A Utilitarian Argument for Increasing Funding for the Neglected Tropical Diseases

Opinion Editorial

Arjun Patel, MSc Global Health, McMaster University

Utilitarianism is an ethical philosophy which suggests that medical and public health interventions should be prioritized in order to maximize utility – including health, happiness, and well-being – among the greatest possible number of people.[1] It is a consequentialist philosophy which argues that the most ethical action is that which increases pleasure and/or reduces suffering to the greatest degree.[1] This philosophy can be applied to fields such as Public Health and Global Health in order to use finite resources wisely.

As of 2016, communicable diseases collectively account for 20.2% of all deaths globally.[2] However, this burden is disproportionately felt by low- and middle-income countries. While only 5.4% of deaths in the European Union are caused by communicable diseases, that figure rises to 27.0% in South Asia and 56.4% in sub-Saharan Africa.[2]

For the past three decades, the vast majority of communicable diseases funding has gone to three diseases, collectively known as the 'Big Three': HIV/AIDS, tuberculosis, and malaria.[3] In response, the World Health Organization (WHO) released a list of eighteen Neglected Tropical Diseases (NTDs) in 2007 in an effort to encourage further awareness, research, and funding for other communicable diseases.[4] However, the enormous funding disparity remains. Figure 1 illustrates the amount of funding – including vaccinations, research, medication, and prevention – allocated to each disease between 2007 and 2015, as calculated by the WHO.[5] The data was collected from more than 200 institutions, including non-governmental organizations and private corporations.[5] The total funding is shown for the 'Big Three' and twelve of the eighteen NTDs for which data was available. The funding for the 'Big Three' over this period totaled $20.5 billion USD, while the funding for the NTDs totaled only $2.5 billion USD.[5]

To some extent, this funding disparity can be justified by calculations of disability-adjusted life years (DALYs) per disease. DALYs are a tool to compare disease burden.[6] DALYs are calculated by summing years of life lost (YLL) and years lost due to disability (YLD).[6] YLLs represent the total number of years lost due to victims of the disease dying early, while YLDs represent the burden of living with the disease, taking into account the number of years and the severity.[6] Globally, between 2000 and 2016, tuberculosis, HIV/AIDS, and malaria accounted for 1.9%, 2.2%, and 1.4% of total DALYs respectively, meaning that they collectively were responsible for 5.6% of global DALYs.[7] On the other hand, the eighteen NTDs collectively account for only 0.9% of DALYs between 2000 and 2016.[7] On the surface, this difference seems to justify the enormous disparity in funding. However, the funding disparity remains unjustified for three main reasons.

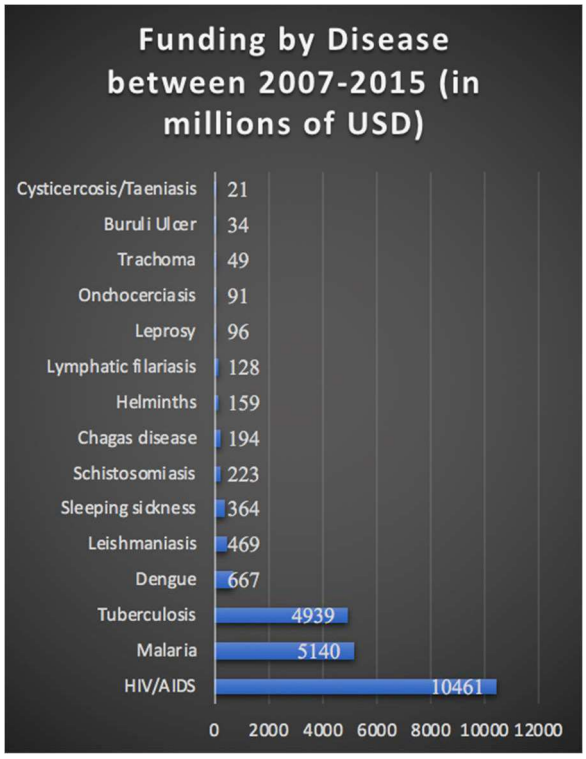

Figure 1: Funding for the 'Big Three' and NTDs (2007-2015)[5]

First, the DALYs caused by the 'Big Three' are 5.9 times greater than the DALYs caused by the NTDs. However, the total funding for the 'Big Three' is 8.2 times as large as the funding for the NTDs.[5] From a utilitarian standpoint, it is logical for the

'Big Three' to receive more funding than the NTDs. However, the extent of this disparity is unjustified and does not accurately mirror the global effect of each disease in terms of DALYs. Funding should mirror the impact that diseases have on DALYs.

Second, many NTDs are localized to specific geographical areas, unlike the 'Big Three' which are all global epidemics.[8] As such, some NTDs are candidates for global eradication.[8] The WHO has acknowledged that the eradication of both malaria[9] and tuberculosis[10] is very unlikely in the foreseeable future. On the other hand, remarkable success has been seen in the eradication of guinea-worm disease, one of the NTDs. In the 1980s, approximately 3.5 million cases of the disease were reported.[11] In 2017, only 30 cases were reported, and it is expected to be fully eradicated within a few years.[11] Similar progress is currently underway with yaws, another NTD, which has experienced a 95% reduction since the 1950s.[12] From a utilitarian perspective, eradication is a very important goal because it represents the permanent elimination of a source of DALYs. By increasing funding, it is possible that additional NTDs may also be targeted for elimination in the near future.

Third, while NTDs are a significant cause of DALYs, research and prevention on NTDs may also indirectly help to decrease the DALYs caused by other diseases, including the 'Big Three.' For example, schistosomiasis and other parasitic NTDs may increase patient susceptibility to tuberculosis by compromising the immune system.[13] Similarly, NTDs such as leishmaniases and soil-transmitted helminthiases accelerate disease progression in patients co-infected with HIV.[14] In other words, funding for NTDs also results in indirect benefits for individuals living with or at risk of acquiring the 'Big Three.'

It is abundantly clear that HIV/AIDS, tuberculosis, and malaria are all pressing issues. However, from a utilitarian perspective, it is equally clear that the *Neglected* Tropical Diseases are unfortunately deserving of their name. They remain chronically underfunded despite their prevalence and impact on DALYs. This does not mean that funding for the 'Big Three' should be ignored. Given that they still account for an enormous proportion of global DALYs, they require a correspondingly large sum of funding. Instead, whenever possible, private corporations, governments from the Global North, and philanthropists should increase funding for the NTDs alongside funding for the 'Big Three.' In this way, people suffering from and at risk of contracting these lesser-known diseases may stand a greater chance of living healthy and safe lives.

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Canine Immunisation: The One Health Approach to Rabies Control

Opinion Editorial

Rachel McDougall, MD, Queen's University Belfast and MSc. Global Health, Maastricht University

The relationship between animal and human diseases was clearly demonstrated by the famous vaccination work of Edward Jenner in 1796. His hypothesis used the zoonotic disease of cowpox to protect humans against the deadly disease smallpox.[1] In today's era of zoonotic threats such as Ebola,[2] it is worth considering if this hypothesis could be reversed, using the immunisation of animals to consequently decrease transmission of zoonotic diseases to humans. This strategy is emblematic of the One Health concept, where animal health and human health are linked when designing interventions. This opinion editorial will focus on the use of rabies vaccines for dogs as a One Health intervention,[3] as well as the challenges facing this strategy.

According to the World Health Organisation (WHO),[4] rabies is prevalent in more than 150 countries today. It is a deadly disease, with approximately one person dying every nine minutes.[5] Forty percent of the world's rabies deaths are children from Asian and African countries, but for many of these people, post-exposure prophylaxis is too expensive.[5] In 2015, the World Bank recorded that 84.5% of people in Sub-Saharan Africa and 81.4% of people in South Asia live below the poverty line on less than $5.50 USD per person per day.[6] In contrast, the WHO states that the average cost of rabies post-exposure prophylaxis (PEP) is about eight times that amount in Africa, at $40 USD, and almost in ten times as much in Asia, with an approximate cost of $49 USD for PEP.[4] Therefore, other strategies should be considered.

Dogs are the main source of human rabies deaths and this has generated interest in a canine rabies vaccination as an alternative or additional intervention to prevent the transmission of the rabies virus to humans.[4] The cost-effectiveness of canine rabies vaccination as a public health intervention was previously investigated as early as 2014.[7] Canine vaccinations in rural Tanzania