



TDR Diseases: Category 1 (Emerging and uncontrolled diseases)

TDR Diseases: Category 2 (Control strategy available but disease burden persists)

TDR Diseases: Category 3 (Control strategy proven effective, disease burden falling and elimination planned)

	African trypanosomiasis	Dengue	Leishmaniasis	Malaria	Schistosomiasis	Tuberculosis	Chagas disease	Leprosy	Lymphatic filariasis	Onchocerciasis
New Basic Knowledge	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs and diagnostics Pathogenesis and host/pathogen interactions Socioeconomic impact of human African trypanosomiasis (HAT) and cost-benefit of control Effect of health systems and policy changes on HAT control, re-emergence and epidemics Factors influencing individual and community participation in control Epidemiological significance of animal reservoir for <i>Trypanosoma brucei gambiense</i> Tsetse genomics 	<ul style="list-style-type: none"> Molecular tools for <i>Aedes</i> transformation; vectorial resistance to dengue; <i>Aedes</i> population genetics and ecology Host/pathogen interactions, including pathogenesis, natural history, definition of high-risk groups Dynamics of virus transmission and population genetics (including modelling) Social, economic, biological factors related to (a) promotion and support of community-based interventions and (b) release of transformed <i>Aedes</i> vectors 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs, vaccines and diagnostics Pathogenesis and host/pathogen interactions Understanding mechanisms for drug resistance Impact of inequity of access to services and health sector reform Socioeconomic, environmental, behavioural risk factors for infection and disease, especially in refugee populations in complex emergencies 	<ul style="list-style-type: none"> <i>Anopheles</i> genome sequencing and genetic manipulation for mosquito vector control Bioinformatics and applied genomics for identifying targets for drugs, vaccines and diagnostics Development of an applied genomic database for the public domain Impact of health sector reform on malaria Understanding mechanisms of resistance to drugs and insecticides 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs, vaccines and diagnostics Pathogenesis (host-pathogen interactions) focusing on reproductive health issues and immunological aspects of co-infection Socioeconomic impact and methodology for burden of disease assessment 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs, vaccines and diagnostics Impact of health sector reform, globalization and inequality of access 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs and elucidation of pathogenesis and risk factors Genetic and entomological studies on vectors (e.g. mechanisms of resistance, adaptation to ecological changes) 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for diagnostics of infection with <i>Mycobacterium leprae</i> Pathogenesis of nerve reactions Social and behavioural constraints for leprosy elimination 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs Progression/reversibility of disease manifestations after treatment, especially in children 	<ul style="list-style-type: none"> Bioinformatics and applied genomics for identifying targets for drugs Understanding ivermectin resistance mechanisms
New and Improved Tools	<ul style="list-style-type: none"> Discovery and development of new drugs and improved formulations Dipstick format diagnostic test for patent infection with improved specificity Diagnostics to monitor central nervous system disease stage and determine cure 	<ul style="list-style-type: none"> Development of new vaccines, including the application of guidelines for trials of dengue vaccines in endemic populations Assess technical and use profiles of available diagnostics 	<ul style="list-style-type: none"> Discovery and development of new drugs Development of <i>Leishmania</i> diagnostic tests Development of vaccine candidates (new adjuvants for 1st generation vaccines; 2nd generation vaccine) 	<ul style="list-style-type: none"> Discovery and development of new drugs, including combinations and drugs for use in pregnancy Discovery of malaria vaccine candidate antigens Development of vaccine candidates Development of non-invasive approach to diagnostics for use close to the home 	<ul style="list-style-type: none"> Discovery and development of new drugs Evaluate safety and efficacy of existing drugs that are potentially anti-schistosomal Review of vaccine research and development Assess technical and use profiles of available diagnostics 	<ul style="list-style-type: none"> Diagnostic test development: detection of disease, rifampicin resistance, latent infection Discovery and development of new drugs 	<ul style="list-style-type: none"> Discovery and development of new drugs Clinical research on proposed prognostic markers of disease 	<ul style="list-style-type: none"> Rifampicin susceptibility test development Development of a test for infection with <i>M. leprae</i> Development of tools for early diagnosis and treatment of leprosy reactions 	<ul style="list-style-type: none"> Discovery and development of macrofilaricidal drugs or drugs to permanently inhibit microfilariae production Further development and evaluation of diagnostics for <i>Brugia malayi</i> 	<ul style="list-style-type: none"> Discovery and development of macrofilaricidal drugs or drugs to permanently inhibit microfilariae production Development of diagnostics for surveillance Development of ivermectin resistance test
New and Improved Intervention Methods	<ul style="list-style-type: none"> Clinical/epidemiological significance of Card Agglutination Test for Trypanosomiasis (CATT) or Card Indirect Agglutination Test for Trypanosomiasis (CIATT) in positive, but parasite-negative cases Evaluation of short treatment duration for pentamidine, suramin and melarsoprol To investigate the existence of melarsoprol resistance 	<ul style="list-style-type: none"> New or improved sampling methods and indicators for entomological surveillance, monitoring and evaluation 	<ul style="list-style-type: none"> Validation of <i>Leishmania</i> field diagnostic test 	<ul style="list-style-type: none"> Improve existing treatment and prevention methods for new indications in children and pregnant women Development of methods/tools to improve access to prevention, early treatment and referral of malaria Development and evaluation of drug combinations for malaria treatment 	<ul style="list-style-type: none"> Field evaluation of existing diagnostics Rapid assessment method for prevalence of intestinal schistosomiasis Optimization of praziquantel (alone or in combination with artemisinins or oxamniquine) 	<ul style="list-style-type: none"> Establishment of role of fixed-drug combinations (FDCs) and evidence base for public health use Development of evidence base for effectiveness of TB preventive therapy in high HIV-prevalence areas 	<ul style="list-style-type: none"> Development of methods for control of non-domiciliated vectors Insecticide effectiveness and the emergence of vector resistance Evaluation of vector detection tools in low density transmission areas Evaluation of non-conventional diagnostics 	<ul style="list-style-type: none"> Development of shorter universal treatment regimens 	<ul style="list-style-type: none"> Assessment of efficacy and safety of albendazole combinations 	<ul style="list-style-type: none"> Field evaluation of diagnostics for surveillance 
New and Improved Strategies and Policies	<ul style="list-style-type: none"> Development of sustainable community-based strategies for tsetse fly control 	<ul style="list-style-type: none"> Validation and improvement of evidence-based dengue fever (DF)/dengue haemorrhagic fever (DHF) treatment guidelines and their implementation 	<ul style="list-style-type: none"> Development of strategies for use of insecticide-treated materials 	<ul style="list-style-type: none"> Developing implementation strategies for scaling up effective methods to treat and prevent malaria and achieve a large-scale impact on the disease Development of indicators for assessing impact of malaria control Provision of evidence for policy changes on combination treatment and prevention of malaria complications 	<ul style="list-style-type: none"> Development of strategies for sustainable control and surveillance in different endemic regions, including improved communication strategies 	<ul style="list-style-type: none"> Analysis of approaches to use of antiretrovirals in high HIV-prevalence areas for prevention of primary and secondary TB 	<ul style="list-style-type: none"> Improved strategy for control of non-domiciliated triatomines Development of strategies for control of expansion of infection within the Amazon region New indicators for control programmes Identification of determinants of effective implementation for <i>Trypanosoma cruzi</i>-safe blood programmes 	<ul style="list-style-type: none"> Development of strategies for integration of multidrug therapy (MDT) into general health services Modelling the impact of MDT on transmission 	<ul style="list-style-type: none"> Development of evidence-based guidelines for elimination strategies using available drug combinations Development of improved drug delivery strategies, including advocacy strategies Development of sustainable strategies for management of lymphoedema and genito-urinary complications 	<ul style="list-style-type: none"> Development of strategies for sustainable drug delivery post-Onchocerciasis Control Programme in West Africa (OCP) and African Programme for Onchocerciasis Control (APOC) Feasibility and cost-benefit of onchocerciasis elimination with ivermectin Development of rapid mapping strategies for <i>Loa loa</i>

Strategic emphases for research *

TDR has undertaken a detailed review of priorities and strategic direction for research on each of the 10 diseases in the programme's portfolio.

This review used a methodology involving a 7-step analytical process that addresses the following questions:

- What is the size and nature of the disease burden and what are the epidemiological trends?
- What is the current disease control strategy?
- What are the major problems and challenges for disease control?
- What research is needed to address these problems/challenges?
- What is currently being done in research and development and what research opportunities exist?
- What are TDR's comparative advantages?
- Based on the above, what should be TDR's strategic research emphasis for this disease?

The findings of the analysis for each disease can be found in summary documents, 'Strategic Direction for Research', available on TDR's website. The analyses have been reviewed and endorsed by TDR's Scientific and Technical Advisory Committee, composed of renowned independent global experts drawn from a variety of disciplines.

The strategic emphases resulting from these analyses are depicted in the matrix.

All TDR's research activities are planned in accordance with these strategic emphases. The matrix is not static and the strategic emphases will be modified according to new research needs or opportunities.

For further information and to join the discussion group, please contact:

www.who.int/tdr/grants/strategic-emphases

* Remme J.H.F. et. al (2002)

Strategic emphases for tropical diseases research: a TDR perspective. *Trends in Parasitology*, 8(10); 421-426



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New Basic Knowledge

generated about the biological, social, economic, health systems, behavioural determinants, and other factors of importance for effective control of infectious diseases.

New and Improved Tools

developed for use in infectious disease prevention and control, e.g. drugs, vaccines, diagnostics, epidemiological tools, environmental tools.

New and Improved Intervention Methods

developed and validated for applying existing and new tools at the clinical and community levels.

New and Improved Strategies and Policies

for large-scale implementation of existing and new prevention and control methods developed and validated, and guidance for application in national control settings made accessible.

TDR Strategic Emphases Matrix for tropical disease research

