**February 28th GDHN Monthly Meeting:**

**Human versus AI: Pros and Cons of different strategies for providing health information and counseling**

The February meeting of the Global Digital Health Network was hosted by FHI 360 and explored how artificial intelligence (AI) and machine learning (ML) are being incorporated into client-facing digital health applications. We had three presentations that illustrated a continuum of possible uses of AI and ML in place of and in addition to humans to provide individuals with important health information, counseling and support. Despite some early technical difficulties, we managed to connect to all three presenters and have time to spare for some great Q&A!

[Rachel Jones](https://www.linkedin.com/in/rachel-m-jones-0738b536/), Research & Evaluation Program Manager, and [Sathy Rajasekharan](https://www.linkedin.com/in/sathyrajan/)**,** Chief Innovation Officer, from [**Jacaranda Health**](https://www.jacarandahealth.org/) kicked us off. Jacaranda Health is a non-profit organization dedicated to transforming maternal and newborn healthcare in East Africa with high-quality, low-cost, and respectful services and through partnerships with public health systems.  Jacaranda has previously implemented and tested the use of an SMS system to provide messages that offer behavioral nudges to pregnant and postpartum mothers. Results from an RCT showed that women were 22% more likely to seek advice for their negative health symptoms and 1.6 times more likely to use a method of family planning postpartum compared to control group. Users can also text in questions to the system to be answered by a Helpdesk agent, some of which are general questions but some of which could be medically serious. As the service has rapidly expanded, Jacaranda has struggled with how to efficiently manage the high-volume of questions in order to identify those that require immediate medical response. They first experimented with a “flow-based” chat- bot, i.e. where women picked choices for the information they were looking for (similar to other menu-based services) and were given responses with the potential to be tailored, for example, based on gestational age. Though it worked well, Sathy and Rachel pointed out that this approach assumes that women know what information they are looking for and that there is a common understanding of how information may be categorized. They have since shifted to using an “intent-based” chat-bot that uses natural language processing (NL) to analyze the content of the quest to determine the intent and to provide appropriate answers. This approach can offer a better experience for users but requires training the chat-bot to analyze and classify information. They trained their bot by feeding the 16,000+ SMS questions that have come into their SMS system, manually categorized into “intents,” into an NLP agent (in this case Dialogflow). Now, the chat-bot can automatically answer general questions while flagging those that are urgent for the human helpdesk agent, a process that ultimately helps them reach women in need of urgent help faster. Rachel and Sathy noted that the NLP doesn’t work well in a context of mixed languages—for example, if someone is asking a question in a mix of English and Swahili—a practice which is common in many parts of sub-Saharan Africa. They also noted that it is possible to download and use NLP agents yourself, though this will require some dedicated staff time.

Next, [Kate Plourde](https://www.linkedin.com/in/kate-plourde-12835a1a/), Technical Advisor with [**FHI 360**](https://www.fhi360.org), presented on a virtual support group for youth living with HIV (YLHIV) which uses a trained (human) facilitator to provide information and support to, and to moderate discussion among, YLHIV via Secret Facebook groups. Kate’s presentation, therefore is the “contrast” to the two other presentations which involve some amount of AI/ML. The intervention—called SMART Connections, for **S**ocial **M**edia to improve **A**RT **R**etention and **T**reatment outcomes among youth living with HIV in Nigeria—is currently underway as an RCT and consists of YLHIV 15-25 enrolling in secret Facebook groups which are facilitated by a trained adult living with HIV who implements a series of 11 educational sessions over a period of 6 months. The educational sessions include a combination of informational messaging—which could be the word of the week, key messages, discussion questions and polls or role model stories, all of which the facilitator posts. The facilitator is also trained to post supportive messages, and participants often reach out for social support from their group members. Kate offered some of her own perception of the pros and cons of human facilitation v. AI. Among the pros, Kate suggested that a human can respond to participant questions via the platform (in this case Facebook) as well as via mother modalities, like a phone call or private message, which the AI could not. Humans can also be adaptable, for example if participants are taking longer than expected to respond to a given poll. They can also correct mis-information that other participants might share with the group. Perhaps most importantly, they can empathize with participants and they can trouble-shoot and respond to participants who may be in crisis. The cons of human facilitation are that humans also make mistakes! They can delay or miss the scheduled content and they make mis-use the platform settings. Perhaps of most consequence, human facilitation is likely to be costlier and therefore less scalable than an AI solution.

[Melissa Persaud](https://www.linkedin.com/in/melissapersaud/), then Director of Partnerships at [**Viamo**](https://viamo.io/) (she has since moved on to [Fraym](https://fraym.io/) but you can contact Alana Ramo ([alana.ramo@viamo.io](mailto:alana.ramo@viamo.io)) with enquiries regarding partnership opportunities ) took it from there, introducing us to how Viamo has tracked the change in mobile mix in the countries in which they work by creating user-friendly Facebook messenger chatbots that allow individuals to consume key information in their moment of need and in different ways (e.g. text, audio, video, photos). Viamo has successfully implemented a pull, IVR information system—most frequently referred to as the “3-2-1” service—in over a dozen countries around the world allowing individuals to obtain information on a number of topics, from agriculture, to weather, to gender, to various health areas like HIV, malaria, and family planning. With the advent of smart phones, they are now looking to tweak their approach to allow individuals to pose general or specific questions and to allow user information to be aggregated to drive content development and be communicated out to more users. Melissa provided an example of a user messaging that they are having a problem with their crop, backed up with a photo of their crop. The AI is able to identify a potential insect as the root cause and provide advice on how to deal with it. The system can then each out to other users in that geographic are with a warning about the potential insect outbreak. Viamo is also exploring putting into place APIs so that their chatbot system can share and pull information with and from relevant databases to strengthen to quality of its responses.

After the presentations and a few questions, our presenters offered some considerations for including AI/ML in a client-facing health intervention:

* AI/ML is good for large amounts of data as well as for systems in which questions are asked repeatedly or consistently
* AI/ML can be useful for triaging (as in the case of Jacaranda Health)
* Weigh what you think the AI/ML will do against what a human can do. In situations with large amounts of data coming in (per first bullet), AI/ML may be able to handle larger quantities of data more efficiently than a human. IN situations where information coming in is nuanced or varied (per second bullet), a human may be better at sorting, analyzing, and responding.
* Look to how AI/ML can be built into existing programs (both Jacaranda and Viamo did this)
* Consider the audience/user needs. In some instances, a user may require a degree of empathy that AI/ML cannot provide (consideration in FHI 360’s presentation)
* In sum, both the content and the context are very important when considering whether to include AI/ML

Finally, Sathy recommended a few resources:

* Articles that might be interesting: <https://www.codementor.io/srijansaxena/how-to-make-a-basic-chatbot-wit-ai-part-1-7g82j81wu> and <https://chatbotnewsdaily.com/build-a-facebook-messenger-chat-bot-in-10-minutes-5f28fe0312cd>
* Chatfuel (chatfuel.com) to build and text a chatbot with Facebook. According to Sathy, “it's very quick and let's you know whether you really need something more complicated once you test with users.”
* Simple Natural Language Processing (NLP) platforms: dialogflow.ai and wit.ai

Thanks Sathy!