Strategic and technical meeting on intensified control of neglected tropical diseases

A renewed effort to combat entrenched communicable diseases of the poor

Report of an international workshop
Berlin, 18–20 April 2005
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Communicable Diseases

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Preface

Infectious and parasitic diseases – most of which are preventable and/or treatable – remain the primary cause of death worldwide. International attention is currently focused on HIV/AIDS, malaria and tuberculosis, as well as on global health security. However, many other chronically endemic tropical diseases, which have a significant negative impact on the lives of poor populations, are still much neglected in the global public health agenda.

Most of these tropical diseases affect almost exclusively poor and marginalized populations living in settings where poverty is widespread and resources, or access to livelihood opportunities, are scarce. These diseases have an enormous impact on individuals, families and entire communities in developing countries in terms of burden of disease, quality of life, loss of productivity, aggravation of poverty and the high cost of long-term care. They constitute a serious obstacle to socioeconomic development and quality of life at all levels. Improved control and prevention of such diseases would be a major contribution to poverty alleviation and in reaching the health-related Millennium Development Goals. Despite the fact that many low-cost and effective interventions are available to control most of these diseases, the majority of affected populations do not have access to them.

In 2003, WHO and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) convened meeting in Berlin on the intensified control of neglected tropical diseases, which was an important milestone in defining a collective response against these diseases. It moved many forgotten diseases out of the shadows and on to the public health agenda. It made a strong case to tackle these diseases from various perspectives - economic, public goods and human rights. Tropical diseases are an important health problem for affected communities and health services.

This first meeting also provided the conceptual framework to move away from a purely disease-centred approach to one that is more sensitive to the health needs of communities. It essentially shifted the focus to neglected communities and to an integrated approach. Given the close links between these diseases and poverty, tackling them together could provide some of the “quick wins” for the achievement of many of the Millennium Development Goals. This opportunity was met with interest and readiness to act on the part of funding agencies.
WHO, with the support of the German Ministry for Economic Cooperation and Development, and the agencies GTZ and KFW convened this second meeting in Berlin to secure strategic and technical guidance on specific options for taking this agenda forward using a three pronged approach: broader coverage with rapid-impact interventions, strengthened vector control to reduce transmission of several diseases, and improved surveillance and high-quality care. Research and development, including operational research, would underpin activities in all three areas.

Such an approach, with mass treatment interventions, would permit the rapid scaling up of access to the available safe and effective treatments, which can be given together to tackle a number of diseases often afflicting the same individual. This would protect communities and bring real benefit to millions. It would also make the most efficient use of human and financial resources and existing infrastructures.

This proactive approach to tackling neglected diseases would reach all at risk as a population-based intervention, and would attack transmission with a real promise of reducing the burden to locally manageable levels. Moreover, it is compatible with the human rights agenda as it is non-discriminatory and ethical. It is also a pro-poor strategy as it enhances human capital by protecting millions of people from debilitating diseases, with considerable collateral benefits on education and productivity.

Berlin II takes the vision a significant step forward to translate the paradigm shift from a disease oriented approach to an integrated one. Amid debates around the streamlining and coordination of activities, the involvement of other sectors in the provision of services, risks, caution, open issues, a bold new approach emerged. It established the framework for a menu that can be adapted to local needs and offered to policy-makers, health services and funding agencies. This integrated, yet flexible, approach can be implemented at a fraction of the cost for many other public health interventions. In addition to the direct health benefits, it provides a host of collateral benefits.

The shift from compartmentalized thinking to viewing the linkages across individual programmes, although intuitive, will be challenging in view of the plethora of partnerships and agencies involved. This process will require a radical change in thinking and moving out of individual areas of expertise towards collaboration with a range of institutions across disease areas on practical issues of implementation.

Institutional persistence and stamina in terms of financing and long-term commitment will also be vital. The rapid-impact interventions need to be repeated, systematically, year after year for over 10 to 20 years.
We need to move ahead with a sense of urgency. This urgency applies to all of these diseases – and not just to those with rapid-impact interventions and immediate chances of success. Vector control is also important, as all tools must be brought to bear on these entrenched problems. We need to simplify and harmonize the individual disease control strategies and tools into a pragmatic and sound integrated package. We should roll out and treat patients and closely monitor the situation.

It is crucial that we now move towards translating the vision into reality and realize the tremendous impact of tackling tropical diseases on ill-health, disability and poverty.

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Neglected tropical diseases, or the communicable diseases of the developing world

Throughout the developing world, socioeconomic progress is impeded by ancient and entrenched infectious diseases that permanently diminish human potential in very large populations. These diseases have largely vanished from affluent nations but continue to flourish in tropical and subtropical climates under the living conditions that surround impoverished populations – the people left behind by socioeconomic development. These neglected tropical diseases thrive in areas where water supply, housing and sanitation are inadequate, nutrition is poor, literacy rates are low, health systems are rudimentary and insects and other disease vectors are constant household and occupational companions.

Neglected tropical diseases continue to permanently maim or otherwise impair the lives of millions of people every year. They anchor affected populations in poverty and also compromise the effectiveness of efforts made by other sectors to improve socioeconomic development. For example, there is ample evidence that children heavily infected with intestinal worms will not fully benefit from educational opportunities and are more likely to suffer poor nutritional status. Adults permanently disabled by blindness or limb deformities may be a burden in rural agricultural communities that eke out a living from subsistence farming. In addition, the stigma attached to many of these diseases closes options for a normal family and social life, especially for women. Efforts to control these diseases thus free people to develop their potential unimpeded by disabling disease and, in so doing, increase the chances that efforts in other sectors, such as education and agriculture, will be successful.
Unprecedented trends – unprecedented opportunities

As noted during an international workshop held in Berlin in 2003, the last decades of the 20th century saw the start of several positive trends, and these trends are continuing in unprecedented ways. The significance of these diseases is receiving greater attention. Ambitious targets have been set for several, and impressive progress is being made. In some cases, research is discovering that interventions bring unanticipated improvements in overall health status, thus building the foundation for better health. Never before have so many of these diseases been targeted for action, with time-limited goals supported by stable and committed partnerships. Never before have so many high-quality interventions been made available at low or no cost. Never before have such large numbers of people been protected or cured from crippling diseases. Supported by these trends, the international community is now close to eliminating or vastly reducing the burden of such ancient companions of poverty as guinea-worm disease, leprosy and onchocerciasis.

This unprecedented momentum has received further impetus from the precise targets and systematic approaches embodied in the Millennium Development Goals. In agreeing on these ambitious goals, world leaders committed the international community to a common set of development objectives for improving health, reducing poverty and protecting the physical environment. Viewed against these objectives, the control of tropical diseases is a pro-poor initiative with benefits well beyond health that contribute directly to some goals and indirectly to several others. Control of these diseases has the further advantage of being able to produce visible and measurable results quickly in ways that improve lives, promote economic productivity and build expertise at the community level.

As with achievement of the Millennium Development Goals, some improvements in control of these diseases will take time and require complex institutional changes. Others involve “quick win” or rapid-impact interventions than can immediately improve the lives of large numbers of people. Abundant experience shows that great strides forward can be made now, even in very poor and largely illiterate populations, pending longer-
term improvements in living conditions, service infrastructures and income status. In some instances, these initiatives have played a pioneering role, making the first inroads into problems long considered insurmountable. The drive to control these diseases has often brought essential interventions and services into remote areas for the first time. They reach receptive communities: disabling and deforming diseases are dreaded even when their medical causes are poorly understood. Moreover, a growing body of evidence shows that many of these interventions bring unanticipated benefits that improve the well-being of people in immediate and visible ways, thus further paving the way for acceptance and creating local demand. When people feel better they can also begin to realize and develop their latent potential for taking charge of their own health and development problems.

Seizing the opportunity: proposed focus for rapid results

For these reasons, WHO is proposing that the control of neglected tropical diseases be immediately intensified through a focus on three main activities:

1. Broader coverage with rapid-impact interventions;
2. Use of strengthened vector control to simultaneously reduce the transmission of several diseases;
3. Improved surveillance and high-quality care in resource-limited settings for diseases where this approach brings the best chance of preventing severely disfiguring disease or reducing deaths.

Research and development, including operational research, underpin activities in all three areas.

Fundamental to this proposal is an urgent need to strengthen the preventive component of all control initiatives. Interventions that are presently available have their greatest power when delivered early – before the development of permanent deformities or irreversible organ damage. Ideally, preventive interventions should be delivered in childhood. As many of these diseases start early in life, they place children at risk during a period of intense physical and intellectual development, further increasing their vulnerability to permanent impairment of their human potential. Similar to the principle of immunization, whereby children receive early protection against a set of common infections according to a schedule of vaccinations and boosters, children can also be protected against a set of tropical diseases through a schedule of early systematic treatments that continue into adulthood.

For many reasons, these diseases have a well-known tendency to present for treatment so late that prevention of permanent physical deformities or internal organ damage is no longer an option. It is this failure to detect and treat sufficiently early, when the costs of interventions are usually low, that makes many of these diseases so costly to individuals, families, communities and national economies. Strategies for intensified control that exploit every opportunity for prevention promise to be the most efficient way to address this last stronghold of disease burden linked to extreme poverty.
Rapid-impact interventions

Large-scale implementation of existing and highly effective strategies is immediately feasible for the prevention and control of four groups of diseases: lymphatic filariasis, onchocerciasis, schistosomiasis and soil-transmitted helminthiases, and blinding trachoma. These diseases impose a great burden on poor populations in the developing world, yet the prospects for success are high – a “quick win” for the masses. They lend themselves to rapid expansion of coverage, rapid results and thus rapid improvements in the lives of many. All of these diseases have robust, low-cost and effective interventions, and well-defined strategies for their implementation have been developed and extensively tested.

In addition, control strategies for these diseases have been greatly simplified by the advent of high-quality drugs – made available at low or no cost – so safe and effective that they can be administered pre-emptively to almost all at-risk populations. Apart from obviating the need for individual case-finding and diagnosis, this approach usually requires limited contact with the health services and does not depend on highly trained staff.

The greatest challenge is to expand coverage to reach all in need, early enough, and to find opportunities to continue to regularly treat at-risk populations throughout life. Only then can the full power of good technology be brought to bear on what is now recognized to be a major impediment to poverty reduction as well as a significant public health problem. At the same time, because the numbers of affected people are so great and hard to reach, innovative ways to expand coverage must be found. The result will be immediate gains in the health and well-being of large populations. These gains will further provide a solid foundation for improvements in the educational and agricultural sectors, and in nutritional status, maternal health and the survival of children into an adulthood free of disabling diseases.

Professor Bruno Gryseels urged the participants to pursue the analysis of existing programme delivery mechanisms. The strategic plan forward should make a strong case for the universal right to accessible high-quality health care, for health systems that integrate care, prevention and control, and for national and local ownership. He called for caution in extrapolating successes from middle-income countries, characterized by political commitment, well-developed health systems and general social progress to countries with much less possibilities and far greater problems. Health priorities, resources and determinants vary strongly from one country, region and district to another, in particular for environment-linked tropical diseases. Actually, their focal nature is the very reason why these diseases are not considered as “global priorities”. The major need and challenge are enabling sustainably local health services to tackle local problems based on local priorities and local resources.
Exploiting the preventive power of vector control

A large number and wide range of physical, biological and chemical methods for vector control have been available for decades. For the many vector-borne tropical diseases, abundant evidence demonstrates the power of these methods to reduce or interrupt disease transmission in ecologically sound ways. These methods thus have a central role to play in an intensified control strategy that places major emphasis on prevention. For diseases such as malaria and dengue, vector control is presently the principal strategy for reducing the risk of infection. For diseases such as Chagas disease, leishmaniasis, onchocerciasis, African trypanosomiasis and lymphatic filariasis, where programme goals aim to reduce or eliminate transmission, vector control has great potential to strengthen a multi-pronged approach that exploits all possible opportunities – in disease ecology as well as biology – to alter the transmission cycle. The potential contribution of vector control is amplified by the simple fact that these methods are so greatly underutilized at present. Although vector control has a proven record of saving lives by preventing, reducing or eliminating transmission, its benefits are not being fully realized.

The advantages of strengthening vector control are multiple. Apart from their great preventive power, methods of vector control are ideally suited for use in an integrated approach to disease control. They have great operational flexibility and readily lend themselves to adaptation to the particular disease situation in a given community. Synergies that derive from combining several methods achieve efficiencies, and these efficiencies increase even further when the methods are used to address more than one disease.

The distribution and incidence of vector-borne diseases are strongly determined by ecological conditions – climate, vegetation, water bodies, terrain and altitude. Some vectors transmit multiple diseases; others share similar habitats and thus overlap geographically. Powerful satellite imaging technologies now allow rapid identification and mapping of these habitats and thus guide precisely targeted interventions. When insecticides are used, their application to bednets or other household materials supports judicious and rational use of chemicals. Moreover, these treated materials can contribute to the simultaneous control of malaria, lymphatic filariasis and leishmaniasis.

Many of these measures can be effectively implemented despite the absence of a strong health system. The nuisance of biting insects helps achieve acceptability and create demand within communities, even when the role of insects in disease transmission is poorly understood. As a final advantage,
vector control of necessity brings in other sectors, such as agriculture and animal health. As some of these sectors have local staff and outreach services, their involvement expands the base of existing resources, infrastructures and delivery systems available for the intensified control of tropical diseases.

**Improved surveillance and high-quality care in resource-limited settings**

With a few exceptions, the clinical case management of most tropical diseases is currently severely limited or impossible to undertake in most regular health services, particularly at the most peripheral levels. Even for obvious early signs of disease – haematuria in the case of urinary schistosomiasis or lymphangitis in the case of lymphatic filariasis – very few patients are able to obtain adequate treatment in peripheral-level health facilities. The problem is particularly acute for diseases such as Buruli ulcer, leishmaniasis and African trypanosomiasis, because of the absence of early specific clinical signs or lack of simple diagnostic tests. For these diseases, clinical case management currently relies on sophisticated and difficult diagnostic methods. Failure to detect and treat sufficiently early has severe consequences: high mortality for African trypanosomiasis, severe disfigurement for some forms of leishmaniasis and high mortality for others, and permanent tissue damage and functional disabilities for Buruli ulcer.

Systematic case-finding and management at an early stage of the disease – when affected people are unlikely to seek health care or when the disease is unlikely to be diagnosed by health-care personnel – remain the only currently available option for intensified control. Simple diagnostic tools and safe treatments are potentially available for development. Ensuring their rapid development and introduction at field level will enable a radical change in control strategies for these diseases and allow a larger and more efficient use of health-care capacities for their control.
Tropical diseases: impact on people, societies, and economies

David Canning.

The economic approach to priority-setting uses three competing methods: measuring the burden of disease, cost-effectiveness analysis and cost-benefit analysis. Neglected diseases do not score high from a disease burden perspective, and this lies at the crux for their neglect. However, from a cost-effectiveness and above all cost-benefit perspective, the scores change particularly for the subset of diseases in the package of rapid impact interventions. These interventions put two arrows in a quiver and bring both health and economic benefits with increased productivity and school attendance. This high return on investment, based on very low costs with a strong contribution to human capital, should attract the ear of finance ministers as the “quick wins” are investment rather than consumption goods.

Measuring the burden of disease

Economic analysis typically measures the demand side of health in terms of mortality, or morbidity or disability adjusted life years (DALYs). Despite the lack of adequate statistics, neglected diseases cannot compare with the leading killers. In terms of mortality they account for only about 1% of the 10 million deaths from infectious diseases. This low weight is also reflected in DALYs. Even in sub-Saharan Africa, these diseases account for only a small part of disease burden.

From a morbidity perspective, however, some tropical diseases are highly prevalent and endemic. Prevalence rates of worm-related diseases are about 30% in sub-Saharan Africa. However, their disability weights are not exceptional based on a panel of experts. The burden of some diseases such as schistosomiasis is undoubtedly underestimated, and could be revised up by a factor of two. However, a low disease burden does not mean low priority as they are high priority for affected communities.

Cost-effectiveness looks beyond the disease burden

Using the cost-effectiveness approach, the global disease burden becomes irrelevant. The objective is to define where money is most effectively invested and to work on the margin. This approach looks at the cost per DALY gained and ranks interventions based on the health benefits they bring. Whenever prevalence is low, the marginal cost of an intervention goes up, as does the cost of screening. When setting priorities, it is desirable to move to low-cost interventions and also to take account of scarce human capital.
Table. Cost-effectiveness of interventions: cost per DALY gained

<table>
<thead>
<tr>
<th>Helminth infections</th>
<th>Community or school-based deworming US$ 6–33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhoea</td>
<td>Water supply hand pump or stand post US$ 94</td>
</tr>
<tr>
<td></td>
<td>House connections US$ 223</td>
</tr>
<tr>
<td></td>
<td>Basic sanitation US$ 270</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Antiretroviral treatment US$ 1000</td>
</tr>
<tr>
<td></td>
<td>Prevention US$10</td>
</tr>
<tr>
<td>Childhood diseases</td>
<td>Immunization (basic 6) US$ 15</td>
</tr>
</tbody>
</table>

The package of neglected tropical diseases is a clear example of a rapid-impact intervention with a high pay-off at a very low cost. School deworming, for example, is highly cost-effective. The challenge is determining the cut-off point. The World Bank suggests a limit of US$ 150 per life-year gained; others propose three times GDP per capita. In any event, rapid-impact interventions are both desirable and cost effective.

Cost-benefit analysis takes a more comprehensive view

Cost-benefit analysis considers comprehensive benefits arising from an intervention, including future benefits on economies, society and communities caused by low infectiousness or elimination of a disease. From a methodological perspective, benefits need not be aggregated into a single dollar value. Health benefits can be measured in health units without putting a monetary value on life. One could thus work with two sets of benefits measured in different units – monetary and welfare.

Economic analysis should move away from considering health as a consumption good to an investment good that increases economic
productivity and human capital. The human capital aspect is closely linked with ability to work as well as to productivity at work and school. This line of reasoning should be discussed with finance ministers so that health is viewed as contributing to economic growth and not as welfare. Welfare gains need continuous investment and usually rely on foreign aid, whereas investment goods raise future productivity.

From a microeconomic perspective, tackling neglected tropical diseases provides both health and economic benefits at low cost. There is ample evidence of significant gains in worker productivity as well as impressive effects on school attendance test scores. Externalities also apply to children attending schools without deworming activities, given the lower rate of infection in the community.

From a macroeconomic perspective, however, there is no evidence as this is largely based on life expectancy data which are not significant for neglected tropical diseases. Calculating the morbidity effect would require national time series for 25 years!

**The verdict**

From an economist’s perspective, the verdict on the three groups proposed is as follows:

- Rapid-impact interventions. A very strong case. Low cost, very high health benefit along with economic and productivity benefits.
- Vector control. A strong case that should be better articulated.
- The other diseases. A weak case as the interventions are costly and the disease burden is low. Not a high priority for economists.

Tackling neglected tropical diseases with rapid-impact interventions achieves increased health and productivity gains in a cost-effective way: high gains and high return on very low investment.
Neglected diseases and the right to health

Paul Hunt,

A human rights approach, driven by the principle of non-discrimination, requires the State, and all other actors in a position to assist, to establish a health system that gives a high priority to the control and elimination of neglected diseases. Any health system that neglects poverty-related diseases is inconsistent with the international right to health. A right-to-health approach to neglected diseases and populations requires accessible, transparent and effective human rights mechanisms of monitoring and accountability. The donor community also has a human rights responsibility to ensure the optimal coordination between the numerous global initiatives that bear upon health in the country.

Key features of a right-to-health approach to neglected diseases

Community participation

Participation is an integral feature of the right to health, and as much importance should be given to the processes by which health-related objectives are achieved as to the objectives themselves. Innovative arrangements are needed to facilitate the participation – in all four stages – of those who are usually excluded from policy-making. Preference revelation enables people to identify their preferences, i.e. what objectives they wish to achieve. Policy choice refers to the stage at which policies are formulated and decisions taken regarding the allocation of resources among alternative uses. People living in poverty are usually left out of this crucial stage of the process. The implementation stage: opportunities must be created to enable those living in poverty, and other disadvantaged groups, to participate in the implementation of the chosen policies. Monitoring and accountability is the final stage of participation, and people who are affected by policies should be able to participate in this.
Stigma and discrimination

In many societies, neglected diseases such as leprosy, lymphatic filariasis and leishmaniasis are sources of fear, stereotypes and prejudices. Discriminatory attitudes, beliefs and actions can contribute to the spread of neglected diseases and worsen their impact on those affected. Fear of stigmatization can lead people living with neglected diseases to avoid diagnosis, delay seeking treatment and hide the diseases. Stigma is thus an impediment to effective prevention and treatment of neglected diseases, and to care and support for those affected.

The socioeconomic consequences of stigma and discrimination associated with neglected diseases may have a particularly severe impact on people living in poverty, who are often subject to overt and implicit discriminatory attitudes by public authorities and private actors alike.

Wide-ranging measures are required to combat all forms of discrimination and stigma associated with neglected diseases, including through the implementation of health-related laws and policies, grounded in human rights, which confront discrimination in public and private sectors.

Research and development

Research and development (R&D) is essential for ensuring access to prevention and treatment of many neglected diseases. Currently, only 10% of global funding for research goes towards diseases that affect 90% of the world’s population. In addition to its public health implications, the highly distorted global health research agenda has important human rights implications. The rights to health and to enjoy the benefits of scientific progress give rise to national and international obligations upon States in the context of neglected diseases. A number of important public-private partnerships have been established over the years in an effort to correct this imbalance by working to enhance research and development into neglected diseases, and improving drug accessibility through cash or product donations, or price reductions.

An integrated health system that is responsive to local priorities

The right to health requires the development of an effective, inclusive health system of good quality for all. In other words, the right gives rise to an obligation to establish a system of health protection, including health care, and the underlying determinants of health, such as adequate sanitation, which provides equality of opportunity for all people to enjoy the highest attainable standard of health.

Thus, the State has a responsibility to maximize the use of all resources at its disposal. For example, if a State already has a mass drug administration (MDA) in relation to one disease and, at minimal extra cost, another drug for another disease could be safely administered with it, the State has a
responsibility to organize such co-administration. If it does not, the State is not using all the resources available for its implementation of the right to health – and this is inconsistent with its right-to-health obligations.

From the point of view of the right to health, a key objective must be an integrated health system that is responsive to local priorities. As far as possible, an intervention for one disease should be designed in such a way that it can also be used as a vehicle for one or more interventions in relation to one or more other diseases. All interventions should form part of – be integrated into – the regular health system. In no circumstances may any intervention undermine or jeopardize progress towards the long-term goal of an effective, inclusive health system of good quality for all.

Monitoring and accountability

Human rights empower individuals and communities by granting them entitlements and placing legal obligations on others. Critically, rights and obligations demand accountability: unless supported by a system of accountability they can become no more than window-dressing. Accordingly, a human rights – or right-to-health – approach emphasizes obligations and requires that all duty-holders be held to account for their conduct.

A right-to-health accountability mechanism establishes which health policies and institutions are working and which are not, and why, with the objective of improving the realization of the right to health for all. Such an accountability device has to be effective, transparent and accessible. In relation to a human right as complex as the right to health, a range of accountability mechanisms is required and the form and mix of devices will vary from one State to another.

The right to health requires effective monitoring and accountability in relation to specific right-to-health standards, with a view to enhancing enjoyment of the right to health for all, including those living in poverty and other disadvantaged individuals and communities.

Conclusions and recommendations

A right-to-health approach to neglected diseases and populations requires accessible, transparent and effective human rights mechanisms of monitoring and accountability. This requires the establishment of a right-to-health unit that is responsible for monitoring those policies, programmes and projects relating to neglected diseases. Significantly, the unit should monitor and hold to account national and international actors in the public and private sectors. The guiding question should be: have all duty-bearers done all they reasonably can to promote and protect the right to health of those suffering from, or vulnerable to, neglected diseases?
Rapid-impact interventions

Introduced by Professor David Molyneux,

Rapid-impact interventions refer to situations in which simple interventions could make profound differences to survival and quality of life. Adopting this approach to a group of neglected tropical diseases would enable more equitable treatment of poor people, by providing such populations infected by multiple parasites with effective and cheap interventions on a preventative basis. This proactive approach would bring real benefit to millions and protect them from disability, poverty and ill-health at low cost. The challenge is to put together an irresistible package for policy-makers to ensure implementation of what is a feasible set of objectives at a minimal cost of US$ 0.40 per person per year. For just US$ 200 million per year for five years, it is estimated that over 500 million individuals could benefit from preventive chemotherapy, which would rapidly contribute to poverty reduction and take steps toward seven of the eight Millennium Development Goals.

Target diseases

Lymphatic filariasis, onchocerciasis, schistosomiasis and soil-transmitted helminthiases and blinding trachoma.

Background

All diseases in this group benefit from a rapid-impact intervention: a breakthrough drug so safe and effective that it can be administered, for prophylactic or treatment purposes, on a mass scale with a required maximum frequency of once or twice per year. All of these diseases further benefit from the support of a strong and committed partnership, a well-designed control strategy and a solid body of evidence demonstrating its effectiveness. For schistosomiasis and soil-transmitted helminthiases, the
price of drugs used for control has plummeted in recent years to affordable levels. For the other diseases, drugs are being supplied, in large quantities and at no cost, by their manufacturers.

Insect vectors spread lymphatic filariasis (mosquitoes), onchocerciasis (blackflies) and blinding trachoma (“filth” flies). Schistosomiasis and soil-transmitted helminthiases, and trachoma are closely associated with poor environmental hygiene and sanitation. While the importance of these environmental factors is fully recognized, control strategies for all these diseases rely most strongly on pre-emptive chemotherapy to all populations at risk of infection. This strategy is considered the most expedient way to drastically reduce and, in some cases, eventually interrupt transmission.

The most mature of these programmes, for onchocerciasis, operates on the principle that control activities will become locally sustainable when the disease burden has been adequately reduced through an international effort. The approach of community-directed treatment with ivermectin was developed to support locally sustained control. Intensified control can be expected to expedite local sustainability, and this prospect provides yet another justification for making a stronger international effort.

The control strategies are well suited to the reality of conditions in endemic communities. They can be implemented where health infrastructures are weak as most drugs require only once-yearly administration by non-specialized staff. In addition, the strategy of mass treatment obviates the need for case-finding and diagnostic testing. However, control strategies rely on campaign-style mass implementation; the logistic requirements are enormous. Finding ways to simplify and streamline these requirements – which affect ministries of health as well as local staff – is central to the task of expanding population coverage.

A second opportunity to improve efficiency arises when additional interventions, which make sense in terms of unmet health needs in a target population, can be easily and logically combined with existing programmes. Bednets and vitamin A supplements are obvious candidates. The wisdom of doing so will depend, in addition to pre-existing need, on similarities in the timing and frequency of intervention, target population and existing delivery systems. To guide such decisions, a clear diagnosis of health needs in the target population is the requisite starting point.

Some mature programmes have spontaneously evolved to acquire additional functions in logical ways. For example, in some areas onchocerciasis control now includes delivery of sight-saving vitamin A supplements and simple eye care, as these functions fall within the mandates and competencies of non-governmental organizations supporting onchocerciasis control. As another example, in Zambia in 2003, an integrated campaign using Red Cross volunteers delivered 75 000 bednets, vitamin supplements and deworming
treatments. An intense campaign-style approach was considered the quickest and most cost-effective way to achieve high population coverage. Because of the great effort needed to achieve this goal, logic dictated that as many appropriate interventions as possible should benefit from the effort. As yet another example, programmes for deworming are now using school systems as a logical channel of delivery: children are the target group, and schools and teachers are often more abundant than health centres and clinicians.

Implementation of large-scale interventions will require adequate planning and management. Such activities need to be linked to a "learning by doing" approach so that issues can be readily identified and addressed and common learning shared internationally. Of particular importance is the need for proper supervision and monitoring by health staff at the local level. These staff play a crucial role in informing the community, in training community distributors and teachers, in managing potential severe side-effects, and in collecting data on these side-effects, drug resistance and the impact of interventions.

In addition, given the pressure of the drugs that are going to be used repeatedly on a large scale, adequate mechanisms to constantly monitor the potential emergence of drug resistance should be put in place.

**Learning from immunization**

At the conceptual level, the interventions to control many of these diseases can be viewed as similar in their public health purpose to childhood immunization. They aim to protect very large numbers of vulnerable people, early in life, from diseases so prevalent that infection can be considered virtually inevitable. In so doing, they further aim to lay the foundation for healthy adulthood. As with childhood immunization, the investment needed to do so is not great; the return on that investment is immense.

The greatest – and by far the most cost-effective – impact occurs when interventions against these diseases, which usually start early in life, are provided in childhood. Simple and effective interventions are available, and their existence provides a programme rationale: when a powerful remedy for a major problem becomes available, public health has traditionally built a programme to deliver the remedy.
Potential advantages

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under-fives sleeping under a bednet</td>
<td>14%</td>
</tr>
<tr>
<td>Under-fives sleeping under an impregnated bednet</td>
<td>2%</td>
</tr>
<tr>
<td>Coverage with EPI</td>
<td>70%</td>
</tr>
<tr>
<td>Proportion of EPI budget financed by national governments</td>
<td>37%</td>
</tr>
</tbody>
</table>

Scaling up integrated control

A number of issues still need to be addressed, such as simplifying and standardizing guidelines to integrating six different vertical control programmes. There are currently disparities between the groups targeted for lymphatic filariasis and onchocerciasis control (treatment is excluded for children under 90 cm long and pregnant women) and the groups targeted for soil-transmitted helminth and schistosome control (control is primarily aimed at school-age children).

There are also political hurdles of persuading each of the partnerships to cooperate on disease control efforts and to fully integrate their activities. Local health services, however, will be greatly relieved when this materializes as they are totally overwhelmed, overburdened and under-resourced to cope with the conflicting demands of each programme.

Some examples of childhood preventive interventions

**Pre-school**
- Immunization against vaccine-preventable diseases
- Vitamin A supplements
- Bednets
- Albendazole + DEC (lymphatic filariasis)
- Anthelminthics (soil-transmitted intestinal helminthiases)

**School-age**
- Anthelminthics (soil-transmitted intestinal helminthiases)
- Praziquantel (schistosomiasis)
- Ivermectin (onchocerciasis)
- Azithromycin (blinding trachoma)

Low cost/high returns

Tackling neglected tropical diseases yields multiple benefits and non-target effects. A rapid impact on morbidity, blindness and skin disease could be achieved at the minimal cost of about US$ 0.40 per person per year. For just US$ 200 million per year for five years, it is estimated that over 500 million individuals could benefit from preventive chemotherapy, which would rapidly contribute to poverty reduction and take steps towards seven of the eight Millennium Development Goals. Poverty reduction would be even more
likely if the resources were allocated as a package for the control or elimination of these diseases of poverty.

By comparison, the treatment for HIV/AIDS exceeds US$ 200 per year per person for the life of the individual while, anti-TB treatment costs at least around US$ 200 per treatment in Africa. The total costs of antimalarial treatment per episode are about US$ 7–10 (including indirect costs). Even with their high unit costs, the current curative approaches to the big three diseases are "reactive" strategies. The treatment of individuals infected with HIV/AIDS, TB and malaria fails to significantly reduce transmission.

The calculated economic rates of return suggest that investment in control/elimination of neglected diseases produces an economic rate of return of 15–30%, and is capable of delivery on a large scale.

Neglected tropical diseases are the unrecognized success, with tremendous potential and dramatic achievements. We must demonstrate leadership and vision, while emphasizing the ethical dimension: it is wrong to deprive very large populations of interventions that work.
Exploiting the preventive power of vector control

Introduced by Professor Harold Townson,

Vector control has been neglected in recent years and there is an urgent need to return it to its rightful place in public health and as a lever of socioeconomic development. The experience from onchocerciasis highlights the success when multiple interventions that target different points in the disease cycle are concomitantly implemented. As the same tools can be used to control various vectors/diseases, integrated vector management is a vital weapon in the arsenal against neglected tropical diseases.

Background

Vector-borne diseases currently account for around 20% of the estimated global burden of infectious diseases. Well-planned and coordinated interventions for vector control, using currently available methods, can contribute significantly to the reduction of this burden. Targeted as they are against the disease-transmitting agent, these interventions have a proven ability to reduce and, under the right circumstances, to arrest transmission.

For diseases such as dengue and Chagas disease, vector control is currently the key public health intervention that can protect populations from the risk of infection. For leishmaniasis, and African trypanosomiasis, where methods for attacking the pathogen through chemotherapy are far from perfect, vector control offers the greatest potential to reduce the disease burden on a large scale. For a third group of diseases, where pre-emptive chemotherapy is the principal control strategy, vector control can accelerate the reduction of transmission, thereby increasing the likelihood that programme goals can be met and resurgence avoided.

Vector control thus has an important role to play in an intensified approach to the control of tropical diseases that emphasizes opportunities for prevention. This potential is, however, largely latent. For many reasons – emphasis on chemotherapy rather than prevention, environmental concerns, costs and logistic needs, technical complexity, complacency, past failures and resistance to chemical agents – vector control has lost its rightful place in public health campaigns aimed at reducing the burden of vector-borne diseases. After two decades of declining interest and dwindling expertise, national capacities to implement vector control have virtually disappeared.
decades of declining interest and dwindling expertise, national capacities to implement vector control have virtually disappeared.

These years of neglect have had major consequences for health and socioeconomic development. Following the discovery and effective use of residual insecticides, beginning in the 1940s, large-scale and systematic control programmes succeeded in bringing most of the important vector-borne diseases under control in many areas of the world. By the late 1960s, most vector-borne diseases were no longer considered major public health problems outside Africa. Control programmes lapsed, resources dwindled, and the training and employment of specialists decreased.

Within two decades, many important vector-borne diseases, including malaria, dengue, African trypanosomiasis and leishmaniasis, had emerged in new areas or re-emerged in old ones. They returned to a world characterized by accelerating population growth, rapid urbanization and land-use trends conducive to the spread of vector-borne diseases. Moreover, vector control specialists were largely replaced by health-care managers, greatly diminishing the technical expertise that is essential for control.

Today, malaria, onchocerciasis, lymphatic filariasis, African trypanosomiasis, leishmaniasis and Chagas disease pose constant and often overlapping threats to health in large geographical areas, placing millions of people at risk and creating a need for large-scale control efforts. For dengue, which is prone to epidemics, the low priority given to vector control has meant a shift from sustained preventive efforts to the emergency containment of epidemics – an option that consumes enormous resources yet is often only marginally effective. With the preventive power of vector control underutilized, the public health orientation for vector-borne diseases has increasingly shifted towards pre-emptive chemotherapy and case management.

Positive trends: good tools and a promising new way to use them

Against this background, several positive developments are again opening opportunities to exploit the preventive power of vector control. First, the renewed drive to bring malaria under control has resulted in the development of insecticide-treated nets as the first major new tool for vector control introduced in more than 50 years. Long-lasting treatment technologies are now rapidly evolving, and these offer prospects for personal protection and, when widely used, for transmission control of other diseases, including leishmaniasis, anopheline-transmitted lymphatic filariasis, and Chagas disease. Additional prospects include long-lasting insecticidal traps for African trypanosomiasis, and treated covers for water storage jars, treated curtains and controlled release larvicides for dengue. These newer tools join a diverse range of control options – whether mechanical, physical,
chemical, cultural or biological in nature – that have been extensively tested and have well-documented roles in reducing transmission in a great variety of settings.

Second, health sector reforms have moved towards decentralization and intersectoral collaboration, and these trends have created an enabling environment for carrying out vector control activities in the most logical place: the community. The distribution and incidence of vector-borne diseases are strongly determined by local ecological conditions; human behaviours – from farming practices to sleeping habits to waste disposal – directly influence transmission risk. Experience suggests that vector control initiatives that rely on community activities can have a significant and sustainable impact on vector densities, are more cost-effective than top-down programmes, are readily integrated with other health and development activities and are politically viable. In rural areas, they can draw on existing resources, staff and programmes in other sectors, such as agriculture extension networks and the successful Farmer Field Schools launched by FAO to improve pest management in environmentally benign ways and tap indigenous knowledge.

Such activities fit well with the holistic approach to rural development being advocated to achieve the Millennium Development Goals. At the same time, however, effective vector control continues to require support from central functions to provide strategic direction, develop national control policies and set standards, norms and indicators for monitoring the progress of operational activities. In addition, for community-based approaches to be successful, the disease must be understood by community members and considered by them to be serious enough to warrant action. Without this willingness to take responsibility, and knowledge of what actions to take and why, programmes will not succeed.

Fortunately, this need is being addressed by a third trend. Sophisticated methods of social mobilization have been developed, and these have demonstrated their ability to promote behaviours that contribute to sustained vector control, particularly for dengue. These methods, which can be extended to other vector-borne and communicable diseases, have made community-based activities a much more viable option for prevention and control.
As another advantage, methods of vector control are well suited for the simultaneous control of multiple diseases, and readily lend themselves to integrated approaches. Vectors that transmit different diseases frequently share similar habitats; single vectors transmit more than one disease, and single interventions can be effective against multiple diseases. This multi-purpose attribute rationalizes the use of human and financial resources and organizational structures, and reduces logistic demands.

A further trend is the use, for public health purposes, of geographical information systems and the development of powerful mapping tools, such as HealthMapper. These new tools have revolutionized the capacity to locate and visualize ecological features that favour specific vector habitats, allowing rapid identification of at-risk communities. Spatial and temporal patterns of vectors are strongly influenced by environmental factors, including vegetation, which can be sensed remotely by earth-observing satellites. As one example, the use of satellite imagery has made it possible to identify the geographical location of human populations at greatest risk of contracting African trypanosomiasis. To identify, characterize and map the patterns of tsetse fly habitats over an area in excess of 10 million square kilometres where nearly 50 million people are at risk would have been impossible before the advent of satellite imagery and geographical information systems. Such advances provide considerable support for strategies that rely on targeted, selective application of measures for vector control.

These trends converge in a new approach to vector control – integrated vector management – that is now being endorsed as the preferred strategy for exploiting the preventive power of vector control in sustained and ecologically-sensitive ways. The approach, which relies on commonsense packages of interventions tailor-made for local settings, provides a way to coordinate and refocus resources for vector control, while at the same time reducing reliance on insecticides as the panacea for control. It is explicitly designed and implemented to control, manage and monitor vector-borne diseases at all relevant points in the life-cycle and transmission cycle of the vector, and can embrace the goals of either reducing vectorial capacity or minimizing opportunities for human–vector contact.

Integrated vector management starts with an assessment of the local epidemiology, drawing on existing knowledge of the vector, its habitats and behaviours, and then selects the most economical and feasible combination of methods to achieve control. It is therefore essentially an evidence-based bottom-up approach in line with trends in health-sector reform and eminently well-suited for community action and management at the district level. In building up the combination of interventions, the approach follows a clear sequential hierarchy. First, consideration is given to locally suitable environmental management and personal protection methods, then biological control methods and thirdly chemical interventions, to achieve the required reduction in transmission risk. Integrated vector management also considers all options for intersectoral action and places responsibility for decision-making at the lowest possible administrative level – where the problems actually reside. It includes both the delivery of vector control interventions and the regulation of activities of other public and private sectors that may influence transmission risks, such as those arising from irrigation schemes, road construction and urban planning.
Although the approach has been endorsed by WHO and most of its regional offices, few programmes are in a position to fully exploit the potential of vector control. The effectiveness of vector-control interventions in reducing the burden of major diseases has never been questioned. Scientific knowledge about vector biology and ecology is extensive. New tools allow identification of at-risk populations for targeted interventions with unprecedented speed. Other tools have enhanced the chances for successful and sustainable community-based control activities. A widely endorsed operational approach is available to capitalize on these trends. The stage is thus set to exploit the preventive power of these interventions more fully. The most pressing challenges now are to extend population coverage to achieve a greater reduction in transmission and to find ways to strengthen the overall capacity of vector control.
Improved surveillance and high-quality care in resource-limited settings

Introduced by Anne Moore.

The focus for the disparate diseases in this group of “tool deprived diseases” should be to develop tools so these diseases could move into the “tool ready”/rapid intervention category. Nonetheless, many diseases in this group have been very well controlled in the recent past, which suggests that we could do better than at present. The immediate focus should be on improving case management. The medium to-long-term goal is to develop new simple tools ideally for use in primary health-care settings. Many new initiatives have emerged that focus on developing these new tools. There is, however, an urgent need for greater collaboration across R&D programmes and between R&D and field control programmes to push new tools through the field evaluation.

Target diseases

African trypanosomiasis, Buruli ulcer, Chagas disease and leishmaniasis.

Background

Because of certain shared features, these diseases present the greatest challenge for intensified control. Strategies for addressing them suffer from non-existent or imperfect early diagnostic and treatment tools. No viable options for prevention presently exist. Given these weaknesses, prospects for control depend first and foremost on early diagnosis, yet all these diseases have features that work, in powerful ways, to deter the early detection of cases.

The inherent limitations of existing therapeutic tools are amplified by their demanding technical requirements, frequently involving long hospital stays which have devastating effects on livelihoods in subsistence-farming areas and which burden hospital services. The available drugs for African trypanosomiasis and leishmaniasis are dangerous, restricting their administration to highly trained professionals in highly specialized facilities. Apart from early detection, effective management of Buruli ulcer depends on ready access to surgical care. Sufficient facilities, skills, equipment and hospital beds simply do not exist in the peripheral areas where the vast majority of patients reside. This unfortunate situation has obvious implications for health services: control cannot be integrated into general health services. Pending the development of better drugs, control efforts must remain extremely resource intensive and poorly suited to strategies for improving population coverage.

As with other tropical diseases, the burden of these diseases will not decrease without continuing support from the international community. In this case, however, the greatest return on international investments will
come through efforts to expedite the development of new diagnostic and therapeutic tools. Opportunities to intensify control using existing tools certainly exist, but they are extremely resource intensive, raising serious questions about their indefinite sustainability. They are likely to bring only incremental improvements to a situation that is unacceptable for many reasons, including humanitarian ones.

In a challenging but potentially exciting new development, WHO is being called upon by external partners, in industry and funding agencies, to perform a new role involving a unique intersection of the research laboratory with the field. In this case, unmet needs identified in the field by efforts to improve control are strategically driving the research agenda. The desire to move promising products quickly to the stage of field application has resulted in specific requests for WHO to play a coordinating and facilitating role. For African trypanosomiasis, extensive field experience has given WHO a unique capacity to contribute in practical ways, including the recruitment of patients and enrolment of sufficient numbers for phase III and IV clinical trials, training of specialized staff to conduct the trials, equipment of facilities, provision of supplies and assistance with drug registration. Efforts are also being made with drug regulatory authorities to streamline and shorten some requirements, while safeguarding procedures for adequate safety and efficacy testing. This new form of collaboration provides strong evidence of the will, in many different public and private sectors, to improve – with appropriate urgency – the prospects for shifting control strategies for these diseases closer to sustainable goals of elimination.

Greater coordination is required across research and field programmes. This would ensure better utilization of facilities as well as a sharing of costs for upgrading and training. Moreover conducting a package of studies at the same facility is highly attractive to donors. It also leads to capacity building within the Ministry of Health and, above all, a reduction of disease burden in communities.

New structures are needed to accelerate testing of tools in development and to push them through field evaluation as a matter of urgency. Control programmes have much to offer to help field trials and thus catalyse tool development. If initiatives can be linked, all would benefit from expensive shared activities. Other needs to be addressed are standardization of clinical trial protocols, expertise in drug registration and planning of trials that consider distribution issues at the onset.
Main conclusions

New urgency for ancient diseases

Neglected tropical diseases strike the world’s poorest people living in remote and rural areas of low-income countries in sub-Saharan Africa, Asia and the Americas, where they inflict suffering by causing life-long disabilities, disfigurement and social stigma. Efforts to control these diseases thus free people to develop their potential unimpeded by disabling disease and, in so doing, increase the chances that efforts in other sectors, such as education and agriculture, will be successful.

Participants agreed that the landscape for controlling neglected tropical diseases has changed. These ancient diseases are now receiving urgent attention. The international environment has become more favourable for control, which is now recognized as a pro-poor initiative with huge benefits that accrue directly to those affected. Evidence shows that these benefits go beyond amelioration of the target diseases and prevention of their related permanent disabilities to include a host of ancillary benefits – better nutritional status, better educational outcomes, improved growth and cognitive development, reduced maternal mortality and increased worker productivity. These are precisely the kind of improvements that can help populations work their way out of poverty and enjoy a better quality of life. Control of these diseases is now recognized as contributing directly to the achievement of several Millennium Development Goals agreed on by the international community.

From the point of view of the right to health, a key objective must be an integrated health system that is responsive to local needs and priorities. In this context, “integrated” has two meanings. First, so far as possible, an intervention for one disease should be designed in such a way that it can also be used as a vehicle for one or more interventions in relation to one or more other diseases. Second, so far as possible, all interventions should form part of – be integrated into – the regular health system. In no circumstances may any intervention undermine or jeopardize progress towards the long-term goal of an effective, inclusive health system of good quality for all.

A right-to-health approach to neglected diseases and populations requires accessible, transparent and effective human rights mechanisms of monitoring and accountability. For one group of these diseases, the impetus to act immediately takes added force from the availability of powerful and cost-effective control tools, well-developed implementation strategies and abundant evidence that they bring results. As agreed during the meeting, diseases that benefit from rapid-impact interventions have the greatest prospects for immediate success. Moreover, these interventions have a direct impact on transmission and – like childhood immunization – have prevention of infection and/or morbidity as their goal. Here, the principal
challenges are to increase population coverage and ensure sustainability. Packages of interventions were proposed as a logical way to streamline logistic and operational requirements and simplify work at the district level, where the burden of control activities resides. The diseases for which flexible packages should be developed are guinea-worm, hookworm, ascariasis, trichuriasis, lymphatic filariasis, onchocerciasis (including loa loa), trachoma and schistosomiasis. Whenever needed, this should also include malaria and dietary supplements and always be accompanied by community health information and education.

Participants further agreed that demand-led initiatives, closely matched to community needs and priorities, would have the best chances of sustainability. In some parts of the world, interventions with visible effects – the expulsion of worms, dead insects in a household – help stimulate community demand and may spearhead community support for a package of interventions. Deforming and debilitating diseases are given high priority by affected populations, but impoverished communities cannot be expected to manage disease control on their own, nor are their voices heard by politicians or policy-makers. Support from both national and international levels is essential, and every effort should be made to make all interventions in a package available at no cost, as is done for childhood immunizations. Moreover, packages would need to be offered as a flexible menu of options that can be tailored to the local disease situation and adapted to community priorities. WHO has a key role to play in putting together technically sound options.

Diseases for which control tools are presently deficient must likewise participate in the move to intensify control of neglected tropical diseases. Populations affected by these diseases have a fundamental right to receive appropriate case management and treatment, though the challenges of adequate clinical management are admittedly great in the peripheral areas where most patients reside – diseases such as African trypanosomiasis and leishmaniasis are not amenable to treatment at health centres given the complexity and risk of the current drugs. To intensify control of these diseases, participants proposed a two-pronged approach: better use of existing tools and urgent work to move new tools from the research stage through clinical trials, field evaluation to implementation. Only then can more ambitious control objectives, aimed at reducing the burden of these disease down to locally sustainable levels, be realistically set.
Vector control, though presently underutilized, can reduce or interrupt transmission when coverage is sufficiently high. It thus has an important role to play in initiatives that seek to reduce transmission and make prevention of infection a high priority. For some diseases with deficient control tools or less than adequate treatment, vector control has been the principal intervention and the key component of success. In addition, methods of vector control are well suited to integrated approaches, as some vectors are responsible for multiple diseases, and some interventions are effective against several vectors. In communities where malaria is a high priority, inclusion of tools for vector control, particularly insecticide-treated nets, in packages of interventions was advised. As with other interventions, tools for vector control have the greatest likelihood of sustainable use when initiatives are demand-led.

Social mobilization and education of communities may be needed, and opportunities exist to combine these activities with those already in place in other sectors, such as farmer field schools and rural extension networks in the agricultural sector. Participants agreed that when methods of vector control are included in intervention packages, they should be made available at no cost. The group was unanimous that no rational policy should discriminate against access to vector control as a preventive tool and that, like vaccination, such access to a public good should be free, as strongly recommended by the UN Millennium project report. On the question of whether internationally formulated strategies will fit national needs, participants stressed the importance of having a flexible menu of options – for delivery systems as well as drug combinations – that can be adapted to local needs in a technically and geographically appropriate approach.

The burden of managerial and operational responsibility for implementation falls on the district health system. Concerning whether wider implementation of rapid impact interventions would overburden district systems, participants pointed out that the burden is already there: it is not unusual for 10–15 community-based programmes to be operating simultaneously, and without coordination, in a single district. Divergent incentives for workers was singled out as a particularly worrisome problem. This situation further underscores the need to simplify and harmonize ongoing control activities through well-planned and technically sound packages of interventions.

Participants readily agreed that so-called vertical and horizontal approaches should be harmonized. Both have roles to play when attempting to make headway against largely ancient diseases firmly entrenched in impoverished settings. In this regard, the onchocerciasis control programme holds important lessons about how an initially vertical programme can bring down the disease burden to a level allowing integration into routine health services and sustainability through community-based activities.
8 Recommendations from the Working Groups

Ready for roll-out

1. Intensified control of tropical diseases can move forward immediately. No technical barriers stand in the way.

2. Diseases that benefit from rapid-impact interventions have the greatest prospects for immediate success and will impact proportionately more on poor populations at lowest cost. However, control of all tropical diseases should be intensified, as for most of these conditions effective tools are available.

3. Recent successes achieved with rapid-impact interventions, and supported by extensive evaluation mounting evidence, provide powerful arguments for advocacy for all neglected tropical diseases whilst it is accepted that implementation research must continue to refine the most effective approaches.

4. Rapid-impact interventions are welcomed by economists as bringing exceptionally high returns on investment; they are cost-effective, improve health, increase worker productivity and increase the domestic pool of resources, thus contributing to economic growth and educational improvement. These interventions need to be sustained over sufficient time to produce long-term impact and protect new generations from infection.

5. Packages of control interventions should be introduced as a way to streamline operational activities, improve efficiencies and ensure that the priority health needs of communities are comprehensively met.

6. Evidence for the safety of core drug combinations is sufficient; post-implementation surveillance should be carried out to monitor for adverse reactions and possible development of drug resistance.

7. The weakness of health systems in most endemic areas is not an absolute impediment to intensified control, especially when expansion is incremental, district by district, and with additional logical interventions added as the package evolves to meet comprehensive health needs for a given locality and epidemiological setting.

8. Evidence suggests that as population coverage increases, essential functions of the health system are strengthened.

9. Sustainability remains an overriding objective. Sustainability is likely to have the greatest chance when these initiatives are demand-led: community needs, capacities and priorities must be the starting point; flexible packages of interventions can be part of the solution.
10. Monitoring for programme effectiveness and for detection of possible drug resistance is also essential. In parallel with monitoring efforts is the need for ongoing research in the development and testing of new-generation control tools including new drugs, vaccines and diagnostics. It is anticipated that, as they become available, new control tools will be incorporated into existing programmes.

11. Better estimates of the burden of these diseases, including the subtle mortality, morbidity and stigma they cause, are urgently needed, especially as existing estimates do not provide sound policy guidance.

Rapid-impact interventions

1. Move forward now
Strategies for the neglected tropical diseases within this group (guinea-worm, lymphatic filariasis, onchocerciasis, loa loa, schistosomiasis and soil-transmitted helminthiases, blinding trachoma and yaws) are ready for implementation, integration and scaling up to expand population coverage. Efficacious, often donated drugs with a broad spectrum impact can begin immediately.

2. Ensure sustainability
While rapid impact can be obtained with existing tools, ensuring the sustainability of control programmes is essential to maintain these rapid gains. Mobilization of political and financial commitment at the international, country and district levels is the principal way to ensure sustainability. Community participation is particularly important, as demand-led initiatives have the greatest chances of enduring success.

3. Develop packages of interventions
Integration of control interventions for several related diseases and other health conditions is technically feasible, economically attractive and in line with principles embodied in the right to health. An integrated approach is also a powerful tool in terms of its ability to improve health and several other outcomes associated with better prospects for development at minimal costs to the health system.

Packages of interventions should be flexible, allowing endemic countries to match options with specific diseases, needs, capacities and community priorities at the district level. Interventions with user fees attached are not recommended for inclusion in packages of interventions.
4. **Include malaria and micronutrient supplements**
   As an integrated control strategy must be adapted to local needs and community priorities, communities where malaria is endemic will expect inclusion of antimalarial interventions in a locally relevant package. Likewise, programmes for the delivery of micronutrient supplements should be taken into account when packages of interventions are being recommended.

5. **Integrate related operational activities**
   Ongoing initiatives should identify shared operational activities and look for ways to integrate them. For example, integrated disease mapping is technically feasible and highly desirable as a planning and monitoring tool when packages of interventions are introduced. Ongoing, rapid single-disease mapping programmes should be encouraged to map additional target diseases, especially as the costs of doing so are very low. Drug procurement and delivery systems offer other opportunities to integrate activities.

6. **Develop managerial and technical guidelines**
   Packages of health interventions need to be supported by guidelines covering technical issues and the practical management of programmes for integrated implementation. The guidelines need to be flexible, allowing adaptation to local conditions and priority health needs.

7. **Encourage coordination of partnerships**
   Coordination among international partnerships provides an entry point for integrated control packages. Both cost and coverage efficiencies can be gained when existing partnerships, committed to combating these diseases, communicate and collaborate with each other and harmonize shared operational activities. Such coordination can bring greater coherence to control activities at the district level and introduce order and simplicity to a managerially complex situation. In particular, partnerships need urgently to address the issue of incentives for community health workers to ensure more uniform policies.

8. **Measure broad outcomes and impact (in line with indicators for the Millennium Development Goals)**
   Poor health in impoverished populations has multiple causes; infection with multiple parasites is common. Interventions have significant collateral benefits apart from their direct impact on a target disease. Traditional efforts to measure the impact of a single intervention lose relevance under the reality of local conditions, especially when multiple health problems are simultaneously addressed. The broad impact of packages of interventions is more appropriately measured by broader outcomes, such as increased productivity, well-being and school attendance or reduced anaemia or other proxies.
9. Promote access to drugs at no cost in affected communities
Additional drug donations should be sought for target diseases, and current donors of drugs should be recognized not only for their generosity but also for continuing investment to support implementation research. Drug donations give ministries of health leverage when approaching ministries of finance; the existence of donated drugs helps secure the financial means, within endemic countries, for building programmes to deliver them, and can thus help strengthen health systems. Donation of other first-line drugs, currently available at low cost, would also allow greater consistency and simplicity in operational strategies when combined drug delivery is recommended.

10. Conduct implementation and post-implementation monitoring and evaluation
Programme monitoring should include coverage of at-risk populations and changes in the intensity of transmission and in morbidity and disability. Safety data for core interventions are sufficient to support recommended drug combinations. Post-implementation monitoring should be conducted to gather additional safety data when drugs are co-administered to large populations. An additional critical component is monitoring for the possible emergence of anthelminthic and antimicrobial drug resistance.

11. Incorporate and evaluate new control tools
It can be expected that the control tools of today may ultimately be supplemented or even replaced by new-generation drugs, diagnostics and vaccines of tomorrow, just as ivermectin was added in a highly effective manner to the vector control activities that were a mainstay of the Onchocerciasis Control Programme. Research and development for new control tools should be carried out in parallel with monitoring and other control efforts. These include new anthelminthic drugs, new vaccines under development for schistosomiasis and hookworm, and new diagnostics.

Exploiting the preventive power of vector control

1. Use existing tools more effectively
Methods of vector control, when appropriately used, have a proven ability to reduce or interrupt the transmission of many tropical diseases targeted for intensified control. They have a role to play in an approach that emphasizes prevention, hence focusing on reduced transmission, relies on existing tools and aims to expand population coverage. More effective use is essential: the ability of vector control interventions to reduce transmission depends on high population coverage. Wider use of these tools encounters no technical or safety barriers and can move forward immediately.
2. **Integrate vector control activities with existing programmes**
   Vector control activities should exploit existing operational opportunities for combined delivery of selected interventions. Opportunities are considerable for vector control interventions, such as insecticide-treated nets and expanded polystyrene beads, that can be delivered by non-medical workers. Delivery of such interventions could be integrated in the activities of programmes with similar frequencies of delivery and demands on health systems. Examples include the Expanded Programme on Immunization and mass delivery of rapid impact interventions. Logistics as well as delivery systems can be shared.

3. **Integrate vector control activities for multiple diseases**
   Where vector-borne diseases overlap geographically, activities should be integrated (i) for diseases that are transmitted by the same vector (malaria and lymphatic filariasis) and (ii) for different vectors susceptible to the same intervention (malaria, cutaneous leishmaniasis and perhaps Chagas disease).

4. **Include vector control (insecticide-treated nets) in intervention packages**
   Insecticide-treated nets should be considered for inclusion in intervention packages based on local diseases and needs, especially when malaria is considered a priority by communities. Vector control can increase the power of rapid impact interventions and expedite reduction of the disease burden, as it shares the goal of reducing transmission. Like the rapid-impact interventions, vector control has collateral benefits. Many interventions also reduce nuisance biting of non-target insects; this relief, which improves quality of life, is appreciated by communities and contributes to acceptance of control interventions and sustained demand for them. As with the expulsion of worms, dead insects are visible evidence of the direct link between an intervention and its effects.

5. **Distribute insecticide-treated nets at no cost**
   Insecticide-treated nets should be distributed at no cost to groups at high risk of infection, such as populations living in areas endemic for lymphatic filariasis, and to groups biologically vulnerable to malaria, such as pregnant women and young children in African countries where malaria is endemic. A no-cost policy further increases the suitability of insecticide-treated nets for inclusion in intervention packages in which drugs are made available at no cost. Such a policy needs to be costed and financed as a national public health good, as are childhood immunizations.

6. **Promote integrated vector management**
   Efforts are needed to strengthen the infrastructure for integrated vector management, embed it in existing health services and link it with other sectors (agriculture, irrigation, environment, public works, information and education). For example, the agricultural sector offers opportunities through its programmes of integrated pest management, farmer field schools and agricultural extension.
networks. Current regional and national training courses on integrated vector control, supported by WHO, should be expanded.

7. Develop good practices for community participation
   When designing interventions for integrated vector management, attention should be given to the users’ needs and priorities. Such an approach is most likely to result in sustainable, demand-led activities, and needs to be supported by appropriate information and education for communities.

8. Promote research for new tools
   Research on the development of new vector control tools should be encouraged and supported, particularly for diseases for which present methods are either inadequate (leishmaniasis) or difficult to implement (dengue).

9. Formally recognize the place of vector control in approaches for intensified control
   This can be achieved by:
   • ensuring adequate technical and managerial capacity (including personnel) for vector control;
   • fully integrating and appropriately funding the vector control component within disease management programmes and the overall health system;
   • including vector-control related research (surveillance, monitoring for insecticide resistance) in the monitoring and evaluation component of action plans and budgets;
   • establishing or strengthening a national medical entomology laboratory as part of national public health laboratory services.

Improved surveillance and high-quality care in resource-limited settings

1. Increase awareness of these diseases
   National health ministries, research institutes and donors need to be aware of the misery caused by diseases in this group (African trypanosomiasis, leishmaniasis, Chagas disease, Buruli ulcer, dengue, trachoma and parasitic zoonoses, including hydatid disease, cysticercosis and foodborne trematodiases). They also need to be aware of existing opportunities to implement control measures, and asked to do more to take advantage of these opportunities. All need to be aware that prospects for intensified control will be greatest when new control tools are ready for field implementation.

2. Increase training and capacity building
   Increased training and capacity building must be undertaken to ensure a sustainable infrastructure to support intensified control of these diseases, whether using currently existing tools or new ones.
3. **Improve access to appropriate health services**
   The diseases in this group, though medically and epidemiologically diverse, share the commonality of having deficient control tools. Despite this disadvantage, populations at risk of these diseases must be given access to appropriate health services. Such access is a fundamental human right.

4. **Improve the use of existing diagnostic and treatment tools**
   Control of these diseases can be immediately intensified by making better use of existing diagnostic and treatment tools. WHO leadership is needed to achieve this goal.

5. **Intensify surveillance**
   For some of these diseases, surveillance through active case detection is the principal intervention for preventing severe and frequently fatal disease. Wherever possible, and in line with shared epidemiological features, surveillance for multiple diseases should be integrated. Combined surveillance for Buruli ulcer and blinding trachoma is one example. Improved surveillance for the challenging diseases in this group would be a pioneering achievement and a model for the control of other tropical diseases. Active and passive case-finding should be strengthened using adequate case definitions, which in some cases need to be developed and validated.

6. **Active and passive case-finding for HAT, leishmaniasis, Chagas disease, Buruli ulcer and the parasitic zoonoses** (hydatid disease, cysticercosis, and food-borne trematodiases) should be strengthened using adequate case definitions, which in some cases need to be developed and validated. Opportunities for integrated case-finding should be sought.

7. **Clinical management**
   Provisions should be made for the clinical management of the more complex neglected tropical diseases. These include Buruli ulcer, hydatid disease and cysticercosis, which can require multiple therapeutic modalities including surgical interventions, as well as HAT, leishmaniasis and Chagas disease, which require complicated medical management that rely on unique drugs. Standardization and/or simplification of clinical algorithms need to be implemented.

8. ** Expedite field evaluation and implementation of new tools now in the research stage**
   New funding opportunities and the establishment of public-private partnerships for product development have opened unprecedented prospects for new tools that could boost the control of neglected tropical diseases in significant ways. To turn these prospects into realities in the field, WHO and TDR should exercise their leadership and practical experience to coordinate activities and facilitate close links between country programmes and the research
community in order to move new tools (diagnostics, drugs, surgical therapies, vaccines and interventions for vector control) from the research stage to field evaluation and implementation.

9. **Create new control strategies, with more ambitious objectives, based on the availability of new tools**

In parallel with expedited field evaluation of new tools, new control strategies need to be developed. These should help ensure that the promise of new tools (e.g. drugs, diagnostics and vaccines) is immediately translated into improved case detection and management in affected populations. New tools with rapid impact will alter prospects for the sustainable control of these diseases, making it possible to set more ambitious programme targets.
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