

Neglected Tropical Diseases and the Research Gap

What are Neglected Diseases (NDs)?

Described by the WHO as “a symptom of poverty and disadvantage,” neglected tropical diseases are a group of infectious diseases that thrive in impoverished settings with little to no treatments available. Often with minimal access to basic health care, infected patients can suffer from life long disabilities or even death. Found predominantly in tropical climates, these diseases are often transmitted by insect vectors like mosquitoes, while others may be spread by contaminated water or soil. Unsanitary living conditions and overcrowding associated with poverty can contribute to exposure to these contagions. For this reason, NDs are concentrated in low to middle income countries.

Not as well known, neglected tropical diseases (NTDs) are a subset of the broader group of neglected diseases, all of which are chronic infections, highly burdening to those in extreme poverty. The 13 NTDs specifically include ascariasis, hookworm infection, trichuriasis, lymphatic filariasis, onchocerciasis, dracunculiasis, schistosomiasis, Chagas disease, African sleeping sickness, trypanosomiasis, leishmaniasis, Buruli ulcer, leprosy and trachoma. The most well known NDs, the “Big 3,” include HIV, TB, and malaria. The WHO considers these NDs the most important in terms of burden of disease. It is estimated that over 1 billion people (excluding those infected by the big 3) are afflicted by one or more NDs, primarily those in the poorest and most marginalized communities in the world.

The saddest truth of NTDs is the lack of research and development (R&D) into treatments options, despite the large number of people who die of these diseases every year.

The research gap

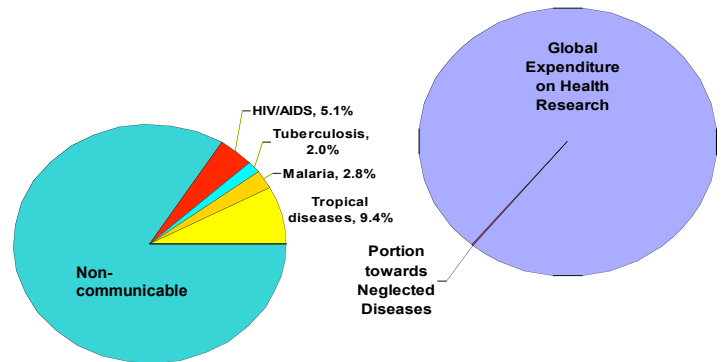


Fig. 1- Disease burden vs. funding

Coined by the Global Forum for Health Research, the research gap, also known as the 10/90 gap, refers to the discord between global needs for treatment and economical innovation. The term refers to a phenomenon whereby a mere 10% of funding is directed to health research on diseases affecting 90% of the world’s population. Since this term has been published, international efforts have begun to close this gap; however, there still remains a gross imbalance between research funding and the medical needs of the poorest nations where ndiseases are endemic.

Further illustrating this gap, from 1975-1999, only 16 of the 1393 new drugs marketed were indicated for NTDs. Following a similar trend, from 2000-2004, only 5 new drugs for NTDs were

developed. 4 of these 5 drugs are indicated to treat malaria².

What's with the research gap?

Despite the wealth of basic research on trypanosome and leishmania, the parasites that cause Chagas, sleeping sickness and leishmaniasis, this knowledge has not translated to viable treatment options. This is thought to be due to the current model of pharmaceutical R&D.

Research and development for neglected tropical diseases is considered to be a “costly and risky activity” according to pharmaceutical companies². Drug development can cost between \$200 million to \$1 billion and beyond, spanning anywhere from 8-15 years. Low income countries spend less than \$20/person each year on health programs, compared to well over 10x as much in high income countries. Due to the fact that those afflicted by NTDs are unlikely able to afford expensive medications, the potential for return on investment for NTDs innovation is low. Financially, pharmaceutical companies have greater incentives to invest in drug development for disease states that affect wealthier populations.

The not so grim future?

Fear not! Despite the sobering numbers, there has been a recent increase funding for ND

projects around the world. By 2010, it is projected that 8-9 new drugs will be available. Some initiatives taking place include public-private partnerships (PPPs). By uniting public and private sectors' efforts, there is hope that, together, they can work towards meeting global health needs. Education and endless advocacy will always remain a staple for work in this area.

Universities Allied for Essential Medicines (UAEM)

Part of UAEM's mission statement includes ensuring “that university medical research meets the needs of the majority of the world's population.”⁵ As universities are the breeding grounds for breakthrough innovations in treatments for NDs, UAEM empowers students, encouraging them to push universities to fulfill unmet ND R&D needs.

Want to learn more?

1. Trouiller, T. Olliaro, P., Torreele, E., Orbinski, J., Laing, R., Ford, N. Drug development for neglected diseases: a deficient market and a public-health policy failure. *Lancet* 2002; **359**: 2188-94.

This baby highlights reasons for so few new drugs that have been developed in the past many years. It also discusses in detail the gap between public health expenditure in developing countries and the cost of drug R&D, in addition to potential solutions such as PPPs.

References

1. Hotez P, Molyneux D., Fenwick A., Kumaresan J., Sachs S., Sachs J., Savioli L. Control of neglected tropical diseases. *N Engl J Med* 2007; **357**(23): 2407-8.
2. Trouiller, T. Olliaro, P., Torreele, E., Orbinski, J., Laing, R., Ford, N. Drug development for neglected diseases: a deficient market and a public-health policy failure. *Lancet* 2002; **359**: 2188-94.
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5. <http://www.essentialmedicine.org>
6. http://www.who.int/neglected_diseases/en/