

**Leveraging digital health and machine learning models to forecast adverse maternal outcome in low resource settings, Geita Tanzania.**

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**Abstract, maximum is 250 words.**

In low and middle-income countries, the persistently high maternal mortality rates (MMR) pose a grave concern, leading to tragic losses of both mothers and infants due to preventable complications. Tanzania, with an MMR of 238 deaths per 100,000 live births, ranks among the highest in the region, exacerbating already challenging living conditions. Studies and maternal death audits have identified several contributing factors to this crisis, including insufficient Antenatal Care (ANC) attendance hindering early screening for adverse maternal outcomes, inadequate ANC screening due to heavy workloads and limited human resources, and a lack of resources for necessary tests and investigations.

Early prediction of maternal complications holds immense potential for preventing these adverse events, thereby saving lives. In response, the Prime Health Initiative Tanzania (PHIT), supported by the Bill & Melinda Gates Foundation (BMGF), initiated a two-year project aimed at predicting adverse maternal outcomes among expectant mothers accessing antenatal care services. This project utilized a tablet-based approach to streamline digital data entry, coupled with a machine learning model for detecting and predicting adverse maternal outcomes. Data collected from 187,438 clients with repeated observations were used to train a predictive model using distributed gradient boosting classification (XGBoost). Preliminary results indicate a model accuracy and precision of 99% and 43%, respectively, for detecting the risk of gestational hypertension. We aim to refine data collection processes and improve feature selection for more accurate predictions. These early findings underscore the transformative potential of digital health in enhancing maternal outcomes and easing the burden on healthcare providers.