



# TDR: HEALTH RESEARCH THAT MAKES A DIFFERENCE

BUILDING ON THE STRENGTH OF  
A LONG AND SUCCESSFUL HISTORY



Special Programme for Research & Training  
in Tropical Diseases (TDR) sponsored by  
UNICEF/UNDP/World Bank/WHO

# TDR MISSION

- To improve existing approaches and develop new ones for preventing, diagnosing, treating, and controlling tropical diseases.
- To strengthen the research capability of countries where tropical diseases occur so that they can lead to the development of new and improved approaches.

TDR



## BUILDING ON A 30 YEAR HISTORY

In the following pages, you will see examples of TDR's work, which builds upon earlier successes and partnerships developed from almost 30 years of existence.

Our work links closely to the UN Millennium Development Goals. Research generated and supported by TDR helps to improve health among the poor and reduce childhood mortality. This work is contributing to the elimination of several diseases as public health problems.

We have a strong and wide network of collaborators and our mission is deeply held. It is played out in hundreds of ways through the scientists and institutions we fund and reach out to around the world, through the many people who guide us in the countries and on our scientific committees, and through our highly committed and skilled staff and board members.

It is through our long-term and extensive commitment that we can point to many successful examples of real impact. I invite you to join us in whatever way you can.

A handwritten signature in blue ink that reads "Robert G. Ridley". The signature is stylized and includes a flourish at the end.

*Dr Robert Ridley  
Director TDR*



# CONTENTS

Community-directed treatment	6
Developing novel drugs for neglected diseases	7
Growing scientific communities and leadership where they're needed	8
Eliminating visceral leishmaniasis	10
Reducing the impact of co-infections of TB and HIV	11
Accessible, quality-assured diagnostics	12
Altering the insects that transmit diseases	14
Discovery research	15
Malaria - reducing childhood mortality	16
Tracking TDR Achievements	21
How TDR works	22





## COMMUNITY-DIRECTED TREATMENT

### OUR PAST...

*Proving that African communities can set up mass drug treatment programs to prevent onchocerciasis, called river blindness.*

### OUR FUTURE...

*Five African countries are testing whether this same approach can be used for multiple conditions and treatment strategies.*

### POWERFUL IMPLEMENTATION RESEARCH

Local communities can better provide mass treatment coverage. This TDR research finding led the African programmes for onchocerciasis control (OCP and APOC) to adopt the strategy of community-directed treatment with ivermectin. Over 35 million people are now treated annually with the medicine, and this successful approach is being modeled for other disease treatments.

# DEVELOPING NOVEL DRUGS FOR NEGLECTED DISEASES

## OUR PAST...

*Partnering with pharmaceutical companies and research institutions to develop new drugs for old diseases and training experts to conduct this work.*

## OUR FUTURE...

*Developing the next generation of innovative, entrepreneurial scientists and institutions committed to the discovery and development of new drug treatments within the developing countries where the diseases exist.*

## DID YOU KNOW?

TDR helped to develop more than half of the 13 new drugs for tropical diseases between 1975 and 2003. In the past two years, we've supported research on new drugs for malaria, tuberculosis, African sleeping sickness and leishmaniasis and work is beginning on a new drug for onchocerciasis. All this was possible in large part because of the TDR-supported training of healthcare workers to conduct the drug evaluations in countries where the diseases are present.



# GROWING SCIENTIFIC COMMUNITIES AND LEADERSHIP WHERE THEY'RE NEEDED

## **OUR PAST...**

*Helping to create a new generation of researchers and public health leaders from developing countries through support and training, with many of them now directing disease control and research efforts in their own countries.*

## **OUR FUTURE...**

*Committing to the long-term expansion and strengthening of research networks and institutions to develop new tools and strategies that increase scientists' ability to have an impact on tropical diseases in their countries.*

## **LEADERSHIP AND NETWORKS**

More than 1 000 people throughout developing nations have received research degrees or other training due to TDR assistance. TDR also supports the Forum for African Medical Editors (FAME) to improve and expand local scientific journals, and has expanded the training capacity of several universities in Africa. TDR also helped to establish SIDCER, the Strategic Initiative for Developing Capacity in Ethical Review, a collaborative network in countries around the world to improve the protection of human subjects during clinical research.

***“ Thank you for  
giving us a chance  
to dream...”***



## STRENGTHENING INSTITUTIONS

We celebrate a major development and success of the Institute of Endemic Diseases (IEND) at the University of Khartoum, Sudan, where TDR has provided support and training for many years. The IEND now has state-of-the-art laboratory facilities and research field sites, with 22 scientists (15 with PhDs) and 11 technicians. IEND scientists have generated more than 50 publications in peer-reviewed journals and are becoming internationally competitive.

Several TDR-supported institutes are now world class research centres. They often begin with initial TDR funding to train young scientists, which is followed by grants for further specialization, career development, scientific partnerships and networks, and institutional support. The majority of TDR-funded scientists stay in their home country, partly because of the long-term commitment.



## ELIMINATING VISCERAL LEISHMANIASIS

### OUR PAST...

*Providing the evidence that miltefosine, taken as an oral pill, can cure visceral leishmaniasis (VL).*

### OUR FUTURE...

*Working with countries and other partners to eliminate VL on the Indian subcontinent.*

### PARTNERING WITH COUNTRIES

Bangladesh, India and Nepal have signed an agreement to eliminate visceral leishmaniasis by 2015. This will require the implementation of new healthcare policies using the available drugs and control methods. TDR will work with national control programmes and scientists in countries to provide research evidence on how best to do this.

# REDUCING THE IMPACT OF TUBERCULOSIS AND HIV CO-INFECTIONS

## OUR PAST...

*Developing and testing new drug combinations that could shorten the treatment time for tuberculosis (TB).*

## OUR FUTURE...

*Identifying best treatment strategies for people infected with both TB and HIV.*

## TB – AN OLD DISEASE WITH A NEW PARTNER

HIV is a virus that doesn't just lead to one disease. It breaks down people's immunity and leads to many complications. Many people with HIV often also develop TB. There is an urgent need for evidence to know the best time to start antiretroviral treatment and how to manage complications from the co-infections.



# ACCESSIBLE, QUALITY- ASSURED DIAGNOSTICS

## OUR PAST...

*Identifying syphilis diagnostic tests that actually work so that babies who have acquired the disease from their mothers can get the medicine they need and not die needlessly.*

## OUR FUTURE...

*Identifying other diagnostic tests that work so that governments can purchase effective tests easily and inexpensively and use them properly.*

## SAVED FOR HIV ONLY TO DIE OF SYPHILIS

Consider the real story of a young mother in Haiti getting prenatal care at a local health clinic, receiving HIV voluntary counseling and testing, taking antiretroviral therapy for prevention of mother-to-child transmission, giving her baby anti-retroviral therapy and artificial milk to prevent HIV transmission through breastfeeding, only to have the baby die three weeks later from congenital syphilis. Why? Because there have been no affordable or accessible tests there to diagnose syphilis, which can be treated for less than US\$ 1 by giving infected women a single dose of penicillin early in pregnancy.



# THE NEED FOR DIAGNOSTICS EVALUATION

The dramatic story of the need for a simple diagnostic test for syphilis led TDR to analyze simple rapid tests for syphilis, *Chlamydia* and gonorrhea. This resulted in nine tests for syphilis being put on the WHO procurement list at a lower cost, leading to national plans being initiated for the elimination of congenital syphilis in several WHO regions.

## **NO STANDARDS OR REGULATIONS FOR DIAGNOSTIC TESTS**

Unlike the production of drugs or vaccines, there are no national or international standards for determining effectiveness or safety of diagnostic tests. Seeing this, TDR has created a diagnostics initiative, based on the success of the work in sexually transmitted diseases, to apply this rigorous analysis to diagnostic tests of tropical diseases. Several biobanks have been set up to collect biological specimens so that these tests could be evaluated.

## **NONE OF 19 AVAILABLE TB TESTS PROVIDED RELIABLE RESULTS**

In TB, none of 19 available immunodiagnostic tests that were analyzed showed adequate sensitivity, and test performance was much poorer on HIV-infected people, providing evidence for not using them and saving countries millions of dollars in unnecessary expense. TDR will be doing the same analysis for tests in malaria, dengue, visceral leishmaniasis and schistosomiasis.

## **DEVELOPING VALIDITY GUIDELINES**

TDR is co-publishing with the journal *Nature* a set of guidelines for countries and donor agencies to use in assessing the validity of tests they are interested in purchasing. The goal is to reduce the purchase of potentially useless tools that could lead to a wrong diagnosis, and to collect a database of what works so that WHO can negotiate lower prices for purchase by member countries.



## ALTERING THE INSECTS THAT TRANSMIT DISEASES

### OUR PAST...

*Establishing the biological basis of insects so that they can be prevented from transmitting diseases like malaria, dengue and sleeping sickness.*

### OUR FUTURE...

*Supporting biologic and genetic methods that replace wild mosquitoes with genetically modified ones that cannot transmit parasites, and identifying the social and ethical issues to consider in this strategy.*

### MAKING CONNECTIONS

TDR is facilitating networks between experts in developed and developing countries to advance, adapt and apply new technologies for the control of tropical diseases. For example, TDR has established 6 training programs in Africa, Asia and Latin America to train young scientists in bioinformatics and applications of genomics in tropical diseases, empowering them to use newly generated genomic data and technologies on parasites and vectors of tropical diseases.

# DISCOVERY RESEARCH

## OUR PAST...

*Some of the compounds being developed as new drugs for neglected tropical diseases benefited from early TDR funding. Public-private partnerships like the Medicines for Malaria Venture (MMV) are using research that started at TDR to develop drugs, such as a new synthetic peroxide.*

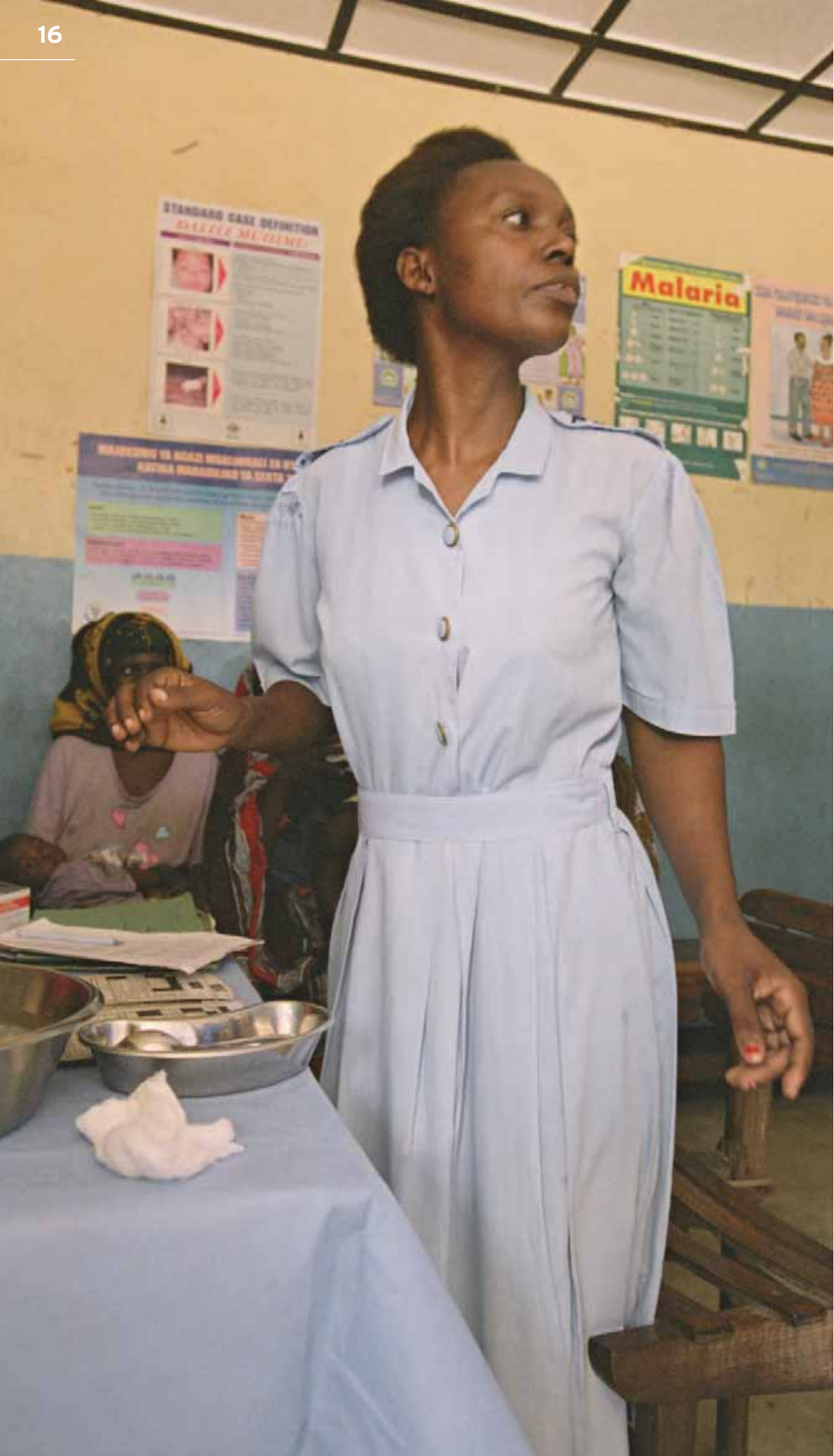
## OUR FUTURE...

*Through networks and public-private partnerships, we are identifying the next generation of leads using our compound screening and medicinal chemistry networks. TDR is helping to translate genomic sequences into product leads for drugs and diagnostics.*

## A PARTNER APPROACH

TDR is bringing together pharmaceutical companies, academic institutions and scientists from developing countries in new ways. For example, we are funding scientists from Africa to work within pharmaceutical companies to identify and develop lead compounds for new drugs. The goal is to develop the capacity for innovation in the countries where the diseases create the greatest burden.





STANDARD CASE DEFINITION  
*STAZZLE MU ZIZWE!*

**Malaria**

WAZIPINDU YA MATAJI WAZIWAJALI ZA WAZIWAJALI WAZIWAJALI ZA WAZIWAJALI

# MALARIA - REDUCING CHILDHOOD MORTALITY

*Malaria kills a child every 30 seconds in Africa (3,000 a day). It is a deadly disease that has been around for thousands of years and has been resistant to elimination. There are several reasons for today's problems.*

- We know what works, but often the tools are not used well because of cost and poor healthcare systems.
- Malaria parasites are developing resistance to the inexpensive, familiar anti-malarial drugs and mosquitoes are becoming resistant to insecticides.
- The countries that suffer the worst from malaria have limited funding and trained people to address the disease.

TDR is working to reduce these problems.

## **EMPOWERING LOCAL RESEARCHERS**

The goal of reducing malaria can ultimately only be achieved through local capacity to execute the research, develop the policy framework for control, and implement successful malaria control programmes. TDR helped to start the Multilateral Initiative on Malaria in Africa (MIM). This initiative funds several major projects in Africa with other agencies to build this capacity development.

*Pregnant women  
and very young  
children are  
the most susceptible*

## **MALARIA TREATMENT CLOSE TO HOME**

In Africa, most people who are at risk for malaria live very far from doctors and medical facilities. They need to know the signs of illness and have the medicines available nearby. TDR studies have shown that trained community members could provide the older anti-malarial drugs and know when to send people to health centres. But will this work with the newer, more complex combination treatments? Early results of a small group in Ghana are showing promise with Coartem, the only available fixed-dose combination treatment, so this research is being expanded to rural and urban areas in African countries.

This closer-to-home management of malaria could lead to fewer children dying from malaria.

At the same time, TDR is looking into how fevers that can be caused by different diseases can be diagnosed and managed. Five African countries are engaged in research to see if trained community-based care providers can manage both malaria and pneumonia.

## **NEW DRUG FOR BABIES WITH SEVERE DISEASE**

Babies with malaria, if not treated at once, often deteriorate very quickly into a coma. At this stage, they need an intravenous drip of medicine and skilled care, but when these facilities are so far away, as they are in many areas throughout Africa, the babies often die at home. A new suppository of artesunate is showing signs of stabilizing the babies long enough to provide the time to get to the hospital. TDR is finalizing the studies analyzing the effectiveness of the drug and the delivery by volunteer mothers in the communities, and licensing the drug so it can be made available for use.

## **IMPROVING THE DIAGNOSIS OF MALARIA**

Because the new combination therapies for malaria are more expensive and have some side effects, it is better to have accurate diagnoses before treatment instead of continuing to base treatment on just the presence of a high fever. TDR is developing guidelines to help countries evaluate whether diagnostic tools actually provide reliable and accurate results, and also identifying those to be put on the WHO procurement list for low-cost access.



## **DRUG SAFETY IN PREGNANT WOMAN AND CHILDREN**

Pregnant women and very young children are the most susceptible to malaria, yet these are the ones who are often not included in the testing of new drugs because of potential safety and liability issues. But information is needed on how effective and safe new drugs work in these vulnerable groups, too. So TDR is collecting data on several drugs for use during pregnancy, including lapdap (chlorproguanil-dapsone), malarone, Coartem and artesunate.

TDR is working with partners to develop a new drug combining lapdap with artesunate, called CDA. The studies are promising, and if its effectiveness and safety are confirmed in larger studies, then the new drug should be available in 2008 as a once-daily dose at preferential prices to those in need.



# TRACKING TDR ACHIEVEMENTS 2000-05

## A BRIEF LOOK

A full set of indicators have been developed to evaluate TDR's impact each year and over time. The scientific measures are validated by our Scientific and Technical Advisory Committee. Full details of each item can be found on our website at [www.who.int/tdr](http://www.who.int/tdr).

### ***New knowledge***

Number of scientific publications	1404
Number of patents resulting from TDR-funded R&D	9
Number of outstanding advances in scientific knowledge	34

### ***New and improved tools***

Number of new and improved tools receiving regulatory approval and/or label extensions or for diagnostics, recommended for use	6
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### ***New and improved intervention methods***

Number of new and improved intervention methods validated for prevention, diagnosis or treatment of infectious disease	7
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### ***New and improved strategies***

Number of new and improved public health strategies for which effectiveness has been determined and evidence made available	12
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### ***Partnerships and capacity building***

Number of R&D partners engaged	2537
Number of MSc degrees completed	43
Number of PhD doctoral degrees completed	117
Number of persons trained in short courses	1149
Number of research institutions in low income disease-endemic countries strengthened	8
Proportion of partners from disease-endemic countries out of the total number of partners engaged	70%
Proportion of total new publications produced by scientists from disease-endemic countries	48%

### ***Technical information, guidelines, instruments and advice***

Number of research instruments and guidelines for infectious diseases developed and published	38
Number of global research priority-setting reports for infectious diseases published	4
Mean monthly web page views	160,612
Number of requests for research guidelines and publications	9,958

# TDR – A UNIQUE ORGANIZATION WORKING THROUGHOUT THE WORLD WITH MANY PARTNERS TO IMPROVE HEALTH

We are sponsored by four UN agencies – UNICEF, UNDP, the World Bank and WHO, and we operate within a broad framework of intergovernmental and interagency cooperation, funding and participation.

## HOW WE ARE GOVERNED

### ***The Joint Coordinating Board (JCB)***

Thirty-one members come together once a year, representing national governments from both the developed and developing countries, sponsoring UN agencies, and other interested parties.

Representatives include:

- 12 governments selected by TDR funding partners
- 12 governments selected by WHO regional committees
- 6 cooperating parties selected by the JCB
- 4 co-sponsors

### ***The Standing Committee***

The Standing Committee oversees the management and financing of TDR and comprises the four co-sponsors -- UNICEF, UNDP, the World Bank and WHO. It meets three times a year in March, June and November. The JCB chair and vice chair and the chair of STAC attend as ex officio participants.

### ***Scientific and Technical Advisory Committee (STAC)***

STAC consists of 15-18 multi-disciplinary scientists from across the world, selected on the basis of scientific or technical competence. The group meets once a year to oversee TDR's scientific activities. It provides an independent evaluation of all the technical aspects of TDR's work, recommends priorities, and reports its findings to the Joint Coordinating Board (JCB).

### ***Scientific Steering Committees***

TDR operates with a number of steering committees that provide technical advice and recommendation for funding. They meet on a regular basis to define priorities and review proposals.

*Our funding comes  
from many sources,  
because we work globally,  
supporting research that  
improves health and  
reduces poverty.*

## **FINANCIAL CONTRIBUTIONS COME FROM**

- governments
- UN agencies
- foundations
- private corporations
- public-private partnerships
- academic institutions

## **TOGETHER, WE ARE MAKING AN IMPACT THROUGH RESEARCH**

We build bridges by bringing together academic institutions, governments and commercial companies. The scientific priorities and recommendations developed through internationally convened TDR committees are received as unbiased, honest assessments that are taken up and used by many.

By leveraging strengths and resources from different groups, TDR is using research to help meet the UN Millennium Goals to reduce poverty, childhood mortality, and the impact of tropical diseases.

*TDR exists for one reason –  
to reduce the burden of illness  
among poor people in poor  
countries. We do that with our  
own unique approach, support-  
ing and mentoring research by  
and for those people.*

TDR has about 100 distinct projects  
currently underway. To find out more, visit  
us online at **[www.who.int/tdr](http://www.who.int/tdr)**



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