A Practical Guide to Incorporating Health Equity Domains in Implementation Frameworks

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Keywords: health equity, implementation, health disparities, framework, theory, implementation science, healthcare, dissemination

Abstract

Background: Due to limited systematic integration of health equity and implementation science, it is imperative to provide researchers and practitioners tools to guide implementation in settings where there is inequitable implementation of an intervention. Our prior work documented and piloted the first published adaptation of an existing implementation science framework with health equity determinants to create the Health Equity Implementation Framework. We suggested how others' might adapt their preferred implementation science frameworks with three health equity domains: 1) cultural factors of recipients, 2) clinical encounter, or patient-provider interaction, and 3) societal influences (including but not limited to social determinants of health). This manuscript is a practical guide to utilize three health equity domains in implementation research and practice.

Methods: We describe in greater depth than in our previous publication domains typical in implementation determinants frameworks and three adaptations: domains known to affect health equity. For each domain, we compiled definitions with supporting literature, defined relevant subdomains, showcased an illustrative example, and suggested sample measures, both quantitative and qualitative.

Results: We describe how to incorporate the three health equity domains in one's preferred implementation science framework, or how to use the Health Equity Implementation Framework specifically. Practical guidelines follow ten published recommendations on how to use frameworks in implementation research and practice. We describe a new case study in which the framework guided evaluation.

Conclusions: Incorporating health equity domains within implementation frameworks may optimize the scientific yield and equity of implementation efforts by assessing and ideally, addressing, implementation and equity barriers simultaneously. The practical guidance and tools provided can assist implementation scientists and practitioners to concretely address inequity in implementation across populations to capture and analyze information used to assess health outcomes.

Contributions to the Literature

Specific definitions of implementation and three health equity domains with examples of how they have been applied in published literature and sample measures.

Practical tools, including a qualitative interview guide and codebook

Case study of how the Health Equity Implementation Framework guided analysis in an implementation study

Background

Health inequities are clinically and statistically significant differences in health or health care between two or more groups.[1] Groups that experience worse health or health care might be defined by race, ethnicity, sexual orientation, gender identity, socioeconomic status, functional limitation, or other characteristics;[2] we refer to these groups as marginalized populations based on social, economic, and/or environmental disadvantage that usually accompanies health inequities.

Several inequitable implementation problems may be undetected. Inequitable healthcare implementation problems exist when a healthcare innovation is delivered with significantly worse rates, access, or quality to certain groups; sometimes, the group experiencing less or worse innovations has higher prevalence of the health problem the innovation is intended to ameliorate.[3] One example in United States (U.S.) pediatric healthcare is screening and diagnosis of autism spectrum disorder to prompt access to treatment. Although there are valid and reliable autism screenings and clear criteria for diagnosis, racial and ethnic minority children who meet criteria are less likely to be diagnosed than white children.[4] Thus, effective screenings and interventions are implemented inequitably for racial and ethnic minority children. The inequity is exacerbated among children who receive an autism diagnosis, with children of color less likely to receive quality treatment.[5] Another example is intervention for maternal, newborn, and reproductive health care in low and middle income countries. Of global maternal deaths related to pregnancy, 15% occur in India.[6] Recently, an intervention with clinical effectiveness was implemented—a multifaceted social franchising model—to increase quality and coverage of maternal, newborn, and reproductive health care in one Indian state. Implementation was unsuccessful; women were not aware of the intervention and healthcare workers did not encourage women to attend services. It is possible implementation was not tailored enough to this population, and without community engagement, training, and access to resources (e.g., internet for telehealth), poor implementation and inequities persist. [7]

Implementation science theories, methods, strategies, and evaluation may ensure effective interventions reach the people they are designed to help. Implementation scientists and practitioners can address broad, systemic, or organizational factors in addition to patient, clinic, and hospital factors that contribute to inequities by using implementation strategies, such as learning collaboratives, audit and feedback, or changing policy.[8] However, it is probable that existing implementation strategies and the methods to select them do not reduce health inequities at this time, based on two assumptions. First, in the U.S., drawing from decades of intervention research, generic interventions—those not adapted for marginalized populations—not only often fail to reduce inequities,[9] but sometimes even exacerbate them.[10] Second, implementation science frameworks that are key to inform study design and selection of strategies to match contextual needs have only recently considered factors and processes unique to health inequities, starting with our own Health Equity Implementation Framework.[11, 12]

Overall, implementation science has yet to actively and systematically assess, address, and evaluate unique factors contributing to healthcare inequities, including institutional and structural problems (e.g., racism) that are economic, regulatory, social, historical, and political determinants of implementation for marginalized groups.[13] A recent workgroup on this topic recommended implementation scientists

"employ strategies and build structures that elevate equity concerns"—this can only be done when current implementation determinant frameworks purposefully incorporate health equity domains for assessment informing implementation strategies and as potential moderators for implementation intervention.[14]

Outside the U.S., health equity and implementation integration predominantly involve the use of implementation frameworks in low and middle income countries or increasing delivery of services for specific populations (e.g., Indigenous communities). Regarding use of implementation frameworks in low and middle income countries, examples include a systematic review and intervention to increase the value of money in Burkina Faso and other countries,[15, 16] as well as unsuccessful implementation of an intervention to increase quality and coverage of maternal care and reproductive health in India.[7] Other examples in low and middle income countries include measurement tools normed with participants from those countries,[17] adapting interventions or delivery methods,[18] and reviewing or developing frameworks specific to those countries.[19–21]

The Need for Practical Tools Specific to Implementation Equity

The need for practical implementation tools specific to equity is significant given the real-world setting of implementation research and practice, and because existing implementation tools focus little or no explicit attention on equity. Frameworks that account for equity and implementation might be too vague to be used meaningfully.[22] Interventions that work well in small-scale or controlled pilots may not perform as expected when disseminated or scaled up in real-world settings due to lack of tools necessary to inform contextual understanding, including presence, drivers, and impact of health inequities.[23] Examples of practical implementation tools include the Consolidated Framework for Implementation Research guide tool,[24] and the website to review and select and implementation framework.[25] Unfortunately, these tools have yet to be explicitly or extensively adapted, integrated with, or tested within health equity efforts. Due to limited systematic integration of health equity and implementation science, [13] we need more implementation tools with an acute awareness for equity.

Our prior work documented and piloted adaptations of one existing implementation science framework with health equity determinants to create the Health Equity Implementation Framework.[11] We also included guidance on how others' might adapt their preferred implementation science frameworks in a similar manner. Since that publication, many scientists and practitioners have requested further clarification of the Health Equity Implementation Framework domains for practical use. This manuscript provides a practical guide to utilizing the three health equity domains in a framework in settings where there is inequitable implementation.

Methods

Health Equity Implementation Framework

In the Health Equity Implementation Framework, we proposed determinants or domains believed to predict successful *and* equitable implementation, seen in Fig. 1.[11] Determinants are factors, levels, or components thought to partially explain why implementation would succeed or fail.[26] In the Health Equity Implementation Framework, we adapted three health equity determinant domains to the Integrated Promoting Action on Research in Implementation in Health Services (i-PARIHS) framework,[27] which also proposes a process—facilitation—by which change in each domain would occur.[26, 27] The focus of this manuscript is on three health equity determinants, rather than facilitation, as science is still emerging on how implementation processes should be tailored to promote equity. One does not need to use i-PARIHS to incorporate health equity determinants into another preferred implementation determinants framework.

[insert Fig. 1 here – Health Equity Implementation Framework]

Domains Typical in Implementation Determinants Frameworks. Broad domains typical in implementation determinants frameworks focus on factors at multiple levels, including the individual (e.g., personal characteristics, actors of implementation, individuals receiving an innovation), organization (e.g., clinical service, school, department, factory), community (e.g., local government, neighborhood), system (e.g., school district, hospital system) and policy (e.g., state government, broader laws).[28] These domains can be further specified, such as inner setting or outer setting within an organization.[29] Domains from i-PARIHS are the basis of the Health Equity Implementation Framework and include those typical in most implementation determinants frameworks.[28] Each domain acts to enable or constrain implementation and is defined in Table 1 with illustrative examples and sample measures.

Table 1

Definitions, Illustrative Examples, and Sample Measures of the Health Equity Implementation Framework

Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Characteristics of the Innovation[32] • Underlying knowledge sources • Clarity • Degree of fit with existing practice / values • Usability • Relative advantage • Trialability • Observable results • Evidence for the innovation[67] o Research o Clinical experiences o Patient experiences	An innovation is a treatment, intervention, or practice with unique characteristics that determine how such innovations will be applied in a particular setting. Innovations fall into one of the "7 Ps": programs, practices, principles, procedures, products, pills, or policies.[31] The innovation should be tailored to the setting's needs and practices for successful implementation.[32]	A study examined uptake of the Healthy Heart Kit (innovation), a risk management and patient education resource for the prevention of cardiovascular disease, in a primary care setting. They found that relative advantage (innovation was the most comprehensive tool for cardiovascular health) and observable results (evidence-based practice supports innovation) were more influential to uptake of Healthy Heart Kit than other characteristics.[68]	Quantitative: • Decision-Maker Information Needs and Preferences Survey • Electronic Health Record Nurse Satisfaction Survey[69] Qualitative: • Barriers and facilitators assessment instrument • General practitioners' perceptions of the route of evidence-based medicine • Knowledge, attitudes, and expectations of web-assisted tobacco interventions[69]

Notes. *a.* Measures or data collection methods are examples from literature; for a repository of implementation science measures, see the Society for Implementation Research Collaboration's Instrument Review Project.[129] *b.* For a repository of measures specific to racism, see Appendix B of Racism: Science & Tools for the Public Health Professional.[130] *c.* Implementation scientists should review existing measurement tools specific to health disparities in your area of interest or study to further integrate health equity into implementation.

Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Clinical Encounter (Patient-Provider Interaction)	This is the nature of the interaction between patient and provider. This domain is centered on how the patient and provider choose, adapt, and coordinate the conversation to achieve their shared and personal goals concerning health related matters.[43] The interaction could be influenced by: • Predisposition features which areindividual differences that influence communication that may be objective (e.g., age) and subjective (e.g., self-concept) • Cognitive / affective influences that show how communication is related to strategy (e.g., goals), attributions (e.g., stereotypical) and trust. • Communication influences which refers to how the patient and the provider should tailor their responses to create a coherent and effective exchange.[43]	In studying recordings of HIV patient-provider encounters, there was less psychosocial talk in patient-provider encounters with Hispanic compared to white patients.[42] In a study on predictors and consequences of negative patient-provider interactions among a sample of African American sexual minority women, authors found racial discrimination was most frequently mentioned, and gender and sexual orientation discrimination were also related to negative patient experiences.[70]	Quantitative: • Patient and provider questionnaires about relevant demographics to assess concordance/ match between patient and provider • Patient rating about encounter: Interpersonal Processes of Care Survey[42] • Experiences of Discrimination Scale[71] Qualitative: • Patient qualitative interviews about their experience of care[72, 73] • Clinical encounters coded using audiotapes, analyzed using the Roter Interaction Analysis System[42]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Recipients[32] • Motivations • Values and beliefs • Goals • Skills • Knowledge • Time, resources, support • Local opinion leaders • Collaboration / teamwork • Existing networks • Learning environment • Power and authority • Presence of boundaries	Recipients are individuals who influence implementation processes and those who are affected by implementation outcomes, both at the individual and collective team levels. Recipients can facilitate uptake of an innovation or resist its implementation.[32]	An example of recipients are stakeholders in a study to identify gaps in care for Indigenous people in Australia. In this example, the following are a few recipient characteristics: • Motivations: commitment to improve Indigenous health outcomes and desire to influence practice and policy • Values: perceived importance of group input, such as discussing data, sharing views and ideas • Knowledge: experience using Continuous Quality Improvement approaches[74]	Quantitative: • Staff implementation ratings of innovation • Point of contact implementation reports assessing the innovation[75] Qualitative: • Point of contact interview[75] • The Agency of Healthcare Research and Quality guides measuring recipient perceptions about implementation[29]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Recipients: Providers and staff Culturally relevant factors include:[38] • Demographics (e.g., neighborhood immigrant status) • Unconscious / implicit bias • Knowledge and attitudes • Skillsets	In a healthcare setting, providers and staff are the people who administer the innovation. A providers' objectives and beliefs about a patient affects how they behave during the patient-provider interaction.[76] Providers, especially in busy healthcare settings, may be vulnerable to subconscious bias and stereotypes.[77]	Physicians who consider themselves "liberal" spent more time giving more information to patients than those who consider themselves "conservative". [43] Providers may engage in more detailed conversations about the health status of educated patients, yet provide basic explanations for less educated patients. [43] During a post-angiogram encounter, physicians perceived patients of lower socioeconomic status as having more negative personality characteristics that include lack of self-control and more negative behavioral tendencies.[41]	Quantitative: • Implicit Association Test to assess implicit bias[78] • Surveys of relevant practice, knowledge, attitudes, or skills[79, 80] • Colorblind Racism Scale[81] Qualitative: • Analysis of taped conversation between provider and patient[42, 78] • Participant observation[82] • One-on-one interviews[83]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Recipients: Patients Culturally relevant factors include: [84–86, 38, 37, 36] • Medical mistrust • Health literacy and numeracy • Demographics (e.g., neighborhood, immigrant status) • Socioeconomic status, including household income, net wealth, health insurance status, education level • Expectations about therapeutic relationships • Biology/genetics	In a healthcare setting, patients are the people (individuals, families, caregivers) who will actually receive the innovation. Culturally relevant factors are associated with health and health care disparities and can include demographic factors, beliefs, information, and biological or genetic conditions related to equitable implementation.	Asian American patients in Hawaii participated less in their medical visits than mainland Americans.[87] Patients with more formal educations are more expressive and tend to want to play a role in the decision-making process than less educated patients.[43] Many patients are unsure about their role in the encounter and the appropriateness of their participation.[88] We have limited ability to predict treatment success based on whether research was conducted with patients of similar clinical phenotype.[89]	Quantitative:[37] • Telephone survey of a random sample of residents • Medical Mistrust Index[90] • Measures of underutilization of health services • Health literacy question[91] • Health numeracy question[92] • Appropriated Racial Oppression Scale[93] Qualitative: • Interview about expectations for treatment or the patient-provider-interaction[42, 94] • Interviews about experience seeking care[95]

Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Inner context (local)[27] • Formal and informal leadership support • Culture • Previous experience of innovation or change • Change mechanisms for embedding innovation • Evaluation and feedback processes	The immediate local setting of implementation. Examples include: • Ward • Unit • Clinic • Hospital department	Among 303 providers working in 49 publicly funded health programs for youths, providers' perception of certain leadership styles were associated with stronger provider willingness to adopt evidence-based treatments. [96] Pisando Fuerte is a fall prevention program linguistically and culturally tailored for Latino individuals at risk for falls. It is adapted from "Stepping On," an evidence-based fall prevention program. Fidelity to Pisando Fuerte was subpar; when comparing fidelity between two sites, fidelity was lower in the site that did not give additional time to implement the program (poor leadership support) and had no experience in organizing programs like Pisando Fuerte (no previous experience of innovation). [97]	Quantitative: • Perceptions of Supervisory Support Scale[98] • Organizational Commitment[99] • Readiness for Organizational Change measure[100] • Validated CFIR Inner Setting measures[101] Qualitative:[102] • Site visit • Key informant interviews about inclusivity • Stakeholder meetings or focus groups with providers about their understanding of equitable care • Public forums & listening sessions • Provider and staff interviews to determine actual practice and processes[103]

Notes. *a.* Measures or data collection methods are examples from literature; for a repository of implementation science measures, see the Society for Implementation Research Collaboration's Instrument Review Project.[129] *b.* For a repository of measures specific to racism, see Appendix B of Racism: Science & Tools for the Public Health Professional.[130] *c.* Implementation scientists should review existing measurement tools specific to health disparities in your area of interest or study to further integrate health equity into implementation.

Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Inner context (organizational)[27] • Organizational priorities • Senior leadership and management support • Culture • Structure and systems • History of innovation and change • Absorptive capacity • Learning networks	The organizational atmosphere in which the unit or team is embedded.	Hospitals' adoption of the Culturally and Linguistically Appropriate Services standards focused on retaining translators and adapting culturally and linguistically appropriate materials. However, this adoption did not often include engagement in broader organizational change.[104] Researchers studied a disparity-reduction program in Israel across 26 clinics and 109 clinical teams. After three years, they found different inner context configurations of factors predicting disparity reduction. One example of a successful configuration were: clinics with a large disparity gap to minimize, high clinic density, high perceived team effectiveness, focused efforts on tailoring services to their enrollees patients.[105]	Quantitative: • Measures of organizational readiness for change[106] • Cultural Competency Assessment Tool for Hospitals[104] Qualitative:[107] • Key informant interviews assessing knowledge/action of policies about equity • Key informant interviews assessing beliefs organization holds about marginalized people • Stakeholder meetings about importance of equitable care • Public forums & listening sessions[108] • Focus groups

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Outer context (healthcare system)[27] • Policy drivers and priorities • Incentives and mandates • Regulatory frameworks or external accreditation systems • Inter-organizational networks and relationships	This is the broader context defined in terms of resources, culture, leadership and orientation to evaluation and learning. There is an increasing amount of research that shows that inequities in obtaining preventative care among minorities compared with whites are due to "organizational characteristics, including location, resources, and complexity of a clinic or practice."[38]	Researchers examined predisposing, enabling, and need factors as predictors of changes in health care utilization, and found that patients' experiences differed by group within the healthcare system, and impacted their beliefs and attitudes about receiving healthcare, ultimately affecting the extent to which healthcare services were utilized.[70]	Qualitative: • Archival analysis, reading and documenting policies, program manuals, or procedural protocols[109, 110] • Interviews with leadership[105] Quantitative: • 15 core measures of health care quality[111] • Population surveys • Social network analysis of relationships between relevant leadership and/or teams [105] • Existing reports hospital-wide scores on assessments of care and equity, e.g., National Quality Forum or Healthcare Equality Index[112]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Societal Influences[35, 44–46] • Economies • Physical structures • Sociopolitical forces • Up-, mid-, or downstream social determinants of health[35]	Forces outside the healthcare system that influence all other domains and subdomains determining success of implementation. May include but be broader than social determinants of health. May focus on presence of stigma and discrimination such as racism, classism, or transphobia (as examples) and the institutionalization of such discrimination in every subdomain of implementation.[b,c]	In piloting the Health Equity Implementation Framework, societal influences affected receipt of antiviral Hepatitis C Virus medicine for Black patients in the U.S. Veterans Health Administration. One economic facilitator was free Hepatitis C Virus treatment for patients instituted by policymakers. One sociopolitical barrier to implementation was stigma about being diagnosed with Hepatitis C Virus.[11]	See below

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Economies[49] • Traditional • Command • Market • Mixed	The structure of the city, state, or country related to the wealth and resources of people and what is exchanged for healthcare delivery (e.g., insurance). This can be divided into human resources (i.e., labor, management) and nonhuman resources (i.e., land, capital goods, financial resources, and technology).[52]	In a study assessing longitudinal effects of health insurance and poverty, researchers reported low-income, middle-aged adults in the U.S. with no insurance, unstable coverage, or changes in insurance have higher out-of-pocket expenditures and financial burdens than public insurance holders, as well as increased financial burden.[113] In a case study, the presence of chronic kidney disease indicators in the pay-for-performance system in primary care created an incentive for improvement.[27]	Quantitative: • Insurance claims data • Gross Domestic Product[114] • Gross National Product[115] • Minimum Wage[116] • Population & total employment[117] • Annual average wage level of the primary, secondary, and tertiary industries[118] • Tax revenue as percentage of total revenue[119] • Interest rate on saving deposits and inflation rate[120] Qualitative:[121] • Key informant interviews about goods and services exchanged[122] • Analysis of comparative economic structure[121]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Physical structures • Location • Availability of public transportation • Actual environment of the point-to-care • Language spoken and/or signage • Available structures in one's neighborhood to use innovation • Grocery stores • Health care facilities • Local businesses • Physical infrastructure	The physical environment, structure, location of services and recipients. Also known as the built environment as it relates to equitable implementation.[52]	In a study comparing Black and white people living in one U.S. city, authors reported that location of residence may affect health inequities. For example, in the racially integrated, low-income neighborhood, inequities in hypertension, diabetes, obesity among women, and use of health services significantly decreased between Black and white Americans.[123] In a qualitative study of transgender individuals' experiences in residential addiction treatment, researchers observed that residential facilities that split the milieu and housing based on the gender binary may be stigmatizing people who identify as transgender or gender non-conforming.[124]	Quantitative: • Indices of Segregation[125][b] • Public data such as: Hospitals per capita, Public transportation trips per capita, Car ownership, Revenue dedicated to parks & recreation, transportation, other infrastructure needs, Grocery stores per capita • Center on Budget and Policy Priorities data • State Departments of Finance and Administration[52] Qualitative: • Windshield & walking surveys include assessing infrastructure; surveyors are on foot and take note of the neighborhood related to physical or built environment.[126]

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Domain & Subdomains	Definition	Illustrative Example(s)	Sample Measures[a]
Sociopolitical Forces[44, 46, 55] • Policy climate • Political support • Laws • Local culture • Social movements or structures such as racism, classism, heterosexism, transphobia[c]	Policies and procedures, formal or informal, in national and local governments that systemically inhibit or promote equitable health.	In a U.S. study on adoption of behavioral health evidence based treatment by states, the following were some factors that played a role: state characteristics, state fiscal supports to promote innovation adoption, and state policy supports to promote evidence based treatment adoption.[55]	Quantitative: • The State-Level Racism Index[127][b] Qualitative: • INCLENS equity lens: examines whether clinical guidelines address health needs and inequities experienced by marginalized groups[128] • Interview questions with recipients about laws, policies, or social movements relevant to the innovation • Archival analysis[109, 110]

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Innovation. Innovation refers to the treatment, intervention, or practice or new "thing" to be implemented, adopted by providers and staff, and delivered to patients.[30] The innovation may be a program, practice, principle, procedure, product, pill, or policy.[31]

Recipients. Recipients are the individuals who influence implementation processes and those who are affected by implementation outcomes, both at the individual and collective team levels.[27] In health care, recipients are often many stakeholders typically grouped into providers and other staff, and patients and caregivers.

Context. Context includes different micro, meso, or macro levels that correspond to inner and outer contexts often specified in determinant frameworks.[27] Context can include factors such as resources, culture, leadership, and orientation to evaluation and learning. In this framework, the micro level includes local inner context (e.g., specific ward or clinic), whereas the meso includes the organization (e.g.,

hospital or medical center). The macro level of outer context includes the wider healthcare system and effect this has on the other domains (e.g., United Kingdom National Health Service).[28]

Facilitation or Process. There are processes by which barriers in implementation domains are solved or overcome, and strengths are harnessed to promote use of an innovation in routine practice.[29] In i-PARIHS, facilitation is the "active ingredient" or process.[32] Facilitation involves implementation strategies that result in implementation coming to fruition.[33, 34]

Domains Known to Affect Health Equity. Three health equity domains have clear, strong associations with inequities in health status, access to, quality of, or outcomes of health care,[35] or there is enough evidence to suggest these domains should be considered.[e.g., 36] The Health Equity Implementation Framework incorporates these domains known to affect health equity: 1) cultural factors, such as medical mistrust, demographics, or biases of recipients, who include patients, providers, and others;[37–40] 2) clinical encounter or patient-provider interaction;[41–43] and 3) societal influences including physical structures, economies, and social and political forces.[44–46] See Table 1 for illustrative examples and sample measures.

Cultural factors of recipients. Recipients in the implementation process are individuals who will consume a particular innovation (e.g., patients, providers).[27] Recipients have unique characteristics, as single individuals and as a group, that influence whether an innovation will be adapted and adopted successfully. Implementers should tailor implementation strategies so they are culturally aligned with beliefs, behaviors, preferences, and needs of all recipients—providers, staff, and patients. Some examples of recipient cultural factors are implicit bias, socioeconomic status, race and/or ethnicity, immigrant acculturation, language, health literacy, health beliefs, or trust in the clinical staff or patient group.[39, 40] Although cultural factors will vary by group and local context, it is crucial recipient cultural factors are considered, particularly when patients belong to a group experiencing a healthcare inequity.

Clinical encounter (patient-provider interaction). This domain recognizes the transaction that occurs between patients and provider in health care, where decisions concerning diagnoses and treatment are made, and providers administer care.[47] It is important the recipients tailor and adapt the conversation accordingly to achieve their individual and shared goals.[43, 48] Factors from both the patient and provider include individual differences in, for example, age and self-concept, pre-existing stereotypes, or lack of trust that could hinder the interaction.[43] There could be subconscious, implicit, or explicit bias from either recipient due to the others' characteristics, such as race, weight, or perceived sexual orientation. Due to the myriad factors intersecting during the clinical encounter, it is crucial to assess and address it, especially with regards to health inequities.

Societal influence. Societal influence includes three subdomains: 1) economies, 2) physical structures, and 3) sociopolitical forces. This domain is similar to social determinants of health, yet incorporates more upstream determinants (e.g., governance) that have been investigated less relative to mid- or downstream determinants (e.g., neighborhoods).[35] Societal influences also include historical or current discrimination against marginalized groups, such as racism, classism, or transphobia, that may be

formally or informally institutionalized within any implementation subdomain. These factors usually occur in broadest levels of the environment (e.g., province, nation), thus affecting downstream the healthcare system, clinics, and recipients. Many societal influences are interrelated, such as a policy affecting a physical structure. It is not as important at this point to distinguish whether a factor is exclusively an economy, physical structure, social norm, or all three; rather, it is important these societal influences are considered and addressed to ensure strategies address these key drivers of societal inequities. For example, Latinx patients in community mental health care (recipients, some immigrants, some Spanish speaking) interface with a service system (purveyor of mental health services, potentially an economic factor). There may be limited purveyors of services in certain geographic regions (physical structure), with higher levels of perceived racism among some providers (social discrimination interacting with recipient factor), and limited purveyors that offer culturally or linguistically aligned care to match needs of monolingual patients who have immigrated to the U.S. (physical structure). Societal influences may not all be assessed in one study or initiative using established measures, due to feasibility constraints, but they should be documented in formative evaluations / initial diagnostic assessments of the implementation problem.

Economies. There are four typical structures of economies including a traditional economy (i.e., mostly agricultural), market economy (i.e., firms and private interests control capital), command economy (i.e., government controls capital), and a mixed economy (combination of command and market).[49] It is helpful to consider how economic structure affects access to resources for implementation. Market forces can be used to change demand for products deemed healthy or unhealthy, therefore driving policy implementation. Examples of market forces include taxes on tobacco, unhealthy food, and soft drinks, or food subsidy programs for women with low incomes.[44] As another example, one study found poverty was concentrated in the U.S. central Appalachia region where mountain top mining was the main income source.[50] These residents had increased exposure to environmental hazards combined with limited resources to address negative health outcomes as a result of those hazards. Implementation in this region would need to account for resources available to residents, their unique health concerns, and healthcare in their local context.

Physical structures. Equity can be affected by how physical spaces, or "built environments," are arranged and how transition between those spaces occurs for health care.[44] One example in healthcare settings is type and quality of language translations of information displayed (e.g., flyers, waiting rooms)— whether it matches the language of patients served.[51] The location of the healthcare setting in a town or city is important in relation to location of patients[51, 52] e.g., is it difficult for patients to get to the point of care? An example even broader includes an air pollution intervention implemented in the U.S. in which low emission zones improved air quality and had positive effects on mortality rates for all residents, but a greater benefit for the wealthiest, widening mortality inequities.[53] Another example is the implementation of one U.S. state's naloxone standing order in which pharmacies could distribute naloxone without a prescription.[54] Results demonstrated 61.7% of retail pharmacies had naloxone available without a prescription. However, naloxone availability was lower in neighborhoods with higher percentages of residents with public health insurance—partially a physical structure problem. This finding

was particularly problematic due to an increased cost of naloxone for people on Medicaid (public health insurance) as a result of the statewide mandate. These examples suggest health inequity can be maintained or widened through implementation efforts, such that the most affluent experience a better outcome than others.

Sociopolitical forces. Other societal influences are social norms or political forces, which can include but are not limited to political support, laws, and social structures such as racism, misogyny, classism, or heterosexism.[46, 55] Public health policies (e.g., fiscal, regulation, education, preventative treatment, and screening) demonstrate positive and negative effects on health inequalities that occur across health domains (e.g., tobacco, food and nutrition, reproductive health services).[44] As another example, a study examined U.S. state legislators' behavioral health research-seeking practices and dissemination preferences and found significant variation between Democrats and Republicans, suggesting dissemination materials be tailored to different social norms for different groups.[56] Another example is how ableism (discrimination and stigma against people with mental or physical disabilities) acts as a barrier to implementation.[46]

Results

How to Use the Three Health Equity Domains as Determinants of Equitable Implementation

Three health equity domains can be applied to one's preferred implementation determinants framework. Implementation determinant frameworks need well-grounded constructs that are clearly defined, labeled, and described, with suggested validated measures[57]—we provide this in Table 1 for the Health Equity Implementation Framework. We will describe how to use the three health equity domains according to ten recommendations on using implementation frameworks in research and practice.[58] Practical tools are presented in additional files. Refer to Table 2 for an overview of all ten recommendations and definitions. We expand in text only on steps relevant for using the three health equity domains.

Table 2
Ten Recommendations on Using Implementation Frameworks

Step	Definition
1. Select a suitable framework.	Choose a framework relevant and for your implementation question and population.
2. Establish and maintain community stakeholder engagement and partnerships.	Engage community members to develop/select, adapt, evaluate, and implement an intervention.[11]
3. Define issue and develop research or evaluation questions and hypotheses.	Specify the problem for the specific population and intervention you plan to implement.
4. Develop an implementation mechanistic process model or logic model.	Use your framework to identify and map out the process and different domains through which you believe the intervention will become implemented.
5. Select research and evaluation methods.	Identify methods and evaluation tools that are specific to the intervention and population you plan to engage for implementation. There exist for populations experiencing healthcare inequities all the usual research challenges for measuring improvement in health or healthcare, and low prevalence of some issues (e.g., suicide) or low numbers of a population (e.g., gender nonconforming people) make measurement harder. Andreson et al (2004) suggested sampling and recruitment techniques for populations that experience health inequities and are hard to reach with traditional techniques (e.g., periodic population-based surveys, Integrated Disease Surveillance and Response).[90] It may also be helpful to incorporate mixed methods assessment of multiple levels to "illuminate plausible causal mechanisms."[63]
6. Determine implementation factors/determinants.	Carry out a formative evaluation and assess barriers and facilitators for relevant domains.
7. Select and tailor, or develop, implementation strategy(s).	Sort or categorize barriers by framework domains then select implementation strategies to address each barrier by framework domain.
8. Specify implementation outcomes and evaluate implementation.	It can be helpful to select an evaluation framework to assess outcomes, as well as selection of outcomes relevant to the implementation.
9. Use a framework(s) at micro level to conduct and tailor implementation.	As implementation progresses, the implementation plan needs to be altered as determinants change.

Step	Definition
10. Write the proposal and report.	Write a scientific and/or program report using the Implementation Framework Utilization Checklist as a final documentation of an implementation effort.

Step 1. Select a suitable framework. The Health Equity Implementation Framework (or three health equity domains adapted to another implementation framework) is population and country agnostic; domains can be adapted to any setting where inequitable implementation occurs. The framework proposes determinants of inequitable implementation and a process (facilitation) by which to address determinants, but it is not an evaluation framework and not suitable for selecting evaluation outcomes.

Steps 3–5. Define issue and develop research or evaluation questions and hypotheses; Develop an implementation mechanistic process model or logic model; Select research and evaluation methods. For quantitative research questions, between-site or between-group comparisons may answer questions about equitable delivery of care.[59] Potential questions of interest to equitable implementation are: Do specific people have more access to the innovation who did not before (i.e., reach)? Are systemic changes (e.g., policy changes, increased training for providers) occurring (i.e., adoption)? Are inequities between low- and well-resourced sites or patients decreasing or non-significant (effectiveness or implementation fidelity)?[60]

For step 4 (mechanisms), using the three health equity domains (added to another implementation framework, as done in the Health Equity Implementation Framework), one may develop theoretically driven hypotheses about which domains or mechanisms must change to lead to improved equity and implementation success.[61] When working on an inequitable implementation problem, this will ensure some mechanisms related to equity *and* implementation are investigated. For example, there may be inequity in the research-practice gap related to outer context (e.g., this intervention is only implemented in well-funded institutions that serve mostly affluent people). Clearly identify patient recipients intended to receive the innovation and if there is a subset within this population who experience inequitable access to, quality of, or outcomes of healthcare.

Research and evaluation methods should match existing evidence of the intervention and implementation, but also the evidence related to the inequity or marginalized population. To select an implementation research design, consider the decision tree from Chinman and colleagues.[62] Consult Table 1 for sample measures as possible measures or methods.

Step 6. Determine implementation factors/determinants. This recommendation is most closely aligned with use of Health Equity Implementation Framework to date.[11] If one is using a different implementation framework for a problem in which inequity occurs, adapt the framework to include the three health equity domains described above. Through formative evaluation to assess barriers and facilitators in each domain,[63, 64] align qualitative interview guides, quantitative measures, and other assessment methods (e.g., participant observation, policy review) to the framework's determinants—see

Table 1. One might also include patient recipient perspectives in formative evaluation, specifically sampling for those who are experiencing the health or healthcare inequity. We provided an example of an interview guide aligned to domains of the Health Equity Implementation Framework (see additional file 1).

Box 1. Application of the Health Equity Implementation Framework to Guide an Equity-Focused Implementation Project: A Case Study

The Health Equity Implementation Framework has been applied to guide evaluation of an ongoing implementation project aiming to reduce inequities in the provision and receipt of publicly funded services for individuals with developmental disabilities. In 2016, the State of California Department of Developmental Services made funds available to address significant inequities in service expenditures for Latinx clients. In response, local researchers initiated a partnership with the San Diego Regional Center, the primary local purveyor of publicly-funded developmental disability services, to identify inequity reduction targets and develop and implement an inequity reduction model. A mixed-methods needs assessment was conducted to inform model development and activities. Quantitative data was gathered from secondary data extraction and analyses of the purveyor's service utilization data for the previous year. Focus groups with purveyor case managers were held to identify key determinants and sources of inequities from their perspectives. The Health Equity Implementation Framework was applied to guide identification of implementation determinants and selection of data coding and analyses for this needs assessment (Steps 5 and 6 described above). Specifically, the framework informed the development of the qualitative codebook, including identification of coding domains and definitions that were then iteratively refined and tailored for this project. The framework also guided subsequent mixed-methods data merging and integration, including use of qualitative themes to complement and expand quantitative findings.

Step 8. Specify implementation outcomes and evaluate implementation. Evaluation frameworks can be helpful in selecting implementation outcomes,[26] and it is essential to also select outcomes to evaluate equity in access to, quality of, or outcomes of implementation.[38, 59] The three health equity domains (in addition to typical implementation domains) can be helpful in designing qualitative codebooks or templates for analysis or re-evaluating quantitative measures first collected during formative evaluation or an earlier data collection period. See Additional File 2 for a codebook for analysis of three health equity domains. Consider innovative analytic techniques to best assess multilevel contributors to implementation success and equity.[65]

Step 9. Use a framework(s) at micro level to conduct and tailor implementation. As implementation progresses, an implementation plan will need to be tailored as determinants change. The Health Equity Implementation Framework can be useful for determining areas to assess repeatedly and thus, intervene on, throughout implementation. Doing so ensures an equity lens is applied throughout implementation and that implementation processes, such as planning, strategy use, and goal setting, are thoughtfully executed according to dynamic needs. Repeated assessments can be done through multimodal methods, including ones used previously in formative evaluation.[64]

Step 10. Write the report. For documenting results of an implementation effort, clarify how the Health Equity Implementation Framework or its three health equity domains were incorporated. For example, barriers and facilitators from formative evaluation may be presented within framework domains. The multimethod assessment and evaluation approaches used in prior steps will provide key information to

be reported, making clear why implementation was successful or not, and how certain strategies affected *equitable* implementation.[13]

Discussion

The three health equity domains are key adaptations for implementation scientists and suggested to adapt one's preferred implementation framework (e.g., CFIR) to incorporate an equity lens. This manuscript, tables, and additional files provide some practical guidance and tools for incorporating three health equity domains into an implementation determinants framework. To focus on health equity explicitly at multiple ecological levels in implementation science and practice will elucidate drivers of health inequities such as structural racism, heterosexism, and patriarchy. Thus, discovery of causes of health inequities should necessitate implementation strategies to overcome or resolve such complex and oppressive structures. Future research should focus on implementation strategies (or other processes) used to address the three health equity determinants of unjust health inequities in our healthcare systems and societies.

Implementation science frameworks have been categorized into three types: determinants (establishing what factors determine or predict implementation success), process (clarifying how to address determinants to achieve implementation success), and evaluation (determining metrics and assessment to know when implementation success is achieved).[57] One may also use the Health Equity Implementation Framework in its entirety as an implementation determinants framework, or use the three health equity domains as additions to another implementation determinants framework. For an implementation process framework that incorporates an equity lens, see frameworks proposed by Nápoles and Stewart[12] and Eslava-Schmalbach and colleagues.[60] For an implementation evaluation framework that incorporates an equity lens, see preliminary equity-focused implementation outcomes[60] and the proposed extension of RE-AIM framework.[66]

There are limitations to our practical guidance presented here. We have piloted test many, but not all, the feasibility and acceptability of steps using three health equity domains described in the results section. We have not piloted feasibility and acceptability of all measures suggested in Table 1. However, we suggest these as starting places, and with confidence, as they all have entire bodies of science showcasing their relevance to health equity. Implementation scientists and practitioners must adopt a health equity lens as foundational to any research-practice gap where inequity exists and collect data on the feasibility, acceptability, and predictive utility of three health equity domains.

Conclusion

The Health Equity Implementation Framework provided groundwork for the use of implementation science frameworks to address health inequities by incorporating factors that drive health inequities.[11] This manuscript providers practical tools and explanations for systematic integration of health equity and implementation science in frameworks. These tools can assist implementation scientists and

practitioners to concretely address inequity in implementation across populations to capture and analyze information used to assess health outcomes.[23]

Abbreviations

i-PARIHS: Integrated Promoting Action on Research in Implementation in Health Services

U.S.: United States

Declarations

- Ethics approval and consent to participate
    - Not applicable

- Consent for publication
    - Not applicable

- Availability of data and materials
    - Data sharing is not applicable to this article as no datasets were generated or analysed during the current study

- Competing interests
    - The authors declare that they have no competing interests

- Funding

This work was in part supported by the National Institute of Mental Health (K23MH115100; PI: Dickson). Dr. Singh was also supported by the Department of Veterans Affairs Office of Academic Affiliations Advanced Fellowship Program in Mental Illness Research and Treatment; the Medical Research Service of the Central Arkansas Veterans Healthcare System; and the Department of Veterans Affairs South Central Mental Illness Research, Education, and Clinical Center

- Authors' contributions
    - ENW conceptualized the manuscript, provided guidance on literature for implementation and health equity domains, prepared and refined all usable tools (additional files), and was a major contributor in writing the manuscript.
    - RSS was a major contributor in writing the manuscript and preparing Tables 1 and 2.
    - PN contributed writing to some implementation and health equity domains, to literature searching and writing in Table 1, and to writing the conclusion.
    - AMC contributed writing to some implementation and health equity domains and to literature searching and writing in Table 1.

- KSD helped conceptualize the purpose of the manuscript, prepared and wrote the case study example, and edited writing of the manuscript.
    - JEK refined conceptualizations of the manuscript and edited writing of the manuscript.
- Acknowledgements
    - Drs. Dickson and Woodward are fellows with the Implementation Research Institute (IRI), at the George Warren Brown School of Social Work, Washington University in St. Louis; through an award from the National Institute of Mental Health (5R25MH08091607). We thank Ross Brownson and Sarabeth Broder-Fingert for their continued encouragement and consultation.

Thank you to Amber D. Haley for astute and generous consultation on the codebook template.

References

1. National Partnership for Action. National Stakeholder Strategy for Achieving Health Equity. US Department of Health & Human Services, Office of Minority Health: Rockville, MD; 2011.

2. Smedley B, Stith AY, Nelson AR, editors. Assessing Potential Sources of Racial and Ethnic Disparities in Care: Patient- and System-Level Factors. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Washington D.C.: The National Academies Press; 2003.

3. Wasserman J, Palmer RC, Gomez MM, Berzon R, Ibrahim SA, Ayanian JZ. Advancing Health Services Research to Eliminate Health Care Disparities. Am J Public Health. 2019;109:S64–9.

4. Mandell DS, Wiggins LD, Carpenter LA, Daniels J, DiGuiseppi C, Durkin MS, et al. Racial/Ethnic Disparities in the Identification of Children With Autism Spectrum Disorders. Am J Public Health. 2009;99:493–8.

5. Magaña S, Parish SL, Rose RA, Timberlake M, Swaine JG. Racial and Ethnic Disparities in Quality of Health Care Among Children with Autism and Other Developmental Disabilities. Intellectual and Developmental Disabilities. American Association on Intellectual and Developmental Disabilities; 2012;50:287–99.

6. Nair H, Panda R. Quality of maternal healthcare in India: Has the National Rural Health Mission made a difference? J Glob Health. 2011;1:79–86.

7. Tougher S, Dutt V, Pereira S, Haldar K, Shukla V, Singh K, et al. Effect of a multifaceted social franchising model on quality and coverage of maternal, newborn, and reproductive health-care services in Uttar Pradesh, India: a quasi-experimental study. The Lancet Global Health. Elsevier; 2018;6:e211–21.

8. Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, et al. Tailored interventions to address determinants of practice. In: The Cochrane Collaboration, editor. Cochrane Database of Systematic Reviews [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2015 [cited 2016 Aug 9]. Available from: http://doi.wiley.com/10.1002/14651858.CD005470.pub3

9. Cerdá M, Tracy M, Ahern J, Galea S. Addressing Population Health and Health Inequalities: The Role of Fundamental Causes. American Journal of Public Health. 2014;104:S609–19.

10. Medicine (US) I of. What Progress in Reducing Health Disparities Has Been Made?: A Historical Perspective [Internet]. How Far Have We Come in Reducing Health Disparities? Progress Since 2000: Workshop Summary. National Academies Press (US); 2012 [cited 2020 Apr 21]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK114236/

11. Woodward EN, Matthieu MM, Uchendu US, Rogal SS, Kirchner JE. The Health Equity Implementation Framework: Proposal and Preliminary Study of Hepatitis C Virus Treatment. Implementation Science. 2019;14.

12. Nápoles AM, Stewart AL. Transcreation: an implementation science framework for community-engaged behavioral interventions to reduce health disparities. BMC Health Services Research [Internet]. 2018 [cited 2019 Jan 9];18. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-018-3521-z

13. Baumann AA, Cabassa LJ. Reframing implementation science to address inequities in healthcare delivery. BMC Health Serv Res. 2020;20:190.

14. DuMont K, Metz A, Woo B. Five Recommendations for How Implementation Science Can Better Advance Equity [Internet]. AcademyHealth Blog. 2019 [cited 2019 May 20]. Available from: https://www.academyhealth.org/blog/2019-04/five-recommendations-how-implementation-science-can-better-advance-equity

15. Ridde V, Yaogo M, Zongo S, Somé P-A, Turcotte-Tremblay A-M. Twelve months of implementation of health care performance-based financing in Burkina Faso: A qualitative multiple case study. The International Journal of Health Planning and Management. 2018;33:e153–67.

16. Turcotte-Tremblay A-M, Spagnolo J, De Allegri M, Ridde V. Does performance-based financing increase value for money in low- and middle- income countries? A systematic review. Health Economics Review. 2016;6:30.

17. Bergström A, Skeen S, Duc DM, Blandon EZ, Estabrooks C, Gustavsson P, et al. Health system context and implementation of evidence-based practices—development and validation of the Context Assessment for Community Health (COACH) tool for low- and middle-income settings. Implementation Science [Internet]. 2015 [cited 2020 Jan 7];10. Available from: http://implementationscience.biomedcentral.com/articles/10.1186/s13012-015-0305-2

18. Lauria ME, Fiori KP, Jones HE, Gbeleou S, Kenkou K, Agoro S, et al. Assessing the Integrated Community-Based Health Systems Strengthening initiative in northern Togo: a pragmatic effectiveness-implementation study protocol. Implementation Science [Internet]. 2019 [cited 2020 Jan 7];14. Available from: https://implementationscience.biomedcentral.com/articles/10.1186/s13012-019-0921-3

19. Nabyonga Orem J, Bataringaya Wavamunno J, Bakeera SK, Criel B. Do guidelines influence the implementation of health programs? — Uganda's experience. Implementation Science [Internet]. 2012

[cited 2020 Jan 7];7. Available from:
http://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-7-98

20. Means AR, Kemp CG, Gwayi-Chore M-C, Gimbel S, Soi C, Sherr K, et al. Evaluating and optimizing the consolidated framework for implementation research (CFIR) for use in low- and middle-income countries: a systematic review. Implementation Science. 2020;15:17.

21. Harding T, Oetzel J. Implementation effectiveness of health interventions for indigenous communities: a systematic review. Implementation Science [Internet]. 2019 [cited 2019 Sep 3];14. Available from: https://implementationscience.biomedcentral.com/articles/10.1186/s13012-019-0920-4

22. Spitzer-Shohat S, Chin MH. The "Waze" of Inequity Reduction Frameworks for Organizations: a Scoping Review. J GEN INTERN MED. 2019;34:604–17.

23. Brownson, Ross C, Colditz GA, Proctor EK, editors. Dissemination and Implementation Research in Health: Translating Science to Practice. 2nd ed. New York, NY: Oxford University Press; 2018.

24. Damschroder L, Hall C, Gillon L, Reardon C, Kelley C, Sparks J, et al. The Consolidated Framework for Implementation Research (CFIR): progress to date, tools and resources, and plans for the future. Implementation Science. 2015;10:A12.

25. Rabin B, Glasgow R, Tabak RG, Brownson RC, Huebschmann A, Malone S, et al. Dissemination and Implementation Models in Health Research and Practice [Internet]. 2020 [cited 2019 Jun 20]. Available from: https://dissemination-implementation.org/

26. Nilsen P. Making sense of implementation theories, models and frameworks. Implementation Science. 2015;10:53.

27. Harvey G, Kitson A. PARIHS revisited: from heuristic to integrated framework for the successful implementation of knowledge into practice. Implementation Science [Internet]. 2015 [cited 2017 Mar 21];11. Available from: http://implementationscience.biomedcentral.com/articles/10.1186/s13012-016-0398-2

28. Tabak RG, Khoong EC, Chambers D, Brownson RC. Bridging Research and Practice. Am J Prev Med. 2012;43:337–50.

29. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation Sci. 2009;4:50.

30. Curran GM. Implementation science made too simple: a teaching tool. Implement Sci Commun. 2020;1:27.

31. Brown CH, Curran G, Palinkas LA, Aarons GA, Wells KB, Jones L, et al. An Overview of Research and Evaluation Designs for Dissemination and Implementation. Annual Review of Public Health. 2017;38:1–22.

32. Harvey G, Kitson A. Implementing Evidence-Based Practice in Healthcare: A Facilitation Guide. New York, NY: Routledge; 2015.

33. Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implement Sci [Internet]. 2015 [cited 2016 Feb 26];10. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4328074/

34. Kirchner J, Ritchie M, Dollar KM, Gundlach P, Smith JL. Implementation Facilitation Training Manual: Using External and Internal Facilitation to Improve Care in the Veterans Health Administration. [Internet]. 2010 [cited 2016 Jan 6]. Available from: https://www.queri.research.va.gov/tools/implementation/Facilitation-Manual.pdf

35. Palmer RC, Ismond D, Rodriquez EJ, Kaufman JS. Social Determinants of Health: Future Directions for Health Disparities Research. Am J Public Health. 2019;109:S70–1.

36. Meghani SH, Brooks JM, Gipson-Jones T, Waite R, Whitfield-Harris L, Deatrick JA. Patient–provider race-concordance: does it matter in improving minority patients' health outcomes? Ethnicity & Health. 2009;14:107–30.

37. LaVeist TA, Isaac LA, Williams KP. Mistrust of Health Care Organizations Is Associated with Underutilization of Health Services. Health Services Research. 2009;44:2093–105.

38. Kilbourne AM, Switzer G, Hyman K, Crowley-Matoka M, Fine MJ. Advancing Health Disparities Research Within the Health Care System: A Conceptual Framework. American Journal of Public Health. 2006;96:2113–21.

39. Betancourt JR, Green AR, Carrillo JE, Ananeh-Firempong O. Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. Public Health Rep. 2003;118:293–302.

40. National Research Council, Institute of Medicine. Policies and Social Values. In: Woolf SH, Aron L, editors. US Health in International Perspective: Shorter Lives, Poorer Health [Internet]. Washington, DC, US: National Academies Press (US); 2013 [cited 2020 Apr 23]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK154493/

41. van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. Social Science & Medicine. 2000;50:813–28.

42. Beach MC, Saha S, Korthuis PT, Sharp V, Cohn J, Wilson I, et al. Differences in Patient–Provider Communication for Hispanic Compared to Non-Hispanic White Patients in HIV Care. Journal of General Internal Medicine. 2010;25:682–7.

43. Street RL. Communication in Medical Encounters: An Ecological Perspective. Handbook of Health Communication. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers; 2003.

44. Thomson K, Hillier-Brown F, Todd A, McNamara C, Huijts T, Bambra C. The effects of public health policies on health inequalities in high-income countries: an umbrella review. BMC Public Health. 2018;18:869.

45. Marmot M. Social determinants of health inequalities. The Lancet. 2005;365:1099–104.

46. Watson DP, Adams EL, Shue S, Coates H, McGuire A, Chesher J, et al. Defining the external implementation context: an integrative systematic literature review. BMC Health Services Research.

2018;18:209.

47. Dieppe P, Rafferty A-M, Kitson A. The clinical encounter - the focal point of patient-centred care. Health Expectations. 2002;5:279–81.

48. Street RL, Liu L, Farber NJ, Chen Y, Calvitti A, Zuest D, et al. Provider interaction with the electronic health record: The effects on patient-centered communication in medical encounters. Patient Educ Couns. 2014;96:315–9.

49. Swedberg R. Principles of Economic Sociology. Princeton University Press; 2009.

50. Hendryx M. Poverty and Mortality Disparities in Central Appalachia: Mountaintop Mining and Environmental Justice. Journal of Health Disparities Research and Practice [Internet]. 2012;4. Available from: https://digitalscholarship.unlv.edu/jhdrp/vol4/iss3/6

51. Brach C, Fraserirector I. Can Cultural Competency Reduce Racial and Ethnic Health Disparities? A Review and Conceptual Model. Medical Care Research and Review. 2000;57:181–217.

52. Metzl JM, Hansen H. Structural competency: Theorizing a new medical engagement with stigma and inequality. Social Science & Medicine. 2014;103:126–33.

53. Benmarhnia T, Rey L, Cartier Y, Clary CM, Deguen S, Brousselle A. Addressing equity in interventions to reduce air pollution in urban areas: a systematic review. Int J Public Health. 2014;59:933–44.

54. Egan KL, Foster SE, Knudsen AN, Lee JGL. Naloxone Availability in Retail Pharmacies and Neighborhood Inequities in Access. American Journal of Preventive Medicine. 2020;S0749379719305318.

55. Bruns EJ, Parker EM, Hensley S, Pullmann MD, Benjamin PH, Lyon AR, et al. The role of the outer setting in implementation: associations between state demographic, fiscal, and policy factors and use of evidence-based treatments in mental healthcare. Implementation Science. 2019;14:96.

56. Purtle J, Dodson EA, Nelson K, Meisel ZF, Brownson RC. Legislators' Sources of Behavioral Health Research and Preferences for Dissemination: Variations by Political Party. Psychiatr Serv. 2018;69:1105–8.

57. Damschroder LJ. Clarity out of chaos: Use of theory in implementation research. Psychiatry Research. 2020;283:S0165178119307541.

58. Moullin JC, Dickson KS, Stadnick N, Albers B, Nilsen P, Broder-Fingert S, et al. Ten Recommendations for Using Implementation Frameworks in Research and Practice. Implementation Science Communications. 2020;1.

59. Keppel K, Pamuk E, Lynch J, Carter-Pokras O, Kim Insun null, Mays V, et al. Methodological issues in measuring health disparities. Vital Health Stat 2. 2005;1–16.

60. Eslava-Schmalbach J, Garzón-Orjuela N, Elias V, Reveiz L, Tran N, Langlois EV. Conceptual framework of equity-focused implementation research for health programs (EquIR). Int J Equity Health. 2019;18:80.

61. Lewis CC, Boyd MR, Walsh-Bailey C, Lyon AR, Beidas R, Mittman B, et al. A systematic review of empirical studies examining mechanisms of implementation in health. Implementation Sci.

2020;15:21.

62. Chinman M, Woodward EN, Curran GM, Hausmann LRM. Harnessing Implementation Science to Increase the Impact of Health Equity Research. Medical Care. 2017;55:S16–23.

63. Grol R, Wensing M, Eccles M, Davis D, editors. Improving Patient Care: The Implementation of Change in Health Care. 2nd ed. West Sussex, UK: John Wiley & Sons, Ltd; 2013.

64. Stetler CB, Legro MW, Wallace CM, Bowman C, Guihan M, Hagedorn H, et al. The Role of Formative Evaluation in Implementation Research and the QUERI Experience. Journal of General Internal Medicine. 2006;21:S1–8.

65. Jeffries N, Zaslavsky AM, Diez Roux AV, Creswell JW, Palmer RC, Gregorich SE, et al. Methodological Approaches to Understanding Causes of Health Disparities. Am J Public Health. 2019;109:S28–33.

66. Shelton RC, Chambers DA, Glasgow RE. An Extension of RE-AIM to Enhance Sustainability: Addressing Dynamic Context and Promoting Health Equity Over Time. Front Public Health. 2020;8:134.

67. Rycroft-Malone J, Seers K, Titchen A, Harvey G, Kitson A, McCormack B. What counts as evidence in evidence-based practice? J Adv Nurs. 2004;47:81–90.

68. Scott SD, Plotnikoff RC, Karunamuni N, Bize R, Rodgers W. Factors influencing the adoption of an innovation: An examination of the uptake of the Canadian Heart Health Kit (HHK). Implementation Science. 2008;3:41.

69. Chaudoir SR, Dugan AG, Barr CHI. Measuring factors affecting implementation of health innovations: a systematic review of structural, organizational, provider, patient, and innovation level measures. Implement Sci. 2013;8:22.

70. Li C-C, Matthews AK, Aranda F, Patel C, Patel M. Predictors and Consequences of Negative Patient-Provider Interactions Among a Sample of African American Sexual Minority Women. LGBT Health. 2015;2:140–6.

71. Krieger N, Smith K, Naishadham D, Hartman C, Barbeau EM. Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. Social Science & Medicine. 2005;61:1576–96.

72. Rounds K, Mcgrath BB, Walsh E. Perspectives on provider behaviors: A qualitative study of sexual and gender minorities regarding quality of care. Contemporary Nurse. 2013;44:99–110.

73. Quiñones TJ, Woodward EN, Pantalone DW. Sexual minority reflections on their psychotherapy experiences. Psychotherapy Research. 2017;27:189–200.

74. Laycock A, Harvey G, Percival N, Cunningham F, Bailie J, Matthews V, et al. Application of the i-PARIHS framework for enhancing understanding of interactive dissemination to achieve wide-scale improvement in Indigenous primary healthcare. Health Research Policy and Systems. 2018;16:117.

75. Lukas CV, Meterko MM, Mohr D, Seibert MN, Parlier R, Levesque O, et al. Implementation of a Clinical Innovation: The Case of Advanced Clinic Access in the Department of Veterans Affairs. Journal of Ambulatory Care Management. 2008;31:94–108.

76. Hall J, Roter D, Junghans B. Doctors Talking with Patients—Patients Talking with Doctors: Improving Communication in Medical Visits. Clinical and Experimental Optometry. 1995;78:79–80.

77. Blair IV, Steiner JF, Havranek EP. Unconscious (Implicit) Bias and Health Disparities: Where Do We Go from Here? Perm J. 2011;15:71–8.

78. Cooper LA, Roter DL, Carson KA, Beach MC, Sabin JA, Greenwald AG, et al. The associations of clinicians' implicit attitudes about race with medical visit communication and patient ratings of interpersonal care. Am J Public Health. 2012;102:979–87.

79. Kitts, RL. Barriers to Optimal Care between Physicians and Lesbian, Gay, Bisexual, Transgender, and Questioning Adolescent Patients. Journal of Homosexuality. 2010;57:730–47.

80. Petroll AE, Walsh JL, Owczarzak JL, McAuliffe TL, Bogart LM, Kelly JA. PrEP Awareness, Familiarity, Comfort, and Prescribing Experience among US Primary Care Providers and HIV Specialists. AIDS Behav. 2017;21:1256–67.

81. Neville HA, Lilly RL, Duran G, Lee RM, Browne L. Construction and initial validation of the Color-Blind Racial Attitudes Scale (CoBRAS). Journal of Counseling Psychology. 2000;47:59–70.

82. Kawulich BB. Participant Observation as a Data Collection Method. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research; 2005;Vol 6:Reuse.

83. Drummond K, Painter JT, Curran G, Stanley R, Gifford AL, Rodriguez-Barradas M, et al. HIV patient and provider feedback on a telehealth collaborative care for depression intervention. AIDS Care. 2017;29:290–8.

84. Adler NE, Rehkopf DH. U.S. Disparities in Health: Descriptions, Causes, and Mechanisms. Annual Review of Public Health. 2008;29:235–52.

85. Agency for Healthcare Research and Quality. 2016 National Healthcare Quality and Disparities Report [Internet]. Rockville, MD: Agency for Healthcare Research and Quality; 2017. Available from: https://www.ahrq.gov/research/findings/nhqrdr/nhqdr16/index.html?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=

86. Mantwill S, Monestel-Umaña S, Schulz PJ. The Relationship between Health Literacy and Health Disparities: A Systematic Review. Antonietti A, editor. PLoS ONE. 2015;10:e0145455.

87. Young M, Klingle RS. Silent Partners in Medical Care: A Cross-Cultural Study of Patient Participation. Health Communication. 1996;8:29–53.

88. Hardavella G, Aamli-Gaagnat A, Frille A, Saad N, Niculescu A, Powell P. Top tips to deal with challenging situations: doctor–patient interactions. Breathe. 2017;13:129–35.

89. Sirugo G, Williams SM, Tishkoff SA. The Missing Diversity in Human Genetic Studies. Cell. 2019;177:26–31.

90. Williamson LD, Bigman CA. A systematic review of medical mistrust measures. Patient Education and Counseling. 2018;101:1786–94.

91. Chew LD, Griffin JM, Partin MR, Noorbaloochi S, Grill JP, Snyder A, et al. Validation of Screening Questions for Limited Health Literacy in a Large VA Outpatient Population. J GEN INTERN MED. 2008;23:561–6.

92. Stagliano V, Wallace LS. Brief Health Literacy Screening Items Predict Newest Vital Sign Scores. The Journal of the American Board of Family Medicine. 2013;26:558–65.

93. Campón RR, Carter RT. The Appropriated Racial Oppression Scale: Development and preliminary validation. Cultural Diversity and Ethnic Minority Psychology. 2015;21:497–506.

94. Woodward EN, Cunningham JL, Flynn AWP, Mereish EH, Banks RJ, Landes SJ, et al. Sexual minority men want provider behavior consistent with attitudes and norms during patient-provider interactions regarding HIV prevention. Psychology, Health & Medicine. 2019;1–14.

95. Willging CE, Salvador M, Kano M. Pragmatic help seeking: How sexual and gender minority groups access mental health care in a rural state. Psychiatr Serv. 2006;57:871–4.

96. Aarons GA. Transformational and Transactional Leadership: Association With Attitudes Toward Evidence-Based Practice. PS. 2006;57:1162–9.

97. Mora Pinzon M, Myers S, Jacobs EA, Ohly S, Bonet-Vázquez M, Villa M, et al. "Pisando Fuerte": an evidence-based falls prevention program for Hispanic/Latinos older adults: results of an implementation trial. BMC Geriatrics [Internet]. 2019 [cited 2019 Sep 25];19. Available from: https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-019-1273-1

98. Fukui S, Rapp CA, Goscha R, Marty D, Ezell M. The Perceptions of Supervisory Support Scale. Adm Policy Ment Health. 2014;41:353–9.

99. Herscovitch L, Meyer JP. Commitment to organizational change: Extension of a three-component model. Journal of Applied Psychology. 2002;87:474–87.

100. Holt DT, Armenakis AA, Feild HS, Harris SG. Readiness for Organizational Change: The Systematic Development of a Scale. The Journal of Applied Behavioral Science. 2007;43:232–55.

101. Fernandez ME, Walker TJ, Weiner BJ, Calo WA, Liang S, Risendal B, et al. Developing measures to assess constructs from the Inner Setting domain of the Consolidated Framework for Implementation Research. Implementation Sci. 2018;13:52.

102. Akhavan S, Tillgren P. Client/patient perceptions of achieving equity in primary health care: a mixed methods study. Int J Equity Health. 2015;14:65.

103. Blakeman T, Protheroe J, Chew-Graham C, Rogers A, Kennedy A. Understanding the management of early-stage chronic kidney disease in primary care: a qualitative study. Br J Gen Pract. 2012;62:e233–42.

104. Weech-Maldonado R, Dreachslin JL, Brown J, Pradhan R, Rubin KL, Schiller C, et al. Cultural competency assessment tool for hospitals: Evaluating hospitals' adherence to the culturally and linguistically appropriate services standards. Health Care Management Review. 2012;37:54–66.

105. Spitzer-Shohat S, Shadmi E, Goldfracht M, Key C, Hoshen M, Balicer RD. Evaluating an organization-wide disparity reduction program: Understanding what works for whom and why. Akinyemiju TF, editor. PLoS ONE. 2018;13:e0193179.

106. Gagnon M-P, Attieh R, Ghandour EK, Légaré F, Ouimet M, Estabrooks CA, et al. A Systematic Review of Instruments to Assess Organizational Readiness for Knowledge Translation in Health Care. Jeyaseelan K, editor. PLoS ONE. 2014;9:e114338.

107. Montesanti SR, Abelson J, Lavis JN, Dunn JR. Enabling the participation of marginalized populations: case studies from a health service organization in Ontario, Canada. Health Promot Int. 2016;dav118.

108. Kano M, Silva-Banuelos AR, Sturm R, Willging CE. Stakeholders' Recommendations to Improve Patient-centered "LGBTQ" Primary Care in Rural and Multicultural Practices. The Journal of the American Board of Family Medicine. 2016;29:156–60.

109. Curran GM, Mukherjee S, Allee E, Owen RR. A process for developing an implementation intervention: QUERI Series. Implementation Science [Internet]. 2008 [cited 2019 Apr 19];3. Available from: http://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-3-17

110. Aarons GA, Green AE, Willging CE, Ehrhart MG, Roesch SC, Hecht DB, et al. Mixed-method study of a conceptual model of evidence-based intervention sustainment across multiple public-sector service settings. Implementation Sci. 2014;9:183.

111. Institute of Medicine C on CM for BH at LC. Vital Signs: Core Metrics for Health and Health Care Progress [Internet]. Blumenthal D, Malphrus E, Michael McGinnis J, editors. Washington, D.C.: National Academies Press; 2015 [cited 2020 May 13]. p. 19402. Available from: http://www.nap.edu/catalog/19402

112. Human Rights Campaign. Healthcare Equality Index [Internet]. [cited 2020 May 19]. Available from: https://www.hrc.org/hei

113. Kwon E, Park S, McBride TD. Health Insurance and Poverty in Trajectories of Out-of-Pocket Expenditure among Low-Income Middle-Aged Adults. Health Serv Res. 2018;53:4332–52.

114. Sabia JJ. Minimum Wages and Gross Domestic Product. Contemp Econ Policy. 2015;33:587–605.

115. Sahin K. Measuring the economy : GDP & NIPAs. Hauppauge, N.Y.: Nova Science; 2009.

116. Autor D, Manning A, Smith C. The Contribution of the Minimum Wage to U.S. Wage Inequality over Three Decades: A Reassessment. National Bureau of Economic Research, INC; 2014.

117. Baily MN, Okun AM. The Battle Against Unemployment and Inflation: Problems of the Modern Economy. New York, NY: W.W. Norton and Company; 1965.

118. Perloff HS. Interrelations of State Income and Industrial Structure. The Review of Economics and Statistics. 1957;39:162.

119. Gupta AS. Determinants of Tax Revenue Efforts in Developing Countries. The International Monetary Fund; 2007.

120. Van Wijnbergen S. Interest rate management in LDC's. Journal of Monetary Economics. 1983;12:433–52.

121. Liu B-C. Economic Base and Economic Structure Growth: Quantitative and Qualitative Measures. 1974;6.

122. Soder N, Steinberg SL. Community currency: an approach to economic sustainability in our local bioregion [Internet]. Humboldt State University; 2008. Available from: http://hdl.handle.net/2148/347

123. LaVeist T, Pollack K, Thorpe R, Fesahazion R, Gaskin D. Place, Not Race: Disparities Dissipate In Southwest Baltimore When Blacks And Whites Live Under Similar Conditions. HEALTH AFFAIRS. BETHESDA: PROJECT HOPE; 2011;30:1880–7.

124. Lyons T, Shannon K, Pierre L, Small W, Krüsi A, Kerr T. A qualitative study of transgender individuals' experiences in residential addiction treatment settings: stigma and inclusivity. Subst Abuse Treat Prev Policy. 2015;10:17.

125. Beyer KMM, Zhou Y, Matthews K, Bemanian A, Laud PW, Nattinger AB. New spatially continuous indices of redlining and racial bias in mortgage lending: links to survival after breast cancer diagnosis and implications for health disparities research. Health & Place. 2016;40:34–43.

126. Rabinowitz P. Chapter 3: Section 21. Windshield and Walking Surveys [Internet]. Center for Community Health and Development at the University of Kansas; 2020. Available from: https://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/windshield-walking-surveys/main

127. Mesic A, Franklin L, Cansever A, Potter F, Sharma A, Knopov A, et al. The Relationship Between Structural Racism and Black-White Disparities in Fatal Police Shootings at the State Level. Journal of the National Medical Association. 2018;110:106–16.

128. Mizen LA, Macfie ML, Findlay L, Cooper S-A, Melville CA. Clinical guidelines contribute to the health inequities experienced by individuals with intellectual disabilities. Implementation Science. 2012;7:42.

129. Lewis CC, Mettert KD, Dorsey CN, Martinez RG, Weiner BJ, Nolen E, et al. An updated protocol for a systematic review of implementation-related measures. Syst Rev. 2018;7:66.

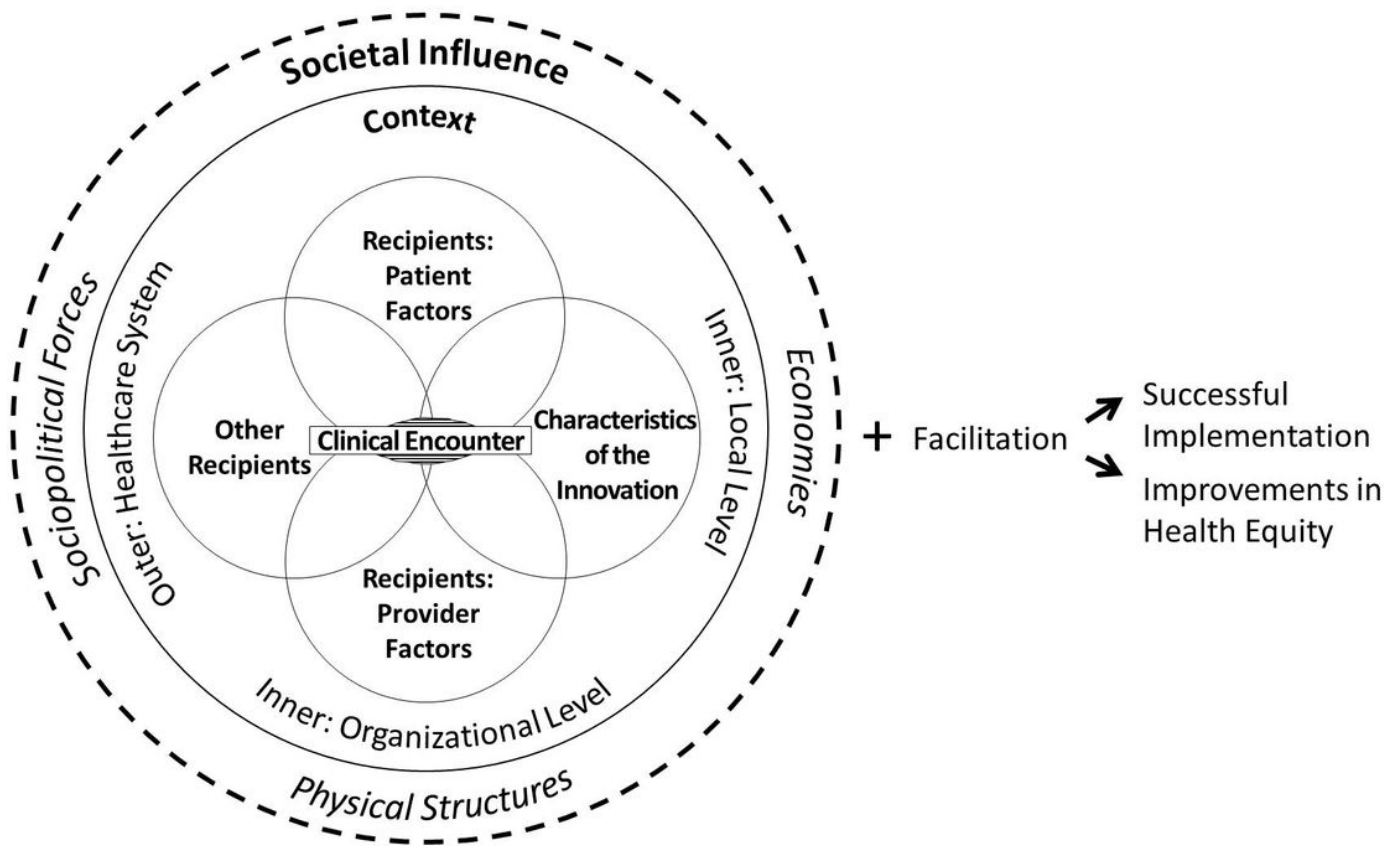
130. Ford CL, Griffith DM, Bruce MA, Gilbert KL, editors. Racism: Science & Tools for the Public Health Professional [Internet]. American Public Health Association; 2019 [cited 2020 May 28]. Available from: https://ajph.aphapublications.org/doi/book/10.2105/9780875533049

Figures

Figure 1

Health Equity Implementation Framework