

MSc Research internship Erasmus MC, Department of Public Health, Infectious Disease Control group

Topic:	Predicting the effect of extended-duration mass drug administration on elimination of worm infections
Hosting dept.:	Erasmus MC Rotterdam, Department of Public Health, Infectious Disease Control Research Group
Collaborators:	NTD Modelling Consortium

About a quarter to about one third of the world population carries one or more worm infections that may cause anaemia, growth retardation, disfiguring skin disease, blindness, and even cancer. The four most common worm infections – lymphatic filariasis, onchocerciasis, soil-transmitted helminths, and schistosomiasis – are currently targeted by the World Health Organization to be controlled or eliminated by 2020 or 2025. The main control strategy is mass drug administration (MDA), which involves distributing deworming drugs to entire populations or specific target groups like school age children in endemic areas on a regular basis, typically annually or six-monthly. Successful control or elimination of worm infections requires that MDA is implemented at high coverage of the target population and that MDA rounds are repeated over an extended period of time, sometimes as long as more than ten years.

A major challenge in optimizing MDA is to reach and treat individuals that are absent from their communities during MDA due to seasonal work, family visits, etc. Individuals that are systematically absent serve as a reservoir of infection for the rest of the community, and therefore prolong the required duration of MDA programmes to achieve control or elimination. A potential solution to this is to extend the time window during which drugs are distributed, i.e. extended-duration MDA, in contrast to the current MDA duration of only about two weeks. However, extended-duration MDA would also involve additional cost and time of the health professionals and/or volunteers that execute the MDA programmes locally. Currently, it is not clear what the potential benefits of extended-duration MDA are in different situation and to what extent these benefits weigh against the additional costs.

The Infectious Disease Control Research Group in the Department of Public Health is specialized in mathematical modelling of transmission and control of infectious diseases and has developed a generalised individual-based model for transmission of worm infections called WORMSIM. The MSc student will have the opportunity to use WORMSIM to generate, visualise, and analyse a large database of predicted outcomes of normal MDA vs. extended-duration MDA in a large number of scenario pertaining to transmission conditions and patterns in MDA coverage. To weigh the benefits extended-duration MDA against the additional costs involved, the MSc student will perform a literature review in the fields of health economics and social sciences.

This project is suitable for students with an interest in and affinity for quantitative science. The student will be using the statistical package R.

Contact: Dr. Luc Coffeng (l.coffeng@erasmusmc.nl)