

Diseases of Poverty: Neglected Tropical Infections in Sub-Saharan Africa

In an age of vaccines and antibiotics, wonder drugs and breakthrough therapies, it is easy to assume that humans can, and will, develop a cure for anything. Smallpox, one of the most feared and devastating of human diseases, has been erased from the planet. Vaccines once thought to be impossible have been developed and licensed. Ask a ten-year-old about chickenpox, and you will meet a blank stare. In short, humans have never before had such an array of tools to prevent and cure infectious diseases. In 1967, U.S. Surgeon General William H. Stewart declared that it was finally time “to close the book on infectious disease,”¹ because the vast majority can be easily prevented and treated with simple, existing interventions. Malaria is effectively and easily prevented using insecticide-sprayed mosquito nets that cost only five U.S. dollars each; despite this, more than 1 million deaths and over 500 million cases of malaria continue to occur each year. In some countries, treatment of malaria cases accounts for nearly half of all government health spending. The hard truth is that even in our era of vaccines and new drugs, millions of people around the world continue to suffer and die from infections like malaria that are largely forgotten by those living in the richest nations.

These diseases, ignored or forgotten by the developed world, have been grouped in a neat category in the public health world aptly called the neglected tropical diseases. With names like onchocerciasis, leishmaniasis, and lymphatic filariasis, the vast majority of these diseases are viewed as obscure, and are excluded from most international public health projects. Some, such as cholera and leprosy, are seen as diseases of antiquity whose importance vanished with the advent of modern medicine. Others, like malaria, are commonly known, but are considered an inevitable part of life in endemic regions. An extremely diverse group of parasitic, viral and bacterial infections, the neglected tropical diseases are responsible for millions of cases of deformity, chronic disability, and social stigmatization every year. While they differ widely in terms of their impacts on human health, their common link is that these infections are only prevalent in conditions of extreme poverty. They exist in areas with poor sanitation, where

insects and other disease-carrying animals thrive. They persist in areas where people have no political voice and little or no means of accessing essential drugs to prevent and treat such infections. And they continue to spread because the vast majority of their victims are marginalized and forgotten by the people and organizations with the money, technologies, and influence to effect change. The very fact that such diseases only persist in the most impoverished populations has led them to be ignored by both individuals and the majority of institutions in rich countries. As a consequence, they are rarely included in global health initiatives, drug and vaccine development programs, and other disease control efforts. And because the impacts of these neglected diseases are disproportionately thrust upon marginalized populations, there is little incentive for pharmaceutical companies to develop improved drugs or novel vaccines for their prevention and treatment. Of the nearly 1,400 therapeutic drugs developed between 1975 and 1999, less than 1 percent can be used to treat or prevent neglected tropical diseases. Clearly, these infections of poverty have been and continue to be ignored by the wealthiest countries.

The impact of the neglected tropical diseases across the developing world, however, is shocking: one billion people living in low-income countries, comprising a sixth of the world's population, are infected with one or more neglected tropical disease. The majority of those affected live in sub-Saharan Africa, where it is estimated that more than 90 percent of the total impact of death and disability caused by neglected diseases occurs. While the manifestations of each disease are different, most neglected tropical diseases can cause severe pain, suffering, and disability when left untreated, including blindness, deformity, and death. Many neglected tropical diseases can severely limit an individual's ability to work, generate income, or care for their families. This is evidenced dramatically in the case of lymphatic filariasis, a parasitic disease spread by mosquitoes that infects more than 100 million people across Africa, Latin America, and Asia. Although it is easily treated in its early stages by anti-parasitic drugs, untreated lymphatic filariasis can cause intense pain as well as permanent swelling, most commonly of the limbs, referred to as elephantiasis. This leaves its victims not only with profound deformities but also prone to infection with other diseases. Not surprisingly, the victims are also frequently stigmatized by their communities and even abandoned by their families. The effects of disease and disability are

often summed up in terms of total mortality and morbidity. But it is important to recognize that the impact of neglected tropical diseases cannot be evaluated solely in terms of death and disability, but must also take into account the negative social and economic impacts associated with the severely disabled and discriminated victims of these diseases. Such diseases are not only facilitated by conditions of poverty, but also make it virtually impossible for the communities they infect to escape from extreme poverty. In an age of globalization, where interactions and exchanges between humans living thousands of miles apart are considered not only possible but inevitable, the global community has recently recognized the pressing importance of eliminating extreme poverty. While poverty reduction initiatives and development programs are now commonplace in low-income nations, this integral link between development, poverty reduction, and health is still widely ignored. In communities where infectious diseases limit cognitive abilities from the time of childhood, maim, blind, and kill, it is difficult for economic growth to thrive. Nowhere has this impact on economic development been more apparent than in the efforts to control river blindness in sub-Saharan Africa. A parasitic disease spread by the black flies that infest large stretches of rivers in central Africa, river blindness causes severe itching, changes in skin coloring, and, eventually, irreversible visual impairment. While effective treatment for river blindness is inexpensive and safe, the rural African populations most heavily impacted often have no means of accessing therapeutic drugs. Instead, they are forced to abandon millions of hectares of the most fertile farmland in central Africa to avoid the disease-carrying flies. Simple control programs based on mass drug administration and the use of traps to catch the infective flies have allowed more than 25 million hectares of abandoned farmland to be resettled, thus stimulating economic growth and dramatically reducing extreme poverty in such areas.

Despite such successes, the global community has yet to fully recognize neglected tropical diseases as major health priorities. It has, however, pointed to extreme poverty and infectious disease pandemics, such as HIV/AIDS, as priorities for the developed as well as the developing world. The next step is for public health leaders to recognize that improving the health of millions of people in the poorest countries by controlling neglected tropical diseases is integrally linked to our ultimate successes, or failures, in eliminating poverty, HIV/AIDS and other global catastrophes. Not only is such control necessary, it is also perhaps the most cost-effective strategy at our disposal to dramatically improve global health: one US \$0.50 package containing several inexpensive and safe drugs can treat more than 15 types of neglected parasitic infections. If such packages were distributed during mass vaccination campaigns, mil-

lions of people including those living in remote areas could be effectively treated – millions of cases of death, impairment and disability could be prevented. The impact of prioritizing such diseases would certainly be unequivocal in terms of improving human health on a global scale. But it would also be pivotal in the fight against the extreme poverty and political instability that threaten our modern world. If the wealthiest nations recognize that a nation's health is integral to its economic development, stability, and contribution to the global community, then they must accept that the health of the poor impacts the health of the wealthy – and vice versa. And they must also recognize that addressing the neglected diseases of poverty is a critical first step in solving the most fundamental global health challenges of our era.

Footnotes:

- 1 Francis, Leslie P., et al. "How Infectious Diseases Got Left Out – And What This Omission Might Have Meant for Bioethics." *Bioethics*. 19 (2005): 307.