

Health and Human Rights 3

Neglected diseases, civil conflicts, and the right to health

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Neglected diseases remain one of the largest causes of disease and mortality. In addition to the difficulties in provision of appropriate drugs for specific diseases, many other factors contribute to the prevalence of such diseases and the difficulties in reducing their burden. We address the role that poor governance and politically motivated oppression have on the epidemiology of neglected diseases. We give case examples including filariasis in eastern Burma and vector-borne diseases (Chagas disease, leishmaniasis, and yellow fever) in Colombia, we show the links between systematic human rights violations and the effects of infectious disease on health. We also discuss the role of researchers in advocating for and researching within oppressed populations.

Introduction

The group of tropical infectious diseases, including protozoan infections, helminths, and other diseases such as leprosy and trachoma, that are prevalent in the world's least developed nations are known as the neglected diseases.¹ Neglected protozoan infections include leishmaniasis, Chagas disease and African trypanosomiasis. Helminth infections include lymphatic filariasis, ascariasis, onchocerciasis, dracunculiasis, and schistosomiasis.¹ Estimates of worldwide disease burden ranked the total burden in DALYs of these diseases as fourth after lower respiratory infections, HIV/AIDS, and diarrhoeal diseases. They were ranked higher than malaria, tuberculosis, and measles.¹

The neglected diseases are burdens of forgotten populations—diseases of the poorest of the poor—and generally do not affect developed countries, thus are largely ignored by medical science.² Although poverty has certainly contributed to the propagation of neglected diseases, evidence is mounting for associations between increased prevalence of these diseases and conflict and systematic violation of human rights. Such situations also tend to disproportionately burden the poorest people in society and could increase the risk of further neglect. In a study in 1996 of the re-emergence of African trypanosomiasis as a result of civil war in the Democratic Republic of the Congo, Ekwanzala et al,³ recorded that cases peaked at more than 30 000 a year in 1930, but had declined to 1000 a year when independence was achieved in 1960. However, in the corrupt and violent decades of the Mobutu dictatorship, cases rose to more than 10 000 a year and during the prevailing social chaos in 1991–94, cases peaked at 34 400 a year in 1994, the highest rate reported in the 20th century. The authors concluded that government neglect brought about an increase in the number of infectious people, an increase in transmission, and higher costs and toxicity of treatment due to an increase in late-stage cases presenting for medical treatment. A 2003 report of emergent visceral leishmaniasis in an area of civil conflict in Somalia identified high rates of

infection associated with both the conflict itself and its consequent food insecurity.⁴

Addressing neglected diseases in war zones has specific challenges related to the nature of these settings and the social ecology of these infections; conflicts can break down community-health infrastructures and restrict access to health care.⁵ Worries about security in conflict areas can hamper outbreak investigations, disrupt surveillance, and reduce donor interest in research.⁶ These conditions result in the continued neglect of these diseases, and people who have these infections are further marginalised. People working in or advocating for health and social justice agree that we cannot ignore these conditions, thus the barriers to implementation of effective programmes for prevention and treatment of disease in conflict settings need to be recorded, analysed, and understood.

Case studies might help investigation of the relations between neglected diseases, human populations and regions at war. We report on lymphatic filariasis infections with *Wuchereria bancrofti* in the conflict zones of eastern Burma and vector-borne infections with *Trypanosoma cruzi* (Chagas disease), leishmaniasis, and yellow fever in Colombia. These cases show how war can maintain the neglected status of such diseases, and undermine attempts at disease control.

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Medics and volunteers in Burma transport a patient in a makeshift stretcher

Lancet 2007; 370: 619–27

This is the third in a *Series* of four articles about health and human rights

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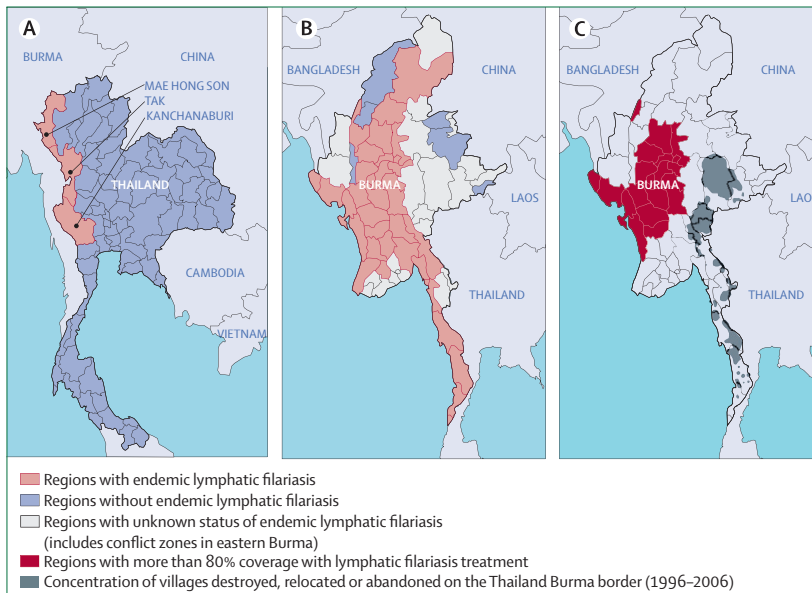


Figure: Distribution of lymphatic filariasis due to *Wuchereria bancrofti*
 (A) Areas with endemic lymphatic filariasis in Thailand, 2004. (B) Distribution of lymphatic filariasis in Burma; (C) Mass drug dosing to treat lymphatic filariasis in Burma, 2004. Eastern Burma has no drug dosing programme activity. Conflict zones in (C) drawn from data provided by the Thailand–Burma Border Consortium. Reproduced from reference 23 with permission.

Eastern Burma

The eastern frontiers of Burma are mostly inhabited by ethnic minority groups who have been engaged in civil war with the Burmese military regime for more than 40 years. These conflict areas have also faced the brunt of the Burmese counter-insurgency strategy, known as the Four Cuts Policy, in which civilians are forcibly displaced, used for forced labour, extorted, and often killed to terrorise the population and reduce support for ethnic insurgents.^{7,8} The conflict has led to a longstanding humanitarian crisis, in which an estimated 600 000 to 1 million people live as internally displaced persons, and more than a million more Burmese are estimated to have fled across international boundaries, most to Thailand.^{9–11} The health and humanitarian situation in eastern Burma is a complex humanitarian crisis that has led to a high prevalence of many infectious diseases including HIV, multidrug-resistant tuberculosis, malaria, and recrudescing lymphatic filariasis.¹²

Lymphatic filariasis remains a prevalent neglected disease, with more than 1·1 billion people in more than 83 countries at risk of infection.¹³ About 120 million people worldwide are infected, and more than 40 million people worldwide have become disfigured and disabled as a result of the infection.^{13,14} In India, home to about 40% of infected people, the costs of treatment and lost productivity are almost US\$1 billion every year.¹⁵ Filariasis affects the poorest of poor people; and those who bear the heaviest burden of disease are likely to encounter increased poverty because of their illness.^{14–16} Worldwide, roughly 90% of infections are due to

Wuchereria bancrofti, which is transmitted by several species of mosquitoes including *Culex*, *Anopheles*, and *Aedes*.^{13,17} Effective control relies on interruption of the infection cycle by reducing the numbers of microfilaria in serum, which is generally accomplished by giving one dose of diethylcarbamazine and ivermectin (or diethylcarbamazine, ivermectin, and albendazole if onchocerciasis is also endemic) to as many people as possible (preferably 80–90%) in communities at risk. This dosing strategy is repeated yearly for 4–6 years; it is simple and inexpensive, costing less than US\$1 per person per year—few public-health measures are as cost-effective, especially ones designed for the poorest communities.^{14–16,18,19} The International Task Force for Disease Eradication named filariasis as one of six diseases that could be eradicated, because of its large disease burden and the availability of cost-effective prevention and treatment methods.^{20,21} Subsequently, WHO issued resolution 50.²⁹ in 1997 calling on all member states to eliminate lymphatic filariasis.²¹

Case study: lymphatic filariasis

By implementing mass drug dosing in endemic areas, Thailand has almost eliminated transmission of filariasis; cases are now mainly confined to three provinces, Tak, Mae Hong Son, and Kanchanaburi, all of which lie along Thailand's border with eastern Burma (figure).^{22–24} By contrast, filariasis remains highly endemic in Burma.²⁵ 2 million cases of filariasis in Burma are reported to WHO every year; although this figure is probably an underestimate, because the situation in the border and ethnic minority zones is unknown (figure).^{25,26} However, we do know that these areas do not have effective mass drug dosing programmes (figure).²⁵ The absence of treatment is not a case of poverty or want of resources alone; Burma is ruled by a military regime that has one of the world's worst human rights records.²⁷ The ruling junta spends less than 3% of national expenditures on health, but higher than 40% on their military.⁷ The military government has actively reduced funding for its filariasis control programme: Burma's National Programme to Eliminate Lymphatic Filariasis (PELF) annual report for 2004, submitted to the WHO, noted "There is decrease in budget source in 2004. WHO biennium budget for [Programme to Eliminate Lymphatic Filariasis] is only 6000 US\$."²⁵ This figure is the total budget for that year from all sources, and no earlier figures are available to establish what this budget had decreased from. Thailand's national budget for filariasis control is about \$500 000. No areas of the country are unsurveyed and in 2002, only 185 new patients were reported to the Thai Ministry of Public Health.^{24,28}

Cross-sectional surveys of Burmese migrant populations studied in Thailand show filariasis rates reaching 10%, and another 40% of migrants show

serological evidence of previous exposure to *Wuchereria bancrofti*.^{23,29} Most received no treatment in Burma.^{29,30} Increasingly, migrants from Burma venture beyond the border zones to the main inland Thai cities to find work.^{23,29} Because most of these migrants are undocumented, the number of people at risk of filariasis and thus eligible for diethylcarbamazine treatment is unknown, commonly resulting in delays in treatment.³⁰ Strains of the *Culex quinquefasciatus* mosquito are prevalent in urban Thailand and are capable of transmitting the strains of *W bancrofti* affecting Burmese migrants, thus conditions are ripe for the re-emergence of filariasis in urban Thailand.^{22,29,31} Indeed, in 2004, Burmese migrants with lymphatic filariasis were located in Chiang Mai, the largest city in northern Thailand.³¹

Few options exist presently to tackle lymphatic filariasis across national borders. The Burmese government has neglected public health, especially in rural areas, of which the absence of filarial control programmes in most of the country is but one example (figure). Without government interest or initiative, implementation of mass drug dosing is difficult in the eastern frontiers of Burma. A weak medical infrastructure, large populations of displaced individuals, and a chronic civil war further hamper dosing efforts. Additionally, in many regions, attempts at provision of medical care and distribution of medical supplies are dangerous, because these activities are perceived by the military as support for rebels. People partaking in such activities are frequently subjected to arrest and abuse.^{32,33} The failure of Burma's government to address these domestic public-health problems and its complicity in the ongoing impoverishment and forced migration of its people will probably continue to undermine public-health gains made by other countries in southeast Asia.³³

Vector-borne diseases in the Colombian conflict

In Colombia, a country with an internal armed conflict that has already lasted for decades, several neglected diseases pose a range of challenges for medicine, public health, and human rights. Political violence, common throughout the country's history, escalated in the 1980s. Guerrilla organisations expanded, followed by the formation and dissemination of so-called self-defence paramilitary groups. In 2006, roughly 25 000 irregular combatants from both sides of the conflict occupied rural areas in almost all regions of the country.³⁴ These groups are sustained financially by illegal activities such as kidnapping (22 363 people were kidnapped in the past decade and more than 5000 people are currently held captive) and cocaine production, trafficking, and export, which accounts for 3% of Colombia's gross domestic product.³⁵ The conflict has led to the internal displacement of an estimated 3·6 million citizens between 1985 and 2005, and is partly responsible for

the migration of an estimated 200 000 Colombians every year over the past decade.³⁶

To date, both negotiations and increased military force have failed to resolve the conflict. Successive governments have attempted to maintain control by steadily increased military expenses from 0·92% of the gross domestic product in 1991 to 3·3% in 2005, and almost doubled army personnel to more than 300 000.³⁷ Throughout this period, several national public-health and social initiatives have been reduced or terminated to reduce public-sector spending, generally on the recommendation of international credit entities. One of the affected bodies was the national agency charged with the control of vector-borne diseases, Servicio de Erradicación de la Malaria. This agency's disease control mission was decentralised to regional governments, which usually have much less operational and technical capacity.³⁸

Diseases affecting the Colombian conflict zones include Chagas' disease (American trypanosomiasis), leishmaniasis, and yellow fever. Most regions of Colombia have environments suitable for effective transmission of these pathogens. Many of these regions have been intermittently under the control of different factions. Additionally, Colombia underwent rapid urbanisation in the second half of the 20th century, with 75% of 43 million Colombians now living in urban areas.³⁹ People at risk of vector-borne diseases in Colombia have faced two main problems: little access to prevention, diagnosis or treatment; and little research for development or improvement of care.

Case study: Chagas' disease

Chagas' disease is a common cause of cardiomyopathy resulting in premature death and disability across much of Latin America.⁴⁰ An estimated 18 million South American people are infected with the protozoan parasite, *Trypanosoma cruzi*, 1 million of whom are Colombians.^{39,40} About 10–30% of infected individuals develop symptomatic disease, usually after decades of chronic asymptomatic infection.⁴¹ Almost all of these people were exposed to the parasite as a consequence of living in poor rural areas and in inadequate housing.

In Colombia, the civil war adds to urbanisation by driving rural migrants at risk of Chagas' disease to the cities. Blood-bank screening has shown high variability in rates of people seropositive for Chagas' disease across regional governments, known as departamentos. High-risk departamentos in northeastern Colombia, accounting for about 25% of the country's area, have a prevalence of between 2·3% and 7%. These values contrast with low-risk areas near the Atlantic coast, which have seroprevalence rates ranging from 0·1% to 0·3%.^{42,43} Many regions near the border with Venezuela must contend with both high seroprevalence of *T cruzi* and political violence. In Bucaramanga the most populated city in northeast Colombia with nearly

1 million residents, surveillance of more than 40 000 blood donations made in 1996–2001 showed a consistent prevalence of 1%. In the neighbouring departamento of Norte de Santander the prevalence in the same period was 3%.⁴⁴ More than 90% of seropositive donors identified in Bucaramanga reported previously living in rural areas.⁴⁵ Yet, more than 95% of infected rural immigrants are thought never to be tested for *T cruzi* because almost no diagnostic services are available to the general population, either in urban or rural settings, and less than 1% of the population donate blood.⁴⁶

Violence in Colombia has weakened an already vulnerable vector-control programme. Because of little resources and adverse circumstances, vector-control programmes are mainly directed at rural areas with the highest risk of transmission.⁴⁷ However, the intensity of the internal conflict has largely established the coverage and sustainability of these programmes in different regions. Vector-control programmes reach only 16.7% of the population in high-risk areas.⁴⁸ Moreover, the government chose not to include Chagas' disease in mandating surveillance for vector-borne diseases.⁴⁹ A survey of homes in the high-risk departamentos of Boyacá and Norte de Santander demonstrated a *T-cruzi* seroprevalence of 6% in children; although prevalence of adult residents in these poorly surveyed conflict areas would be expected to be higher.^{50–52}

Diagnosis is essential for provision of appropriate treatment of individuals infected with *T cruzi*. Treatment has several limitations, including sparse data for treatment efficacy and high incidence of adverse effects.⁵³ The Colombian government issued treatment guidelines for *T cruzi* calling for the import of benznidazole, which was not marketed in Colombia at that time, for infected individuals aged younger than 20 years—the population most likely to benefit from treatment. However, with so little identification of the infected population, the programme was unable to distribute some 5000 treatments throughout the whole country by 2005. Furthermore, the mandated monitoring of side effects of an 8-week treatment excluded municipalities regarded as red zones, a term used to describe opposition-controlled areas. For example, Santander, a departamento with several red zones and endemic *T Cruzi*, received only 70 treatments for seropositive children in 14 municipalities, and regional authorities have taken more than 2 years to distribute those treatments. A further drawback of benznidazole is the absence of paediatric formulations.

Case study: leishmaniasis

Cutaneous leishmaniasis is a parasitic disease prevalent in many regions of Colombia; with reported numbers of cases rising in recent years.^{54,55} Leishmaniasis is a chronic and recurrent infection that manifests clinically, unlike Chagas' disease. Many of the same vector control

issues associated with Chagas' disease are also relevant to leishmaniasis. However, unlike Chagas' disease, most of the vectors that cause leishmaniasis are not affected by living conditions, thus disease prevention is difficult. Disease outbreaks are associated with conditions seen in conflict; the lay media have often refer to leishmaniasis as a disease of guerrilla warfare;⁵⁶ more than 25% of cases (3163 of 12 433) reported in 2004 affected military personnel patrolling conflict areas of Colombia.^{57,58} Such incidence in the military is an increase of three times from that of 2003.⁵⁹

For civilians living in conflict areas, the size and pattern of disease incidence is unknown, although access to diagnosis and treatment is a challenge. Indeed, treatment for leishmaniasis has become an unfortunate casualty of internal conflict. By contrast with vaccines or drugs for other parasitic infections, the government controls the purchase and distribution of meglumine antimonate, the standard therapy. Patients and doctors need to meet first to formally report and confirm cases and then again for follow up. These logistical considerations, and the security issues associated with conflict, substantially restrict access to treatment. After several months of increases in disease incidence coupled with little availability of treatment in several regions, the Colombian government responded by purchasing enough meglumine antimonate for 10 000 treatments in 2005.⁶⁰ Unfortunately, this amount is clearly insufficient.

In the Colombian conflict, kidnapped and incarcerated individuals often become infected with leishmaniasis and generally receive unconventional treatments such as cauterisation with heated knives and boiled honey applied to ulcers.⁶¹ The government grants the military responsibility for both the storage and distribution of meglumine antimonate, and these drug stocks are common targets for guerrilla fighters.^{62–64} These conditions result in many thousands of civilians, mostly children, who live in regions with endemic leishmaniasis and continuing warfare, being exposed to chronic and recurrent morbidity from this easily treated disease.

Case study: yellow fever

Yellow fever is yet another neglected disease posing a serious threat to public health in Colombia. About 20 million Colombians live in areas that are at risk of transmission of the yellow fever virus. Although this disease has no adequate treatment, it is prevented effectively by vaccination. The yellow fever vaccine has been available in Colombia for more than 50 years. In fact, Colombia was a notable exporter of this vaccine until the late 1980s, when vaccine production was partially dismantled and coverage rates began to decrease. With the gradual obsolescence of the vaccine production plant at the Colombian National Institute of Health, the government chose to import the vaccine when needed. Throughout this period of transition,

both vector-control and vaccination programmes were decentralised and transferred to regional governments resulting in problems with resources, capacity, and coordination of the programmes.

In 2003–04, Colombia had the largest outbreak of yellow fever in the past 50 years; more than 200 cases and 50 deaths were reported in rural areas, with a high risk of the epidemic reaching urban areas, but this outbreak eventually self-limited. Index cases were mostly workers who had migrated from urban areas to illegal drug crop sites in areas under control of guerrilla groups; these individuals should have already been immunised had an adequate vaccination programme been in place.⁶⁵ By the time the outbreak came to the attention of government and a public-health emergency was declared, more than 5 million people in high-risk areas were in need of immediate vaccination.⁶⁶ Public-health workers were prevented from reaching some high-risk rural areas by guerrilla groups. For example, in the *departamento* of Chocó, officials reported the hijack of 25 000 vaccines by armed groups.⁶⁹ Although the Red Cross reported the delivery of 1456 doses of vaccine in such areas, overall coverage at the epicentre of the epidemic did not exceed 45%.^{65,68} As a result of limited resources and the political and social conditions of armed conflict, the public had no guarantee of effective disease prevention strategies.

After this outbreak, the government imported 1.5 million doses of yellow-fever vaccine from Brazil, in addition to 500 000 donated by Venezuela.⁶⁹ Furthermore, only weeks after issuing the public-health alert, the Colombian government decided to restart the production of the yellow-fever vaccine.⁷⁰ Nevertheless, a credible threat of recurrence remains and since the conflict is ongoing, civilians and internally displaced persons continue to be at risk of yellow fever.

Neglected diseases case studies and human rights

The included case studies discuss some important themes common to neglected diseases and neglected areas of conflict. Disease surveillance is currently restricted by conflict in both Burma and Colombia, and other countries around the world. At-risk populations in these countries have limited access to preventive and curative services, and these conditions have led to disease recrudescence. For filariasis and yellow fever, effective prevention and control programmes exist, but their coverage has been limited by conflict. Government military priorities in these conflicts have trumped the public-health needs of affected populations, and further restricted opportunities for humanitarian assistance. Article 23 of the Geneva Convention of 1949⁷¹ states that “Each High Contracting Party shall allow the free passage of all consignments of medical and hospital stores intended only for civilians of another High Contracting Party, even if the latter is its adversary.” Yet we have noted that in both Burma and Colombia,

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A pregnant woman is examined by a mobile obstetric medic in Burma

military forces have interrupted access of civilians to essential medicines. And in both countries, research that might lead to better use of existing interventions or development of new ones is hampered by security concerns. Diseases for effective methods of prevention or treatment have not been developed are arguably the most neglected of all; however denial of access to treatment for diseases for which effective controls or treatments exist should evoke concern about human rights.

In at least one case, that of ivermectin for onchocerciasis, a programme model incorporating the right to health care is a successful public-private partnership designed to address a neglected disease.⁷² In the Mectizan Donation Program, Merck and Co has donated its ivermectin product to countries with endemic onchocerciasis since 1987, greatly improving river blindness treatment and control. In a review of ivermectin delivery programmes, Burnham and Mebrahtu⁷³ reported on how the Mectizan Donation Programme has fared in regions of conflict. They noted that surveillance mapping of onchocerciasis was incomplete for Angola, much of the Democratic Republic of the Congo, and areas in southern Sudan—all regions with conflict and instability. They noted that conflict had stopped the ivermectin programmes in Côte d’Ivoire and Liberia, rendered large areas of the Democratic Republic of the Congo inaccessible, and halted the programme for eight years in Sierra Leone. Encouragingly, however, they also reported that in Colombia and Sudan, opposing sides managed to either temporarily suspend hostilities or even cooperate to allow distribution of the treatment.⁷³

A model for both the development and testing of drugs for neglected diseases is evolving with the establishment of OneWorld Health, a nonprofit pharmaceutical company. With many donors, this company completed the largest to-date phase III trial of a treatment for visceral leishmaniasis, resulting in approval of paromomycin in India. OneWorldHealth is researching new drugs for treating neglected diseases

Panel: Strategies for research in vulnerable populations and neglected diseases

- Develop sustained dialogue with the public through standardised community advisory boards, fact-finding missions, and education about key issues
- If appropriate, identify national ethics committees that can set clear guidelines on national practice, engage in debate with foreign committees, and train local ethics committees that have community membership
- If appropriate, increase community participation—engage and educate a wide range of stakeholders as active and informed partners for decisionmaking about the research
- Ensure documented medical follow-up of participants after the study to monitor adverse events related to trial interventions

In communities and countries in which the rights of the target community are threatened, researchers should establish if it is appropriate to engage in research, seek help from human rights monitoring bodies when appropriate, and advocate for trial participants if they are able to do so.

in neglected populations.⁷⁴ The growth and support of such a company opposes the indifference of pharmaceutical companies towards the development of therapeutics expected to make small profits or even losses.^{75–77} The models of the ivermectin programme and OneWorld Health show how public-private partnerships can overcome some of the barriers to provision of services for neglected diseases. Unfortunately, these programmes are also limited by conflict and instability.

Research on neglected diseases and in warzones

Many ethical and logistical problems accompany research of neglected diseases such as ensuring protection of participants in places in which official local approval is not sought or provided, and participants or researchers are at risk of arrest, violence, or inadvertent disclosure of HIV status. For example, in Burma, the junta has prevented research from being done that would expose the general status of health in the country, including measuring HIV infections and the death toll from the tsunami in 2004.^{78,79} The Global Fund has since withdrawn health funding for Burma, because of government restrictions on access to project sites and populations.⁸⁰ However, should this situation result in no research in the Burmese population? We believe that research should be done, when needed and feasible, and that we have a moral obligation to report on human rights abuses and the health status of populations. This research is necessary so that international agencies, such as non-governmental organisations, international law groups, or WHO, can make informed decisions regarding delivery of aid. Although protection of research participants might be difficult to guarantee in conflict areas—these protections are most important in places where human rights

violations take place or are likely to occur. Research and programmes aimed at neglected diseases need innovative approaches and quick responses to changing rights circumstances, but can never disregard core principles for protection of participants.

Research in oppressive or violent places needs careful planning with an independent and informed ethics review group. Community representatives from the research population should have a role in the planning and design of research. Such representation is most likely to happen in the safest possible places, such as refugee camps or safe houses. Confidentiality of participants is of the utmost importance, as is ensuring that records of research participation cannot be linked back to study staff, community members who provide assistance or participants themselves. In places such as Burma and Colombia, discretion is needed when engaging in research with the community, as government informants could be present. These realities are constant reminders that researchers from free societies should carefully consider the safety of their colleagues and participants in oppressive societies. Researchers therefore need to engage with stakeholders to ensure ethical and security concerns are identified and dealt with early in the process.⁸¹ Additionally, researchers should be acutely aware of their position with respect to local and international politics, and should consult human rights organisations' and other stakeholders to fully understand the local political context and human rights conditions.^{82,83} The recent arrest of the head of the Médecins Sans Frontières mission in Sudan for alleged crimes against the state after releasing a report on sexual violence in Darfur, is a harsh reminder that researchers and health workers are not exempt from the punishments of political regimes.^{81,83,84} Researchers also have a responsibility to disseminate findings carefully.⁸⁴ The research community needs to establish whether the optimum improvements in health in such countries will occur by announcing findings in press-releases, peer-reviewed publications, or in private meetings with international politicians.⁸⁵ The panel summarises the steps that should be taken by researchers working in countries with oppressive governments.

Although research is difficult in oppressive regimes, our human rights obligations to provide treatment when we can, and to seek cures for neglected diseases, do not diminish. Indeed, such rights are universal and are common to almost all human rights instruments. Successful health-care provision is best achieved by interdisciplinary efforts of health workers, lawyers, and advocates to apply a rights-based approach to health. Several human rights instruments have been successfully used to guarantee the availability of treatment for neglected diseases.⁸⁶ Although most successful legal appeals have addressed HIV/AIDS, others have addressed diseases that do not receive as

much attention.⁸⁶ In the case of Mariela Viceconte versus Argentinean Ministry of Health and Social Welfare,⁸⁷ the courts ordered the Argentinean government to make available a vaccine for Argentine haemorrhagic fever, a disease affecting nearly 3.5 million people in that country.⁸⁸ The court referred specifically to the right to health in Article 25 of the Universal Declaration of Human Rights⁸⁹ and Article 12 of the International Covenant on Economic, Social and Cultural Rights.⁹⁰ A similar case in South Africa successfully argued for the provision of nevirapine for HIV-infected pregnant mothers.⁹¹ These and other cases show that the right to health can be legally enforced and public and judicial respect for human rights can lead to changes in government policy.⁹¹ Although litigation is a last resort, these cases show how health workers can work with legal colleagues to improve health of the most disadvantaged people. We encourage health workers to recognise the benefits that knowledge of human rights instruments can have on delivery of care.

Discussion and conclusions

The case studies Eastern Burma and Colombia show how diseases can become important public-health threats in chronic civil conflicts. In both cases, increased military action has undermined public-health and disease-control programmes. Both countries reduced health sector spending, and violence has limited surveillance, prevention, treatment, and vector control. They also have very large numbers of internally displaced persons and widespread migration out of conflict zones with high prevalence of disease, further restricting disease control and access to treatment. Although military personnel in both settings are highly exposed to these morbid pathogens, civilians and their children in these conflict zones face both high rates of exposure and poor access to treatment. A final connection, and one not addressed here that surely deserves further attention, is the extent to which the narcotics-based economies of these troubled states (heroin and methamphetamine in Burma; cocaine in Colombia) have added to the neglected health status of both states and of their civilian populations.

We have argued the ethical and human rights imperative to address neglected diseases and populations. Additionally, we have recommended strategies for research and programme activities in places with oppression or conflict. Certainly, resolving these health problems cannot be better done than with peace, reconciliation, and the end of chronic conflicts. In the absence of peace, we argue that ignorance of populations suffering from neglected diseases is both poor attention to public health and poor humanitarianism. We continue to ignore neglected diseases to the detriment of public health in affected places, and of our morals.

References

- Hotez PJ, Molyneux DH, Fenwick A, Ottesen E, Ehrlich SS, Sachs JD. Incorporating a rapid-impact package for neglected tropical diseases with programs for HIV/AIDS, tuberculosis, and malaria. *PLoS Med* 2006; 3: e102.
- Ehrenberg JP, Ault SK. Neglected diseases of neglected populations: thinking to reshape the determinants of health in Latin America and the Caribbean. *BMC Public Health* 2005; 5: 119.
- Ekwanzala M, Pepin J, Khonde N, Molisho S, Bruneel H, De Wals P. In the heart of darkness: sleeping sickness in Zaire. *Lancet* 1996; 348: 1427–30.
- Marlet MV, Wuillaume F, Jacquet D, Quispe KW, Dujardin JC, Boelaert M. A neglected disease of humans: a new focus of visceral leishmaniasis in Bakool, Somalia. *Trans R Soc Trop Med Hyg* 2003; 97: 667–71.
- Mock NB, Duale S, Brown LF, et al. Conflict and HIV: A framework for risk assessment to prevent HIV in conflict-affected settings in Africa. *Emerg Themes Epidemiol* 2004; 1: 6.
- Beyrer C, Brookmeyer R, Natpratan C, et al. Measuring HIV-1 incidence in northern Thailand: prospective cohort results and estimates based on early diagnostic tests. *J Acquir Immune Defic Syndr Hum Retrovirol* 1996; 12: 495–99.
- International Crisis Group. Myanmar background: ethnic minority politics. May 7, 2006. <http://www.crisisgroup.org/home/index.cfm?id=1528&l=1> (accessed June 28, 2007).
- Risser G, Kher O, Htun, S. Running the Gauntlet: the impact of internal displacement in southern Shan State. Bangkok, Thailand: Institute of Asian Studies, Chulalongkorn University; 2004. <http://www.ibiblio.org/obl/docs3/Gauntlet-ocr.pdf> (accessed June 28, 2006).
- Caouette TM, Pack ME. Pushing past definitions: migration from Burma to Thailand. Refugee International, 2002. <http://www.refugeesinternational.org/content/publication/detail/3074/> (accessed June 28, 2006).
- Migrant Assistance Project. Migrant Health Rights. Mae Sot, Thailand 2006. <http://www.mapfoundationcm.org/Eng/map.html> (accessed June 28, 2006).
- Leiter K, Tamm I, Beyrer C, Wit M, Iacopino V. No status: migration, trafficking and exploitation of women in Thailand. Health and HIV/AIDS risks for Burmese and Hill tribe women and girls. Report. Boston, MA: Physicians for Human Rights; June 2004. <http://physiciansforhumanrights.org/library/report-nostatus-2004.html> (accessed June 28, 2007).
- Beyrer C, Suwanvanichkij V, Mullany LC, et al. Responding to AIDS, tuberculosis, malaria, and emerging infectious diseases in Burma: dilemmas of policy and practice. *PLoS Med* 2006; 3: p e393.
- WHO. Lymphatic filariasis: the disease and its epidemiology. World Health Organization; Nov 18, 2006. http://www.who.int/lymphatic_filariasis/epidemiology/en (accessed Jan 1, 2007).
- Molyneux D. Lymphatic filariasis (elephantiasis) elimination: a public health success and development opportunity. *Filaria J* 2003; 2:13.
- Global Alliance to Eliminate Lymphatic Filariasis. <http://www.filariasis.org> (accessed July 5, 2007).
- Sunish IP, Rajendran R, Mani TR, Gajanana A, Reuben R, Satyanarayana K. Long-term population migration: an important aspect to be considered during mass drug administration for elimination of lymphatic filariasis. *Trop Med Int Health* 2003; 8: 316–21.
- Heymann DL. Control of communicable diseases manual. 18th edn. Washington, DC: American Public Health Association Publications; 2004.
- Ottesen EA. The global programme to eliminate lymphatic filariasis. *Trop Med Int Health* 2000; 5: 591–94.
- WHO. Global Program to Eliminate Lymphatic Filariasis Policy; http://www.who.int/lymphatic_filariasis/policy/en/ (accessed June 15, 2007).
- CDC. Recommendations of the International Task Force for Disease Eradication. *MMWR Recomm Rep* 1993; 42: 1–38. <http://www.cdc.gov/mmwr/preview/mmwrhtml/00025967.htm> (accessed July 3, 2007).
- Elimination of Lymphatic Filariasis as a Public Health Problem, WHA50.29. WHO, May 13, 1997 http://www.who.int/lymphatic_filariasis/resources/WHA_50%2029.pdf (accessed July 1, 2007).

- 22 Triteeraprab S, Kanjanopas K, Suwannadabba S, Sangprakarn S, Poovorawan Y, Scott AL. Transmission of the nocturnal periodic strain of *Wuchereria bancrofti* by *Culex quinquefasciatus*: establishing the potential for urban filariasis in Thailand. *Epidemiol Infect* 2000 August; **125**: 207–12.
- 23 Triteeraprab S, Nuchprayoon I, Porksakorn C, Poovorawan Y, Scott AL. High prevalence of *Wuchereria bancrofti* infection among Myanmar migrants in Thailand. *Ann Trop Med Parasitol* 2001; **95**: 535–38.
- 24 Division of Communicable Disease Control. Annual Report, Filariasis Unit. 2002. Nonthaburi, Thailand, Ministry of Public Health.
- 25 National Programme to Eliminate Lymphatic Filariasis. Annual Report for the National Programme to Eliminate Lymphatic Filariasis (PELF), Myanmar. Yangon, Myanmar: Ministry of Public Health; Dec, 2004. http://w3.who.sea.org/LinkFiles/New_Lymphatic_Filariasis_Annual_Report_Myanmar_2004.pdf (accessed July 7, 2007).
- 26 SEARO. Elimination of Lymphatic Filariasis in Myanmar. CDS Info 2. 31 Jan, 2001. Department of Communicable Diseases, World Health Organization.
- 27 US Department of State. International Narcotics Control Strategy Report. Report. Washington DC; 2005. <http://www.state.gov/p/inl/rls/nrcrpt/2005/> (accessed July 1, 2007).
- 28 National Programme to Eliminate Lymphatic Filariasis. Annual Report for the National Programme to Eliminate Lymphatic Filariasis, Thailand. Bangkok, Thailand: Ministry of Public Health; Feb, 2005. http://w3.who.sea.org/LinkFiles/New_Lymphatic_Filariasis_Annual_Report_Thailand_2004.pdf (accessed July 5, 2007).
- 29 Triteeraprab S, Songtrus J. High prevalence of bancroftian filariasis in Myanmar-migrant workers: a study in Mae Sot district, Tak province, Thailand. *J Med Assoc Thai* 1999 July; **82**: 735–39.
- 30 Koyadun S, Bhumiratana A. Surveillance of imported bancroftian filariasis after two-year multiple-dose diethylcarbamazine treatment. *Southeast Asian J Trop Med Public Health* 2005; **36**: 822–31.
- 31 Huanok W. Thailand under threat: how Burma's dams project could spread disease. *The Irrawaddy*, 2005. <http://www.burmalibrary.org/show.php?cat=1915&lo=&sl=1> (accessed Jan 1, 2006).
- 32 Karen Human Rights Group (KHRG). "Peace," or Control? The SPDC's Use of the Karen Ceasefire to Expand its Control and Repression of Villagers in Toungoo District, Northern Karen State. Mar 22, 2005. <http://www.khrg.org/khrg2005/khrg05f3.pdf> (accessed July 7, 2007).
- 33 Lee TJ, Mullany LC, Richards AK, Kuiper HK, Maung C, Beyrer C. Mortality rates in conflict zones in Karen, Karenni, and Mon states in eastern Burma. *Trop Med Int Health* 2006; **11**: 1119–27.
- 34 The EU's relations with Colombia—Overview. Europa: Gateway to the European Union; 2006. http://europa.eu.int/comm/external_relations/colombia/intro/index.htm (accessed July 7, 2007).
- 35 Informe Colombia. Terra com informes especiales 2006. <http://www.terra.com/especiales/informecolombia/> (accessed July 6, 2007).
- 36 Gráfico de Comportamiento del desplazamiento 1985-2005 por año. Consultoría para los derechos humanos y el desplazamiento (CODHES) 2006. http://www.codhes.org/index.php?option=com_content&task=view&id=3&Itemid=5 (accessed Nov 15, 2006).
- 37 Situación presupuestal del ministerio de defensa para el año 2005. Slide presentation, minister of defense, Aug 25 2004. http://alpha.mindefensa.gov.co/descargas/Documentos_Home/Presupuesto_Mindefensa_2005.ppt (accessed July 7, 2007).
- 38 Decreto 1525 de 1994. Presidencia Republica de Colombia 2006. <http://www.presidencia.gov.co/decretoslinea/1994/julio/15/dec1525151994.doc> (accessed Nov 14, 2006).
- 39 Data Finder. Population Reference Bureau 2006. <http://www.prb.org/datafind/prjprbdata/wcprbdata6.asp?DW=DR&SL=&SA=1> (accessed Sept 12, 2006).
- 40 Barrett MP, Burchmore RJ, Stich A, et al. The trypanosomiasis. *Lancet* 2003; **362**: 1469–80.
- 41 Laranja FS, Dias E, Nobrega, Miranda A. Chagas disease: A clinical, epidemiologic and pathologic study. *Circulation* 1956; **14**: 1035–60.
- 42 Guhl F, Restrepo M, Angulo VM, Antunes CM, Campbell-Lendrum D, Davies CR. Lessons from a national survey of Chagas disease transmission risk in Colombia. *Trends Parasitol* 2005; **21**: 259–62.
- 43 Beltran M, Bermudez MI, Forero MC, Ayala M, Rodriguez MJ. Control of infection for the *Trypanosoma cruzi* in blood donors. *Biomedica* 2005; **25**: 527–32.
- 44 Villar JC. Cardiovascular Health Investigation and Collaboration to Assess the Markers and Outcomes of Chagas disease (CHICAMOCHA) pilot study 2003. Hamilton: McMaster University Press, 2003 (MSc Thesis).
- 45 Villar JC, Herrera VM, Smieja M, Yusuf S. Previous poor rural housing and present poor urban residence are both associated with *T cruzi* positive serology: analysis of a three year registry of Colombian blood donors for the CHICAMOCHA pilot study. *J Am Coll Cardiol* 2002; **39**: 444B.
- 46 Schmunis GA, Cruz JR. Safety of the blood supply in Latin America. *Clin Microbiol Rev* 2005; **18**: 12–29.
- 47 Guhl F, Restrepo M, Angulo VM, Antunes CM, Campbell-Lendrum D, Davies CR. Lessons from a national survey of Chagas disease transmission risk in Colombia. *Trends Parasitol* 2005; **21**: 259–62.
- 48 Padilla JC. Situación de la Enfermedad de Chagas en Colombia. Bogotá: Universidad de los Andes; 2005. <http://cdiaec.uniandes.edu.co/> (accessed Sept 14, 2006).
- 49 Nichols RS. Que se está haciendo actualmente con los pacientes chagásicos en Colombia. Bogotá: Universidad de los Andes; 2005. <http://cdiaec.uniandes.edu.co/> (accessed Sept 14, 2006).
- 50 Zipa NY. Situación de la enfermedad de Chagas en el departamento de Boyacá. Bogotá: Universidad de los Andes; 2005. <http://cdiaec.uniandes.edu.co/> (accessed Sept 14, 2006).
- 51 Sanchez E, Lobo PA. Situación actual de la enfermedad de Chagas en el departamento Norte de Santander e intervenciones realizadas en los años 2002–2004. Bogotá: Universidad de los Andes; 2005. <http://cdiaec.uniandes.edu.co/> (accessed Sept 14, 2006).
- 52 Lima e Costa MF, Barreto SM, Guerra HL, Firmo JO, Uchoa E, Vidigal PG. Ageing with *Trypanosoma cruzi* infection in a community where the transmission has been interrupted: the Bambuí Health and Ageing Study (BHAS). *Int J Epidemiol* 2001; **30**: 87–93.
- 53 Villar JC, Marin-Neto JA, Ebrahim S, Yusuf S. Trypanocidal drugs for chronic asymptomatic *Trypanosoma cruzi* infection. *Cochrane Database Syst Rev* 2002; **1**: CD003463.
- 54 King RJ, Campbell-Lendrum DH, Davies CR. Predicting geographic variation in cutaneous leishmaniasis, Colombia. *Emerg Infect Dis* 2004; **10**: 598–607.
- 55 Davies CR, Reithinger R, Campbell-Lendrum D, Feliciangeli D, Borges R, Rodriguez N. The epidemiology and control of leishmaniasis in Andean countries. *Cad Saude Publica* 2000; **16**: 925–50.
- 56 Leishmaniasis. El espectador May 25, 2003. http://www.elespectador.com/2003/20030525/la_revista/nota7.htm (accessed Sept 10, 2007).
- 57 Velazquez-Gómez R. Leishmaniasis: un brote serio. El Colombiano; Nov 7, 2004. http://www.elcolombiano.terra.com.co/BancoConocimiento/L/leishmaniasis_un_brote_serio/leishmaniasis_un_brote_serio.asp (accessed Sept 10, 2007).
- 58 Agencia de Noticias del Ejército. Leishmaniasis: enemigo silencioso, pero combatible. Ejército Nacional, República de Colombia 2006. <http://www.ejercito.mil.co/index.php?idcategoria=79442&PHPSSESSID=76f19ff8fac9b17654e983d8b2678d7c> (accessed July 7, 2007).
- 59 ABC Colombia. Colombia this week; Feb, 2005 7. http://www.abcolombia.org.uk/previews_weeks.asp?id=32 (accessed July 7, 2007).
- 60 Velazquez-Gómez R. Leishmaniasis: un brote serio. El Colombiano; Nov 7, 2004. http://www.elcolombiano.terra.com.co/BancoConocimiento/L/leishmaniasis_un_brote_serio/leishmaniasis_un_brote_serio.asp (accessed Sept 10, 2006).
- 61 Interview to Agenor Vieyar, from the navy infantry, after his liberation. Colombia com noticias 2006. <http://www.colombia.com/noticias/autonoticias/2003/DetalleNoticia19713.asp> (accessed Sept 10, 2006).

- 62 Molano-Bravo A. Perversa Estrategia. Agencia de Prensa Rural; April 9, 2005. <http://www.prensarural.org/molano20050409.htm> (accessed July 7, 2007).
- 63 Unidad Investigativa. Roban medicamentos del estado para grupos armados. Vanguardia Liberal; June 12, 2003. <http://www.vanguardia.com/unidad/uni120603.asp> (accessed Sept 10, 2006).
- 64 Policía Brasileña investiga posible desvío de medicinas para las FARC. El Tiempo; March 23, 2005. http://eltiempo.terra.com.co/coar/ACC_JUDI/accionesjudiciales/ARTICULO-WEB-_NOTA_INTERIOR-2017750.html (accessed Sept 10, 2006).
- 65 Velandia MP. Yellow fever and its control. *Biomedica* 2004; **24**: 5–6.
- 66 SIVIGILA Boletín Epidemiológico Semanal. Instituto Nacional de Salud, República de Colombia; Jan 4, 2004; http://www.col.ops-oms.org/sivigila/2004/bole01_04.htm (accessed Sept 12, 2006).
- 67 Pese a campañas de vacunación, persisten en el país enfermedades que debían estar erradicadas. El Tiempo; April 12, 2005. http://eltiempo.terra.com.co/salu/especialdesalud/ARTICULO-WEB-_NOTA_INTERIOR-2034471.html (accessed Sept 4, 2006).
- 68 Colombia: el CICR apoya campaña de vacunación contra fiebre amarilla en zonas de conflicto. International Red Cross, Colombia; Feb 18, 2004 http://www.icrc.org/Web/spa/sitespa0.nsf/htmlall/5WALYU?OpenDocument&style=custo_print (accessed July 5, 2007).
- 69 Colombia recibe 1.5 millones de dosis de vacunas para enfrentar el brote de fiebre amarilla. Pan American Health Organization; January 23, 2004. <http://www.paho.org/spanish/dd/pin/ps040123.htm> (accessed July 7, 2007).
- 70 Comunicado Oficial 004 Ministerio de la Protección Social. Presidencia de la Republica de Colombia; Jan 24, 2004. <http://www.presidencia.gov.co/fiebre/fiebre16.htm> (accessed July 6, 2007).
- 71 UN. Geneva Convention relative to the Protection of Civillian Persons in Time of War. Geneva: United Nations, Aug 12, 1949. <http://unhchr.ch/html/menu3/b/92.htm> (accessed July 24, 2007).
- 72 Peters DH, Phillips T. Mectizan Donation Program: evaluation of a public-private partnership. *Trop Med Int Health* 2004; **9**: A4–15.
- 73 Burnham G, Mebrahtu T. The delivery of ivermectin (Mectizan). *Trop Med Int Health* 2004; **9**: A26–44.
- 74 Institute for OneWorld Health; 2006. <http://www.oneworldhealth.org/business/index.php> (accessed July 6, 2007).
- 75 Nwaka S. Drug discovery and beyond: the role of public-private partnerships in improving access to new malaria medicines. *Trans R Soc Trop Med Hyg* 2005; **99** (suppl 1): S20–29.
- 76 Nathan C, Goldberg FM. Outlook: the profit problem in antibiotic R&D. *Nat Rev Drug Discov* 2005; **4**: 887–91.
- 77 Croft SL, Barrett MP, Urbina JA. Chemotherapy of trypanosomiasis and leishmaniasis. *Trends Parasitol* 2005; **21**: 508–12.
- 78 Beyrer C. Burma and Cambodia: Human Rights, Social Disruption, and the Spread of HIV/AIDS. *Health Hum Rights* 1998; **2**: 84–97.
- 79 Jimba M, Wakai S. South-Asian tsunami. *Lancet* 2005; **365**: 933–34.
- 80 Ahmad K. Global Fund suspends grants to Burma. *Lancet Infect Dis* 2006; **6**: 14.
- 81 Mills EJ, Singh S, Singh JA, Orbinski JJ, Warren M, Upshur RE. Designing research in vulnerable populations: lessons from HIV prevention trials that stopped early. *BMJ* 2005; **331**: 1403–06.
- 82 Hill P. Ethics and health systems research in ‘post’-conflict situations. *Developing World Bioeth*; **4**: 139–53.
- 83 Beyrer C, Kass NE. Human rights, politics, and reviews of research ethics. *Lancet* 2002; **360**: 246–51.
- 84 Moszynski P. Sudan arrests aid worker for “crimes against the state”. *BMJ* 2005; **330**: 1350.
- 85 Mills EJ, Robinson J, Attaran A, et al. Sharing evidence on humanitarian relief. *BMJ* 2005; **331**: 1485–86.
- 86 Hogerzeil HV. Ruling for access: an analysis of 20 court cases in 7 developing countries. Montreal, PQ: WHO; Oct 1, 2005. <http://mednet2.who.int/tbs/tbs2005/HumanRights.ppt> (accessed July 6, 2007).
- 87 Hunt P. Neglected diseases, social justice and human rights: some preliminary observations. WHO; Dec, 2003. http://www.who.int/hhr/news/en/Series_4_neglected%20diseases_social_justice_human_rights%20Paul_Hunt.pdf (accessed July 7, 2007).
- 88 Yamin AE. Not just a tragedy: access to medications as rights under international law. Trustees of Boston University and Consumer Project of Technology; Jan 3, 2004 <http://www.cptech.org/ip/health/cl/yamin03012004.pdf> (accessed July 5, 2007).
- 89 UN. Universal Declaration on Human Rights. Geneva: United Nations, 1948. <http://www.udhr.org/UDHR/ART25.HTM> (accessed July 24, 2007).
- 90 UNHCR. International Covenant on Economic, Social, and Cultural Rights. Geneva: United Nations, 1966. http://www.unhcr.ch/menu3/b/a_ceschr.htm (accessed July 24, 2007).
- 91 Annas GJ. The right to health and the nevirapine case in South Africa. *N Engl J Med* 2003; **348**: 750–54.