milestones for the initial UG3 phase are achieved, a subsequent four-year UH3 phase will conduct a prospective study of implementation strategies refined and adapted through the UG3 phase. Here we describe the DECIPHeR Alliance with overview of study designs, disparities populations, evidence-based interventions, planned implementation strategies and outcomes as well as the organizational structure promoting cross-center partnership and collaboration. At this early stage of the project the approach to the research planned for the UH3 phase remains flexible and will likely change as information from our communities and their barriers and facilitators expands.

Methods:

The DECIPHER Alliance

The DECIPHeR Alliance brings together seven Implementation Research Centers (IRCs) and a research coordinating center (RCC). Figure 1 summarizes DECIPHeR Alliance projected outputs and distal outcomes. An advantage of the Alliance is the close collaboration between Alliance members and community partners to improve the quality of the studies and strengthen partnerships. Given the focus on translational research, implementation science, and community engagement, the teams are both multi-disciplinary and multi-stakeholder, bringing together academic researchers with leaders from the study communities. Table 1 provides an overview of the seven DECIPHeR IRCs, and we describe the individual projects below.

Multi-ethnic Multi-level Strategies and Behavioral Economics to Eliminate Hypertension

Disparities in LA County -University of California Los Angeles

In Los Angeles County (LAC), the second largest US municipal health system, patient, clinician, health system, and community factors contribute to disparities in hypertension prevalence,

control, and outcomes. In the LAC Department of Health Services (DHS) 43% of patients have hypertension, of whom 60% are inadequately controlled. The study will focus on racial/ethnic populations within LAC DHS with high rates of hypertension, including Latino (42%), African American (48%), Chinese (31%), Filipino (62%), and Korean (34%) populations. Population differences in healthy eating, physical activity, obesity, antihypertensive pharmacotherapy use, medication adherence, community awareness of hypertension, and community-level physical and social resources contribute to disparities in blood pressure (BP) control. In partnership with 51 adult primary care clinics in LAC DHS, we plan to significantly reduce hypertension disparities by leveraging our team's expertise in multi-ethnic, multi-level evidence-based strategies, community/stakeholder engagement, public-private partnerships, implementation science, and behavioral economics. Using the Exploration, Preparation, Implementation, Sustainment (EPIS) framework, we are planning a multi-level intervention for hypertension control that will complete Exploration/Preparation stages in the UG3 phase and the Implementation/Sustainment stages in the UH3 phase[21]. Through patient and stakeholder interviews, we will first assess multi-level (patient, clinician, health system leadership, and community) barriers to, facilitators of, and preferences for a menu of culturally-tailored evidence-based practices and sustainable implementation strategies with established efficacy for hypertension control (Aim 1; UG3). Our initial focus will be on medication therapy management, home BP monitoring, and cultural adaptation of lifestyle modification with support from community health workers. We will then link preferred multilevel (patient-, clinician-, or community-directed) implementation strategies to behavioral science approaches, for example, patient incentives to attend initial pharmacy visits or clinician peer comparisons

for patient BP control. (Aim 2; UG3) To test the effectiveness of these behavioral-science linked implementation strategies, we plan a stepped-wedge cluster randomized trial design using RE-AIM to guide assessment of uncontrolled hypertension, and BP disparities in comparison to non-minority LAC populations, and evidence-based practices[22]. The effectiveness outcomes are BP control in the electronic health record (primary), medication adherence, and costs. The implementation outcomes are acceptability of the intervention components and sustainment of the intervention strategies and BP control.

Church-based Health Intervention to Eliminate Racial Inequalities in Cardiovascular Health (CHERISH) - Tulane

Louisiana residents, especially African Americans, bear a disproportionately high burden of atherosclerotic cardiovascular disease (ASCVD). Age-adjusted CVD mortality was 274.0 per 100,000 (the 4th highest in the US) and stroke mortality was 46.7 per 100,000 (the 2nd highest in the US) in Louisiana residents in 2016-2018.[23] CHERISH is a cluster randomized trial that aims to test whether a multifaceted strategy for implementing the 2019 American College of Cardiology (ACC)/American Heart Association (AHA) primary prevention guideline will reduce cardiovascular health (CVH) disparities in Black populations in Louisiana[24]. CHERISH utilizes an effectiveness-implementation hybrid design to: (1) test the effectiveness of a community health worker (CHW)-led church-based multifaceted implementation strategy for improving CVH over 18 months among Black participants at high risk for cardiovascular disease (CVD), and (2) assess implementation outcomes. The EPIS is used for developing intervention program and implementation strategies and the RE-AIM for evaluating study outcomes[25, 26].

Implementation strategies include CHW-led health coaching on lifestyle changes and medication adherence; church-based exercise and weight loss programs; self-monitoring of physical activity, BP, and glucose; and provider education and engagement. The primary effectiveness outcome is the difference in proportion of participants having ≥ 4 ideal or improved CVH metrics[27], defined as a healthy diet score of 4-5 components or increase of 2 components from baseline; 150 min/wk moderate- or 75 min/wk vigorous-intensity physical activity or a combination; never smoking or quitting ≥ 6 months ago; BMI < 25 kg/m² or weight loss ≥ 10 pounds; A1c $< 7.0\%$ (or $< 8.0\%$ with complications); use of statin therapy as appropriate; and BP $< 130/80$ mmHg or systolic BP reduced by ≥ 10 mmHg. CHERISH will recruit 1,050 Black participants (25 per church) aged ≥ 40 years who have < 4 ideal CVH metrics and randomly assign 21 churches to intervention and 21 to control. Data on effectiveness and implementation outcomes will be collected at 6-, 12-, and 18-month follow-up visits and a 6-months post-intervention follow-up visit.

Reducing Asthma Attacks in Disadvantaged School Children with Asthma - University of Colorado

Asthma is a leading cause of children's hospitalizations, missed school days and caregivers' missed work days that has a significant impact on low income families.[28] The well-documented disparities in asthma outcomes for minorities, including death, worse asthma control, greater likelihood of emergency room visits, and high rates of school absenteeism are partly related to unmet SDOH for low-income families[29-31]. Core elements of our existing Colorado school-based asthma program (Col-SBAP) are concordant with those identified as effective in a recent Cochrane review, including counseling strategies to improve asthma

knowledge and self-management skills to successfully control asthma[32, 33]. Although our impact was significant, we recognized that we could do better by addressing SDOH in combination with Col-SBAP with an asthma navigator[34]. The Colorado program seeks broad-scale implementation of our effective school-based asthma program (Col-SBAP) to improve asthma disparities for children aged 5-12 years in five regional asthma ‘hot spots’ across the state of Colorado. We define asthma ‘hot spots’ as regions with both high rates of uncontrolled asthma and high levels of socioeconomic need. Using community-based participatory methods with stakeholders representing schools, clinics, families and public health in each region, we will adapt our Col-SBAP that reduces asthma exacerbations and missed school days to meet the needs, priorities, practices and resources of these diverse communities[32, 35-37]. The EPIS framework is being applied during our Planning phase of the UG3 award with community stakeholders to iteratively adapt our current implementation guide into a set of common implementation strategies that meet local community and school setting needs[38]. During the Exploration Phase we are conducting meetings with stakeholders in our 5 targeted regions of Colorado to understand the needs, resources and outcomes of success. We are using this information in the Preparation Phase to develop implementation strategies for each region tailored for their abilities to conduct the Col-SBAP as well as assess and manage SDOH for their school children with asthma who suffer health disparities. We will use this information to design and conduct a cluster-randomized trial in participating regions in the Implementation Phase, using a randomized stepped-wedge study design to compare two interventional elements with a control population: (1) our original evidence-based Col-SBAP that addresses a targeted subset of social determinants of health (SDOH) that limit healthcare access, and (2) a

comprehensive assessment and case management approach to SDOH. This complex, combined program is termed Stop Asthma Attacks (SAA). Meanwhile, for the Sustainment Phase, we intend that the interventional elements will be designed for sustainable delivery by school nurses, in partnership with trained asthma navigators who provide ‘high-touch’ care coordination with students/families, primary care and community SDOH resources[39]. We will also work with the community stakeholders to identify the appropriate support to sustain the program. We will determine what capacity each region has for sustaining the Col-SBAP and/or the SAA Program. The central hypothesis is that SAA will have broad and equitable Reach (primary outcome) and yield important benefits in reducing asthma attacks and symptoms, as compared to schools that have not yet implemented SAA. Cost effectiveness of each program will also be assessed.

**Community Intervention to Reduce Cardiovascular Disease in Chicago (CIRCL-Chicago)-
Northwestern University**

The population in the South Side of Chicago is primarily Non-Hispanic Black and suffers from hypertension rates that are significantly higher (37%) than the estimated rate of hypertension (28%) of the adult population in Chicago[40]. The CIRCL-Chicago project represents a collaboration between a successful model to engage and train community members of faith-based organizations in the South Side, a network of local Federally Qualified Health Centers (FQHCs) and a multi-institutional team of academic investigators across Chicago[41, 42]. The CIRCL-Chicago Intervention is based on a model developed and tested by a large integrated health system (Kaiser Permanente) in Northern California which successfully increased blood pressure (BP) control rates from 44 to 88% over eight years through implementation of an

evidence-based bundle (the Kaiser Hypertension Control Bundle) that included a system-wide hypertension registry, annual reporting of hypertension control rates, development and promulgation of practice guidelines, medical assistant lead follow-up, and promotion of single pill combination therapy[43]. Using the Dynamic Adaptation Process, EPIS Framework and community-engaged implementation research methods based in part on the Pastors for Patient-Centered Outcomes Research model, CIRCL-Chicago aims to determine how components of the Kaiser Hypertension Control Bundle can be successfully adapted to the South Side of Chicago for coordinated delivery between FQHCs and faith-based organizations and demonstrate improvement in a primary clinical outcome of hypertension control [41, 44]. In addition to our community engagement and community-academic partnership development strategies, other implementation strategies include implementer training, patient engagement, and practice facilitation[45]. Partnering with FQHCs that are part of practice-based research networks with shared health information technology infrastructures will facilitate implementation of the Kaiser Bundle components (e.g., patient registry) and the evaluation of our implementation efforts and intervention effectiveness[46-48]. Guided by RE-AIM [25], the primary implementation outcomes are reach into the population, delivery costs, and sustainability of the intervention.

Mi QUIT CARE (Mile Square QUIT Community-Access-Referral-Expansion-University of Illinois at Chicago

Tobacco use is the leading preventable cause of pulmonary health morbidity and mortality in the U.S.[49] Despite a decline in the prevalence of smoking, 14.1% of adults – more than 34

million people - continue to smoke[50]. Low-income populations are disproportionately burdened by tobacco use and carry a greater burden of smoking-related pulmonary health morbidity[51, 52]. FQHCs represent an important yet under-utilized model for reducing smoking-related health inequalities. Nationally, 25.8% of all patients receiving care at FQHCs are current smokers[53].

Public Health Service guidelines recommend the 5 A's framework (ask patients about their smoking status, advise smokers to quit, assess their readiness to make a quit attempt, assist with accessing treatment, and arrange a follow-up appointment to monitor progress) for smoking cessation [56]. Although effective, the 5As model is time-consuming and challenging to implement in high-volume clinical settings and a simplified version of the framework (Ask-Advise-Refer, [AAR]) was subsequently developed[57].

Our multi-disciplinary team proposes MI QUIT CARE (Mile Square QUIT Community-Access-Referral-Expansion), an innovative strategy for using the patient portal to deliver evidence-based tobacco treatment (AAR) within an urban FQHC system, Mile Square Health Center. Patient portals are secure online tools linked to an individual's electronic health record designed to help patients access and manage their health information and increasingly used to deliver educational and health promotion content and interventions[58]. The intervention components include using the patient portal to send a provider message advising current smokers to quit, proactively linking smokers interested in quitting smoking or cutting down to the Illinois Tobacco Quitline, and using patient navigation to address barriers to treatment engagement. The EPIS framework is being used to guide the study. During the Exploration Phase, we will use clinic data to examine smoking prevalence rates in the patient population

and identify patients and clinic sites disproportionately impacted by smoking. In the Planning Phase, we will conduct in-depth interviews with clinic patients and providers to identify barriers and facilitators to smoking cessation, attitudes regarding the intervention components (patient portal, proactive linkage to the quitline, and patient navigation), and finalize outreach and education materials. In the Implementation Phase, we will conduct a randomized clinical trial comparing the treatment engagement (the receipt of counseling from the tobacco quitline) and smoking cessation outcomes (biochemically verified smoking status at 6 months). The intervention is being developed to maximize sustainability by using low-touch (sending mass mailings to portal message boxes), automated and population-based strategies (opt-in and proactive linkage), and a cost-effective approach (use of the state-run quitline). In the Sustainment Phase, we will work with all key stakeholders (patients, providers, patient navigators, and the Illinois Tobacco Quitline) to identify potential barriers to sustainability. The final step of the project will be to translate all materials to Spanish to increase inclusivity and evaluate the program's cost effectiveness.

New York University Grossman School of Medicine: Actions to Decrease Disparities In Risk and Engage In Shared Support For Blood Pressure Control (ADDRESS-BP) In Blacks

Black Americans have the highest rate of hypertension in the United States, (56.2% prevalence compared to 48% in Whites) and greater rates of fatal stroke (1.5X) and CVD mortality

(1.3X)[60, 61]. The most common reason for the mortality gap between Black and White communities is uncontrolled hypertension[62].

The ADDRESS-BP Project uses practice facilitation to implement three evidence-based interventions (EBIs) designed to improve hypertension control among Black patients in primary care practices in New York City[63, 64]. The study integrates: 1) Nurse case management (NCM); 2) Home blood pressure monitoring (HBPM); and 3) community health workers (CHWs) into routine care. These EBIs will be delivered as an integrated community-clinic linkage model [Practice support And Community Engagement (PACE)] to address patient-, physician-, health system-, and community-level barriers to hypertension control in Blacks. Community-clinical linkage models are partnerships facilitating connections among health care providers, community organizations, and public health agencies to improve patients' access to preventive, chronic care, and social services. Employing CHWs to be part of the care team, and to assist patients in navigating complex health systems and facilitate access to community resources is one such strategy[64]. While NCM and HBPM improve HTN provider- and self-management, these strategies do not address community-level barriers to hypertension control which CHWs are well-suited to address.

The study planning phase utilizes CFIR to examine barriers and facilitators to implementation of PACE through analysis of secondary data, as well surveys and interviews of practice leadership, providers and staff, and community- and faith-based groups. Using Proctor's Implementation Outcomes Framework, the implementation phase will evaluate the impact of PACE on BP

control, adoption and fidelity at 18 months compared to usual care (UC) via a stepped-wedge cluster RCT of 20 NYU PCPs in 500 Black patients with uncontrolled hypertension. The project includes partnership with a payer (Healthfirst) to assess cost-effectiveness and inform the sustainability and scalability of integrated community-clinical linkage models. We hypothesize that rates of BP control and cost-effectiveness will be higher during the PACE intervention period than during the UC period at 18 months, and that rates of BP control will be higher in practices that exhibit higher levels of adoption and implementation fidelity of PACE at 18 months. Payer reimbursement mechanisms will be explored to sustain and scale the model across the NYU health system.

Achieving Cardiovascular Health Equity in Community Mental Health: Optimizing Implementation Strategies – Johns Hopkins University School of Medicine and the University of Michigan

Persons with serious mental illness experience marked increased prevalence of all cardiovascular risk factors, low control rates, and twice the rate of cardiovascular disease-related mortality compared to the overall United States population[65-68]. Cardiovascular risk reduction interventions require tailoring for persons with serious mental illness who often have psychiatric symptoms and cognitive impairment[69]. To overcome US general medical and mental health systems fragmentation, behavioral health homes, where mental health organizations coordinate primary care services, have proliferated. While behavioral health homes have shown improved cardiovascular risk factor screening, to-date they have not

resulted in risk factor improvement, likely because they are not implementing evidence-based interventions[70].

The overarching project goal is to partner with Michigan and Maryland communities serving persons with serious mental illness to improve uptake of (IDEAL) and Life Goals evidence-based interventions to reduce cardiovascular risk in behavioral health homes[71-73]. IDEAL is a comprehensive cardiovascular risk reduction intervention consisting of individual education and counseling sessions and care coordination/care management addressing all CVD risk factors[74]. Life Goals is a self-management focused intervention that aims to help individuals cope with mood symptoms and improve health by using healthy behavior changes such as physical activity and eating habits, and also incorporates care coordination[75]. Replicating Effective Programs (REP) Framework components will lay the groundwork alongside Coaching and Facilitation implementation strategies, addressing provider and organizational barriers respectively[75]. In the first phase, we are partnering with community mental health programs in Maryland and Michigan to tailor IDEAL/Life Goals and implementation strategies to fit site needs. In the second phase, we plan to conduct a non-restricted SMART with these community mental health programs to determine effectiveness of Coaching and Facilitation augmentations to REP on IDEAL/Life Goals delivery, risk factor care quality and control, assessing mechanisms, moderators, and other implementation measures. Uptake of IDEAL/Life Goals at 18 months is the primary outcome and will be measured by the number of evidence-based practice sessions delivered. This project will inform which combination of strategies lead to optimal uptake of effective cardiovascular risk reduction interventions for persons with serious mental illness, a critical step in reducing their cardiovascular health disparities.

The Research Coordinating Center at the University of North Carolina at Chapel Hill

The Research Coordinating Center (RCC) supports and enriches the work of the seven studies by maximizing synergistic effects of multiple investigators working on separate, but related projects. The RCC coordinated the formation of an alliance structure to stimulate communication and learning among investigators with the goal of promoting increased creativity, dynamic innovation and outstanding research. A Steering Committee, composed of PIs from each study, the RCC and NHLBI staff, was convened as the DECIPHeR Alliance governing body. Subcommittees were established to encourage sharing of ideas and approaches among experts with common interests in focused areas: 1) Implementation; 2) Intervention; 3) Community Engagement; 4) Measurement; 5) Design and Analysis; 6) Publications, Presentations and Ancillary studies; and 7) Training and Mentoring. At least one representative from each IRC is a member of each subcommittee. Table 2 describes the objectives of the subcommittees. Ad hoc working groups are formed as needed to provide in-depth collaboration and produce products in specific areas, for example: cost measurements and analysis, qualitative measurements and analysis, project coordinators, recruitment and retention and adverse events. The RCC also provides data-related and study monitoring functions, supports the convening and activities of a single consortium-wide Data Safety and Monitoring Board, provides reports to NHLBI and participates as a scientific partner. The RCC has created a resource section on the DECIPHeR website, <https://www.decipheralliance.org/resources> with links to other implementation science resources. As the RCC develops products and resources that would be beneficial to other researchers and the general public, they will be added. In addition, at the end of the study the RCC will archive study materials and make them available to investigators outside

the DECIPHeR study. They will also construct a de-identified public use data base that will be available to other investigators in accordance with NIH data sharing policies.

Conclusion

The mission of the DECIPHeR Alliance is to reduce or eliminate disparities in cardiovascular and pulmonary health, disease, and disease risk factors in high-burden communities in the U.S. through the rigorous study of implementation strategies for proven effective interventions[76]. NHBLI initiated planning for DECIPHeR well before the global COVID-19 pandemic with a focus on health disparities that was prescient. Now the DECIPHeR Alliance is prominently positioned to move the field forward by testing effective and equitable strategies that can be sustained and disseminated to improve population health. The DECIPHeR Alliance is an ambitious national effort to develop and support sustainable implementation of interventions to achieve cardiovascular and pulmonary health equity and maximize the positive impact on population health.

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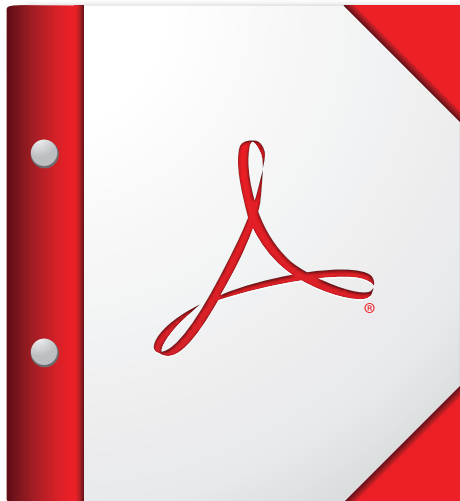
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Table 1. DECIPHeR Alliance Implementation Research Center Project Stakeholders

	University of California Los Angeles	University of Colorado	Tulane University	Northwestern University	University of Illinois at Chicago	New York University Grossman School of Medicine	Johns Hopkins University School of Medicine and University of Michigan
Study	Multi-ethnic Multi-level Strategies and Behavioral Economicsto Eliminate Hypertension Disparities in LA County	Reducing Asthma Attacks in Disadvantaged School Children with Asthma	Community Health Worker-Led Church-Based Intervention for Eliminating Cardiovascular Health Disparities in African Americans	Community Intervention to Reduce Cardiovascular Disease in Chicago (CIRCL-Chicago)	Mi QUIT CARE (Mile Square QUIT Community-Access-Referral-Expansion),	Actions to Decrease Disparities In Risk and Engage In Shared Support For Blood Pressure Control (ADRESS-BP) In Blacks	Achieving Cardiovascular Health Equity in Community Mental Health: Optimizing Implementation Strategies
Stakeholders							
Faith-based organizations			X	X		X	
Schools		X					
Community-based service providing organizations	X	X	X	X	X	X	X
Health Systems	X	X	X	X	X	X	X
Payer organizations		X		X		X	
Government	X	X	X	X	X	X	X
Community Health Workers	X		X	X	X	X	
Advocacy organizations	X			X			X
Large non-profit organizations	X			X	X		
Institutional partners	X			X	X	X	
Persons with mental illness and family members							X

Figure 1. The inputs, outputs and distal outcomes for the DECIPHeR Alliance.

The inner circle lists the inputs, the middle circle lists the outputs and the outer circle lists the distal outcomes. The DECIPHeR Alliance’s organizational structure promotes cross-center partnership and collaboration and the project’s study designs, populations, evidence-based interventions, planned implementation strategies and outcomes as currently planned. The DECIPHeR Alliance represents an ambitious national effort to develop and support sustainable implementation of interventions to achieve cardiovascular and pulmonary health equity.

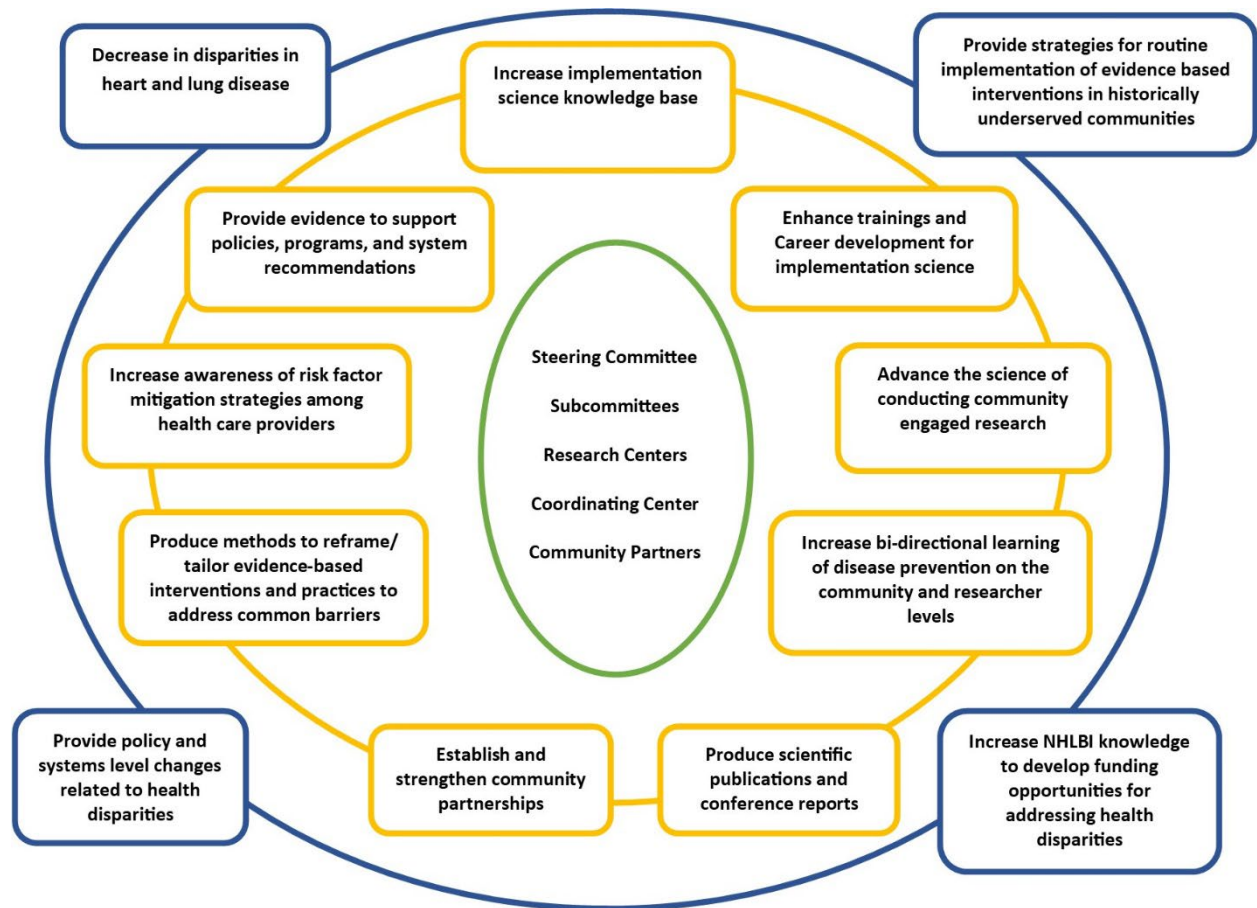
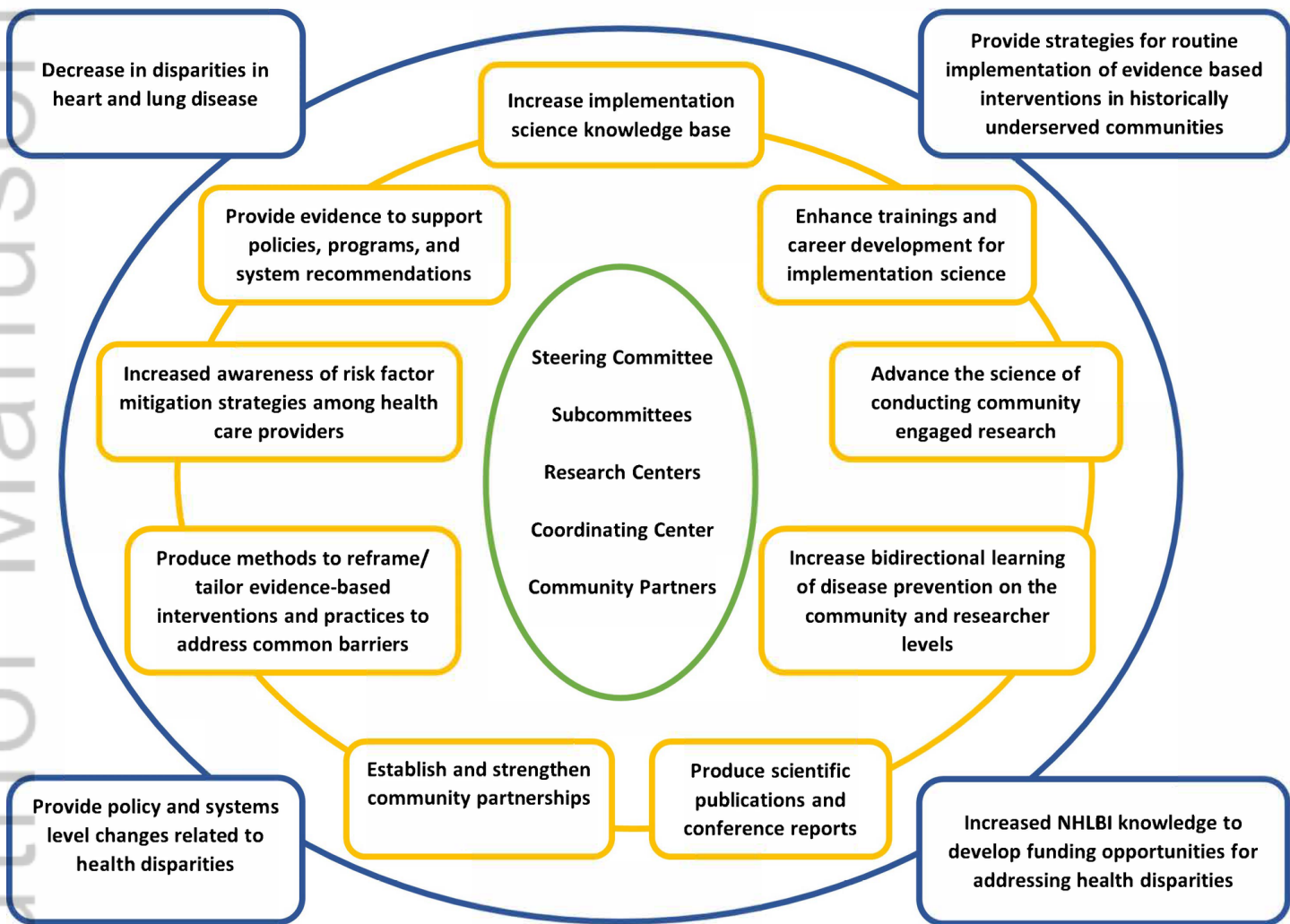


Table 1. DECIPHeR Alliance Implementation Research Center Projects

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Population	Latino, Black, Korean, Chinese, and Filipino-American adults	Children living in disadvantaged & under-resourced communities (rural, mid-size urban)	Inner City & Rural Blacks & African American adults	Black and African American adults	Low-income racial/ethnic minority adults in clinics	Blacks & African Americans with uncontrolled Hypertension	Adults with serious mental illness
Setting	County Health Services including Community Agencies and Non-Profit Organizatios	Schools	African American Churches	Faith-based organizations and Federally Qualified Health Care Centers (FQHCs)	Federally Qualified Health Care Centers (FQHCs)	Primary care practices	Outpatient community mental health programs, behavioral health homes
City/State	Los Angeles, CA	Colorado	New Orleans, LA	South Side Chicago, IL	Chicago, IL	New York City	Maryland and Michigan
Health Outcomes	Hypertension management	Asthma in children	Cardiovascular health	Hypertension control	Smoking cessation	Hypertension control	Cardiovascular disease risk
Currently proposed Study Design	Stepped-wedge cluster randomized design	Stepped-wedge design	Effectiveness-implementation hybrid type 2 design - Cluster randomized trial	Effectiveness-implementation hybrid type 2 design	Effectiveness-implementation hybrid type 1 design	Stepped-wedge cluster RCT	Non-restricted SMART with 2x2 factorial

Evidence-based Intervention	1) Medication therapy management 2) Home blood pressure monitoring 3) Cultural adaptation of lifestyle modification with support from community health workers	1) Colorado School-Based Asthma Program (Col-SBAP) 2) Comprehensive Assessment and Case Management of SDOH	Community-Health Worker led church based multifaceted implementation strategy	Adaptation of the Kaiser Hypertension Control Bundle	1) an electronically delivered brief smoking cessation intervention (Ask, Advise, Refer, AAR), 2) proactive linkage of smokers to the Illinois Tobacco Quit Line (ITQL) 3) patient navigation to reduce barriers to care.	1) Nurse case management (NCM); 2) Home blood pressure monitoring (HBPM) 3) community health worker (CHWs) led health education and coaching.	1) IDEAL: CVD risk factor counseling and education as well as care coordination /management 2) Life Goals: self-management focused intervention for coping with psychiatric symptoms and improving overall health behavior change around CVD risk factors
Implementation Process and Determinants Framework(s)	EPIS	EPIS and PRISM	EPIS	EPIS	PRISM	CBPR and CFIR	REP
Implementation Evaluation Framework	RE-AIM	RE-AIM	RE-AIM	RE-AIM	RE-AIM	Proctor	Proctor



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Objectives of the DECIPHeR Subcommittees

Subcommittee	Objectives
Implementation Subcommittee	Discuss all aspects of preparation, planning and operationalization of implementation research with the goal of optimizing the research by the sharing of ideas including the identification of facilitators and barriers. In collaboration with the Measurement Subcommittee select and plan implementation outcome measures with an emphasis on common measures (measurements used by more than one Implementation Research Center). Identify cross center opportunities to advance implementation science.
Intervention Subcommittee	Discuss all aspects of preparation, planning and operationalization of the evidence-based effectiveness intervention with the goal of optimizing the research by the sharing of ideas. Develop a list of common process evaluation measures across the studies, including a set of process components that each site will measure (i.e. reach, dose delivered, dose received, fidelity, and secular trends) and, if possible, a common way to measure each process component.
Community Engagement Subcommittee	Support community and participant engagement and identify opportunities to strengthen (and potentially align) study approaches to engagement and community capacity building. Share plans for the development of partnerships and methods for engagement of stakeholders. Also identify cross center opportunities to advance the science of how best to engage communities/partners/stakeholders in research to implement the multilevel interventions needed to reduce disparities and promote equity in heart and lung disease
Design and Analysis Subcommittee	Review and enhance study designs and quantitative analytic plans.
Measurement Subcommittee	In collaboration with other subcommittees, provide recommendations for standardization of common measures. This includes <u>all</u> types of measures – implementation, process variables, clinical/effectiveness measures (intervention, outcome, mediators, moderators), adverse events, recruitment, retention, engagement, and social determinants of health.
Publications, Presentations, and Ancillary Studies Subcommittee	Develop policies regarding publications, presentations, ancillary studies, and access to data from the DECIPHeR studies.
Training and Mentoring Subcommittee	Provide cross research center mentorship and training opportunities to trainees and early stage investigators in the DECIPHeR Alliance (post-doctoral fellows and junior faculty) and to community members and stakeholders.