

Leveraging Implementation and Community Engagement to Advance Equitable Artificial Intelligence

Artificial intelligence (AI) has the potential to revolutionize healthcare by solving complex problems, improving decision-making, and expanding access to care. However, to ensure that AI solutions are equitable, it is essential to integrate both implementation science and community engagement into AI development processes. These approaches help ensure that AI systems are designed to meet the needs of vulnerable populations, reduce disparities, and enhance the cultural relevance and ethical integrity of the interventions.

Reframing Implementation Science for Equity

There is a growing call to reframe elements of implementation science to better address inequities, particularly in healthcare settings. One key strategy is focusing on *reach* from the very beginning of an intervention. This means ensuring that AI technologies are accessible to those who need them the most—typically underserved and marginalized populations. Additionally, it is crucial to design and select interventions with the specific needs of underserved populations in mind, ensuring that these tools can be effectively implemented in real-world settings.

To further reduce inequities, it is important to implement strategies that have been proven to work in diverse populations and to develop the science of *rapid adaptation* and *rapid qualitative analysis* to remain responsive to evolving challenges. Applying an *equity lens* to implementation outcomes ensures that disparities are identified and systematically addressed throughout the development and deployment of AI tools.

Community Engagement in AI Development

Community engagement is central to advancing equity in AI. It is a collaborative process that actively involves community members in decision-making and program development. This engagement ensures that the needs, values, and insights of the communities most affected by health disparities are incorporated into AI solutions. By prioritizing equitable participation, community engagement also addresses historical inequities and systemic barriers that marginalize certain populations.

Why Community Engagement Matters in AI

- 1. Cultural Relevance and Sensitivity:** Community involvement helps ensure that AI interventions are culturally relevant, ethical, and responsive to the unique needs of diverse populations. In healthcare, for example, AI tools must be adapted to consider cultural, linguistic, and social nuances to improve their effectiveness and uptake.



**Omar Martinez, JD,
MPH, MS**
omar.martinez@ucf.edu



**Huanmei Wu, PhD,
MS**
huanmei.wu@temple.edu



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2. Building Trust and Transparency: Transparent communication with communities fosters trust in AI technologies, which is especially important when these tools are used in sensitive areas such as healthcare. Communities that have experienced historical discrimination or marginalization may be skeptical of new technologies. Engaging with these communities throughout the AI development process helps reduce fear and builds confidence in the tools.

3. Co-Creation of Solutions: Community engagement allows AI systems to be co-developed with the input of community members. This co-creation process ensures that the design and functionality of AI tools align with the real-world needs and values of the people who will use them. It also empowers communities to take an active role in shaping solutions that affect their lives.

Ensuring Fairness in AI

AI systems are only as fair as the data and algorithms that underpin them. Machine learning fairness is the process of correcting and eliminating algorithmic bias from AI models to ensure fair decision-making. Bias in AI can emerge in several forms, often due to imbalanced or unrepresentative data. For example, if an algorithm is trained on datasets that reflect the biases present in society, such as racial or gender disparities, it may make decisions that are skewed in favor of certain groups while disadvantaging others. In the context of healthcare, algorithmic bias can have serious consequences, particularly for marginalized groups, such as racial minorities, people with disabilities, or those from lower socioeconomic backgrounds. Fairness in AI involves ensuring that AI systems are designed and trained to avoid making decisions based on inherent or acquired characteristics like race, gender, sexual orientation, disability, religion, or class. AI fairness is critical to promoting justice, equity, and inclusion in decision-making processes.

Correcting Bias in AI

Addressing bias requires a comprehensive approach, including using diverse and representative datasets, continuously monitoring AI models for bias, and ensuring that algorithms are transparent and interpretable. Developers must be intentional in eliminating unfair patterns from AI systems, ensuring that decisions do not disproportionately harm any particular group. In healthcare, this can mean refining AI models to ensure that they deliver equitable outcomes across racial, ethnic, and socioeconomic lines.

Conclusion

The integration of implementation science and community engagement is essential to advancing equitable AI, particularly in healthcare. By focusing on the needs of vulnerable populations and incorporating cultural relevance, trust-building, and fairness into AI systems, we can develop technologies that not only improve care but also reduce health disparities. Ensuring that AI is developed through an equity lens and in collaboration with the communities it serves is key to creating lasting, positive change.