6 Cost effective means of fighting the diseases of poverty

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This chapter considers the cost-effectiveness of existing strategies for addressing the diseases of poverty promoted by the WHO and other intergovenmental organisations and compares these to other possible strategies. The first half examines the UN's response to HIV/AIDS and malaria. The second half looks at what might be done to tackle those diseases of poverty which have a lower political profile but nonetheless constitute a significant proportion of the disease burden of less developed countries – diarrhoeal diseases, acute lower respiratory infections and diseases associated with malnutrition.

HIV/AIDS: The WHO's '3 by 5' treatment plan

In September 2003, the World Health Organisation announced that it would ensure that by the end of 2005, 3 million HIV-infected people would be on anti-retroviral treatment. Since then, many billions of dollars have been spent attempting to achieve that goal. However, by December 2005, only 1.3 million people

Table 1 Doctors and nurses available and people living with HIV/AIDS for selected sub-Saharan countries

	Medical doctors per 100,000 pop	Nurses per 100,000 pop	PLWHAs (thousands)	Total population (thousands)	PLWHAs per 100,000 population	PLWHAs per medical doctor	PLWHAs per nurse
Malawi	1	26	900	12,105	7,435	7,435	286
Mozambique	2	21	1,300	18,863	6,892	3,446	328
Zimbabwe	6	54	1,800	12,835	14,024	2,337	260
Tanzania	2	37	1,600	36,977	4,327	2,164	117
Rwanda	2	21	250	8,387	2,981	1,490	142
Zambia	7	113	920	10,812	8,509	1,216	75
Swaziland	18	320	220	1,077	20,427	1,135	64
Botswana	29	241	350	1,785	19,608	676	81
Uganda	5	54	530	26,699	1,985	397	37
South Africa	69	388	5,300	45,026	11,771	171	30

Source: adapted from http://www.who.int/globalatlas/default.asp & http://www.who.int/hiv/universalaccess2010/en/

had access to these drugs – representing only 43 per cent of the WHO target of 3 million people by the end of 2005 (UNAIDS, 2006). In sub-Saharan Africa, only 11 per cent of those who needed treatment were receiving it in June 2005 (UNAIDS/WHO, 2005a).

Depressingly, the failure of the initiative was entirely predictable. The necessity of reaching its ambitious target led the WHO to scale up treatment despite the manifest absence of workable health infrastructure in the worst afflicted countries. The overwhelming majority of people living with HIV/AIDS (PLWHA) are in sub-Saharan Africa, where public health systems are fragmented, dilapidated or nearly non-existent. Most countries in the region lack sufficient qualified health workers and doctors, not to mention pharmacies, clinics and doctors. Figure 1 shows that some of the worst afflicted countries also have the fewest medical professionals.

Antiretroviral drugs are complex to administer, requiring specified regimens and oversight by knowledgeable professionals and testing equipment, both of which are in short supply in most of Sub-Saharan Africa. Seen in this light, the WHO's decision to push its mass treatment initiative as the key to solving the AIDS crisis was a gross strategic error. Without sufficient staff and facilities, there is a substantial risk that inappropriate doses will be handed out to patients, and patients will not adhere to regimens. This raises the spectre of resistance, which has the potential to render many of the currently available treatments ineffective (Blower et al., 2003). Samples taken before 1996 showed about 5 per cent drug resistance to existing HIV strains, rising to at least 15 per cent between 1999 and 2003. This all implies significant extra costs as drug-resistant patients have to be moved onto expensive second-line and third-line therapies (REF).

It is unlikely that the governments of these most afflicted countries, with a good knowledge of their infrastructural and human resource constraints, would have imposed such ambitious ARV treatment targets on themselves – indeed, the WHO never consulted or asked for approval from member states when it launched "3 by 5" in December 2003. Many extremely poor countries have enormous

difficulty delivering simple vaccines and essential medicines to their populations, let alone delivering and monitoring complex ARV regimes.

Meanwhile a variety of factors – including the mismanagement of funds, inefficiency, waste, expensive technical assistance and corruption within recipient governments – has meant the cost of treating a developing-country patient for two years ballooned to $12,538 by the end of 2005 – nearly 10 times the $1,633 initially estimated by UNAIDS. Such inflated costs will be unsustainable if the UN is to meet its current target of placing 10 million PLWHA on ARV treatment by 2010.

It is not even clear that the WHO's efforts directly led to the achievement of 1.3 million on ARV treatment by the end of 2005, not least because many of the countries that have been most successful in scaling up treatment – such as Thailand and Brazil – were already running successful treatment programmes independent of WHO advice. Furthermore, it is recognised that by the end of 2005, some 716,000 people were receiving ARV treatment independently of "3 by 5" through the Accelerating Access Initiative, a partnership between the UN and several pharmaceutical companies.[14]

Prevention

Leading public health experts are virtually unanimous in concluding that prevention is of paramount importance in the fight against AIDS (Salomon et al., 2005). However, by making itself publicly accountable to meeting such ambitious treatment targets, the WHO has been forced to devote far more resources to treatment at the expense of prevention.

The overriding focus on treatment was one result of the 2000 international AIDS conference in Durban, South Africa. At about this time, advances in medical science were making AIDS in the west a manageable (but not curable) condition, as opposed to the automatic death sentence it was a few years previously. Health activists

thought – not unreasonably – that if American AIDS patients could get the miracle drugs, why shouldn't people in poor countries? Previously, international agencies had focused on prevention out of a desire to contain the pandemic, but also because ARV therapies were too expensive. However, after voluble and emotive campaigns from AIDS activists following the Durban AIDS conference, governments and global agencies reoriented their strategies towards favouring treatment.

One outcome of this lobbying by pressure groups was the creation of the WHO's flagship "3 by 5" programme. But the presumption towards treatment has been further institutionalised by the creation of the President's Emergency Plan for AIDS Relief (PEPFAR) in 2003, which has been required by the US Congress to dedicate 55 per cent of the US $15 billion five year budget for HIV to treatment of individuals with HIV/AIDS. In financial years 2006 through to 2008, 75 per cent of those funds are to be spent on the purchase and distribution of antiretroviral drugs, with only 20 per cent of all funding to be spent on prevention.[15]

The prioritisation of treatment over prevention has had significant opportunity costs, by not curtailing new infections and increasing the pool of people with the potential to transmit the virus. The UN's own statistics indicate that more people became infected with HIV in 2005 than ever before, with an estimated additional five million new infections worldwide. The number of people living with HIV globally has also reached its highest level ever. By the end of 2005, global HIV prevalence had risen to an estimated 40.3 million people (UNAIDS, 2006), from a figure of 34.9 million in 2001 (UNAIDS, 2004). 4.1 million people were infected in 2005 alone, an increase from 3.9 million in 2003. According to UNAIDS, HIV prevalence is increasing in South Africa, China, Indonesia, Papua New Guinea, Vietnam, Bangladesh and Pakistan. While prevalence rates in many sub-Saharan African countries seem to be stabilising, very few countries are experiencing significant declines in prevalence (UNAIDS, 2006). Figure 2 illustrates the increasing numbers of infections globally.

Table 2 **Regional HIV and AIDS prevalence and infection
rates, 2003 & 2005**

Region	*Adults and children newly infected with HIV*	*Adult (15–49) prevalence (%)*
Sub-Saharan Africa		
2005	2,700,000	6.1
2003	2,600,000	6.2
North Africa and Middle East		
2005	64,000	0.2
2003	54,000	0.2
Asia		
2005	930,000	0.4
2003	860,000	0.4
Oceania		
2005	7,200	0.3
2003	9,000	0.3
Latin America		
2005	140,000	0.5
2003	130,000	0.5
Caribbean		
2005	37,000	1.6
2003	34,000	1.5
Eastern Europe and Central Asia		
2005	220,000	0.8
2003	160,000	0.6
North America, Western and Central Europe		
2005	65,000	0.5
2003	65,000	0.5
TOTAL		
2005	4,100,000	1
2003	3,900,000	1

Source: UNAIDS, 2006.

This failure has been underplayed and deflected by WHO, which has justified the failure of its "3 by 5" programme on the grounds that it has galvanised further efforts towards achieving universal access to treatment, and has demonstrated the feasibility of providing HIV treatment even in the poorest parts of the world (UNAIDS, 2006).

However, the shortcomings of this strategy have been highlighted by a little-publicised external evaluation document commissioned by WHO following the end of the "3 by 5" programme. As the document states, "HIV prevention efforts are not containing the pandemic, since some 4.9 million more people became infected with HIV during 2005." The document continues:

> *HIV prevention has been a technical area within the "3 by 5" initiative that has received relatively little investment and effective prevention interventions, such as the prevention of mother–to-child transmission of HIV, were not properly prioritised"* (WHO, 2006b).

The WHO's focus on treatment has therefore allowed the pandemic to become even more out of control. In countries that have pursued active and sustained HIV prevention strategies, the numbers of infected people has generally decreased, thereby reducing both the economic burden of caring for PWLHA, as well as reducing the potential human tragedy of a worsening AIDS pandemic. In Uganda, one of the few countries in sub-Saharan Africa where HIV prevalence has fallen in the last decade, education played the key role. The country's ABC programme ('Abstain, Be faithful, or Condomize') emphasised the risks of casual, unprotected sex, and has had a dramatic effect on patterns of sexual activity, contributing to an 80 per cent reduction in HIV prevalence (Singh et al., 2003). Brazil and Thailand have also managed to reverse the spread of HIV through early prevention efforts. More recently, there is some evidence the decline of HIV prevalence in Cambodia, Zimbabwe, and in areas of Tanzania, Haiti, Kenya and Burkina Faso are partly due to HIV prevention efforts (UNAIDS, 2005b).

An increasing body of evidence shows how the expansion of prevention programs could save millions of lives. One study calculates that if prevention programmes are scaled up sufficiently, 28 million new HIV infections could be averted between 2005–2015. As well as preventing an impending human tragedy, this would also generate significant cost savings. Although the authors estimate that it would cost $3,900 to avert each infection, this would save $4,700 in treatment and care costs for each individual, resulting in savings of $780 per infection averted (Stover *et al.*, 2006). Furthermore, this paper also demonstrates that the data reveals that a lack of attention to prevention between 2001 and 2005 has resulted in a huge missed opportunity to save lives; indeed, as of 2003 prevention services were only partially available globally.

Even if HIV prevalence is brought under control, we are still left with the issue of how best to distribute antiretroviral drugs to infected patients. A remarkably successful public private partnership in Botswana between the Gates Foundation, several western drug companies and the government offers some lessons. This initiative involved the construction of clinics to distribute high-quality antiretrovirals, while schools and colleges have undertaken public education programmes (Ramiah & Reich, 2005). Botswana now has more people on ARV treatment than any other country in sub-Saharan Africa and is the only such country to provide free treatment for all.

Private philanthropy can be an effective stop-gap measure. In the medium to long term, however, Africa needs self-sustaining, efficient health-care systems that allow effective distribution of life saving medicines, as well as the propagation of vital health education.

Malaria

In order to combat the global malaria problem, the WHO and associated agencies kicked off an ambitious plan to 'Roll Back Malaria' (RBM) in 1998, with the goal of halving malaria incidence by 2010.

It proposed to achieve this by a combination of judicious use of medicines and the distribution of insecticide-treated bed nets.

Seven years in, there are some indications that the global malaria problem is not improving and may be getting worse. Although problems associated with collecting accurate data make it difficult to determine precisely how many people suffer from malaria, in 2002 an external evaluation of RBM set up by the WHO said:

> *Anecdotal evidence and the strong consensus among experts suggests that, at the very least, the malaria burden has not decreased. What is more likely, and believed to be the case by most of those involved, is that malaria has got somewhat worse during this period.* (Malaria Consortium, 2002)

More recently, scientists from the University of Oxford suggested, on the basis of improved measurements, that more than half a billion people – nearly double previous estimates – were infected by the deadliest form of malaria in 2002 (Snow et al., 2005). Clearly, the Roll Back Malaria campaign is failing to achieve its stated goal.

But the real tragedy is that malaria might be far less of a problem today if the WHO had adopted a different strategy from the beginning. An important part of such a strategy would have included spraying the inside walls of residential buildings with insecticides such as DDT. Remarkable control was achieved in the 1950s and 60s, even in regions where transmission rates were unusually high. But since the cessation of such activities the disease has returned to many such areas, often with devastating impact on human mortality. Residual treatments are far more effective than using bednets, but have been rejected because of environmental concerns. Such indoor residual spraying (IRS) helps prevent mosquitoes from entering dwellings and it repels or kills those insects that do manage to enter. Because it minimises the chances of humans being bitten, IRS effectively prevents the transmission of the malarial parasite, which makes it an excellent tool for preventing the spread of the disease. In the years following World War II, the WHO put DDT at the

centre of its malaria eradication plan, saving an estimated 50 to 100 million lives through prevention alone (Roberts et al., 1997).

Many countries have tamed malaria through IRS with DDT (Roberts et al., 2000). India, for example, started a nationwide programme of IRS with DDT in the 1960s. In that decade, India deployed around 18,000 tonnes of DDT and reduced malaria cases from 75 million per year to less than 100,000. Unfortunately, the caseload increased significantly when the use of DDT was reduced in subsequent decades (Sharma, 1987).

More recently, Namibia, Botswana, Mozambique and South Africa have been somewhat successful in reducing the incidence of malaria through IRS programmes utilising DDT and alternating with other pesticides (Baird, 2000). Uganda is determined to utilize this powerful tool, despite potentially being threatened with trade sanctions by the EU.[6]

Over the last few decades, however, the WHO has discouraged the use of DDT in member states – encouraged by environmentalists, who have often massively overstated the negative effects of DDT on human and animal health (Roberts et al., 2000). Until recently, most Western aid agencies discouraged the use of DDT and indoor residual spraying generally, and the WHO has provided little financial assistance to those governments that wish to go down this route.

Recently, however, USAID has re-evaluated its support of IRS, deciding to allocate more funding to such projects. The WHO also undertook something of a *volte face* in November 2005, when it announced that IRS with DDT would form a key plank of its Roll Back Malaria programme. In September 2006, the WHO announced that it would henceforth strongly recommend to member states the use of DDT for IRS.

In terms of prevention, the WHO's Roll Back Malaria strategy has largely focused on the distribution of insecticide treated bednets, claiming that they provide the most effective means of vector control. It has historically funded bednets almost to the exclusion of other preventative measures.

While bednets may have a role in preventing transmission of malaria (Premji et al., 1995; Philips-Howard et al., 2003), they are far from perfect, particularly in the poorest areas where they are most needed but can only be obtained at considerable expense. Mosquitoes tend to be most active in the hottest parts of the year, and few people relish the thought of covering themselves in a net during these hot nights. In certain parts of Africa, people are reluctant to sleep in nets because they resemble a shroud. People also often misuse bednets, with enterprising individuals using them as fishing nets. Even when bednets are used properly they are a far from perfect barrier, not least because mosquitoes, being opportunistic, will take advantage of any occasion when a person happens to get out of bed during the night (Bean, 2001; Choi, 1995).

Bednets also face the hurdle of effective distribution. While public health authorities in many parts of Africa find it difficult to distribute routine and simple vaccines and treatments, so too are they failing to get the nets out to all people who need them. These problems are compounded by the fact that the nets need to be retreated with insecticide every three months, or else they lose much of their utility.[17] According to one study, fewer than five per cent of children in malarial areas currently sleep under a bednet (Hamel et al., 2001).

Indoor residual spraying alone is not enough. The most successful malaria control strategies have been those which have combined indoor spraying with education campaigns to encourage people to eliminate breeding sites, such as used tires which can collect stagnant water, and changes in the management of animals in order to reduce the proximity of these malaria parasite reservoirs to people.[18]

In combination with these strategies, prophylactic drugs can play an important role in reducing the pool of malaria parasites in the human population and thereby reduce transmission rates. This is especially important for the most deadly species of human malaria parasite, *Plasmodium falciparum*. In addition, effective drug treatment can help to reduce the number of deaths.

However, the WHO has also mishandled treatment recommendations. Until as recently as 2004, it advocated the use of chloroquine in Africa, even in the face of increasing resistance to that drug by the *P. falciparum*. This was despite the existence of a far more effective – albeit more expensive – alternative, Artemisinin Combination Therapy (ACT). In fact, the WHO recognised the benefits of ACT and named it a central plank of its RBM strategy, only then to approve the use of the nearly useless chloroquine in many African countries because it is cheaper (Attaran et al., 2004). The WHO only recently started heeding its own advice and properly approving ACT after it came under pressure from malaria experts and the international press. But in part because of the abruptness of WHO's belated change in strategy, artemisinin supply is now unable to keep up with increased demand.

Clearly, the availability of appropriate and effective medicines is of great importance to helping those already infected with the malarial parasite. However, sensible and wide-scale prevention techniques could remove much of the need for medication, largely because there would be far fewer infections in the first place. Reducing the prevalence of malaria would then free up considerable resources for the purchase of the most effective, modern medicines and avoid debacles such as occurred with RBM and chloroquine.

Diarrhoeal diseases

Diarrhoeal diseases are one of the major causes of premature childhood deaths in lower-income countries. According to the World Bank, three million children die every year from cholera and other water-borne diarrhoeal disorders (World Bank, 2002). Much suffering could be averted with effective use of treatments such Oral Rehydration Therapy (ORT). In addition, antibiotics could be used to eliminate more serious bacterial infections. Finally, vaccines have been and are being developed against viral causes of diarrhoea, such as rotavirus; if these vaccines were deployed widely, the incidence of such diseases could be reduced

dramatically. In the case of rotavirus, a vaccine could prevent some 500,000 childhood deaths annually.[19] Unfortunately, at present even inexpensive treatments such as ORT do not reach those most in need (Rao et al., 1998).

Another, more fundamental approach to controlling these diseases focuses on improving the quality of drinking water. Currently, water resources in most countries are owned and controlled by the state (typically municipal governments). Yet in poor countries, the state has shown itself to be a very poor provider of water, with some respite from dry or non-existent taps being provided by informal private suppliers (Okonski, 2006). Where ownership and/or management have been transferred to the private sector, access has typically improved considerably, as has been shown for Chile (Rosegrant & Gazmuri, 1994), Argentina (Galiani et al., 2003) and Guinea (Menard and Clarke, 2000; Noll et al., 2000; Brook Cowen, 1999). In Argentina, in particular, there is strong evidence that privatisation of supply has led not only to improved access but also to reduced incidence of water-borne disease, especially in the poorest districts (Galiani et al., 2003).

Finally, much could be done to improve sanitation in poorer countries, including improvements in sewerage. In addition, this means educating people to use soap and other cleansing agents. Such education could in principle be provided by the private sector – for example, by companies who have a material interest in selling soap – but this is often inhibited by a political environment hostile to commercial enterprise.

Acute lower respiratory infections

Another major contributor to premature deaths in lower-income countries is acute lower respiratory infections (ALRI). One of the leading causes of such infections is inhalation of smoke from dirty energy sources such as wood, dung and crop residues burnt in poorly ventilated dwellings. Exposure to such smoke increases the risk of ALRI (such as pneumonia), especially in children and women.

This problem afflicts up to half of the world's population, almost entirely in the poorest countries. Globally, ALRI represent the single most important cause of death in children under five years of age, and contributes to approximately two million deaths annually in this age group (Bruce et al., 2002).

Thus, if the poor were able to use more efficient, cleaner forms of energy, the positive impact (in terms of reducing the global disease burden) would be immense. Unfortunately, governments tend to restrict the ability of people to use cleaner fuels and technologies such as electricity, liquefied petroleum gas (LPG) or even kerosene. The impact of these restrictions falls primarily affects poorer households, who must then resort to burning wood, low-grade coal, crop residues and animal dung, which in turn exacerbates both indoor and local air pollution.

In India, for instance, the country's 2001 census revealed that less than 44 per cent of households have an electricity connection (Goswami, 2004). Because the national and state governments have intervened extensively in the supply of electricity, the country has an artificial shortage – so merely possessing an electricity connection does not mean that a household actually receives electricity.

Policies of the Indian government have also contributed heavily to a shortage of petroleum-based fuels in the country, which particularly affects the rural poor. Kerosene is subject to government rationing. Only two government-run companies in India supply LPG – thus, these companies are not competing in a dynamic, competitive market. Although LPG production is in principle subsidised by the state, it is unclear whether these subsidies are passed on to consumers (in the form of lower costs) or whether the companies inflate their production costs (thus absorbing the subsidy). Moreover, there is little if any distribution network for LPG – so private suppliers are unlikely to enter the market. This explains why rural access to LPG is extremely low; India's 2001 census revealed that fewer than 10 per cent of rural households utilize LPG (Goswami, 2004).

These examples show why government policies towards can

have harmful side effects for health – contributing directly or indirectly to the prevalence of ALRI in poor countries such as India.

While prevention is almost certainly preferable to cure, there are also many inexpensive medicines that can be used to treat pneumonia and other ALRI. However, these often are not available.

Diseases associated with malnutrition

Poor nutrition contributes to 53 per cent of deaths associated with infectious diseases among children under five years of age in lower-income countries (Black et al., 2003). Many cases of malnutrition could be prevented if people were able to produce and distribute food more efficiently, yet in Africa especially this has been difficult because of weak property rights.

In agrarian communities, strong property rights enable more efficient farming practices. First, the ability freely to buy and sell land means farmers are better able to achieve economies of scale. Second, clearly defined property rights enable land owners to access low-cost capital, in the form of mortgages, that otherwise would not be available. Such loans enable people to invest in more capital-intensive forms of production, both on farm and off. The result is higher yields, greater investment – and profit from – non-farm forms of economic activity, and generally an increase in wealth.

In addition to improving the efficiency of agricultural production, many technologies exist that could help improve this situation. One such technology – biofortification – entails breeding specific traits into a plant such that it produces and contains essential micronutrients that can be utilized by the human body.

One example of biofortification is Golden Rice, which was developed as a humanitarian project to address Vitamin A deficiency. This deficiency kills at least 6,000 children every day and leads to irreversible blindness in 500,000 children each year (WHO, 1995). Traditional interventions such as the distribution of vitamin A capsules by the WHO are helpful but have not substantially reduced these figures.

In 1999, a 15-year project culminated when two teams of

European scientists successfully modified the starchy tissue of rice (the part consumed by humans) to produce pro-Vitamin A (the chemical that is converted into Vitamin A in the body).

However, activists who are opposed to GM foods more generally objected that the fortified rice, when eaten in normal quantities, would not provide a poor person with the necessary levels of dietary Vitamin A. However, a new strain of the rice (Golden Rice II) has been developed that would provide 23 times more pro-Vitamin A compared to Golden Rice I, effectively solving this problem (Paine et al., 2005).

Since 1999, the inventors of Golden Rice have sought to transfer the benefits from this technology to the poor in lower-income countries – e.g. the people for whom it was intended. Governments and charities were able to finance the entire project research, but not the subsequent development and regulatory stages. Attempts to take Golden Rice to its next phase, with field trials and tests for nutritional compatibility in individual countries, have been thwarted by an overly precautionary approach by regulators, fuelled by the sentiments and actions of activists. The same fate befalls many other genetically modified crops (Paarlberg, 2006).

The field trials have been delayed because opponents of Golden Rice insist that the plants must pose no risk to the environment. For humanitarian projects, such barriers create unnecessary expense and delay. This is not to suggest that Golden Rice should be exempted from normal regulatory procedures. The problem is that regulators have focussed on hypothetical and mostly non-existent risks rather than reasonably assessing the actual risks alongside the real benefits, in particular, the potential to immediately reduce Vitamin A deficiency and thereby save human lives. As a result, researchers will be less inclined to use biofortification to solve other micronutrient problems – such as iron, protein and zinc deficiency.

Conclusion

In tackling diseases of poverty such as malaria and HIV/AIDS, global public authorities such as the WHO have a track record of prioritising grandiose but unachievable schemes over more practical approaches. Billions of dollars have been spent in recent decades, with little discernible impact on mortality rates.

In the context of HIV/AIDS, intervention by the WHO seems to have exacerbated the problem by neglecting prevention in its aspiration to achieve 'treatment for all,' with the result that new infections are soaring.

In the context of malaria, public health experts have long advocated indoor residual spraying with insecticides such as DDT, yet the WHO and aid agencies have until recently provided little practical support for those nations wishing to adopt this practice. The failure to date of the WHO's Roll Back Malaria programme also reveals the limitations of the argument that intellectual property rights are standing in the way of improving human health. The price of patented drugs has little (if anything) to do with the failure of public health agencies to reduce the impact of the disease. RBM failed because WHO was responsive to special interest groups whose concerns seemingly had no relationship to actions which would actually improve the lives of the poor.

The burden of both HIV/AIDS and malaria could be significantly reduced with sensible prevention strategies and careful treatment programmes. While new medicines for these diseases would obviously be beneficial, in order to address the inevitable development of resistance to available treatments, we must recognise that effective distribution of those treatments will be practically impossible until the physical and human aspects of health infrastructures are improved.

The cases of ALRI and diarrhoea reinforce the fact that there is a need for greater focus and more appropriate strategies in tackling all the diseases of poverty. Policies pursued by intergovernmental agencies, national governments, and humanitarian charities would benefit from an improved understanding of the

root causes of extreme poverty and ill health. In this regard, a growing body of literature implicates corruption, weak or non-existent rule of law and limits on economic freedom (see e.g. Greenspan, 2003; Gwartney & Lawson, 2004; Kasper, 2006). The reform of governance structures must therefore be a priority; that means strengthening property rights, liberating markets and entrenching the rule of law.

Admittedly, the reform of governance in sovereign states is outside the bounds of WHO policy. But the fact that so many African governments are corrupt and ineffective does not excuse the WHO from promulgating the disastrous strategies it has followed. Indeed, the very fact that health infrastructure is so weak in the world's poorest countries makes many of these strategies all the more absurd.