

Reflection & Reaction



Drugs for neglected diseases

Recent global partnership initiatives have focused on stimulating further interest in the development and provision of drugs for the world's top three killer infectious diseases: AIDS/HIV, malaria, and tuberculosis. The "most neglected" diseases (where there are no affordable, effective, easy to use medicines available) continue to cause significant morbidity and mortality in developing countries. A series of articles in this journal will outline research and development priorities for three neglected diseases prevalent in the developing world: human African trypanosomiasis (sleeping sickness) in this issue (see page 437), visceral leishmaniasis (kala azar) in August, and malaria in September.

Only 10% of expenditure on health research is on those diseases that account for 90% of the global burden of disease.^{1,2} Existing treatments for killer infectious diseases are increasingly ineffective due to poor diagnostic options, growing drug resistance, unaffordability, poor distribution, and inadequate health systems. Lack of scientific knowledge is not the major barrier to drug development—more is known about the biology, immunology, and genetics of leishmania and trypanosomes than any other parasites.³ Nor does the gap lie with technology, which has greatly benefited from recent advances. Policy issues seem to be the main obstacle to the translation of this knowledge into actual benefit for patients.

While basic science research takes place in the university or government laboratories, drug development is done almost exclusively by the pharmaceutical industry ("pharma"). The selection of promising candidate drugs by pharma is based on potential profits for the company and its shareholders, not global public health concerns. This system obviously fails the needs of poor countries.

Sleeping sickness drugs were developed during colonial times. Malaria causes over 2 million deaths every year, yet antimalarial drugs were

made primarily for the colonial administration, western tourists, and the military. Drug research and development for tropical diseases is at a virtual standstill. The past two and a half decades have seen pharma develop only four new drugs, out of 1223, for the treatment of tropical diseases² responsible for millions of deaths annually: atovaquone/proguanil and artemether for malaria, and eflornithine and nifurtimox for sleeping sickness. Atovaquone was originally indicated for *Pneumocystis carinii* pneumonia; eflornithine was a by-product of cancer research and was withdrawn from production between 1995 and 2000 because of non-profit; and nifurtimox was originally developed for veterinary use.

The public-private partnership (PPP) model is increasingly being favoured for improved access to drugs and to stimulate discovery of easy to use, affordable, effective drugs. For example, this model has been extremely successful in the campaign against river blindness (onchocerciasis) in west Africa. Why did this campaign for one specific disease work while other equally important diseases remain neglected? High-profile advocacy in the west by former US President Jimmy Carter's "Carter Foundation", in concert with the WHO's Tropical Diseases Research programme, political support and co-operation of west African governments, non-government organisations, and other charities, and the generosity of Merck's donation of ivermectin all contributed to its success.

The success of the onchocerciasis-control programme indicates that effective PPPs are possible. However, significant private sector input into diseases like sleeping sickness, Chagas disease, and kala azar, for which a global market is non-existent, seems unlikely. To ensure sustainable development of, and equitable access to, drugs for tropical diseases, the public sector must play a much greater part.

A crucial first step is to define a needs-driven research and

development agenda to assist policy makers, funding agencies, and the research community in setting priorities to address effectively the needs of developing countries. Too often, scarce resources are spilled in highly fragmented activities that do not necessarily correspond to what is most urgently needed. In addition, the specific requirements that must apply to tropical diseases—for example, ease of use and affordability—are not always adequately considered. Public sector responsibility and greater leadership is essential. Developing country governments must show greater commitment and root out corruption, and western governments must devote far more resources towards neglected diseases, both to actively undertake research and development activities, and through development aid to build upon existing research and development capacity in the less-developed world, where a shift in research priorities is also required.⁴

Distances and differences have shrunk in the face of globalisation making the world a global village, and self-interest alone should be enough to make us all morally obliged to be seriously committed to interrupting the poverty-disease cycle affecting the poorer sections of the world.^{5,6}

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