Crafting a More Equitable Framework for Global Epidemiological Research Practice: Working *With* Not *On*

Juliette Unwin - *Using statistics and mathematical modelling to improve global public health*

Digital tech can indeed be used for good in the health sector, but this hasn't always been the case. As an emerging academic, I use other people's health data in my research on modelling infectious diseases (Unwin, H.J.T. *et al.*, 2022, 2023), including aggregated numbers of people infected by Ebola during an outbreak, childhood malaria prevalence from household surveys, and more recently electronic health records. I have seen first-hand how important it is to co-create my research with people in Africa and Asia if I want to consider disease transmission outside my own country. I can bring maths to the table, but I don't fully understand the intricacies of how the data have been collected or what interventions make the most sense in their context.

Historically academics, many I'm sure unintentionally, have made their careers by using health-related data provided by other people and have not fully recognised the efforts of those who collected it. Having come from a background in engineering where I didn't really work with large data sets, this was something I struggled with in my earliest 'first author' publication. I was developing a new method and applied it to some data that had kindly been shared with me. But when it came to publication, the data owners had changed and couldn't be contacted, and we were a bit stuck. From that moment I decided I didn't want to end up in that position ever again.

The digital analysis of good quality health data can save lives. For example, powerful computers have been used during disease outbreaks to predict where diseases will spread and help plan who to vaccinate and where extra medical interventions are

necessary. And – whatever your feelings about how the COVID-19 pandemic was managed – it would have been much worse if there hadn't been easy sharing of information around the globe.

Since the global burden of infectious disease is not equitable, it's important to help train my future colleagues around the world in methods and tools so they can model transmission themselves. Teaching courses and running workshops at Malawi Liverpool Wellcome in Blantyre, the National Institute of Public Health in Cambodia, and the African Institute for Mathematical Sciences (AIMS) in Rwanda and Cape Town, has not only been personally fulfilling, but it has hopefully also helped lay the foundations for a more mutually beneficial and equitable model of impactful science.