

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

Topic:	Understanding the methodological differences between various disease burden estimates for Neglected Tropical Diseases
Hosting dept.:	Erasmus MC Rotterdam, Department of Public Health, Infectious Disease Control Research Group
Collaborators:	Institute for Health Metrics and Evaluation (IHME)

Neglected Tropical Diseases (NTDs) are a diverse group of communicable diseases that is prevalent in tropical and subtropical countries across the globe. In 2012, the World Health Organization (WHO) targeted 17 NTDs¹ for elimination [1], affecting an estimated 2.3 billion people worldwide. Due to its high prevalence worldwide, and to understand the relative importance of each NTD as compared to other diseases, the Global Burden of Diseases (GBD) studies provide an update of the total number of Disability-Adjusted Life Years (DALYs) lost for a wide variety of diseases, including NTDs [2]. These DALY estimates are widely accepted by the scientific community, but they are estimates and not the only way to measure disease burden estimates.

There are other groups working on DALY estimates for several of these NTDs. In some situations, these different burden estimates may lead to large discrepancies as compared to the GBD estimates. This may be largely due to the use of different statistical or even mathematical models. As these DALY estimates are heavily used for health policy purposes, intervention strategies, and funding allocation, it is essential to understand the methodological grounds of these differences as to explain how to refine such burden estimates.

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 dive into the methodological differences (both statistical and mathematical) that drive the disease burden estimates for NTDs. For this reason, the student will collaborate closely with the Institute for Health Metrics and Evaluation (IHME) and Erasmus MC. This project is suitable for students with an interest in quantitative science, and an affinity in the methodology of statistical and mathematical models. The student will develop an understanding of methodological differences between models and the consequences of adapting different

¹ Dengue, rabies, blinding trachoma, Buruli ulcer, endemic treponematoses (yaws), leprosy (Hansen disease), Chagas disease, human African trypanosomiasis (sleeping sickness), leishmaniasis, cysticercosis, dracunculiasis (guinea-worm disease), echinococcosis, foodborne trematode infections, lymphatic filariasis, onchocerciasis (river blindness), schistosomiasis (bilharziasis), soiltransmitted helminthiasis (intestinal worms).

methodological choices. The student will also perform a comparison analysis of different DALY estimates available by the different available models for the 17 NTDs.

Please send your CV and a motivation letter to

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Background reading

1. WHO. Accelerating work to overcome the global impact of neglected tropical diseases – A roadmap for implementation. 2012.
http://www.who.int/neglected_diseases/NTD_RoadMap_2012_Fullversion.pdf. Accessed 2 May 2016.
2. Hay SI, Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, et al. Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2017;390:1260–344.
3. Hotez PJ, Alvarado M, Basáñez M-G, Bolliger I, Bourne R, Boussinesq M, et al. The global burden of disease study 2010: interpretation and implications for the neglected tropical diseases. de Silva N, editor. *PLoS Negl. Trop. Dis.* 2014;8:e2865.
4. Herricks JR, Hotez PJ, Wanga V, Coffeng LE, Haagsma JA, Basáñez M-G, et al. The global burden of disease study 2013: What does it mean for the NTDs? Zhou X-N, editor. *PLoS Negl. Trop. Dis.* 2017;11:e0005424.