Roadmap for embedding health equity research into learning health systems

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ABSTRACT

Background Achieving health equity is vital to fulfil the quadruple aim for optimal healthcare system performance. Traditionally, academic medicine and healthcare systems have focused their efforts on addressing health inequities with an emphasis on improving workforce diversity. Although this approach is *an important requisite*, a diverse workforce alone is not sufficient; rather holistic health equity should be established as the anchoring principal mission of all academic medical centres, residing at the intersection of clinical care, education, research and community.

Methods NYU Langone Health (NYULH) has embarked on significant institutional changes to position itself as an equity-focused learning health system. One-way NYULH accomplishes this is through the establishment of a *health equity research roadmap*, which serves as the organising framework through which we conduct embedded pragmatic research in our healthcare delivery system to target and eliminate health inequities across our tripartite mission of patient care, medical education and research.

Results This article outlines each of the six elements of the NYULH *roadmap*. These elements include: (1) developing processes for collecting accurate disaggregate data on race, ethnicity and language, sexual orientation and gender identity and disability; (2) using a data-driven approach to identify health equity gaps; (3) creating performance and metric-based quality improvement goals to measure progress toward elimination of health equity gaps; (4) investigating the root cause of the identified health equity gap; (5) developing and evaluating evidence-based solutions to address and resolve the inequities; and (6) continuous monitoring and feedback for system improvements.

Conclusion Application of each element of the *roadmap* can provide a model for how academic medical centres can use pragmatic research to embed a culture of health equity into their health system.

STATEMENT OF THE PROBLEM

Health equity is conceptualised as a *fair and just opportunity to be as healthy as possible*.[1] Attainment of health equity requires removing obstacles rooted in structural and social determinants of health (SDH) such as poverty and racism, and the associated downstream consequences. Health equity is an essential element of healthcare quality and an indispensable requisite to fulfil the quadruple aim of improved patient experience, enhanced population health and better provider and staff work–life balance at reduced costs.[1] Health systems measure their progress toward achieving equitable health outcomes by changing care process and/or implementing interventions to reduce the systematic and avoidable health disparities that disproportionately affect populations experiencing social, economic and/or environmental disadvantage.[2] According to the National Academy of Medicine's seminal report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, two fundamental factors underlie health inequities in the USA—exposure to racism and SDH, defined as 'conditions in the environment where people are born, live, play, worship and age'.[3] Racism operates at multiple levels from the individual (eg, race-based maltreatment) and internalised levels (eg, acceptance of negative stereotypes by minoritised populations) to the interpersonal level (eg, discriminatory interactions between individuals), which together both drive and are driven by structural racism.[4 5] Structural racism is chronic exposure to environments, systems, practices and policies such as neighbourhood poverty, incarceration and segregation that limit individual's access to health promoting resources (eg, access to green spaces) and inhibits the development of healthy behaviours (eg, physical activity).[5 6] This produces multiple and far-reaching social and health-related consequences for afflicted communities due in part to limited access to quality healthcare and housing, lower economic mobility and fewer opportunities for social advancement, among others.[6] Structural racism trickles down to individual-level racism, whereby sociocultural and demographic characteristics are used to classify individuals as members of outgroups, making them vulnerable to unfair treatment, marginalisation and harassment.[7]

Within healthcare systems, structural racism also operates through experiences of interpersonal racism, often in the form of clinician implicit bias within the clinical interaction. Implicit biases, which are non-conscious racial attitudes, can negatively affect how clinicians communicate, perceive and treat minoritised groups, even though race is a social construct.[8] For example, a robust body of evidence has documented an association between clinician implicit bias and lower referral rates, false beliefs about pain tolerance and medication-seeking behaviours, misdiagnosis of mental health conditions and fewer prescriptions for evidence-based treatments as well greater clinician verbal dominance, less supportive communication and shorter clinical encounters with black and Hispanic patients.[8 9]

Despite the prominent role racism plays in healthcare access and quality, academic medicine and healthcare systems have traditionally focused their efforts on addressing health inequities with an emphasis on improving workforce diversity.[10]

Although this approach is *an important requisite*, a diverse workforce alone is not sufficient; rather holistic health equity should be established as the anchoring principal mission of all academic medical centres, residing at the intersection of clinical care, education, research and community. If anything, outcomes of the COVID-19 pandemic have demonstrated an urgent need for transformative and sustainable evidence-based solutions that inform national policies designed to make health equity a strategic priority through dismantling systems, policies and processes that perpetuate structural racism.

POSITIONALITY STATEMENT
Prior to discussing our approach to addressing health equity, we describe our own positionality. The authors represent multiple racial/ethnic and gender identities with over 20 years of collective experience engaging in research and clinical practice dedicated to addressing health inequities. In the spirit of self-reflexivity and as a white woman, the first author acknowledges that her experiences of those facing health inequities have come through her interactions with colleagues, patients and community members, rather than personal experience. We also acknowledge that our positionality has influenced our ability to lead this work and gain access to certain resources. We strive to be aware of any biases we bring to this work and mindful of the privileges bestowed on us through our leadership positions.

OUR PROACTIVE APPROACH TO ADDRESS THE PROBLEM
Although NYU Langone Health (NYULH) has long been committed to diversity, equity and inclusion in its pursuit of inclusive excellence, it became clear in the early 2000s, that we needed to not only achieve compositional diversity, but to weave inclusion into our institutional culture across all mission areas—patient care, medical education and research. Through the establishment of the Institute for Excellence in Health Equity (IEHE), we embarked on significant institutional changes to position NYULH as an equity-focused learning health system (LHS). We infuse an equity lens into the foundational tenants of the LHS model, in which hospital operations, research and informatics are actively engaged in systematically integrating and acting on real-time data, clinician and patient experience, and external evidence to ensure delivery of high quality, safe, efficient and patient-centred care.[11] One way we accomplish this is through the establishment of a *health equity research roadmap* (figure 1), which serves as the organising framework through
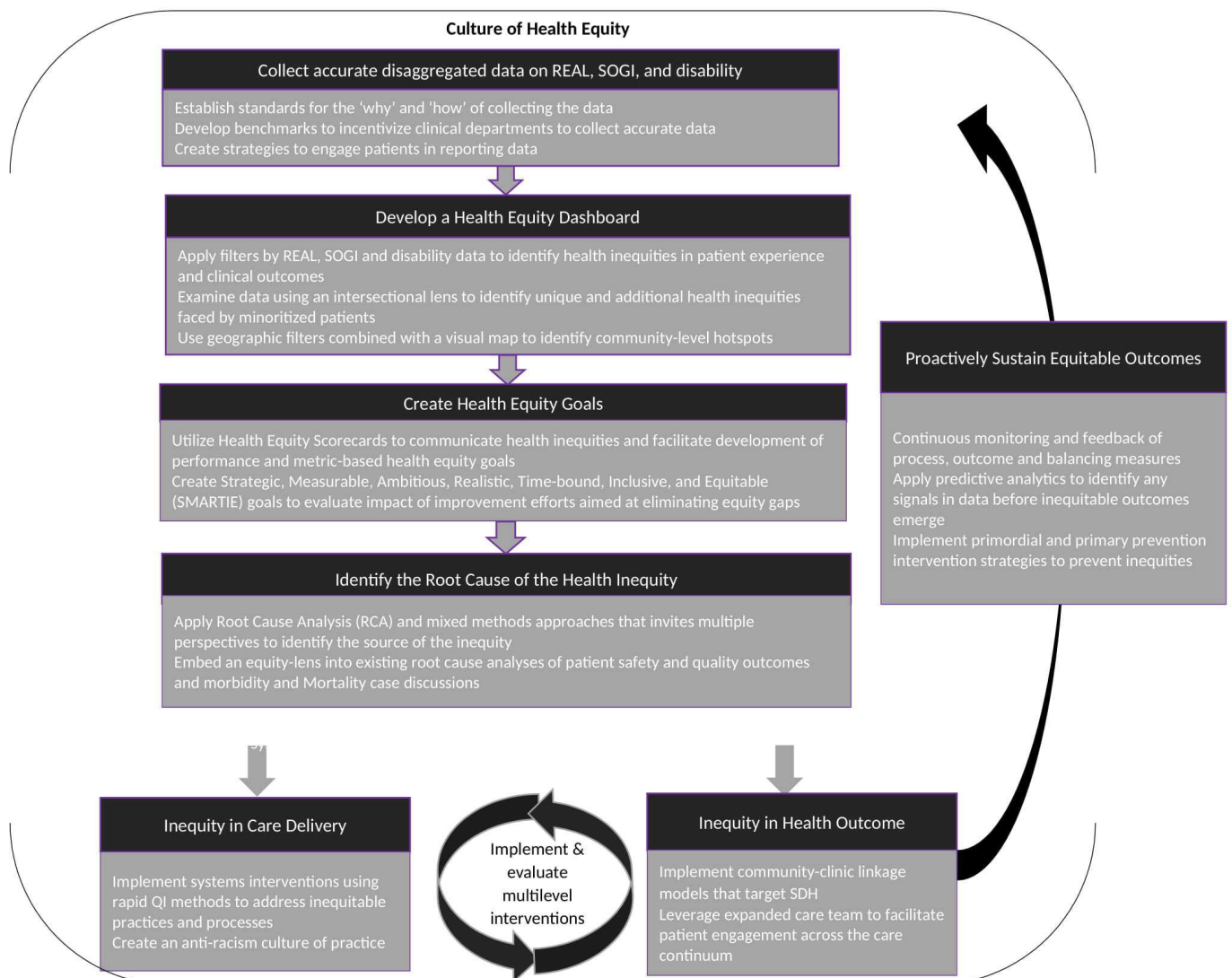
Figure 1 Health equity research roadmap. REAL, race, ethnicity and language; SDH, social determinants of health; SOGI, sexual orientation and gender identity.

which we conduct embedded pragmatic research in our healthcare delivery system to target and eliminate health inequities. Embedded pragmatic research leverages our robust medical centre information technology (MCIT) infrastructure to collect data as part of routine care, thus allowing for real-time health system analyses and integration of best practices in the delivery of evidence-based equitable care. This article outlines each of the six elements of the *roadmap* to provide a model for how academic medical centres can use pragmatic research to embed a culture of health equity in their health system.

Collect accurate disaggregate data on race, ethnicity and language (REaL), sexual orientation and gender identity (SOGI) and disability

We are engaging in system-wide efforts to gather accurate data on REaL, SOGI and disability in the electronic health record (EHR)[12] that includes: (a) forming an interdisciplinary task force to establish the *what, why and how* of data collection; (b) leveraging our MCIT to embed questions on REaL, SOGI and disability into standard clinic procedures such as patient facing questionnaires, self-check in kiosks and previsit data via patient portals; (c) creating a system-wide campaign to engage staff and patients in accurate data collection and provide training in structural, cultural and linguistic competency[13]; and (d) setting benchmarks to incentivise clinical departments to increase rates of accurate data collection and monitor progress toward our goals.

Use a data-driven approach to identify health equity gaps

A key feature of an LHS is an integrated, interoperable EHR that systematically captures real-time data for clinical care, research and continuous improvement.[14] At NYULH, we have built a health equity dashboard that leverages our EHR data to measure and track core health equity metrics. The metrics for the dashboard were defined by operational and clinical leadership (ie, chief of hospital operations, chief medical officer, chief quality officer and others). These metrics combine standard benchmarked quality and safety data (eg, 30-day readmission rates, observed/expected mortality rates, patient experience) with sociodemographic filters to create a system-wide tool to identify difference in patient care within the health system.

Accuracy of the data in the dashboard is validated through a user acceptance testing process, wherein a dedicated team in our MCIT works in collaboration with key stakeholders (ie, IEHE, chief quality officer) to compare data in the dashboard to various existing data sources in the EHR such as Reporting Workbench reports. Institutional stakeholders, including leadership in ambulatory care, quality and safety along with IEHE, manage the ongoing monitoring and iterative refinement of the dashboard. To facilitate this process, the MCIT team generates reports describing monthly data trends, which are discussed at quarterly meetings to identify opportunities for improvement.

Create performance and metric-based quality improvement goals to measure progress toward elimination of health equity gaps

As an LHS, measures of equity are embedded within our health system to continuously track changes in health equity gaps and drive rapid, tailored quality improvement projects. Measures of equity can focus on evaluating differences in care quality (eg, lower screening rates) and outcomes (eg, higher mortality) experienced by subpopulations of patients. To understand the magnitude of these differences, the data could be compared with

an organisational target set by the institution, in relation to a more socially advantaged population (eg, non-Hispanic white males) or to the best-performing group (eg, those with the best outcomes). Several papers provide best practices for comparing groups and identifying meaningful differences in data.[15–17]

In the coming year, data from the health equity dashboard will be communicated to clinical departments through a Health Equity Scorecard, which will facilitate the development of performance and metric-based goals to assess improvement efforts aimed at eliminating health equity gaps. Goals, which will be conceptualised as Strategic, Measurable, Ambitious, Realistic, Time-bound, Inclusive, and Equitable (SMARTIE),[18] will inform the measurement approach that captures changes in process and clinical outcomes and are central to evaluating impact. As an example, an equity measure may include examining 30-day readmission rates among Hispanic patients, as compared with non-Hispanic white patients. Based on analysis of the health equity dashboard, data may show higher 30-day readmission rates among Hispanic patients as compared with white patients. A SMARTIE goal could be defined in terms of change in the outcome for the target population relative to the comparison group before and after an intervention (eg, 20% reduction in readmission rates among Hispanic patients relative to non-Hispanic whites from pre intervention to post intervention).

Investigate the root cause of the identified health equity gap

To create a culture of health equity, we will explicitly integrate an equity lens into existing root cause analyses (RCA) of patient safety and quality outcomes and morbidity and mortality case discussions. Participatory design is a hallmark feature of an LHS and involves key stakeholders in identifying problems that affect clinical care and patient outcomes, and in generating solutions that can be applied to real-world practice.[19] At NYULH, we will apply best practices from RCA and priority matrices to identify the most important, feasible and actionable health equity gaps to target. Filters built into the dashboard will also allow clinical departments to apply an intersectional lens to stratify health equity metrics by combinations of REAL, SOGI, language preference and socioeconomic status, facilitating identification of the most vulnerable populations experiencing inequities in our system. Applying a geographic filter to these data will also allow for visualisation of neighborhood-level 'hot spots' that represent areas of high need for outreach. The dashboard will be augmented by the integration of screening tools into our EHR to systemically collect and act on SDH data (eg, food insecurity, housing instability) across inpatient and ambulatory care settings. Disaggregating these key metrics by patient-reported sociodemographic and geographic factors will give critical insights into the root causes of the health disparity.

Revisiting the example of 30-day readmission rates, applying a filter to examine the data by zip code could help departments disentangle whether the source of the disparity stems from inequities in care delivery or inequities in health outcomes due to SDH (figure 1). For example, if the differences in readmission rates between Hispanic and non-Hispanic white patients does not change when applying the zip code filter, it may be that factors within the health system (eg, clinician differences in delivery of discharge instructions) are driving the disparity. However, if the gap widens when examining zip codes then neighborhood-level factors such as lack of access to pharmacies may explain this difference. To better understand these root causes, our process moves beyond data collected via the health equity dashboard to include qualitative approaches that invite multiple perspectives

in the RCA, including providers, staff, patients/families and our community partners. Strong community–clinic partnerships also provide an opportunity to understand the impact of structural factors such as those rooted in SDH that contribute to health inequities in our system.[20] The IEHE Community Engagement Pillar serves as a centralised hub for our health system, and facilitator of meaningful community and stakeholder engagement across the large and diverse populations served by NYULH.

Our participatory approach is exemplified by the active engagement of clinical departments in identifying disparities in healthcare delivery via the health equity dashboard and developing projects in collaboration with IEHE to improve the provision of equitable care as part of the NYULH Quality and Safety Performance Improvement Program. These projects directly apply the principles of the *roadmap* and offer opportunities to refine the process based on the department's experiences engaging in the work. An exemplar of this participatory approach was the creation of a multidisciplinary Diversity and Health Equity Committee between the NYULH Department of Surgery and Transplant Institute. The Committee partnered with IEHE to create a department-wide Cultural Complications Curriculum that leverages the existing morbidity and mortality case infrastructure to integrate sociocultural considerations into case discussions rather than solely focuses on surgical complications. Example topics include understanding the role of implicit bias on care delivery, the importance of recognising patients' intersectional identities in treatment and the impact of stereotype threat on minoritised clinicians' performance. The committee elicits ongoing feedback from residents, fellows and attendings on the utility of these discussions and breadth of topics.

Develop and evaluate evidence-based solutions to address and resolve the inequities

We apply rapid cycle randomised controlled trial methodology and design-thinking approaches (eg, incorporating the values, needs and 'workflows' of patients and providers into the (re) design of tools or services) in combination with real-time system improvement analyses to decrease the gap between generating evidence and translated findings directly into practice.[21] A spectrum of quality improvement tools, including plan, do, study, act cycles, is used to test, refine and implement strategies to close the equity gap, with opportunities for scale up for the most effective approaches.

The multifactorial nature of most health inequities also require multipronged evidence-based solutions and diverse modes of delivery that meet the needs of end-users.[22] We are leaders in the development and implementation of multilevel interventions embedded in practice-based settings to addresses community and clinical needs through the lens of an SDH framework. One focus at NYULH is the disturbing racial disparities in hypertension management and control. To help improve treatment and reduce hypertension disparities, investigators at IEHE are collaborating with clinical leadership and front-line staff at the Family Health Centers at NYULH, one of the largest Federally Qualified Health Center networks in the nation, to implement a model of technology-facilitated team care into its primary care clinics.[23] These tools embedded in the EHR provide clinics with a standardised strategy for integrating evidence-based solutions (eg, remote patient monitoring, nurse case management) into the clinical workflow to promote improved medication adherence and blood pressure control in minoritised populations. These solutions can be replicated and adopted by health centres around the country to reduce disparities.

Implementation of evidence-based health equity solutions extends beyond our research and patient care to our commitment to excellence in medical education at NYULH. We invest heavily in training providers and trainees in principles of cultural humility and structural competency, which emphasises the importance of appreciating the role SDH play in influencing risk factors, symptoms, diseases and attitudes toward patients, communities and health systems.[13]

Continuous monitoring and feedback for system improvements

An LHS is inherently iterative in nature; principles of continuous monitoring and feedback are essential for evaluating effectiveness of interventions, identifying barriers to success and making readjustments or introducing new strategies, when needed. Our health equity dashboard, which is continuously updated with real-time data, facilitates ongoing monitoring of health inequities in our system and can be used to rapidly identify opportunities for improvement and innovation until optimal equitable outcomes for all patients are achieved. The application of cutting-edge methods from predictive analytics helps to identify any 'signals' in our data before inequitable outcomes emerge. This is facilitated through the creation of phenotypes that identify subgroups of patients with similar physical, social, psychological and environmental (ie, neighbourhood poverty) characteristics who are at high risk for poor outcomes (eg, higher readmission rates).[24] By using the dashboard to proactively identifying high-risk patients in our system, we are able to get ahead of the curve to implement tailored intervention strategies to avoid the poor outcome. For example, knowing in advance that a subset of our patients who are scheduled for an ambulatory procedure experiences transportation difficulties due to financial strain, allows the care management team to provide patients targeted support prior to the admission with the goal of reducing complications and avoid preventable readmissions due to these complex risk factors. The use of *process and balancing measures* also allows for continuous evaluation of whether the strategy is performing as intended (eg, implemented consistently) and producing the expected *outcomes* (reducing readmission rates in the target population) as well as to identify factors associated with success or failure in reducing inequities, even as quality or safety improves.

LESSONS LEARNED

Over the past 2 years, IEHE has engaged in a deliberative effort to embed a culture of health equity across all three mission areas of NYULH—excellent patient care, medical education and research. A defining feature of this effort has been the implementation of a *health equity research roadmap*, which outlines a systematic process for identifying, addressing and evaluating NYULH's progress toward achieving equitable health outcomes for all patient populations. Several lessons have emerged from this work. One key lesson is the importance of buy-in and engagement at all levels of the organisation. IEHE is a system-wide strategic priority championed by the Dean and CEO of NYULH and supported by an Internal Advisory Board comprised of leaders across the system. Another lesson learnt is the importance of collaborations between many stakeholders; such that all initiatives that are executed as part of the *roadmap* to include partnerships with academic researchers, clinicians, clinical operation leaders, regulatory, human resources, communications, informatics and patient/family stakeholders. These cross-disciplinary partnerships are central to ensuring

that initiatives that stem from the *roadmap* are embedded into healthcare delivery as an LHS. A final lesson is the importance of a multipronged approach designed to implement evidence-based solutions to improve health outcomes but also includes creating equity-focused attitudes and practices through institution-wide trainings, communication campaigns and antiracist strategies that actively engage individuals in recognising and addressing implicit biases in care delivery.

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