

Research Title: Digital Phenotyping to Predict Relapse in Serious Mental Disorders among Slum Residents in Dhaka, Bangladesh

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Abstract

Mental health diagnoses are dependent on professional opinion based on diagnostic manuals and clinical history. Relapse and recurrence of serious mental disorders (SMDs) is a major contributing factor to the high burden associated with mental illnesses. Due to challenges in identifying patients prone to relapse and poor compliance with antipsychotic drugs, which can result in incapacitating outcomes, it is vital to prioritize the recognition and prevention of relapses. Passively collected behavioural data from smart devices present an opportunity to monitor patients diagnosed with mental health disorders in a data driven, objective manner. This can be done through digital phenotyping, the in-situ quantification of moment-by-moment human phenotype at an individual level using data from personal digital devices. The current study aims to explore if relapse of SMDs can be predicted using acceptable, reliable digital phenotypes in Korail Slum, Dhaka, Bangladesh. This study will be conducted in three phases. First, I will conduct a systematic review focusing on methodology of previous digital phenotyping studies in mental health disorders. The second phase will involve qualitative data collection with slum residents to understand their perspective and acceptability of digital phenotyping. The third phase will be a 12-month longitudinal study, where participants will be invited to take part in prospective data collection of the acceptable phenotypes via their smartphone. Participants will complete clinical measures at baseline and then every two weeks alongside providing digital phenotype data passively every two days. This data will be used to develop machine learning models to predict relapse of SMDs.

The study therefore achieves to explore if acceptable digital phenotypes reliable to identify relapse of SMDs among residents diagnosed with SMDs in Korail Slum by targeting the following objectives:

- To identify what methodologies has already been used in previous studies to detect digital phenotypes in mental health disorders. (Phase 1)
- To identify what smart devices are available, what is acceptable regarding digital phenotyping, what data people in slums are willing to share and their perception towards digital phenotyping. (Phase 2)
- To determine if the acceptable digital phenotypes are reliable and can be identified among individuals and their relationship to SMDs. (Phase 3)
- To explore if relapse could be predicted using digital phenotype signals in LMIC settings. (Phase 3).

The poster aims to address Phase 1 and Phase of the current study as Phase 3 is scheduled to start mid this year.