The application of Artificial Intelligence in the diagnosis and treatment of malaria in Tanzania

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Abstract:

Malaria is considered as a life-threatening disease caused by parasites that are transmitted to humans through the bites of infected female Anopheles mosquitoes. This epidemic disease poses a significant concern in sub-Saharan Africa particularly in Tanzania with high records of morbidity and mortality over the years. However, due to malaria control interventions, Tanzania has witnessed a major drop in the late 2000s. The main interventions included Long Lasting Insecticide Treated Nets (LLINs) and improved access and availability of quality assured Artemisinin-Based Combination Therapies (ACTs). Given the science and technology-based point-of-care innovations, Artificial Intelligence (AI) using Artificial Neural Networks (ANN) algorithm for detecting malaria under the microscope will give accurate, reliable and effective diagnosis and treatment of malaria than humans. The automated microscope, Autoscope, is almost 100 percent accurate and specific at detecting malaria parasites. The Autoscope employs deep learning software to analyze and quantify malaria parasites in microscopic images in a given sample. Deep-learning software uses artificial neural networks that emulate human brain to allow computers to recognize abstract patterns using visual features. Data was collected through interviews. Interviews were conducted with health/social workers and practitioners in Dar es Salaam region using a semi-structured interview guide. Secondary data was sourced from annual reports and publications that are released by Muhimbili University of Health and Applied Sciences, Ifakara Health Institute (IHI), National Institute for Medical Research (NIMR), Centre for Chronic Disease Prevention and Control (CCDPC), Ministry of Health World Health Organization (WHO), CARE International and other institutions dealing with Malaria.

Biography:

HDr. Jane Mpapalika is an economist by professional and a research Fellow at the Economic and Social Research Foundation (Think-Tank Institute) in Tanzania. I pursued M.A. Economics at Leeds University Business School in Leeds, UK and PhD in Economics at the University of Witwatersrand in Johannesburg, South Africa. Dr. Mpapalika has been working at ESRF for almost two years now. I was involved in a multi-year project in collaboration with Muhimbili National Hospital and University of Dar es Salaam under the Global Challenge Research Fund (GCRF/GAHSI) as a Co-Investigator for Tanzania. The project was on technological innovations in the health care, in particular, the diagnostics, drugs, and treatment of non-communicable diseases (NDCs) such as hypertension, diabetes and HIV in Tanzania, Malawi, Zambia and South Africa. ESRF has previously worked together with the GCRF Research hub in carrying out (i) "Health-industry linkages for local health: reframing policies for African health system strengthening" (2013); (ii) "Health as a productive sector: Integrating health and industrial policy" (2017). I have recently published a paper on the "determinants of sovereign risk premium in African countries" with the link https://www.mdpi.com/1911-8074/12/1/29. Living in South Africa, a country with high records of HIV/AIDS and Working in a research institution that deals with socio-economic issues has significantly motivated me to engage in further research on viral and tropical diseases.

Publication of speakers:

1. Bolin, G. & Schwarz, J., 2015. Heuristics of the algorithm: Big Data, user interpretation and institutional translation. Big Data & Society.

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