Inclusive AI Design in Action - Co-Creating Solutions with Community Health Workers (Part 1)

This blog post is the first in a three-part series exploring the development and deployment of large language models for community health workers in low-resource settings.

Context

With the advent of generative AI, especially Chat GPT, the point of contention is whether AI technologies' design and development in healthcare originate from regions where they are most needed, addressing the historical knowledge imbalances and disparities in access to resources between the Global North and South. Until now, technological innovations designed for community health workers (CHWs) have seldom considered their perspective and cultural context, often burdening them with more tasks rather than empowering them with greater knowledge. Our work at the George Institute for Global Health (GIGH) focussed on co-creating AI technology with CHWs, understanding their needs and limitations so that technology can support them in navigating challenges within an under-resourced, fragmented public health system.

CHWs face a myriad of challenges, with a key aspect of their role being to support rural women throughout pregnancy and the postpartum periods. They provide essential information that prevents long-term health issues like anaemia, hypertension or gestational diabetes. However, one of the pertinent challenges they continue to face is support for their continuous learning in an ever-changing health landscape. Conducting frequent in-person training is often resource-intensive, especially in low-resource settings. Remote training, on the other hand, may lead to a decline in attention. To address this issue, we developed an interactive chatbot for CHWs, equipped with access to a curated ‘encyclopaedia’ of pregnancy and postpartum care. This intervention, based on Indian national guidelines and validated by clinicians and experts, aims to provide high-quality, contextually relevant healthcare guidance in real-time.

Our Approach

Our commitment to creating an 'inclusive' design prompted us to first focus on understanding the digital needs of CHWs through a series of group discussions. This process enabled us to customise our chatbot to better align with the specific needs, pain points, and goals of CHWs.

Conducting user analysis

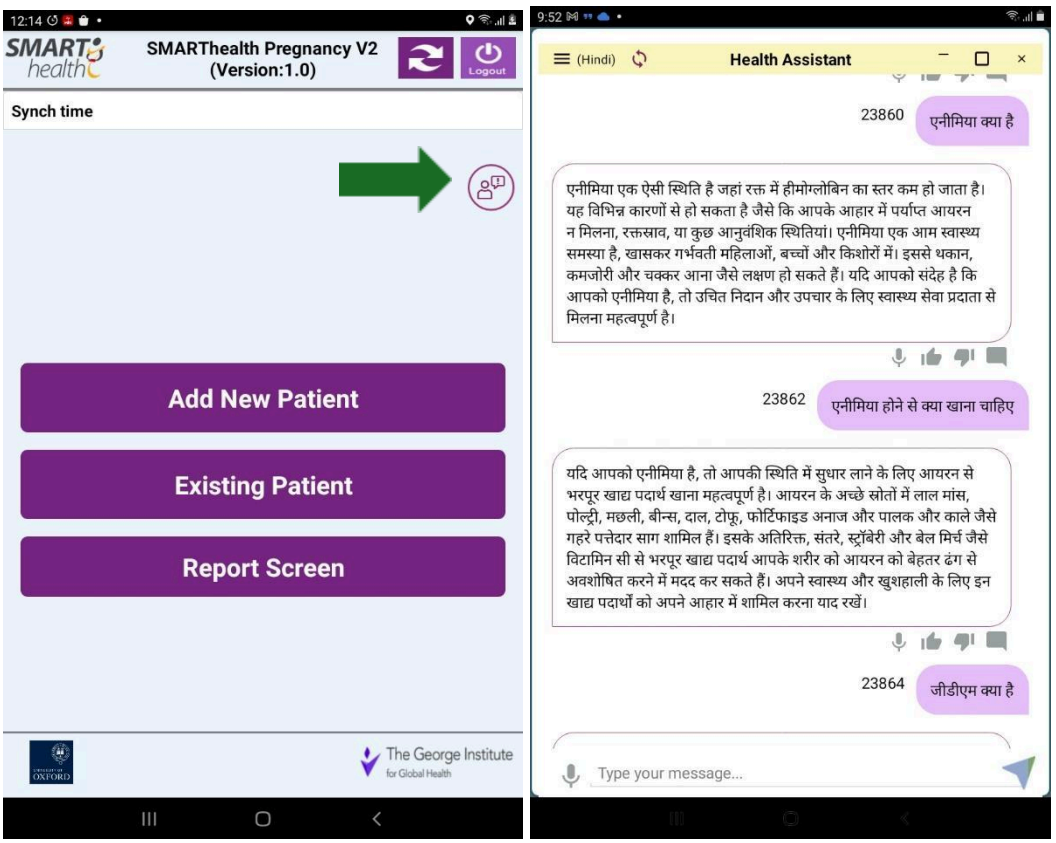
Our greatest challenge was the absence of a blueprint for an inclusive approach, especially for AI technology not designed with CHWs in mind — particularly those with low literacy levels who work in rural communities. Where do you begin when identifying an appropriate sample of CHWs, particularly in a country with nearly 1 million of them? We began with a small-scale approach but with a clear plan to establish processes for designing AI-based interventions that could be scaled up in the future. We prioritised selecting CHWs from different backgrounds, with varied levels of digital literacy in two demographically and culturally diverse states, Haryana and Telangana.

To address the challenge of building an "as unbiased as possible" encyclopaedia, the GIGH team conducted a user needs analysis to understand the questions CHWs encountered frequently. This user analysis reflected the many issues these workers navigate every day — poverty, caste and religious discrimination, access to healthcare services, and gender issues including male child preference and gender-based violence. The encyclopaedia of questions, answers, and supporting guidelines was reviewed in-depth by clinicians hailing from both states and further validated for ethical compliance by a panel of experts.

Designing a user-friendly interface

Language is a significant barrier in deploying inclusive AI solutions, particularly with diverse communities whose primary language is not English. Despite the need for context-specific, multilingual solutions, most available resources and tools are predominantly in English, limiting accessibility and inclusivity. This underscores the importance of designing AI technologies that prioritise linguistic and contextual relevance. To achieve this, we designed our chatbot to support voice input in local languages and included a 'read-aloud' answer button. This feature enables CHWs with low literacy skills or visual impairments to easily access answers in their local language.

Figure 1 depicts the SMARThealth Pregnancy chatbot. On the left is the home screen that is displayed after a user logs in. On the right is a chat window with a conversation in Hindi. Each response includes options for community health workers to provide feedback, featuring a 'thumbs-up,' 'thumbs-down,' and a comment option for every answer. There is also a 'read-aloud' voice button for users who wish to listen to the chatbot's responses.



Way Forward – The Need for Continuous Learning

It is often presumed that people with low literacy skills cannot adapt to technological innovation, which often leads to them being left out in the design phase. The key takeaway that came through multiple rounds of user testing phases is that 'continuous learning' is crucial for overcoming obstacles effectively.

> *We might get stuck in the beginning like with BP (blood pressure) machines or glucometers but with sufficient training, we will learn how to use it. This can be helpful in the field when someone asks us a question and we don't have an answer, we can tell her immediately.*
> (Female CHW, Haryana, India)

No technology can succeed without a deep understanding of the people it is designed for. Therefore, it is imperative to prioritise inclusivity in AI design to ensure its benefits reach everyone. As new evidence emerges, we must stay open to re-evaluating our assumptions, ensuring that the advantages of AI extend beyond a select few and truly benefit many.

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