New weapon against drug resistant malaria: Big Data, says Telenor Research

(Fornebu, 25 April 2019) A new study has found that combining malaria genetic data with human mobility data from mobile networks can help map and predict the spread of drug-resistant malaria. The study was conducted by the Harvard TH Chan School of Public Health, Telenor Group, Mahidol-Oxford Research Unit and the National Malaria Elimination Programme in Bangladesh.

The study, Mapping imported malaria in Bangladesh using parasite genetic and human mobility data, is one of the largest efforts ever undertaken to quantify the human mobility patterns which spread disease. By modelling population movements that spread new, drug-resistant forms of malaria, the study aimed to help local health authorities track and contain this emerging threat to health in Southeast Asia. Combining epidemiological data, travel surveys, parasite genetic data, and anonymised mobile phone data from Telenor's local operations, Grameenphone, the study was able to measure the geographic spread of different types of malaria parasites in southeast Bangladesh, including drug-resistant mutations. Data pointed to transmission from outside high-incidence areas, and showed
substantial transfer of parasites throughout the Chittagong Hill Tracts in southeast Bangladesh. “Our combined method gave us detailed insight into the direction and intensity of parasite flow between locations,” Hsiao-Han Chang, Research Associate at Harvard T.H. Chan School of Public Health, explained to eLife Sciences, publisher of the study. “The study proves that we have a potent weapon at our disposal in the fight against malaria – Big Data,” says Kenth Engø-Monsen, Senior Research Scientist, Telenor Research. “When used in tandem with disease information from local authorities, anonymised mobile network data shows us very accurately whether drug-resistant mutations of malaria parasites spread locally or if they came from outside the local area,” Engø-Monsen says.

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Fighting the drug-resistant parasite

Geoffrey Canright, Fellow in Telenor Research adds, “Knowing this makes it easier for health authorities to disseminate public disease information, enact prevention efforts like distributing more mosquito nets and warnings in both current and potential malaria hotspots. It’s a case in point of how data in aggregate form can be deployed for the good of society.” There is only one effective drug left to treat severe malaria, and resistance to this drug has emerged in Cambodia and has spread via human travel to other parts of Southeast Asia. Bangladesh was chosen for this study in large part due to its central location between Southeast Asia and the rest of the world. The ability to track and quantify the spread of malaria, particularly the drug-resistant strain, has become a priority for national health programs, and this is what the study has addressed.

Applied learnings from prior Telenor study on dengue fever in Pakistan

The study is based on learnings from a previous Big Data-driven study in Pakistan, which examined the spread of dengue fever. The study analysed anonymised call data records during the 2013 dengue outbreak to accurately map the geographic spread and timing of the epidemic and can contribute to more effective national response mechanisms. Malaria a today is major burden on the world community, where about 200 million people are infected annually by the parasite and as many as 400,000 people die. This study points to the importance of data integration and analytics with disease genetic data as effective resources for malaria elimination.

About the study

The study has been funded by Bill and Melinda Gates Foundation and the National Institutes of Health, with support from Chittagong Medical College and BRAC. The study used anonymised, aggregated mobile data to model the patterns of human movement within southeast Bangladesh. The study was conducted between 2016 through the beginning of 2019. Study collaborators included the Harvard TH Chan School of Public Health and Telenor Group’s Grameenphone and Telenor Research divisions, together with partners at the Mahidol-Oxford Research Unit in Bangkok and the National Malaria Elimination Programme (NMEP) within the Government of Bangladesh. Read the full study here Full size image available here Media contacts Jonathan Higgins, Director, Communications, Telenor Group Jonathan.higgins@telenor.com +47 9011 0606