

## **Presentation Abstract**

We would like to present some interesting findings in our recent publication in *npj Digital Medicine* entitled “Long-term participant retention and engagement patterns in an app and wearable-based multinational remote digital depression study” (<https://doi.org/10.1038/s41746-023-00749-3>). This paper shows various factors such as sociodemographics, depression severity, phone status, and app usage behavior could be linked to long-term participant retention and engagement in remote mobile health studies. The abstract of this paper is shown below:

Recent growth in digital technologies has enabled the recruitment and monitoring of large and diverse populations in remote health studies. However, the generalizability of inference drawn from remotely collected health data could be severely impacted by uneven participant engagement and attrition over the course of the study. We report findings on long-term participant retention and engagement patterns in a large multinational observational digital study for depression containing active (surveys) and passive sensor data collected via Android smartphones, and Fitbit devices from 614 participants for up to 2 years. Majority of participants (67.6%) continued to remain engaged in the study after 43 weeks. Unsupervised clustering of participants’ study apps and Fitbit usage data showed 3 distinct engagement subgroups for each data stream. We found: (i) the least engaged group had the highest depression severity (4 PHQ8 points higher) across all data streams; (ii) the least engaged group (completed 4 bi-weekly surveys) took significantly longer to respond to survey notifications (3.8 h more) and were 5 years younger compared to the most engaged group (completed 20 bi-weekly surveys); and (iii) a considerable proportion (44.6%) of the participants who stopped completing surveys after 8 weeks continued to share passive Fitbit data for significantly longer (average 42 weeks). Additionally, multivariate survival models showed participants’ age, ownership and brand of smartphones, and recruitment sites to be associated with retention in the study. Together these findings could inform the design of future digital health studies to enable equitable and balanced data collection from diverse populations.