

## Neglected Tropical Diseases 1

# Programmes, partnerships, and governance for elimination and control of neglected tropical diseases

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Neglected tropical diseases represent one of the most serious burdens to public health. Many can be treated cost-effectively, yet they have been largely ignored on the global health policy agenda until recently. In this first paper in the Series we review the fragmented structure of elimination and control programmes for these diseases, starting with the ambiguous definition of a neglected tropical disease. We describe selected international control initiatives and present their effect, governance arrangements, and financing mechanisms, including substantial drug-donation programmes. We also discuss efforts to exploit shared features of these diseases by integration of selected control activities within countries, thus creating economies of scope. Finally we address the challenges, resulting from the diversity of disease control approaches and governance structures—both nationally and internationally—and provide some suggestions for the way forward.

### Introduction

Neglected tropical diseases represent the most common diseases for the 2·7 billion people living on less than US\$2 per day.<sup>1</sup> Despite their substantial disease burden, they have been largely ignored in the global health policy debate until recently. These diseases hinder economic development, cause chronic life-long disability, and impair childhood development in poor and disenfranchised communities in which they are most prevalent.<sup>2-4</sup> Some advocates suggest that control of neglected tropical diseases might be an efficient way to fight poverty,<sup>5</sup> since some of these diseases can be treated very cost-effectively.<sup>6-8</sup> Measured in disability-adjusted life-years (DALYs) lost, the group of diseases represents one of the most serious burdens in global public health, ranking higher than malaria and tuberculosis in some assessments (table 1).<sup>9</sup>

Social stigma, prejudice, marginalisation, extreme poverty of afflicted populations, and low mortality are several factors contributing to the neglect of these diseases. Their prevalence in specific geographical and environmental conditions outside the developed world and their insignificant market share for pharmaceutical business further reduces these diseases' prominence in the global health debate.<sup>11</sup> Neglect is also evident in monetary terms, since these diseases receive a very small proportion of official development assistance for health. Of the total official development assistance for health from 2003 to 2007, the average share of control projects for HIV/AIDS was 36·6%, for malaria 3·6%, and for tuberculosis 2·2%; by contrast, the average share for control of neglected tropical diseases was 0·6%.<sup>12</sup> In research and development, the share for the so-called big three diseases is even larger, at 80% of total spending.<sup>13</sup>

Neglected tropical disease is an umbrella term for a large group of diseases. Although more high-level attention and advocacy has recently been given towards

such diseases,<sup>14</sup> there is also a proliferation of programmes and partnerships that are engaged in their control.

### Renewed interest in neglected tropical diseases

One of the first internationally coordinated initiatives addressing a neglected tropical disease was the Onchocerciasis Control Programme (OCP), which was conceived as early as in 1968, and launched in 1974, with co-sponsorship by WHO, the World Bank, UNDP, and the Food and Agriculture Organization.<sup>15</sup> The UN co-sponsorship was typical of initiatives started during that period. Its primary objectives at inception were dual, emphasising both the public health and economic dimension—to eliminate the blinding disease and by doing so opening up large areas of prime agricultural land for settlement.<sup>16</sup> But in the late 1970s and 1980s, resources and the political momentum for control of tropical diseases dwindled, partly because of the failure of the malaria eradication programme and a shift of focus to the social and equitable dimensions of health in the form of primary health care.<sup>17</sup> By the late 1980s, another public health issue gained prominence, which increasingly dominated and continues to dominate the discourse in popular culture, academia, and even the security and intelligence community—the HIV/AIDS pandemic.<sup>18,19</sup> An exclusive innovative financing mechanism was set up for HIV/AIDS, malaria, and tuberculosis in the form of the Global Fund, while funding for neglected tropical diseases remained limited to a few donors. Although funding for HIV/AIDS is often regarded as additional to the historical official development assistance flows to health, many believe that it has forced out other public health resources.<sup>20</sup> Yet, this trend shows that resource mobilisation through innovative mechanisms can be successful when the need is effectively communicated to a broad coalition of stakeholders.

Against this backdrop, two workshops in Berlin, co-hosted by the German Agency for Technical

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This is the first in a [Series](#) of four papers about neglected tropical diseases

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	Disability-adjusted life-years (million)	Deaths	Approximate global prevalence (million)	Approaches to control
<b>High-prevalence diseases</b>				
Hookworm infection	1.8–22.1	3000–65 000	600	MDA with rapid effect package or albendazole
Ascariasis	1.2–10.5	3000–60 000	800	MDA with rapid effect package or albendazole or mebendazole
Trichuriasis	1.6–6.4	3000–10 000	600	MDA with rapid effect package or albendazole or mebendazole
Lymphatic filariasis	5.8	<500	120	MDA with rapid effect package or diethylcarbamazine+ albendazole or ivermectin+albendazole
Schistosomiasis	1.7–4.5	15 000–280 000	200	MDA with rapid effect package or praziquantel
Trachoma	2.3	<500	84	SAFE strategy with azithromycin
Onchocerciasis	0.5	<500	37	MDA with rapid effect package or ivermectin
Leprosy	0.2	132 000	0.2	MDA with dapsone, rifampicin, or clofazimine
<b>Vector-borne protozoan and viral diseases</b>				
Dengue fever	0.7	19 000	50	Integrated vector management
Leishmaniasis	2.1	51 000	12	Case detection and management, and integrated vector management
Chagas disease	0.7	14 000	8–9	Integrated vector management
Human African trypanosomiasis	1.5	48 000	<0.1	Case detection and management, and tsetse control

Table reproduced from reference 5, with permission from authors and publisher. Data from Hotez and colleagues,<sup>5</sup> WHO, and Jamison and colleagues.<sup>10</sup> MDA=mass drug administration. SAFE=Surgery, Antibiotics, Face cleanliness, and Environmental improvement. Rapid effect package of four drugs=albendazole or mebendazole, and praziquantel, ivermectin or diethylcarbamazine, and azithromycin.

**Table 1: High-prevalence and other vector-borne neglected tropical diseases**

Cooperation and WHO in 2003 and 2005, refocused attention towards so-called neglected diseases. In the first workshop, participants called for an integrated approach towards these diseases both for efficiency and advocacy reasons.<sup>21</sup> The second workshop concluded that the burden of disease shared by all the neglected tropical diseases justified an increased share of resources, that low-cost and cost-effective interventions were widely available, and that some integration or co-implementation was possible.<sup>22</sup>

### Terminology

Nonetheless, there is still some ambiguity about the term neglected tropical diseases, which is shown in a study by the UK Department for International Development stating in 2003 that “There is no standard global definition of neglected diseases”,<sup>23</sup> a finding that still holds nowadays. Rather than having a widely accepted and endorsed definition, we find two approaches to defining neglected tropical diseases, which have resulted in many similar, yet different, definitions that contain co-existing and changing lists of diseases (panel 1). The first approach emphasises neglect as the defining characteristic, whereas the second concentrates on the diseases’ shared features and their effects on poverty and development. Although initially neglect was emphasised as the defining characteristic, recent definitions draw attention to the diseases’ shared features and their effects on poverty and development.

The 2003 International Workshop on Intensified Control of Neglected Diseases in Berlin constituted the first systematic approach to redirect international

attention and to define neglected diseases. Its report specifically identifies the three levels of neglect that are common to all the targeted diseases—neglect locally, nationally, and internationally.<sup>21</sup>

Subsequently, publications and the overall discourse placed more emphasis on other shared features that had also been noted in the 2003 report. In particular, the diseases’ link to poverty and development has been singled out as their key characteristic. The phrase most commonly used by WHO is that neglected tropical diseases “persist in conditions of poverty, where they cluster and frequently overlap”.<sup>28</sup> This trend towards the term diseases of poverty is apparent in academia and policy alike.<sup>15,29</sup> Yet neglect is still emphasised when these diseases are analysed under a human-rights paradigm.<sup>30</sup>

Recently, there has been a tendency to broaden the geographic scope of neglected tropical diseases beyond the tropics. Attempts are made to connect the neglected diseases in the developing world to those of disenfranchised minorities in the developed world.<sup>31</sup> Thus it seems as if neglected tropical diseases in all its variations serves as a rather vague umbrella term that is used to promote several slightly different agendas.

### International control initiatives

Despite early calls for integration and the apparent similarities of neglected tropical diseases, their control initiatives are heterogeneous. They differ in terms of origins, geographic coverage, epidemiological goal, stakeholders involved, funding, and governance structure. Table 2 presents an overview of initiatives that we have selected to show key differentiating organisational and

control features. There are, of course, many more initiatives that are no less important.

Onchocerciasis control remains one of the longest continuous international disease control efforts. Initially based on larvicide spraying by helicopter to control the larvae of *Simulium* (blackfly) vectors in the rivers of 11 west African countries in 1987, it moved to include a mass drug administration component when the pharmaceutical company Merck provided its drug ivermectin (Mectizan) free of charge as long as needed.<sup>32,33</sup> OCP was concluded in 2002, resulting in the elimination of onchocerciasis from large parts of west Africa and freeing up 250 000 km<sup>2</sup> of arable land.

The African Programme for Onchocerciasis Control (APOC) follows the collaborative structure of OCP. Its primary objective is control of the disease. In 1995, APOC expanded the area of onchocerciasis control to the remaining 19 endemic countries throughout Africa. The programme relies entirely on mass drug administration and an extensive network of community drug distributors to reach marginalised communities that are outside the reach of the regular health system.<sup>34</sup> A crucial element to this strategy is the contribution from non-governmental development organisations, which organised themselves in a coordination group as early as 1992. The group's orchestrated advocacy facilitated and accelerated the launch of APOC, particularly the component of community-directed treatment with ivermectin.<sup>35–37</sup> APOC, similar to its predecessor OCP, is governed through a charter—a memorandum of understanding—which explicitly outlines the roles and responsibilities of all entities comprising the programme.

Established in 1991, the Onchocerciasis Elimination Programme for the Americas is a multinational, multiagency coalition between national governments, Merck, the Pan American Health Organization (PAHO), the US Centers for Disease Control and Prevention (CDC), the Carter Center, the Bill & Melinda Gates Foundation, Lions Club International, and others. The programme also deploys a community-based distribution strategy of ivermectin, but with the goal to eliminate the disease in the Americas. A programme coordinating committee provides programmatic and technical review, whereas the main responsibility for implementation lies with national control programmes of the participating countries.<sup>38,39</sup>

Unlike the onchocerciasis control programmes, the Guinea Worm Eradication Programme is a fully-fledged eradication programme with the aim to interrupt the disease's transmission. It relies not on drugs but on provision of health education, safe drinking water, and vector control.<sup>40,41</sup> Started in 1980 by the CDC, the programme is spearheaded by the Carter Center since 1986, as a global public–private partnership including CDC, WHO, UNICEF, Bill & Melinda Gates Foundation, and other stakeholders at all levels

### Panel 1: Definitions of neglected tropical diseases

#### WHO

##### Definition

"...Chronically endemic and epidemic-prone tropical diseases, which have a very significant negative impact on the lives of poor populations [and] remain critically neglected in the global public health agenda."<sup>24</sup>

##### Diseases

Focus diseases: blinding trachoma, Buruli ulcer, Chagas disease, dengue, dracunculiasis, human African trypanosomiasis, Japanese encephalitis, leishmaniasis, leprosy, lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiasis, yaws; other diseases: anthrax, anthroponotic leishmaniasis, brucellosis, cysticercosis, echinococcosis, rabies.

#### Global Network for Neglected Tropical Diseases

##### Definition

"The neglected tropical diseases are a group of 13 parasitic and bacterial infections that affect over 1.4 billion people, most of whom live on less than \$1.25 per day."<sup>25</sup>

##### Diseases

Ascariasis, Buruli ulcer, dengue, dracunculiasis, human African trypanosomiasis, hookworm, leishmaniasis, leprosy, lymphatic filariasis, onchocerciasis, schistosomiasis, trachoma, trichuriasis.

#### Public Library of Sciences Neglected Tropical Diseases

##### Definition

"The [neglected tropical diseases] are defined as a group of poverty-promoting chronic infectious diseases, which primarily occur in rural areas and poor urban areas of low-income and middle-income countries. They are poverty-promoting because of their impact on child health and development, pregnancy, and worker productivity, as well as their stigmatizing features."<sup>26</sup>

##### Diseases

Amoebiasis, balantidiasis, Chagas disease, giardiasis, human African trypanosomiasis, leishmaniasis, taeniasis-cysticercosis, dracunculiasis, echinococcosis, food-borne trematodiasis, loiasis, lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiasis, toxocariasis and other larva migrans, dengue, Japanese encephalitis, jungle yellow fever, other arboviral infections, rabies, Rift Valley fever, viral haemorrhagic fevers, bartonella, bovine tuberculosis in human beings, Buruli ulcer, cholera, enteric pathogens, leprosy, leptospirosis, relapsing fever, trachoma, treponematoses, mycetoma, paracoccidiomycosis, scabies, myiasis.

#### Neglected Tropical Disease Program (USAID)

##### Definition

"These diseases disproportionately impact the poor and rural populations, who lack access to safe water, sanitation, and essential medicines. They cause sickness and disability, compromise children's mental and physical development, and result in blindness and severe disfigurement."<sup>27</sup>

##### Diseases

Targeted diseases: lymphatic filariasis, schistosomiasis, trachoma, onchocerciasis, soil-transmitted helminthiasis.

USAID=US Agency for International Development.

of governance.<sup>42</sup> The principal leadership of a few stakeholders is widely recognised, and each takes the lead in respective countries. Jointly, they periodically liaise to sustain global funding and coordinate strategies.

	Focus disease	Duration	Relation to WHO	Regional distribution	Membership	Types of activities	Epidemiological goal	Stated objectives
APOC	Onchocerciasis	1995–2010	Formal (internal) partner	19 countries in Africa	Countries, international organisations, NGOs, private sector	Advocacy, financing, technical assistance	Control	Eliminate onchocerciasis in Africa through community-based ivermectin treatment
OEPA	Onchocerciasis	1991–2007	Formal (internal) partner	6 countries in Americas	Countries, international organisations, NGOs, private sector	Technical assistance	Elimination	Eliminate onchocerciasis in Americas through ivermectin distribution in endemic communities
GWEP	Dracunculiasis	1991–present	Formal (internal) partner	6 countries in Africa	Countries, international organisations, NGOs, private sector	Advocacy, financing, programming, technical assistance	Eradication	Complete eradication of dracunculiasis
INCOSUR	Chagas disease	1991–present	Formal (internal) partner	7 countries in South America	Countries, international organisations	Technical assistance	Control/eradication	Elimination of <i>Triatoma infestans</i> and reduction of Chagas disease
GAELF	Lymphatic filariasis	2000–20	Formal (external) partner	83 countries in global tropics	Countries, international organisations, NGOs, private sector	Advocacy, technical assistance	Elimination	Elimination of lymphatic filariasis by 2020; alleviate hardships for individuals with disability induced by lymphatic filariasis
ITI	Trachoma	1998–2020	Formal (external) partner	17 countries in Africa+Vietnam	Countries, international organisations, NGOs, private sector	Advocacy, financing, programming, technical assistance	Elimination	Achieve global elimination of blinding trachoma by 2020 through the SAFE strategy
IILEP	Leprosy	1975–present	No formal relation	14 developing countries	NGOs	Advocacy, technical assistance	Control	Support leprosy programmes by providing technical assistance
SCI	Schistosomiasis	2002–present	No formal relation	Sub-Saharan Africa	NGOs, private sector	Advocacy, programming, technical assistance	Control	Reduce the global disease burden of neglected tropical diseases in sub-Saharan Africa by 2015

APOC=African Programme for Onchocerciasis Control. OEPA=Onchocerciasis Elimination Programme for the Americas. GWEP=Guinea Worm Eradication Programme. INCOSUR=Southern Cone Initiative to Control/Eliminate Chagas Disease. GAELF=Global Alliance for the Elimination of Lymphatic Filariasis. ITI=International Trachoma Initiative. IILEP=International Federation of Anti-Leprosy Associations. SCI=Schistosomiasis Control Initiative. NGO=non-governmental organisation. SAFE=Surgery, Antibiotics, Face cleanliness, and Environmental improvement.

**Table 2: Selected initiatives for control of neglected tropical diseases**

Chagas disease (caused by *Trypanosoma cruzi* and transmitted by triatomine bugs) in the Americas is tackled by another type of programme. Affected countries initiated regional programmes, such as the Southern Cone Initiative to Control/Eliminate Chagas Disease (INCOSUR). Founded in 1991, INCOSUR is a key example of regional coordination. On the one hand, countries retain full responsibility for financing, designing, and implementation of their own national programmes. On the other hand, there is a common commitment and a yearly exchange of strategies, goals, and results.<sup>43</sup> Such regional cooperation was fostered by the simultaneous development of a common market and the historic links between countries in this region. Moreover, technical assistance is provided by an international technical secretariat based at PAHO, which catalysed cooperation.<sup>44</sup> Similar initiatives in the PAHO region are undertaken in Amazonian, Latin American, and Andean countries.

Another approach is to focus on advocacy, communication, and technical assistance to support a WHO global programme. This approach was taken by the Global Alliance for the Elimination of Lymphatic Filariasis in supporting WHO's Global Programme to Eliminate Lymphatic Filariasis. Organised as a partnership of WHO, World Bank, pharmaceutical companies, non-governmental development organisations, and country representatives, the Global Alliance for the Elimination of Lymphatic Filariasis retains a

“light governance structure that facilitates flexibility in addressing specific needs at regional and national levels”.<sup>45</sup> All partners of the alliance elect a representative contact group, which reflects their different expertise and perspectives. However, management and strategic planning is undertaken by a smaller body—the executive group.

The International Trachoma Initiative (ITI) is a public–private partnership created by the Edna McConnell Clark Foundation and Pfizer in 1998, to promote the WHO-endorsed SAFE strategy (Surgery, Antibiotics, Facial cleanliness, and Environmental improvements) and coordinate the distribution of the antibiotic azithromycin (Zithromax), donated by Pfizer, in selected countries.<sup>46–48</sup> This initiative is a partner of WHO's Alliance for Global Elimination of Trachoma by 2020, established with the goal to eliminate blinding trachoma and a governance structure similar to other WHO-driven initiatives described in this paper.<sup>49,50</sup> In 2009, ITI merged with the Task Force for Global Health. Its governance has been changed by dissolving the previous ITI board of directors and expanding the authority and decision-making responsibilities of the trachoma expert committee, which consists of independent technical experts together with liaison representatives from international organisations, development agencies, and Pfizer. The trachoma expert committee obtains input from national governments of endemic countries through representation by and a close working

	Donated drug	Donor company	Duration of programme	Amount of drugs donated by 2008
Onchocerciasis <sup>61</sup>	Ivermectin	Merck	1987–open-ended	2.1 billion tablets by 2007
Lymphatic filariasis <sup>62</sup>	Ivermectin	Merck	1998–2020	648 million tablets by 2007*
Lymphatic filariasis <sup>63</sup>	Albendazole	GlaxoSmithKline	1998–2020	1 billion tablets
Trachoma <sup>64</sup>	Azithromycin	Pfizer	1998–open-ended	551 million tablets†
Leprosy <sup>65,66</sup>	Multidrug therapy	Novartis	2000–10	NA
Human African trypanosomiasis <sup>67</sup>	Pentamidine isetionate, melarsoprol, eflornithine	Sanofi-Aventis	2001–11	NA (total of 940 000 vials in 2001–06)
Human African trypanosomiasis <sup>68</sup>	Suramin	Bayer Healthcare	2002–12	NA
Schistosomiasis <sup>68</sup>	Praziquantel	MedPharm	NA	NA (14 million tablets in 2004)
Chagas disease <sup>68,69</sup>	Nifurtimox	Bayer Healthcare	2004–12	NA (500 000 tablets in 2004–05; 2.5 million tablets pledged in 2007–12)
Soil-transmitted helminthiasis <sup>70</sup>	Mebendazole	Johnson & Johnson	2006–open-ended	NA (30 million tablets in 2006; 50 million tablets per year pledged)
Fascioliasis <sup>71</sup>	Triclabendazole	Novartis	2007–09	NA (600 000 tablets pledged in 2007–09)
Schistosomiasis <sup>72</sup>	Praziquantel	Merck KGaA	2008–17	NA (200 million tablets pledged in 2008–17)

NA=data not available. \*216 million treatments, three tablets per treatment. †145 million treatments, 3.8 tablets per treatment.

**Table 3: Overview of selected drug-donation programmes for neglected tropical diseases**

relationship with the Alliance for Global Elimination of Trachoma by 2020.<sup>51</sup>

In addition to public–private partnerships, there are also alliances by various private or non-governmental organisations working on shared goals. In 1966, major antileprosy associations organised themselves into an umbrella organisation, which became the International Federation of Anti-Leprosy Associations (ILEP) in 1975. ILEP partners coordinate their policies by regularly sharing information and frequently collaborating on priority projects. Moreover, they assign one lead association to every endemic country or state within large countries. Although there have been recurrent attempts to forge an alliance between ILEP and WHO's Leprosy Elimination Programme, that partnership was not always harmonious.<sup>52,53</sup> The debate about whether elimination or control should be the goal of the alliance clearly shows the need for having a congruent mission, strategy, and values in a successful partnership.<sup>54</sup> Nonetheless, the alliance was re-established in 2004, and the partners from both sides are optimistic.<sup>55</sup>

The Schistosomiasis Control Initiative was established in 2002 at Imperial College London through a grant from the Bill & Melinda Gates Foundation, partnering with WHO and the Danish Bilharzia Laboratory. Its goal was to establish sustainable national schistosomiasis and intestinal helminth control programmes in sub-Saharan Africa, focusing on treatment of school-aged children and other high-risk groups.<sup>56,57</sup> Eight countries were selected, and the initiative focused on operational research and in-country training through a project-based approach. In 2006, its mission was broadened with another grant from the Bill & Melinda Gates Foundation to include other prevalent neglected tropical diseases, because co-infections were the norm

rather than the exception in the target countries.<sup>58</sup> Consequently, programme managers in the field have now started to explore integrated approaches for drug delivery, monitoring, and assessment.<sup>59</sup>

### Drug donations

No other public health initiative has benefited from the availability of donated drugs to such an extent as have neglected tropical diseases. Key enabling factors for these donations are the preventive public health nature of the programmes; their large scale; the pre-existence of structured multidonor, international control efforts; and clearly delineated accountability and evaluation mechanisms.<sup>60</sup> These factors seem to facilitate both the willingness of the pharmaceutical industry to provide such charitable donations and their effective use. Such cooperation between the industry and programmes for neglected tropical diseases is a good example of a public–private partnership. Table 3 provides an overview of selected drug-donation programmes.

One of the oldest and largest examples of a private–public partnership is Merck's Mectizan Donation Programme, which was launched in 1987. Merck committed to donate as much Mectizan (ivermectin) as was needed for the treatment of onchocerciasis and for as long as necessary. In 1998, the programme expanded the donation to include ivermectin for the elimination of lymphatic filariasis wherever onchocerciasis and lymphatic filariasis are co-endemic.<sup>73</sup> By 2007, Merck had donated more than 2.7 billion ivermectin tablets for these diseases.<sup>61,62,74</sup> Another private–public partnership to eliminate lymphatic filariasis was formed in 1998, when GlaxoSmithKline pledged to provide albendazole free of charge in support of a global effort to eliminate this disease by 2020.<sup>63</sup> To combat trachoma, Pfizer has

**Panel 2: Example of challenges of integration in Tanzania**<sup>82,83</sup>

Tanzania's national Government initiated discussions to integrate control of neglected tropical diseases through preventive chemotherapy as early as 2004. Moreover, these diseases have represented a separate item in the country's medium-term expenditure framework since the financial year 2007–08. However, Tanzania also showcases the organisational challenges in harmonising fragmented governance structures for preventive chemotherapy and transmission control. For example, the control of soil-transmitted helminths in most regions is undertaken under the auspices of the National Schistosomiasis and Soil-transmitted Helminths Control Programme. That programme is placed within the National School Health Programme and conceived as a joint partnership of the ministries of health and education. Programming and operations are closely coordinated with the Schistosomiasis Control Initiative. However, deworming in selected other regions will be managed under the auspices of the new nationally integrated neglected tropical disease programme, which was developed by a consortium of several international non-governmental development organisations, the Ministry of Health and Social Welfare, the National Institute for Medical Research, and all four national vertical neglected tropical disease programmes.

donated its antibiotic Zithromax (azithromycin) across 18 countries through ITI since 1998.<sup>64</sup>

One of the most recent private–public partnerships is called Children Without Worms, which was launched in 2006 by the Task Force for Child Survival and Development and Johnson & Johnson, with Johnson & Johnson committing mebendazole to treat school-aged children.<sup>70</sup> In 2007, German Merck KGaA launched another drug-donation programme in partnership with WHO to combat schistosomiasis. The company pledged to supply praziquantel for 10 years, allowing the treatment of roughly 27 million schoolchildren in Africa.<sup>72</sup>

**Integration of national activities**

Shared features and integration of activities for control and prevention of neglected tropical diseases has attracted some attention, as shown through a series of grants by the Bill & Melinda Gates Foundation. Its proponents emphasise the organisational and financial synergies and economies of scope by co-implementation of preventive chemotherapy, mapping, and community involvement.<sup>21</sup> Suggestions range from combining several drugs into rapid impact interventions and development of common delivery mechanisms to link neglected tropical diseases with other diseases.<sup>6,9</sup> Theoretically, there would be a wide range of gradual measures to exploit or create synergies.<sup>75</sup> Yet, in view of the multiplicity of programmes, differences in financing mechanisms, and diverse governance structures, the

co-implementation and harmonisation of activities for neglected tropical diseases remain challenging. Furthermore, government interest and funding are scarce since these diseases largely affect communities with little political power.

Most attention in integration of activities so far has focused on technical challenges—eg, compatibility of drug combinations, preventive chemotherapy, joint mapping, monitoring and surveillance, and exploring economies of scale through community-directed treatment.<sup>22</sup> In particular, the preventive chemotherapy and transmission control approach articulated by WHO, which is widely accepted and increasingly used, advocates the joint and synergistic implementation of large-scale drug treatment interventions for several helminthic infections: lymphatic filariasis, onchocerciasis, schistosomiasis, and soil-transmitted helminthiasis.<sup>76</sup>

Since 2007, several pilot programmes—mostly in Africa—are underway to test not only preventive chemotherapy and transmission control but also the premise of integrated control for neglected tropical diseases.<sup>77</sup> Two examples from Nigeria show particularly promising results. In the first case, two operational tasks (mass anthelmintic drug administration and vector control) were successfully combined.<sup>78</sup> The second case lends supports to the claim that community-directed approaches could be used as entry-point for the delivery of other drugs and micronutrients.<sup>79</sup> Sceptical assessments are voiced in view of the experiences in Uganda, where challenges encountered include the overburdening of community drug distributors, inability to harmonise health information and education, and the risk of setting up an extensive health-care system that is parallel to the existing one.<sup>80</sup> However, a recent multicountry study by the Special Programme for Research and Training in Tropical Diseases on community-directed health interventions in Africa showed that communities managed integrated interventions successfully.<sup>81</sup> On the basis of such studies, major donors, academics, and senior professionals forcefully promote integration of activities.<sup>22</sup>

In-country implementation of integrated activities by government agencies, however, is still at an initial stage. Although geographical areas where the diseases overlap and co-endemicity occurs could benefit from an integrated approach,<sup>77</sup> there are still substantial challenges to overcome in practice by integration of activities that have different epidemiological goals, different control methods, and different local and international constituencies. The key operational challenges for countries (panel 2) range from integration of such disease control efforts into the country's overall health-delivery system, to differences in key institutional contributors implementing control—eg, school-based mass drug administration programmes within the portfolio of the Ministry of Education and community-based programmes through district health services under the Ministry of Health—and intra-ministerial coordination of disease control units.

	Hosted or independent	Board	Charter	Membership	Activities (primary/secondary)
APOC	Hosted by World Bank/WHO/UNDP	Constituency-based	Yes (MOU with World Bank and WHO)	Countries, international organisations, NGOs, private sector	Financing/technical assistance
OEPA	Hosted by NGO	None	No	Countries, international organisations, NGOs, private sector	Financing/technical assistance
IILEP	Independent	Constituency-based	Yes (constitution)	NGOs	Coordination/advocacy
GWEP	Hosted by NGO	None*	No	Countries, international organisations, NGOs, private sector	Financing/advocacy
INCOSUR	Hosted by PAHO	None	No	Countries, international organisations	Coordination
ITI	Independent	Competency-based	No	Countries, international organisations, NGOs, private sector	Financing/advocacy
GAELF	Hosted by academia	Constituency-based	No	Countries, international organisations, NGOs, private sector academia	Advocacy/technical assistance
SCI	Hosted by academia	Competency-based	No	NGOs, private sector academia	Financing/technical assistance

APOC=African Programme for Onchocerciasis Control. OEPA=Onchocerciasis Elimination Programme for the Americas. IILEP=International Federation of Anti-Leprosy Associations. GWEP=Guinea Worm Eradication Programme. INCOSUR=Southern Cone Initiative to Control/Eliminate Chagas Disease. ITI=International Trachoma Initiative. GAELF=Global Alliance for the Elimination of Lymphatic Filariasis. SCI=Schistosomiasis Control Initiative. NGO=non-governmental organisation. PAHO=Pan American Health Organization. MOU=memorandum of understanding. \*Eradication certified by WHO-appointed commission.

**Table 4: Governance of selected programmes**

### Harmonisation of a fragmented governance structure

Before addressing governance structures for control of neglected tropical diseases (table 4), the tested governance system established for HIV/AIDS, malaria, and tuberculosis can serve as a point of reference. Exclusively dedicated to the fight against HIV/AIDS, the Joint UN Programme on HIV/AIDS (UNAIDS) brings together ten UN organisations, representatives from national governments and non-governmental organisations, and associations of people living with HIV/AIDS. Its structure and operations are governed by resolutions of the UN Economic and Social Council, and its director is responsible to the UN Secretary-General.<sup>84–86</sup> Similarly, the programmes Roll Back Malaria and Stop TB Partnership are sophisticated global partnerships involving a multiplicity of stakeholders with structured, constituency-based boards, hosted by WHO.<sup>87,88</sup>

Such a level of organisation and governance is unlikely to be reached for many neglected tropical diseases, the exception being the long running African onchocerciasis programmes and, to an extent, the Guinea Worm Eradication Programme. Major efforts have focused not on governance and coordination, but on advocacy, both to establish neglected tropical diseases firmly on the map of international health priorities and to access more financial resources. Yet, even in the area of advocacy, the effort is more complex than it is when dealing with a single disease such as HIV/AIDS, malaria, or tuberculosis, because delivery of a disease-related message is difficult. Therefore, advocacy has focused on neglect, poverty, and economies of scope—ie, the possibility of integrating control. A combination of several political and academic contributors has been particularly effective in advocacy, leading to two substantial US Government grants for

integrated control of neglected tropical diseases.<sup>89</sup> A major driving force in these advocacy efforts has been the Global Network for Neglected Tropical Diseases—an alliance of mostly USA-based or UK-based organisations working to control these diseases by 2020, with support from two grants from the Bill & Melinda Gates Foundation.<sup>90</sup>

Although harmonisation efforts so far have thus concentrated on advocacy and technical challenges, almost no attention has yet been given to national governance and sustainability challenges. Financing is largely off-budget for many recently established programmes for neglected tropical diseases, almost all in Africa, and special semi-autonomous implementation arrangements are common. Such arrangements result in a high amount of donor dependence, high transaction costs, and difficulties with sustainability.<sup>91</sup> By contrast, the large multilaterally financed single-disease programmes—such as APOC or WHO's Global Programme to Eliminate Lymphatic Filariasis—work fully within the recipient countries' institutional and budgetary framework. In the effort towards securing additional resources for integrated control of neglected tropical diseases and establishment of pilot programmes, these issues have been neglected and remain to be adequately addressed.

To harmonise activities of the multiplicity of partners and programmes globally, WHO called a first meeting for neglected tropical disease partners in 2007.<sup>92</sup> Although this action has facilitated the working relation between ongoing programmes, particularly those using preventive chemotherapy, an attempt to forge a more formal umbrella or a coalition for these diverse programmes has not yet been undertaken. Towards the same end, WHO created a special neglected tropical diseases department in 2006 that coordinates efforts to control these diseases. However, even within WHO, integration of control still

presents challenges since the department is within the infectious disease cluster, which does not cover onchocerciasis and trachoma. Furthermore, regional WHO offices have created their own structures or focal points and developed lists of regionally relevant neglected tropical diseases.<sup>24,93</sup>

### The way ahead

Globally, some coordination of the fragmented structure seems desirable. Since the profile of neglected tropical diseases has recently been greatly raised, such coordination has become urgent. There are models such as the Stop TB Partnership, which have been effective in harmonising activities of several diverse partners through a so-called partners forum, navigating the complicated link between WHO's institutional support, normative functions, country responsibility, and partner authority.<sup>94</sup> An exploratory meeting of crucial stakeholders—modelled after the well regarded Rockefeller Foundation Bellagio meetings—to identify shared goals and the areas in which collaboration could improve outcomes, as well as exploring strategy, structure, membership of a larger alliance, could be important next steps to ensure momentum and sustainability of the present advocacy for these diseases.

Such a meeting could also attempt an agreement about what constitutes a neglected tropical disease. Although some flexibility seems inevitable and necessary in this very dynamic field, the present proliferation of different definitions and interpretations of the term needs some clarification. This definition could lead to the development of criteria for inclusion of a disease—ie, disease burden, effect on the poorest and most vulnerable populations, and suitability for integration. Furthermore, identification of categories of neglected tropical diseases that are suitable for integration, taking into consideration regional epidemiological patterns and the institutional settings, would operationalise the discussion and be helpful for funders.

However, immediate coordination of governance arrangements is needed between the supporting international contributors of neglected tropical diseases for national programmes that are based on preventive chemotherapy and transmission control. Such programmes have been forcefully supported by the Bill & Melinda Gates Foundation and recently by the US Agency for International Development, sometimes including complex trachoma control, yet they are organisationally diverse and their governance arrangements are strongly affected by funding source and donor requirements. The identification of best practices for preventive chemotherapy and transmission control and the development of harmonised processes between the global programmes and partnerships would decrease the burden on national health systems that have to work with many partners under different frameworks of cooperation and with diverse requirements for mapping, data reporting, and monitoring and evaluation.

Another governance issue is the emerging pattern of allying control of neglected tropical diseases with other programmes, such as programmes for malaria, HIV, or tuberculosis and those for micronutrients distribution, particularly vitamin A. Co-implementation of mass drug administration with home-based management of malaria and distribution of longlasting bednets, or combination of mass drug administration with intermittent preventive treatment, has shown remarkable interactions. The next step will be to scale up from operational research or pilot projects to large-scale co-implementation nationally or subnationally, and thus forging administrative mechanisms to allow such co-implementation to occur routinely. Yet, to establish and, importantly, maintain cooperation between well resourced programmes such as malaria and marginal initiatives for neglected tropical diseases will be no trivial challenge. If successful, it could have a substantial public health effect. But most importantly, the present momentum in putting neglected tropical diseases on the global health agenda needs to be maintained, which includes not only increased advocacy and funding but also the establishment of consensus across stakeholders on definitions, objectives, and strategies.

#### Contributors

All authors contributed to the conceptualisation of the report and have approved the final version. BL and AS conceptualised, drafted, and revised the report.

#### Conflicts of interest

We declare that we have no conflicts of interest.

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