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POLICY BRIEF

Training for Equity:

Participatory Systems Mapping in Global Health Education

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EXECUTIVE SUMMARY

While equity remains a defining goal of global health, perspectives on how to promote fairness in pathways to health have significantly changed over the last decade. Major shocks in health financing, together with calls to decolonize health education, mark a moment to document perspectives on equity in global health.

We conducted a participatory study at the University of Global Health Equity in Rwanda, a university founded to advance a social medicine approach to global health by integrating the humanities, social sciences, biomedical sciences and clinical medicine. We sought to better understand how students reasoned about causal influences on health equity, using an approach known as Fuzzy Cognitive Mapping (FCM). The FCM exercise invited first-year medical students to define health equity and its drivers through a visual and participatory mapping exercise. Two rounds of mapping sessions were conducted with three groups of students, one round at the start and one round at the end of their 'Foundations in Global Health Equity' semester, to capture potential shifts in participatory learning and systems thinking.

Students understood health equity as grounded in fairness, responsiveness, and accountability. Their maps identified diverse factors across community influence, governance, the health system, and socioeconomic opportunity. Based on the variables and connections students mapped, we modeled hypothetical scenarios to illustrate potential pathways for change. The analysis indicated that over the course of their semester, students gained confidence in identifying where improvement might occur, with less emphasis on structural barriers and greater attention to influences that could enable system-wide gains. Scenario simulations showed that, from students' perspectives, strengthening socioeconomic opportunity would have the broadest effects across the system, amplifying the potential impact of other reforms.

This mapping approach has enormous value for participatory learning, systems thinking, and dialogue-building within health-professional education. It enables respondents to visualize components of the health system and how they interact, and to identify potential points of intervention that may address inequity. By engaging students, the next generation of global health practitioners and scholars, this approach brings their voices and perspectives to the forefront of global discussions on health equity.

Keywords:

Health Equity; Global Health Education; Student Perspectives; Fuzzy Cognitive Mapping; Participatory Mapping; Systems Thinking

KEY INSIGHTS

- Health equity is understood as fairness through proportionality. Students defined equity as providing care and opportunity according to need, not identical treatment for all.
- Health equity is a systemic issue. In their maps, students drew multiple connections, showing that equity reflects interactions across the system.
- Participatory mapping gives a sense of how change can unfold. Students emphasized factors they believed could strengthen the system.
- Participatory systems mapping connects ethical reasoning with system analysis. It helps build analytical skills for engaging with complex health systems.

BACKGROUND

Global Health Equity

Health equity lies at the heart of global health's ethical and practical agenda. As Koplan et al. (2009) articulated fifteen years ago, global health "places a priority on improving health and achieving equity in health for all people worldwide." This definition, now foundational in the field, emphasizes that equity is both a moral and operational principle guiding research, practice, and policy.

More recent definitions (August et al., 2022; Braveman et al., 2017) emphasize fairness and justice as commitments that require reductions in disparities. For example, the Robert Wood Johnson Foundation (RWJF) defines health equity as ensuring that "everyone has a fair and just opportunity to be as healthy as possible" (Braveman et al., 2017). This definition underscores two dimensions: (1) the moral commitment to fairness and justice and (2) the practical requirement to measure and reduce disparities. It recognizes that equitable systems demand both ethical intent and structural accountability.

A Moment of Upheaval

In early 2025, the global health landscape experienced a widespread and devastating shock. The United States - the world's largest global health donor - reduced its development assistance for health by nearly two-thirds, precipitating a 21 percent decline in total global health aid within a single year (Institute for Health Metrics and Evaluation, 2025). This contraction exposed the fragility of global health's dependence on a narrow funding base and reignited longstanding debates about who sets priorities, whose knowledge informs policy, and how global solidarity is enacted in practice. It also generated efforts to address the fragility of global health systems and to re-imagine efforts that would strengthen health equity in society.

In the years preceding this crisis, scholars and practitioners had issued strong calls to decolonize global health by questioning the systems of knowledge that sustain the field. These calls advanced along several distinct lines of argument. Affun-Adegbulu and Adegbulu (2020) called for pluriversalities, or multiple ways of knowing and engaging with health. They defined decolonization not as substituting new actors into old frameworks, but as interrogating the very systems that sustain inequality. Complementary analyses highlighted how persistent power asymmetries within global health governance reproduce structural imbalance (Kentikelenis et al., 2019). Krugman and Bayingana (2025) urged closer attention to the material bases of these inequalities, drawing focus to the economic conditions that constrain autonomy. Mogaka et al. (2021) emphasized the need to clarify both why and for whom such transformations are pursued. The sharp contraction in global health funding made clear that decolonization involves building the financial and epistemic capacities needed for stable and accountable health systems.

Whose Knowledge Counts?

As these financial and epistemic pressures mount, important questions arise: How is equity understood by younger generations of scholars? Whose knowledge counts in defining and pursuing health equity?

There is a pressing need for higher education that develops critical thinking and engages students with the social systems influencing healthcare (Eichbaum et al., 2014). The University of Global Health Equity (UGHE) was founded in 2015 by Partners in Health and the Government of Rwanda precisely to meet this need. Through its curriculum and practice, UGHE trains health professionals to interrogate power, equity, and justice as structural - not peripheral - dimensions of health.

UGHE's dual-degree (MBBS and Master in Global Health Delivery) curriculum combines clinical training with the humanities and social sciences, grounding medical education in a strong commitment to equity. To strengthen this model, UGHE partnered with Yale University's Conflict, Resilience, and Health (CRH) Program and its Global Health Studies (GHS) Program. The CRH Program focuses on societal resilience and works with academics, practitioners, and policymakers to promote innovations in global health research and evaluate interventions. The GHS Program broadens undergraduate education by offering students opportunities to apply analytic skills to practical challenges in global health (for example, Assefa et al., 2024; Evanson et al., 2024).

This collaboration provided the foundation for a participatory study examining how UGHE students conceptualize and map the drivers of health equity. Understanding how students conceptualize the drivers of health equity, and how those views develop through education, offers valuable insight into how future leaders may contribute to more equitable systems of care.

MAPPING THE DRIVERS OF HEALTH EQUITY

Fuzzy Cognitive Mapping

To document how UGHE students conceptualize health equity, we used Fuzzy Cognitive Mapping (FCM), a participatory visual method that elicits stakeholder knowledge and models pathways for system change. Students discussed two guiding questions:

1. What does health equity mean to you?
2. What are the drivers of health equity?

Three groups of first-year medical students took part in 90–120-minute FCM sessions that examined perceived drivers of health equity at the start of their 'Foundations in Global Health Equity' semester, which includes introductory courses in Sociology, Health Economics, Principles of Global Health Equity, Medical Anthropology & Social Medicine, Community-based Training, and History of Health in Africa. Each group generated its own map in June (round 1). The same groups reconvened in October for a second round of mapping, conducted after they had nearly completed their semester. Both rounds followed identical procedures, and students did not see their earlier maps when generating the second set; each round produced a new map based solely on the discussion at that moment.

In both rounds, participants identified factors influencing equity, drew directional causal links, assigned influence strengths from –1 to +1, and organized variables into color-coded categories. The maps record each group's thinking at two moments in their training and offer collective accounts of how equity is advanced or undermined.

FCM generates visual, qualitative, and semi-quantitative data that reveal how people understand complexity and prioritize interventions. Because each link carries both weight and direction, maps can be analyzed to test "what-if" scenarios - illustrating how changes in one element, such as financing or education, might reverberate through the broader system. The method thus functions as both a learning process, enabling reflection and dialogue, and an analytic tool for visualizing and testing pathways of system change (Barbrook-Johnson & Penn, 2022; Panter-Brick et al., 2025; Tbaishat et al., 2025; Panter-Brick et al., 2024; Sarmiento et al., 2020).

How is Health Equity Defined?

Across the three groups, students articulated a shared vision of health equity grounded in fairness, proportionality, and access without barriers. Their maps and accompanying definitions present equity as fair opportunity for health rather than identical provision of care.

Students defined health equity as "the absence of injustice in the health system, where everyone receives the care they truly need." Others described it as "ensuring that natural social divisions such as poverty or rural settlement do not lead to health inequalities," and "providing health services tailored to people's needs to ensure fair opportunities for good health." The three themes emerged consistently in their discussion (Box 1).

BOX 1:
STUDENT VOICES ON HEALTH EQUITY

- ***Fairness through proportionality.*** Students emphasized that equity means providing care and resources according to need, not distributing them equally. Fairness, in this sense, requires differential support to achieve just outcomes. In their words, "meeting people's health needs, at every level, requires giving more to those with less."

- ***Access without barriers.*** Many definitions underscored that financial capacity, social status, or geography should never determine one's ability to obtain care. Equity, they noted, requires that everyone can access healthcare regardless of background or circumstance. Students emphasized: "creating a system where everyone can access healthcare without obstacles, regardless of background."

- ***Redistribution and systemic responsibility.*** Students linked institutional accountability to the correction of structural disadvantage, arguing that systems - not individuals - must adapt to ensure justice in access and opportunity. They stated that "ensuring that natural social divisions like poverty or rural settlement do not lead to health inequalities."

These themes echo the Robert Wood Johnson Foundation's concept of health equity as "a fair and just opportunity to be as healthy as possible" (Braveman et al., 2017) but extend it to include structural accountability and context-specific fairness. They also resonate with Bekele et al. (2024, 2025), who found that a liberal arts curriculum in the first year of medical education strengthens students' capacity to engage with the social and ethical foundations of health.

How Are the Pathways to Health Equity Mapped?

While students quickly converged on definitions of equity centered on fairness, proportionality, and access without barriers, the mapping sessions required them to translate these principles into causal systems. This exercise encouraged students to consider which factors held the most influence and to discuss how these factors related to one another. Each group had to reach agreement on the factors to include, the arrows linking them, and the weights assigned to those links. Through this collaborative reasoning, the resulting maps show how different domains interact to advance or hinder equity.

In round 1, each group emphasized distinct but overlapping drivers of health equity. One group focused on system integrity and economic access, including corruption, income inequality, and insurance coverage. Another highlighted education, governance, and social stability. A third concentrated on geographical place, government policy, and poverty. These differences reflected the varied starting points from which students approached the task and the diverse ways they understood opportunities and obstacles within the health system.

In round 2, students generated new maps that reflected the pathways they now considered most influential for advancing equity. While the core domains remained similar, their emphasis shifted from identifying barriers to identifying enablers within the system. Maps contained more positive links and fewer negative ones, indicating that students viewed the system as more open to improvement.

Figure 1 presents an example of how a single group's map changed across rounds. The comparison shows how students identified variables related to governance, health systems, socioeconomic opportunity, and cultural influence, and how they depicted directional links among them. It also illustrates how students moved from focusing on constraints to identifying elements that could drive improvement. For example, in round 1, the group mapped poverty as a constraint, while in round 2, they introduced income as a positive driver linked to education and economic status.

Figure 1

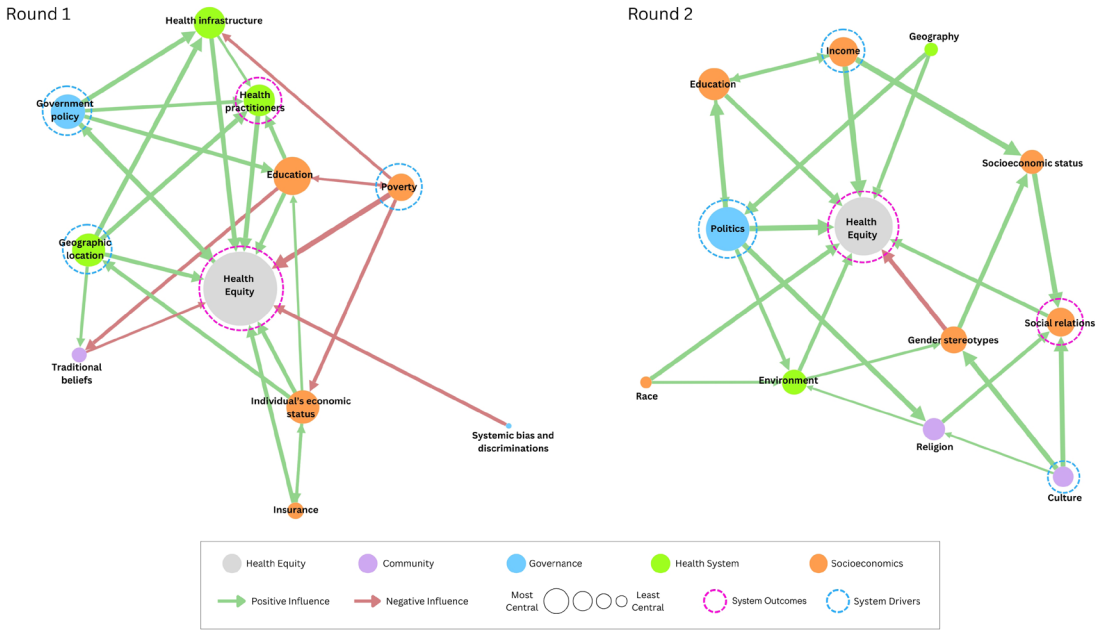

Figure 1: Fuzzy Cognitive Maps from round 1 and round 2 sessions, for the same student group, showing a shift from constraint-focused to enabler-focused reasoning.

Comparative emphasis across student groups

A comparison across groups shows how they differed in the emphasis they placed on the major domains influencing equity, as shown in Figure 2. This radar graph illustrates that the three student groups assigned different degrees of emphasis to the major domains influencing health equity. Some groups weighted governance more heavily, others placed greater emphasis on socioeconomic opportunity or the health-care system. This variation reflects distinct lines of reasoning among the three groups about which domains exert the strongest influence on equity.

SCENARIOS OF CHANGE

The maps and simulations generated through Fuzzy Cognitive Mapping were used to test what-if scenarios, assessing how activating different parts of the system might support or limit progress in health equity.

Steady-state scenario

The steady-state scenario indicates where the system settles under current conditions. Most variables cluster near the upper end of the scale, suggesting that students anticipated broadly positive outcomes across domains. Only a few variables fall near zero or negative values, signaling limited obstacles to system-wide improvement. This scenario highlights the unassisted dynamics of the system and provides a point of comparison for subsequent simulations that activate specific drivers of change.

Figure 2

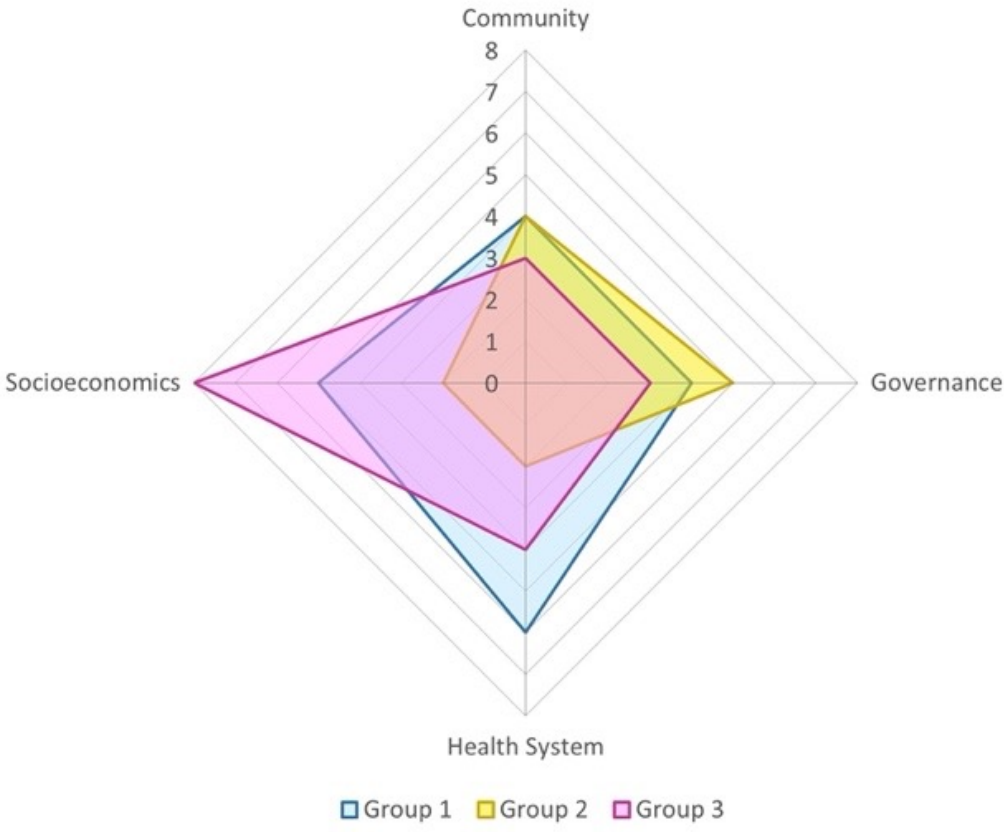

Figure 2: Relative emphasis placed by three student groups on major domains influencing health equity, based on aggregated mapping across rounds 1 and 2.

Figure 3

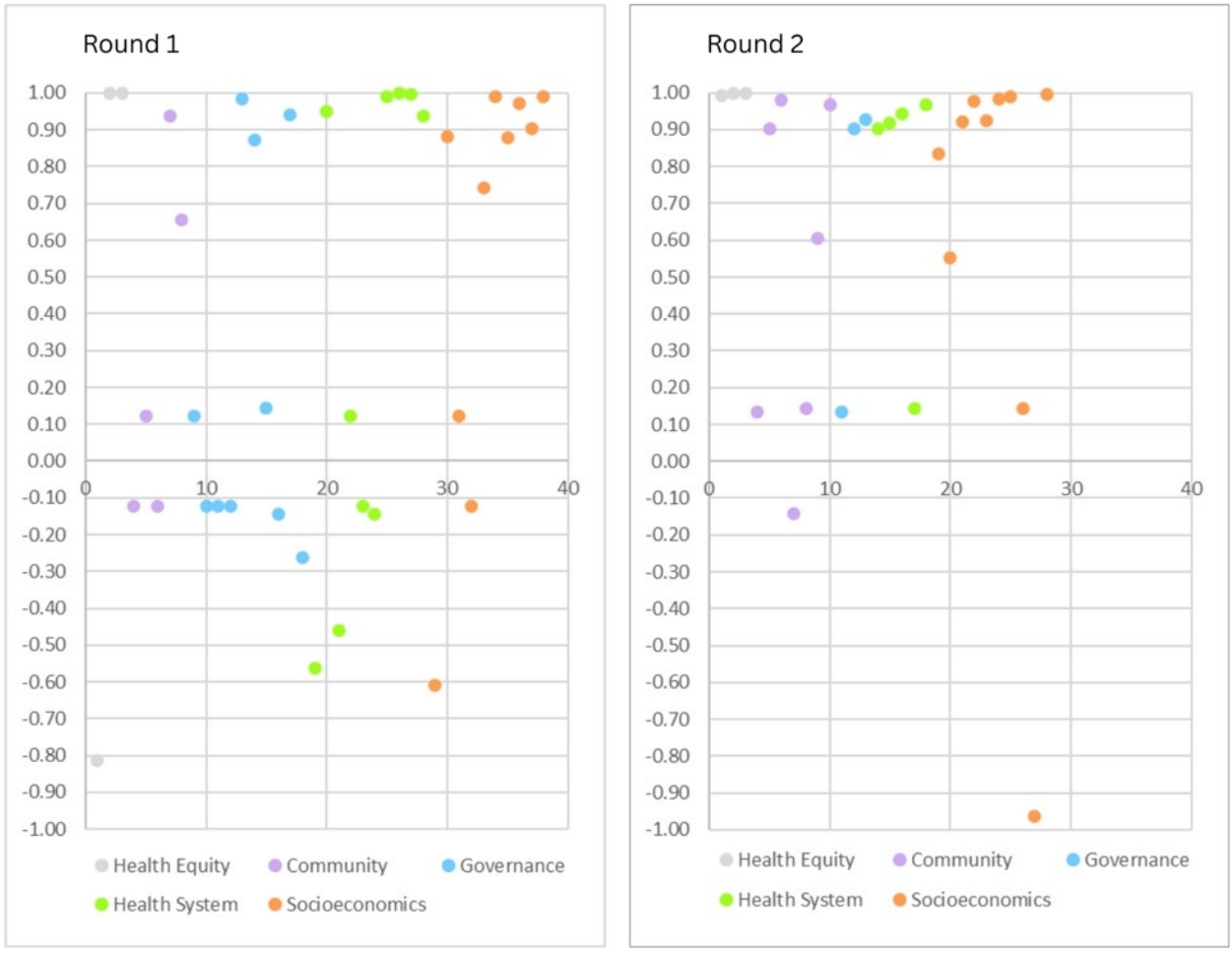

Figure 3: Steady-state scenario. Each dot represents the steady-state values reached by each variable after simulation, with values closer to +1 indicating more positive outcomes. Colors denote community, governance, health system, and socioeconomic domains, as well as health equity.

Testing Pathways for System Improvement

Four scenarios were run, each activating one domain in turn: community influence, governance, health system, and socioeconomic opportunity. Each simulation generated a full set of system-wide outcomes. Figure 4 presents only the gains in the upper band of the scale, defined as improvements of 80 to 100 percent. The histograms for Round 1 and Round 2 show which domains produced the strongest improvements when activated.

Across all four scenarios, activating any one domain results in gains in the health equity variable. In round 2, students demonstrated a more differentiated understanding of where policy interventions might generate the strongest improvements. Their assessments shifted from broad expectations of community influence to a clearer recognition that equitable progress relies on advancing socioeconomic opportunity, strengthening governance, and improving health-care systems in tandem.

This set of scenarios illustrates how different parts of the system contribute to improved outcomes and helps identify where students anticipated the most significant gains across rounds.

Figure 4

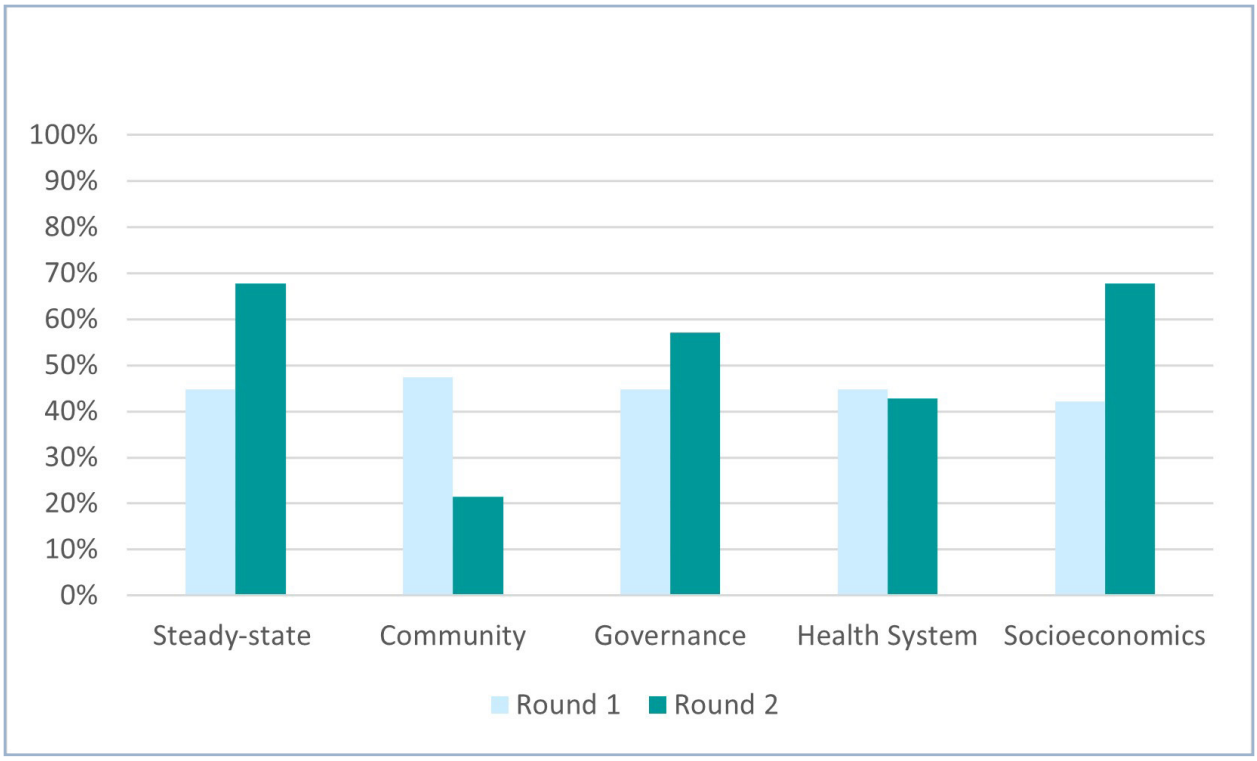

Figure 4: Bars represent the percentage of variables that reached the upper band of the scale (representing the strongest improvement) when activating each scenario. The activated scenarios were steady-state baseline, community, governance, health system, and socioeconomic domains.

CONCLUSION

Students described health equity in terms of fairness, responsiveness, and accountability. In their maps, equity meant that everyone should have the chance to achieve good health through care and policies that respond to different levels of need. The simulations reinforced this view: progress depended on advances across socioeconomic opportunity, governance, and the health-care system. Strengthening services mattered, though it was not enough on its own to secure lasting improvements.

Two shifts stood out across the mapping and scenario work. Students moved away from a focus on barriers and instead pointed to factors that could propel the system forward. They also became more confident in tracing where meaningful change might come from and how it could unfold. These developments were evident in the second round of mapping, where students identified more positive links, fewer negative ones, and more differentiated effects across the scenarios.

This understanding treats equity as a dynamic feature of a system, grounded in trust, fair policy, and institutions capable of addressing deep-seated disparities. These reflections align with wider debates in global health about context-specific accountability and the importance of working with diverse forms of knowledge.

For higher education, the exercise highlights the value of participatory systems methods such as Fuzzy Cognitive Mapping in health-professional training. These methods help students connect ethical reasoning with an understanding of how systems function, encouraging them to analyze not only where inequities lie but what kinds of structural change might reduce them.

This work adds to previous scholarship on the contribution of the liberal arts to health professional education (Bekele et al., 2024) and a qualitative evaluation

of UGHE's innovative curriculum based on humanities and social sciences during the first semester of medical training (Bekele et al., 2025). It shows how systems mapping can deepen students' understanding of equity as both an ethical commitment and a structural objective

RECOMMENDATIONS

1. ***Methods: Incorporate participatory systems mapping into professional training***
   Methods such as Fuzzy Cognitive Mapping help learners articulate how systems function, identify where inequities arise, and understand how different domains interact. Embedding such methods in health-professional education supports more deliberate reasoning about equity and strengthens the capacity to assess system-level consequences of policy or practice.

2. ***Analysis: Strengthen links between classroom learning and system thinking***
   Educational programs can connect conceptual learning on equity with exercises that require students to trace causal relations and consider how coordinated action across domains can reduce inequity. This supports analytical skills that are directly relevant to clinical practice, program design, and policy engagement.

3. ***Interpretation: Develop skills to interpret system-wide gains***
   Professional training can build the skills needed to understand how system-wide gains develop and why they carry implications for equity.

POLICY IMPLICATION

Health equity is not achieved through isolated programs or technical fixes but through system-wide initiatives that are fair, responsive, and accountable. The participatory study conducted with UGHE students shows that equity is understood as both an ethical commitment and a structural goal, advanced through improvements across community, governance, health system, and socioeconomic domains. The work also revealed a clear learning trajectory, with students moving from identifying obstacles to identifying where positive influence in the system may occur. This outcome highlights the value of moving health education beyond problem-listing toward system reasoning. Training institutions and health professionals have a central role in cultivating this understanding. Integrating systems thinking into professional education can equip practitioners to recognize where inequities arise and how coordinated action across multiple domains may reduce them.

HOW TO CITE

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