Artificial intelligence for malaria: Bridging the gap for real world usage

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Nema et al[1] discuss pertinent aspects of artificial intelligence (AI) for malaria. While these algorithms appear ready for deployment given the high median accuracy of 96.7%[2] (see Appendix, bubble-plot), malaria film digitalization with present day high-cost digital microscopes poses a significant barrier for adoption, particularly in resource-poor areas. The authors propose using camera smartphones to develop algorithms; however, this has limitations in image standardization and lacks the scalability in digitalizing large numbers of films. To fully harness AI, the development of low cost, automated digital microscopes allowing rapid whole slide imaging is necessary.

Secondly, existing regional malaria slide banks have yet to establish online digital archives. Hence, most AI studies used data exclusively from National Institutes of Health's malaria database (27 558 images, falciparum and vivax species only), with few trained from private datasets. These studies, including a large multicentre study[3] evaluating an algorithm trained with 500 slides from 11 countries, lack high quality data of uncommon, but morphologically distinct species of ovale, malariae and knowlesi. In a post COVID-19 world with disruption of existing malaria control measures[4] and increasing cross-border travel, acquired non-falciparum, non-vivax malaria infections may be missed by AI due to biased datasets.[5] We propose existing regional malaria slide banks digitize their slides to provide publicly available digital datasets to augment data of uncommon malaria species. Lastly, the establishment of a global digital repository can provide oversight in image standardization for training, downstream validation, and quality assurance for robust AI solutions for malaria.

Contributors

All authors contributed equally to the data analysis and writing of this correspondence.

Declaration of interests

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