International Federation
of Pharmaceutical
Manufacturers & Associations

Pharmaceutical R&D Projects to Prevent and Control Neglected Conditions

2014 status report on pharmaceutical R&D to address diseases disproportionately affecting people in low- and middle-income countries

IFPMA

The research-based pharmaceutical industry is actively involved in the fight against diseases affecting vulnerable populations. With 186 compounds in development, R&D programs and pipelines show industry's commitment to these pressing health challenges. Most of these R&D projects are carried out through innovative collaborations with non-industry partners.

Pharmaceutical R&D Projects

Prevent and Control Neglected Conditions

2014 status report on pharmaceutical R&D to address diseases disproportionately affecting people in low- and middle-income countries

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Cutting-edge R&D for unmet health needs

One billion people affected worldwide. One person in seven suffers from one or more neglected diseases. Each year neglected diseases kill or disable millions of people primarily in tropical and subtropical areas of the world.

Neglected diseases are linked to poverty. They can cause blindness, chronic pain, severe disability, disfigurement or even death. Affecting both children and adults, these diseases can impair childhood development, lead to stigmatization and hinder economic productivity by limiting the ability of infected individuals to work. Their impact on individuals and communities is devastating. As long as neglected diseases continue to be endemic in poor countries, they will remain a contributor to a vicious cycle of poverty.

Neglected diseases by the numbers

186 R&D projects to develop medicines and vaccines for 11 neglected conditions: tuberculosis, malaria, human African trypanosomiasis (sleeping sickness), leishmaniasis, dengue, onchocerciasis (river blindness), American trypanosomiasis (Chagas disease), schistosomiasis, lymphatic filariasis, soil-transmitted helminthic diseases and Ebola.

Pharmaceutical R&D investment reached **USD 527.2 million** in 2012, an annual increase of 3.7%.

Pharmaceutical industry is the **3rd largest funder** of R&D for neglected diseases, after the public and philantropic sectors.

14 billion treatments donated this decade to support the elimination or control of nine key neglected diseases.

40 health partnerships programs that combine prevention, training and treatment.

Eliminating or controlling neglected diseases is achievable. Success relies on multi-stakeholder approaches, which not only drive further R&D but also integrate environmental improvements, boosting capacity-building efforts, effective health policies, better screening, and availability of high quality, safe and effective medicines.

A comprehensive effort to fight against neglected diseases is needed. The pharmaceutical industry is the third largest funder of R&D for neglected diseases. Also companies provide in-kind contributions that are specifically targeted to neglected disease R&D but cannot easily be captured in dollar terms[1], such as transfer of technology, sharing compound libraries, and technical expertise to develop, manufacture, register and distribute neglected disease products, provision of expertise, teaching and training, intellectual property, and regulatory assistance. In addition, as a partner in global health, the pharmaceutical industry works with the WHO and other partners to implement capacity-building efforts in low- and middle-income countries to train healthcare professionals, raise awareness of diseases and roll out of prevention programs, and strengthen health systems. These efforts are complemented by medicine donation programs.

1 See Table 29 "Typical industry in-kind contributions to neglected disease R&D 2012", Policy Cures (December 2013), G-FINDER report "Neglected Disease Research and Development: The Public Divide", p. 80.

This status report provides a snap shot of the R&D projects funded by IFPMA members in 2014.

R&D projects to develop new or improved treatments and vaccines for neglected diseases

The industry contributes to the fight against neglected diseases in several ways. First, through cutting-edge R&D: IFPMA member companies currently work on 186 R&D projects[2]. The focus is on developing new or improved medicines and vaccines for 11 neglected conditions. These diseases are: tuberculosis, malaria, human African trypanosomiasis (sleeping sickness), leishmaniasis, dengue, onchocerciasis (river blindness), American trypanosomiasis (Chagas disease), schistosomiasis, lymphatic filariasis, soil-transmitted helminthic diseases and Ebola.

2 A project is a compound in development for a specific disease target, or a program to screen compounds against a specific disease. Data are from responses to IFPMA queries and open sources.

Of the 186 current R&D projects listed in this status report, 164 (88%) are product development partnerships (PDPs) involving IFPMA member companies, the remaining 22 projects are company-only undertakings. Since 2013 the number of medicine and vaccine R&D projects has increased by 13%, from 164 to 186.

Growing R&D pipeline by industry and partners for neglected diseases

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Medicines	32	43	50	58	75	91	82	117	150	168
Vaccines	(not counted)	6	8	9	9	11	11	15	14	18
Totals projects	32	49	58	67	84	102	93	132	164	186

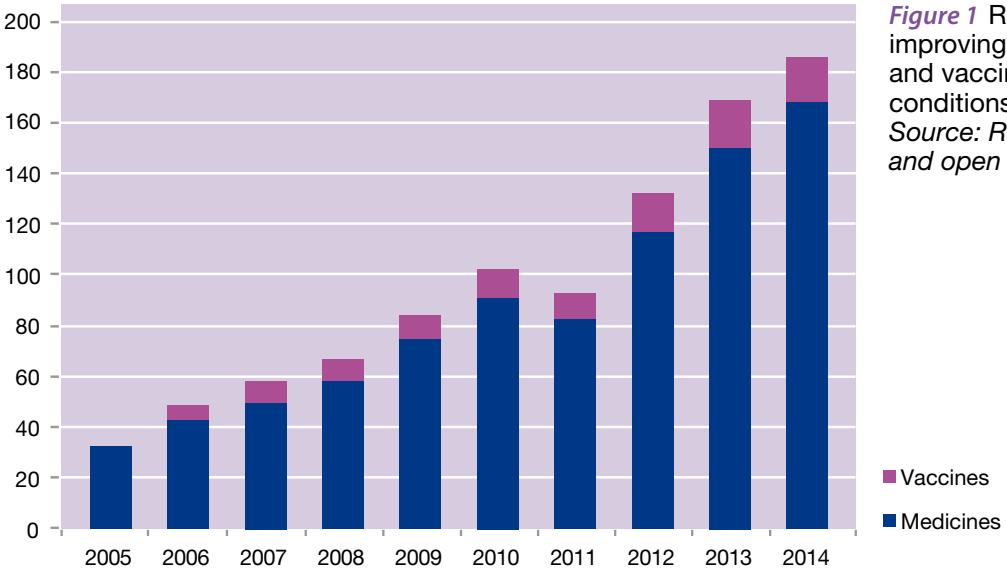


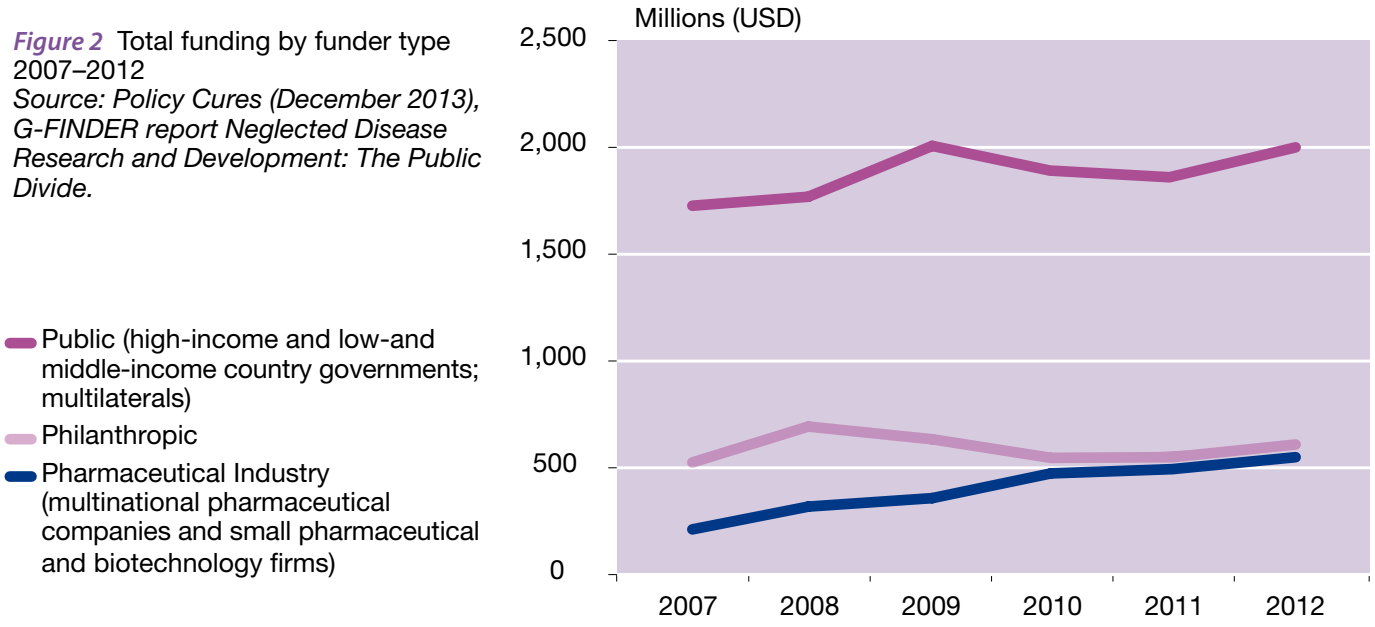
Figure 1 R&D projects that focus on improving or developing new medicines and vaccines for eleven neglected conditions
Source: Responses to IFPMA queries and open sources

Diseases	Tuberculosis	Human African trypanosomiasis	Malaria	Leishmaniasis	Dengue	Onchocerciasis	American trypanosomiasis	Schistosomiasis	Lymphatic filariasis	Soil-transmitted helminthic diseases	Ebola
Ongoing medicines R&D projects	48	9	37	15	5	13	18	6	12	1	4
Ongoing vaccines R&D projects	2		4	2	4		2				4

Global R&D investment for neglected diseases

Data from the sixth annual G-FINDER report "Neglected Disease Research and Development: The Public Divide" (December 2013) shows total R&D funding for neglected diseases as USD 3.2 billion in 2012. The public sector provides nearly two-thirds (USD 2.0 billion, 63.2%) of global funding for R&D followed by the philanthropic sector contributions (USD 631 million, 19.9%) and the pharmaceutical industry (USD 527.2 million, 16.7%). The majority of multinational pharmaceutical companies' investments in neglected disease R&D in 2012 focused on three diseases: Dengue, tuberculosis and malaria. However, year-on-year investments increased for most diseases, including Dengue (up USD 11.9m, 7.9%), malaria (up USD 11.9m, 12.6%), kinetoplastids (up USD 4.2m, 46.0%), diarrhoeal diseases (up USD 3.8m, 17.6%), and bacterial pneumonia & meningitis (up USD 1.4m, 4.4%).

Figure 2 Total funding by funder type 2007–2012
Source: Policy Cures (December 2013), G-FINDER report Neglected Disease Research and Development: The Public Divide.



Emergence of pharmaceutical industry centers dedicated to neglected diseases R&D

The industry's efforts are supported by R&D centers which are dedicated solely to diseases that disproportionately affect people in low- and middle-income countries. Some companies integrate these R&D activities within their broader R&D organization while others provide financial and technical support to independent institutions. For example, Lilly supports the Infectious Disease Research Institute (IDRI) in Seattle, USA, for early phase drug discovery efforts for new or improved therapies for tuberculosis, including multidrug-resistant strains.

Company	R&D center	Location	Disease	Since
Celgene	Celgene Global Health	Summit, NJ, USA	Visceral Leishmaniasis Chagas Human African Trypanosomiasis Malaria Lymphatic Filariasis Onchocerciasis Wolbachia Tuberculosis Hemorrhagic Fevers	2009
GSK	Tres Cantos Medicines Development Campus	Tres Cantos, Spain	Malaria Tuberculosis Kinetoplastids	2002
Merck	R&D Translational Innovation Platform "Global Health"	Geneva, Switzerland	Schistosomiasis & Helminthic diseases Malaria Co-infections	2014
MSD (MSD operates as Merck & Co. Inc. in the US and Canada)	MSD Wellcome Trust Hilleman Laboratories	New Delhi, India	Rotavirus Otherenteric diseases	2009
Novartis	Novartis Institute for Tropical Diseases (NITD)	Singapore	Dengue fever Malaria Human African trypanosomiasiss	2002
Novartis	Novartis Vaccines Institute for Global Health (NVGH) *	Siena, Italy	Diarrheal diseases Salmonella Typhoid fever	2008
Novartis	Genomics Institute of the Novartis Research Foundation (GNF)	La Jolla, USA	Chagas disease Leishmaniasis Malaria	2010

* NVGH is currently being transferred to GSK as part of GSK acquisition of part of the Novartis Vaccines business.

WIPO Re:Search: a collaborative platform to boost R&D

Launched in October 2011, the WIPO Re:Search consortium provides access to intellectual property, pharmaceutical compounds, technologies, know-how and data for R&D of neglected tropical diseases, tuberculosis, and malaria. By providing a searchable, public database of available intellectual property assets and resources, WIPO Re:Search facilitates new partnerships to support organizations that conduct research on treatments for neglected tropical diseases, ultimately improving the lives of those most in need.

IFPMA member companies involved in WIPO Re:Search are: AstraZeneca, Eisai, GSK, Merck, MSD, Novartis, Pfizer, and Sanofi.

More information is available at http://www.wipo.int/research/en/

Global Health Innovative Technology Fund (GHIT): a new force for global health

The Global Health Innovative Technology Fund (GHIT Fund) is a non-profit organization focused on the discovery and development of new health technologies, including medicines, vaccines, and diagnostics for infectious diseases prevalent in developing countries. The first product development fund of its kind in Japan, the GHIT Fund is supported by the Japanese Government, United Nations Development Programme (UNDP), Japan' s leading pharmaceutical companies, and the Bill & Melinda Gates Foundation.

More information is available at http://www.ghitfund.org/

A holistic approach to fighting neglected diseases

Taking a holistic approach involving partnerships is key to tackling neglected diseases and reducing their impact on people. In addition to R&D, IFPMA members work with the WHO and other partners to implement capacity-building efforts in developing countries. These efforts are complemented by medicine donation programs.

Implementation of capacity-building efforts: an integrated approach combining prevention, training, and treatment

To address neglected diseases in low- and middle-income countries, IFPMA members work with the WHO and other partners to implement prevention/awareness/outreach programs, improvements in health system infrastructure, and training.

The IFPMA Developing World Health Partnerships Directory[3] is the most comprehensive online database for health development programs involving the research-based pharmaceutical industry and documents over 250 health partnerships currently running in the developing world. These include access, capacity-building and R&D programs that focus on neglected diseases.

3 http://partnerships.ifpma.org and Business Social Responsibility (BSR) (September 2012), Working toward Transformational Health Partnerships in Low- and Middle-Income Countries.

EDCTP-TDR Clinical Research and Development Fellowships – Increasing R&D capacity in low and middle income countries (LMICs)

Researchers from LMICs who are involved in clinical research projects have limited opportunities to acquire experience and develop skills for conducting clinical trials outside of an academic or public sector setting. Founded in 1999 to promote high quality clinical research in LMICs, the TDR (WHO Special Programme for Research and Training in Tropical Diseases) Career Development Fellowships (CDF) programme, which was developed with the help of the IFPMA, offers targeted training to enhance competencies in clinical trials for medicines, vaccines and diagnostics on a broad range of infectious diseases of poverty.

In 2012, the European & Developing Countries Clinical Trials Partnership (EDCTP) partnered with the European Federation of Pharmaceutical Industries and Associations (EFPIA) to offer researchers similar placements in pharmaceutical companies. EDCTP is a partnership between Europe and sub-Saharan Africa that supports the clinical development of new or improved interventions to prevent or treat HIV/AIDS, tuberculosis, malaria, neglected infectious diseases and related research capacity building.

In 2014, TDR and EDCTP signed an agreement to harmonize and streamline their two fellowship programmes. The partnership ensures synergies for the organisations involved, and facilitates common communication with researchers and clinical staff, pharmaceutical companies, PDPs and research institutions. Between 2008 and 2014, 32 fellows have been trained as part of the TDR fellowship programme. The EDCTP-TDR collaboration will allow for this number to increase in future years.

TDR and EDCTP launched their first joint call on 31 October 2014. 20 product development organisations offered to host fellows in 2015, including Astellas, Bayer, GSK, Novartis, Merck, Sanofi and Sanofi Pasteur. The host organisations will train scientists – for a period of up to 24 months – to develop specialist product development skills not readily taught in academic centres or public research institutions. On returning to their home organisations, the fellows are expected to become an important resource for institutional capacity development to undertake and manage clinical research in accordance with international regulatory requirements and standards.

More information is available at: http://www.who.int/tdr/grants/EDCTP_TDR_Call_for_Proposals.pdf?ua=1

http://www.edctp.org/call/edctp-tdr-clinical-research-development-fellowships/

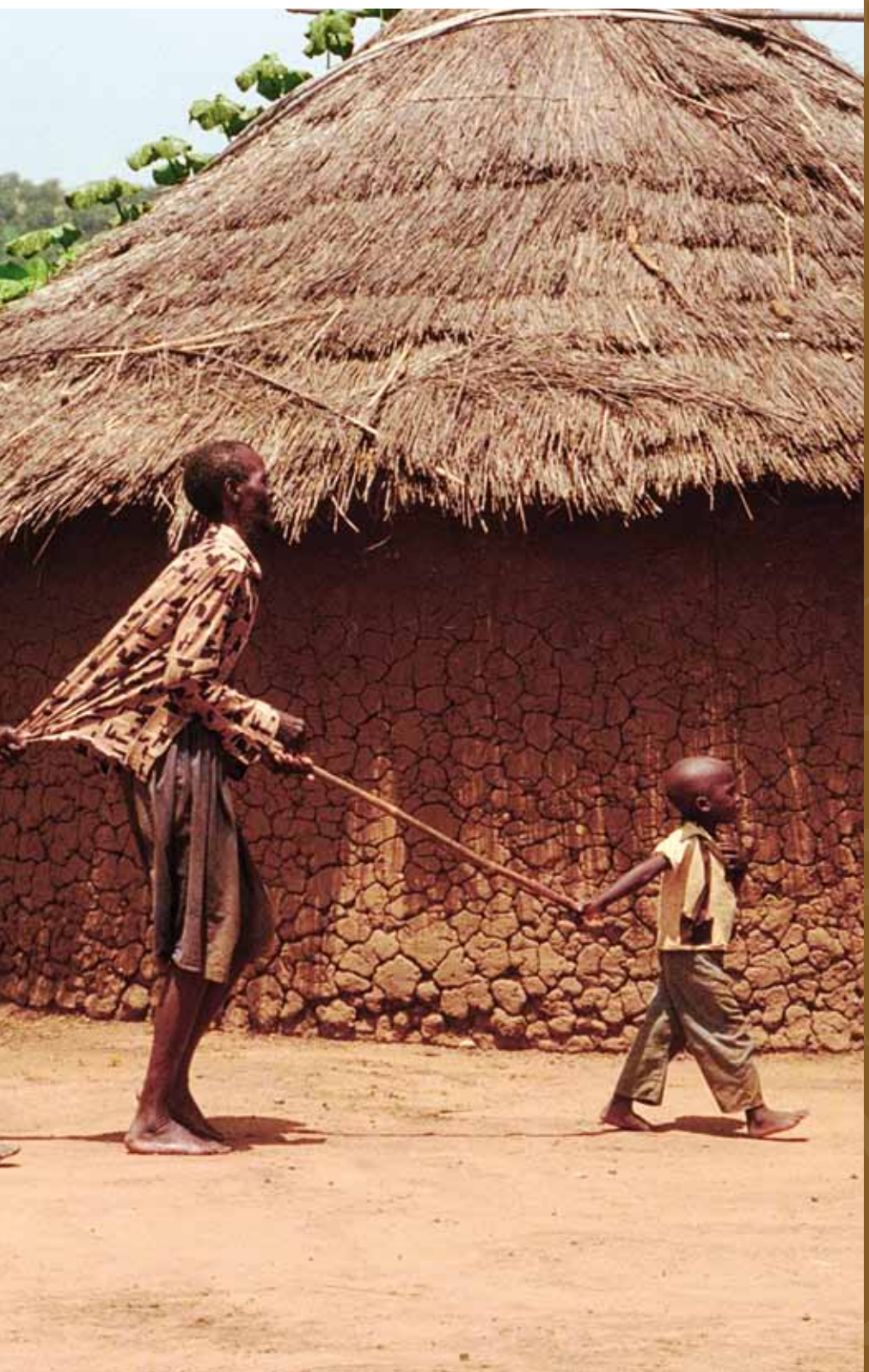
A life-changing pledge: research-based pharmaceutical industry donates over 1.4 billion treatments annually to eliminate or control neglected diseases

As part of the pharmaceutical industry's commitment to improve global health, IFPMA members have pledged[4] to donate an average of 1.4 billion treatments for each of the ten years from 2011 to 2020. The 14 billion treatments over this period will help eliminate or control the nine neglected diseases that represent more than 90% of the global neglected diseases burden (human African trypanosomiasis, Chagas disease, lymphatic filariasis, soil-transmitted helminthiases, onchocerciasis, schistosomiasis, leprosy, fascioliasis, and blinding trachoma). This pledge can only reach patients through strong commitment from both concerned countries and implementation partners.

4 IFPMA (January 2011), Ending Neglected Tropical Diseases, IFPMA member companies support eliminating and controlling neglected tropical diseases over the next decade through landmark donations.

R&D pipeline for new medicines and vaccines[5]

5 IFPMA members' R&D projects.



Tuberculosis

Disease impact Tuberculosis (TB) remains one of the world's deadliest communicable diseases. In 2013, an estimated 9 million people developed TB and 1.5 million died from the disease, 360 000 of whom were HIV-positive. Worldwide, the proportion of new cases with multidrug-resistant TB (MDR-TB) was 3.5% in 2013 and has not changed compared with recent years. Of the estimated 9 million people who developed TB in 2013, more than half (56%) were in the South-East Asia and Western Pacific Regions. A further one quarter were in the African Region, which also had the highest rates of cases and deaths relative to population. India and China alone accounted for 24% and 11% of total cases, respectively.

Available therapies WHO recommends Directly Observed Treatment, Short-Course (DOTS) to ensure patients adhere to long treatment with anti-TB cocktail (options include Isoniazid, Rifampicin, Pyrazinamide, Streptomycin and Ethambutol), but this places a heavy burden on health care resources. Length of treatment (standard six-month course) encourages non-adherence, which facilitates development of resistance and now multi-drug resistance. TB is closely linked to HIV/AIDS, but incompatibility of ARVs and TB therapies is an issue. Access to MDR-TB treatment is still a challenge: only a reported 97,000 patients with MDR-TB were enrolled on treatment out of the estimated 480,000 cases of MDR-TB among the 8.9 million cases of pulmonary TB reported to WHO in 2013. Currently used regimens require five or more drugs, to be taken for a minimum of 18 months.

Access/Capacity Building AbbVie, AstraZeneca, Celgene, Johnson & Johnson, Lilly, Novartis, Otsuka, Sanofi, and Takeda.

Products approved since 2005 Otsuka's Deltyba™ (delamanid) received conditional approval from the European Commission in April 2014. In July 2014, the Ministry of Health, Labour and Welfare of Japan (WHLW) approved Deltyba for use in adult patients and in October 2014, Deltyba received regulatory approval from the Korean FDA. In November of 2014 the WHO issued interim policy guidance on the use of delamanid which paves the way for country adoption and future access in high-burden countries. Otsuka remained in 2014 the largest private funder of tuberculosis research and development according to the Treatment Action Group.

The U.S. Food and Drug Administration (FDA) granted accelerated approval to SIRTURO® (bedaquiline) tablets for the treatment of pulmonary multi-drug resistant tuberculosis (MDR-TB) as part of combination therapy in adults on December 28, 2012. In Russia, Janssen's partner Pharmstandard sought and obtained approval, as announced in December 2013. Also in March 2014, the European Commission granted a conditional marketing authorisation for SIRTURO® (bedaquiline) for use as part of a combination therapy for pulmonary multidrug-resistant tuberculosis in adult patients when an effective treatment regimen cannot otherwise be composed for reasons of resistance or tolerability. Additional approvals in high burden countries were granted in March 2014 (South Korea), October 2014 (South Africa and the Philippines), and December 2014 (Peru).

In 2014, FDA approved rifapentine for the treatment of latent TB infection, toghether with isonihazid in a three month weekly dose regimen (12 doses).

Terminated/completed projects since 2005 Methyl erythritol pathway inhibitors (AstraZeneca), isocitrate lyase inhibitors (GSK/TB A), peptide deformylase inhibitors (GSK/TB A), peptide deformylase, PDF (Novartis) and nitroimidazole backup compounds (Novartis), pleuromutilins (GSK/TB A), target based approaches (5) (Sanofi), anaerobic screen and other cell-based TB screens (Novartis/NIAID), screening, target identification (multiple) (AstraZeneca), DNA gyrase inhibitors (AstraZeneca), malate synthase Inhibitors (GSK/TB A), compound library screening (Daiichi Sankyo/DBT), compound screening (AbbVie/TB A), whole cell screening program (Pfizer/TBDA), PNU 100480 (Pfizer), moxifloxacin/TB REMox TB approach (Bayer/TB A/BMRC/UCL), Aeras-402 vaccine (AdVac®)(Crucell), screening target identification (multiple) (AstraZeneca/MM4TB (EUFW7), predicting efficacious drug combination to treat TB (AstraZeneca/Wellcome/Cellworks), medicinal chemistry DMPK and chemo informatics support (AstraZeneca/iTHEMBA), screening natural products (AstraZeneca/Griffith Uni), moxifloxacin (AstraZeneca/TB A/BMRC/UCL).

Notes The Critical Path to TB Drug Regimens (CPTR) initiative, co-founded by the Bill & Melinda Gates Foundation (BMGF), the Critical Path Institute, and the TB Alliance, is a multi-sectoral effort to overcome the challenges associated with TB drug development and to dramatically accelerate the development of new and impactful TB drug regimens. This innovative partnership brings together pharmaceutical companies (including AstraZeneca, Bayer, Celgene, GSK, Johnson & Johnson, Novartis, Otsuka, Pfizer, and Sanofi), global regulatory agencies, and civil society organizations to support advances in regulatory science, the development of infrastructure, and other progress needed to facilitate the development and availability of new TB drug treatments.

In April 2012, eight pharmaceutical companies and four research institutions, working with the Bill & Melinda Gates Foundation, launched a groundbreaking partnership that aims to speed the discovery of essential new treatments for tuberculosis. The partnership, known as the TB Drug Accelerator (TBDA), will target the discovery of new TB drugs by collaborating on early-stage research. The long-term goal of the TBDA is to create a TB drug regimen that cures patients in only one month by 2024. The participating pharmaceutical companies – AbbVie, AstraZeneca, Bayer HealthCare, Eisai, Lilly, GSK, MSD, and Sanofi –open up targeted sections of their compound libraries and share data with each other and five research institutions: the Infectious Disease Research Institute; the National Institute of Allergy and Infectious Diseases, part of the US National Institutes of Health; Texas A&M University; University of Cape Town; Weill Cornell Medical College. On November 2014, the public private partnership Global TB Alliance also joined TBDA as a full member and will collaborate in the development of regimens.

Pfizer outlicensed the PNU-100480 compound to Sequella in 2013.

Nitroimidazole PA 824 (Novartis/TB A) was moved to TB Alliance for further clinical testing, and discovery projects (Novartis) were moved to H3D Drug Discovery Center in Novartis.

Roche is developing a molecular-based diagnostic test to detect MDR-TB.

Company	Partners	Project	Phase
AbbVie	TB A	Technical consulting and preclinical support	Preclinical
AbbVie	Gates TBDA	Whole-cell screening program, collaborative drug discovery	Lead identification
AstraZeneca	TB A	Joint research collaboration agreement	Lead identification/optimization
AstraZeneca	Gates TBDA	Whole-cell screening program	Lead identification

Company	Partners	Project	Phase
AstraZeneca	NIAID	AZD5847	Phase II
Bayer HealthCare	Gates TBDA	Whole-cell screening program	Lead identification
Celgene	British Columbia Uni	Screening Celgene's library	Screening
Celgene	Weill Cornell	R/NR Screening	Screening
Celgene	Weill Cornell	PKR Screening	Screening
Celgene	Cape Town Uni	Hit-to-Lead and SAR	Lead identification
Celgene	PHRI	Compound screening	In vivo efficacy
Celgene	Pittsburg Uni	Compound screening	In vivo efficacy
Celgene	TB A, Johns Hopkins Uni	Compound screening	In vivo efficacy
Daiichi Sankyo	TB A, GHIT	Compound screening	Lead identification
Eisai	Gates TBDA	Whole-cell screening program	Lead identification
GSK	Gates TBDA	Whole-cell screening program	Lead identification
GSK	TB A	Whole-cell screening program	Lead optimization
GSK	Frame Work 7	InhA inhibitors	Lead identification
GSK	TB A	Whole-cell hit to lead screening program	Lead identification
GSK	company	Leu RS inhibitor GSK3036656	Preclinical
GSK	TB A	Sulfonamides	Lead optimization
GSK	Wellcome (SDD)	Ethionamide Boosters	Lead optimization
GSK	TB A	Mtb DprE1 inhibitors	Lead optimization
Janssen (J&J)	company	Diarylquinoline bedaquiline (SIRTURO®) for Treatment of MDR-TB	Phase III
Janssen (J&J)	TB A	Diarylquinoline, bedaquiline for treatment of drug sensitive TB	Phase II
Janssen (J&J)	TB A	Next generation diarylquinoline	Lead optimization
Lilly	IDRI, NIH	CPZEN-45	Preclinical
Lilly	IDRI, NIH, TB A	Screening program	Discovery
Lilly	IDRI, NIH, TB A	Lead generation/optimization portfolio	Discovery
Lilly	Gates TBDA	Whole-cell screening program	Lead identification
MSD	Gates TBDA	Whole-cell screening program	Lead identification
MSD	Gates TBDA	Novel (ALIS) binding assay to ID hits/target MOA	Lead identification
Otsuka	company	Deltyba® (Delamanid) for adult patients with MDR-TB	Phase III
Otsuka	company	Deltyba® (Delamanid) for pediatric patients with MDR-TB	Phase II
Pfizer	Seoul National Uni	Linezolid	Phase II
Roche	Zurich Uni	Protein secretion system	Discovery
Roche	HMS	Novel enzymatic target for drug development	Discovery
Roche	HMS	Identify novel target genes and new genotypic-based diagnostic and therapy	Discovery
Sanofi	TBTC	Rifpentine (new regimen development for active TB)	Phase II
Sanofi	company	Rifapentine (new regimen development for latent TB)	Registration
Sanofi	NIAID	Rifapentine (new regimen development for latent TB)	Phase III (FDA approved 2014)
Sanofi	company	Antimycobacterial screening program (2 groups)	Discovery
Sanofi	MM4TB FP7	Screening, target identification	Lead identification
Sanofi	Cornell Uni	Screening on non growing TB phenotypes	Lead identification
Sanofi	TB A	Lead to candidate portfolio	Lead optimization
Sanofi	TB A	Hit to lead portfolio	Lead identification
Sanofi	Gates TBDA	Whole-cell screening program	Lead identification/optimization
Takeda	TB A, GHIT	Compound screening	Lead identification
Vaccines			
GSK	Aeras	Vaccine (GSK M72)	Phase II
Sanofi	SSI, Aeras, Intercell	Vaccine HyVac4 IC31 (AERAS-404)]	Phase I

Human African trypanosomiasis (sleeping sickness)

Disease impact Sleeping sickness occurs only in 36 sub-Saharan Africa countries where there are tsetse flies that transmit the disease. Over 70 million people are exposed to the disease. Sustained control efforts have lowered the number of new cases. In 2009, the number of cases reported dropped below 10 000 (9878) for first time in 50 years and in 2012 there were 7216 cases recorded.

Available therapies Eflorinithine, melarsoprol, pentamidine, nifurtimox, and suramin.

Access/Capacity Building Bayer HealthCare, Celgene, Novartis, and Sanofi.

Products approved since 2005 Nifurtimox oral and Eflornithine IV combination (Epicentre/MSF/DNDi/Swiss TPH/TDR/Sanofi/Bayer HealthCare) included in WHO essential medicines list (May 2009) and is available via WHO.

Terminated/completed projects since 2005 Compound screening (Pfizer/TDR), compound library screening (Pfizer/DNDi), target screening and hit optimization (Merck/TDR), target screening and hit optimization (MSD/DNDi), discovery (Sanofi/DNDi), Cheminformatics support (AbbVie/Sussex Uni), focused compound library screening (AstraZeneca/UCSF), DMPK and chemo-informatics support (AstraZeneca/Northeastern Uni).

Company	Partners	Project	Phase
AbbVie	DNDi	Tecnical consulting	Phase II
Astellas	DNDi, Tokyo Uni, Tokyo Inst. of Technology, Nagasaki Uni, KEK, AIST	Discovery/Reprofiling of selected compounds	Discovery
AstraZeneca	DNDi	Focused compound library screening	Lead identification
Bristol-Myers Squibb	DNDi	Focused compound library screening	Lead identification
Celgene	DNDi, Antwerp Uni	Compound screening	Screening
GSK	DNDi	HTS compound library screening	Lead identification
Novartis	company	Early discovery efforts	Lead optimization
Sanofi	DNDi	Fexinidazole (antiprotozoal compound)	Phase II
Takeda	DNDi, GHIT	Compound screening	Lead identification

Malaria

Disease impact There were about 198 million cases of malaria in 2013 and an estimated 584,000 deaths. 90% of all malaria deaths occur in sub-Saharan Africa, and 77% occur in children under five.

Available therapies WHO recommends combination therapy to slow continually evolving resistance, to increase compliance and improve disease control.

Access/Capacity Building AbbVie, Celgene, GSK, MSD, Novartis, Pfizer, Sanofi, and Takeda.

Products approved since 2005 Artesunate-Amodiaquine Winthrop® FDC (Sanofi/DNDi) in Morocco and sub-Saharan countries (2007), WHO prequalified (2008), Pediatric Coartem® Dispersible (Novartis/MMV) (2009), Eurartesim (dihydroartemisinin-piperaquine (DHA/PQP)) (MMV/ Sigma-Tau), Pyramax® (fixed-dose combination of pyronaridine and artesunate) (MMV/Shin Poong Pharmaceuticals), Synriam™ (Ranbaxy (Daiichi Sankyo)) in India (2012) and 4 African countries (August 2014), ASMQ FDC (DNDi/Farmanguinhos/ Cipla) WHO prequalified (2012).

Terminated/completed projects since 2005 Artemisone (Bayer HealthCare/MMV), peptide deformylase inhibitor (GSK/ MMV), protein franesyltransferase inhibitors (BMS/MMV), intrarectal quinine (Sanofi), 4(1H)-pyridone derivate (GSK/MMV), fatty acid bionsynthesis/Fab I (GSK/ MMV), chloroproguanil-dapsone-artesunate (GSK/MMV), falcipain inhibitors/cysteine protease (GSK/MMV/UCSF), novel macrolide (GSK/ MMV), P. falciparium vaccine (Sanofi/Inst. Pasteur), N-tert butyl Isoquine (GSK/Liv Uni/MMV), Novel Macrolide (GSK/MMV), 4(1H) pyridones Lead – GSK 932121 (GSK/MMV), compound screening (Daiichi Sankyo/MMV), trioxaquine and trioxaquine backup (Sanofi), pyrazoles (Novartis/Drex Uni/ Wash Uni), compound library screening (Pfizer/TDR), compound library screening (Pfizer/MMV), pyridone back-up (GSK/MMV), DHODH inhibitors (GSK/MMV), compound screening (Eisai), cysteine protease inhibitors (AbbVie/Penn Uni/MMV), targeted compound screening (MSD), carbazole (Merck/TDR), bis-thiazolium (SAR97276A/T3) (Sanofi), thiazolium back-up (Sanofi/CNRS), Lopinavir/ritonavir (potential preventive therapy) (AbbVie/NIH), MVI AdVac®-based malaria vaccine and NIAID AdVac®-based malaria vaccine (Crucell), backup compound KDU691 (Novartis/ Wellcome/MMV/BPRC/Swiss/TPH), compound screening/preclinical support (AbbVie/University of Washington Seattle), MMV AZT-Chloroquine Programs (Pfizer), ELQ300 (Takeda/MMV/GHIT)), mini portfolio (AstraZeneca/MMV), focused compound library screening (AstraZeneca/ UCSF), focused compound library screening (AstraZeneca/HMS).

Notes Ranbaxy's RBx 11160 initially with MMV. Bayer HealthCare and MMV stopped Artemisone in 2005, the University of Hong Kong has taken it to Phase II with MMV. MSDMK-4815 was initially with MMV.

Company	Partners	Project	Phase
AbbVie	MMV	DSM265 PK studies, formulation evaluation, PD and metabolite sample analysis, pathology peer review; GLP toxicology study conducted; technical consulting	Phase I/IIa
AbbVie	MMV	MMV390048 PK studies, formulation evaluation, PD sample analysis, pathology peer review; technical consulting	Phase I/IIa
AstraZeneca	LSTM	Focused compound library screening at LSTM	Lead identification
AstraZeneca	Harvard School of Public Health	Target identification of leads	Lead identification/optimization
Celgene	MMV	Compound screening	Early lead identification
Daiichi Sankyo	MMV, GHIT	Compound screening	Lead identification
Eisai	Academia	Compound screening	Discovery
Eisai	Fiocruz	Toll-like receptor 9 (TLR9) antagonists	Preclinical
Eisai	St. Jude, MMV, GHIT	Inhibitor of ATP4	Preclinical
Eisai	Broad Inst., GHIT	Inhibitor of Protein Synthesis	Lead optimization
Eisai	MMV, GHIT	Compound screening	Lead identification
Genzyme (Sanofi)	MMV, Broad Inst.	Mini-portfolio	Lead generation
Genzyme (Sanofi)	MMV, Broad Inst.	Aminoindole	Lead optimization
Genzyme (Sanofi)	MMV	DHODH	Lead optimization
GSK	MMV	Tafenoquine (radical cure of P vivax)	Phase III
GSK	MMV	Anti-malarial whole-cell inhibitors	Lead optimization
GSK	Wellcome grant	Anti-malarial whole cell inhibitors	Lead optimization
GSK	MMV	Anti-malarial fast acting	Preclinical
Merck	MMV	Inhibitor of protein synthesis with blood, liver and gametocytic effects	Phase 0
Merck	MMV	Long acting piperinidyl	Lead optimization
Merck	MMV	Long acting backup	Discovery
Merck	MMV, Academia	In-house compound library screening	Discovery
MSD	USF	MK4815	Preclinical
MSD	WEHI	Targeted screening	Discovery
Novartis	Wellcome, MMV, BPRC, Swiss TPH	PI4 Kinase inhibitors	Lead identification
Novartis	Wellcome, MMV, BPRC, Swiss TPH	Imidazolopiperazines (KAF156)	Phase II
Novartis	Wellcome, MMV, BPRC, Swiss TPH	Spiroindolone (KAE609)	Phase II
Novartis	MMV	Coartem® Dispersible	Phase IV
Ranbaxy (Daiichi Sankyo)	company	Arterolane (RBx 11160) and piperaquine	Phase III completed
Sanofi	PATH - iOWH	Semi-synthetic artemisinin	Production
Sanofi	DNDi, MMV	Artesunate-amodiaquine Winthrop ASAQ FDC	Phase IV
Sanofi	company	Ferroquine (SSR97193)	Phase II
Sanofi	MMV	Discovery portfolio	Lead optimization
Sanofi	Inst. Pasteur Cambodia	Discovery	Lead generation
Sanofi	Academia	Discovery	Lead generation
Takeda	MMV, GHIT	Compound screening	Lead identification
Takeda	MMV, GHIT	DSM265	Phase I
Vaccines			
Eisai	Fiocruz	Novel vaccines using adjuvant E6020	Preclinical
GSK	PATH, MVI	RTS,S/AS01E vaccine	Under evaluation at EMA
MSD	NYU	CSP synthetic peptide (NANP)6-OMPC conjugate	Discovery
Pfizer	company	Multi – dose vial development	Development

Leishmaniasis

Disease impact An estimated 200,000 to 400,000 new cases of Visceral leishmaniasis (VL also known as kala-azar) occur worldwide each year. Over 90% of new cases occur in six countries: Bangladesh, Brazil, Ethiopia, India, South Sudan, and Sudan. An estimated 700,000 to 1.3 million new cases of Cutaneous leishmaniasis occur worldwide annually. 20,000 to 40,000 people die from leishmaniasis per year.

Available therapies The number of treatments has increased in the past decade, but there are numerous drawbacks to each of the treatments, such as difficulty to administer, length to treat, toxicity, cost, and increasing parasitic resistance to treatment: Pentavalent antimonials: toxic and increasingly ineffective due to resistance, 30-days of hospital-based parenteral treatment; Amphotericin B: dose-limiting toxicity, 15–20 days of hospital-based IV treatment; Paromomycin: registered in India, and recommended as first line treatment in East Africa in combination with SSG & PM; Liposomal amphotericin B (AmBisome®): excellent, but IV, registration being broadened; Miltefosine: first orally available drug registered in India, but expensive and teratogenic (through the WHO, significant cost reduction of both AmBisome® and miltefosine is available for the public sector of developing countries as of 2007).

Access/Capacity Building Celgene, MSD, Novartis and Sanofi.

Products approved since 2005 Miltefosine/Impavido® (Zentaris – sold to Paladin Labs in 2008 – TDR), Paromomycin IM (iOWH), SSG & PM (DNDi).

Terminated/completed projects since 2005 Compound screening (Pfizer/TDR), Sitamaquine (WR6026) (GSK), compound screening (Pfizer/DNDi), anti-IL-10 monoclonal antibody combination therapy (MSD/NIH), Buparvaquone formulation and pharmacokinetics (AbbVie/DNDi), discovery (Eisai).

Company	Partners	Project	Phase
AbbVie	DNDi	Compound screening, preclinical support, technical consulting	Lead identification
Astellas	DNDi, Tokyo Uni, Tokyo Inst. of Technology, Nagasaki Uni, KEK, AIST	Discovery/Reprofiling of selected compounds	Discovery
AstraZeneca	DNDi	Focused compound library screening at Institut Pasteur K, Dundee Uni, Swiss TPH	Lead identification
Bristol-Myers Squibb	DNDi	Focused compound library screening	Lead identification
Celgene	Advinus, LSHTM DNDi	Compound screening	Lead optimization
Eisai	DNDi, GHIT	Compound screening	Lead identification
GSK	DNDi	Focused compound library screening	Lead identification
GSK	Dundee Uni	LO project	Lead optimization
GSK	Wellcome grant	LO project	Lead identification
MSD	DNDi	Target screening and hit SAR development	Lead identification
Novartis	company	Discovery efforts	Preclinical
Sanofi	company	Development of topical formulations	Preclinical
Sanofi	DNDi	Focused compound library screening	Lead optimization
Sanofi	DNDi	Compound screening	Lead identification
Takeda	DNDi, GHIT	Compound screening	Lead identification
Vaccines			
Eisai	SVI	Adjuvant to support vaccine development	Preclinical
Eisai	Fiocruz	Novel vaccines using adjuvant E6020	Preclinical

Dengue/Dengue hemorrhagic fever

Disease impact Dengue is a major unmet medical need and a growing public health concern worldwide. It is prevalent in more than 100 countries in Latin America, South and South East Asia, and Africa, and is an important health risk for travelers to these regions. It is estimated that 2.5 to 3 billion people are at risk of dengue infection world-wide and that 390 million dengue infections occur per year, of which close to 100 million infections manifest apparently (any severity) and 25,000 will account for dengue-related deaths. While much of the burden of disease is in children and young adults, all ages and socio-economic groups are affected, from infants to the elderly.

Available therapies None.

Access/Capacity Building Novartis and Sanofi.

Products approved since 2005 None.

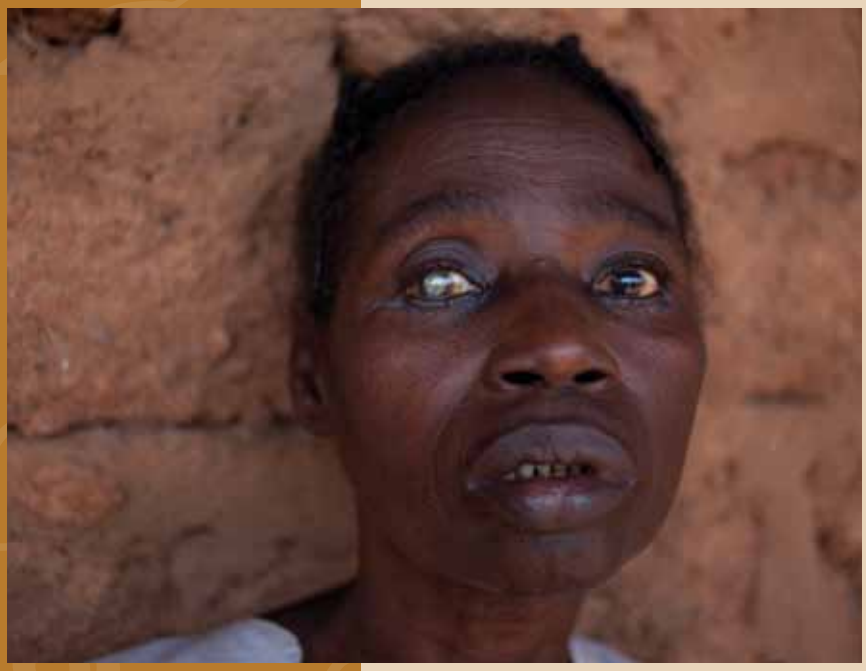
Terminated/ completed projects since 2005 NS3 helicase and protease inhibitors (Novartis), exploratory program (Roche), tetravalent live attenuated vaccine (GSK/WRAIR/PDVI), compound library/plant extract screening (Daiichi Sankyo/ICGEB, DBT).

Company	Partners	Project	Phase
Astellas	Tokyo Inst. of Technology, Nagasaki Uni	Discovery/Reprofiling of compounds	Discovery
Bristol-Myers Squibb	company	Lead generation	Discovery
Janssen (J&J)	Wellcome, KULeuven	Lead generation	Discovery
Novartis	Multiple	Early 4 discovery efforts	Discovery
Roche	HMS	Search for Prophylaxis and Treatment	Discovery
Vaccines			
GSK	WRAIR, Fiocruz	Dengue purified and inactivated virus vaccine candidate	Phase I (WRAIR antigens) Preclinical (GSK antigens)
MSD	company	Tetravalent subunit	Phase I
Sanofi	company	Tetravalent live attenuated chimeric vaccine	Phase III (efficacy completed)
Takeda	company	Four-strain recombinant viral vaccine (TAK003)	Phase II

Onchocerciasis (river blindness)

Disease impact More than 100 million people are at risk for infection. Onchocerciasis occurs mainly in tropical areas. More than 99% of infected people live in 31 countries in sub-Saharan Africa.

Available therapies The major approach used to control onchocerciasis over the past 27 years has been an annual dose of ivermectin, which aside from eventually breaking transmission, also serves to relieve the severe itching and reverse the dermatitis caused by this infection. Ivermectin does this by killing the early stage worms and only has a limited effect on adult worms that can live for over 12 years. Spraying the blackfly breeding sites assists in control but alone has not been effective in moving towards control and elimination of onchocerciasis. Treatment of LF and onchocerciasis can be combined through the administration of ivermectin plus albendazole in areas where both are endemic. Concern remains for the introduction of ivermectin treatment in new areas where another filarial worm, Loa loa, is present; a number of deaths have been seen in people carrying high loads of Loa loa microfilaria, probably due to severe immunologic reactions and CNS adverse events.



Access/Capacity Building MSD.

Products approved since 2005 None.

Terminated/completed projects since 2005 Compound screening (Pfizer/TDR), Moxodectin (Pfizer/TDR), Flubendazole formulation and toxicology (AbbVie/DNDi), compound screening (AstraZeneca/McGill Uni).

Company	Partners	Project	Phase
AbbVie	LSTM	Collaborative preclinical development program	Preclinical
AbbVie	DNDi	Compound screening	Lead identification
AstraZeneca	DNDi	Focused compound library screening at NPIMR	Discovery
AstraZeneca	A-WOL, LSTM	Focused library screening and DMPK support	Lead identification
Bayer	DNDi	Development of emodepside	Preclinical
Bristol-Myers Squibb	DNDi	Focused compound screening	Lead identification
Eisai	LSTM, Liv Uni, GHIT	Novel compounds for anti-Wolbachia	Lead optimization
Janssen (J&J)	company	Formulation of flubendazole + IND enabling studies	Preclinical
Janssen (J&J)	Bonn Uni (consultant)	In vivo preclinical studies of flubendazole efficacy	Preclinical
Janssen (J&J)	Michigan State Uni (consultant)	In vivo studies of flubendazole efficacy	Preclinical
Janssen (J&J)	McGill Uni (consultant)	In vivo studies of flubendazole MOA efficacy	Preclinical
Sanofi	DNDi	Repositioning and label extension of marketed/advanced medicines	Discovery/Preclinical
MSD	DNDi	Targeted compound screening	Lead identification

American trypanosomiasis (Chagas disease)

Disease impact About 7 to 8 million people worldwide are estimated to be infected and 25 million are at risk, primarily in Latin American countries. More than 10,000 die each year from this disease, mostly from cardiac complications.

Available therapies The preferred treatment for acute Chagas disease is a 60-day course of benznidazole (supplied by the LAFEPE, part of the Government of Brazil) or, as second-line treatment, a 60–90-day course of nifurtimox (supplied by Bayer HealthCare). However, the timeliness of the intervention is crucial as there is no cure for organ damage stemming from a chronic infection.

Access/Capacity Building AbbVie Foundation, Bayer HealthCare, Celgene, MSD, Novartis, Roche, and Sanofi.

Products approved since 2005 Paediatric formulation of benznidazole (LAFEPE/DNDi) (2011).

Terminated/completed projects since 2005 Compound screening (Pfizer/TDR), compound library screening (Pfizer/DNDi), focused compound library screening (AstraZeneca/UCSF).

Company	Partners	Project	Phase
AbbVie	DNDi	Compound screening, preclinical support, technical consulting	Lead identification
Astellas	DNDi, Tokyo Uni, Tokyo Inst. of Technology, Nagasaki Uni, KEK, AIST	Hit characterization and SAR development	Lead identification
AstraZeneca	DNDi	Focused compound library screening at Swiss TPH, Inst. Pasteur K	Lead identification
Bayer	company	Nifurtimox pediatric (dosing in children)	Phase IIb
Bristol-Myers Squibb	DNDi	Focused compound library screening	Lead identification
Celgene	DNDi, Antwerp Uni	Compound screening	Screening
GSK	DNDi	HTS compound library screening	Lead identification
GSK	Dundee Uni	LO project	Lead optimization
GSK	Wellcome grant	LO project	Lead optimization
Eisai	DNDi, GHIT	E1224	Phase II
Eisai	DNDi, GHIT	Compound screening	Lead identification
Eisai	Broad Inst., GHIT	Focused compound library screening	Lead identification
MSD	DNDi	Targeted screening and hit SAR development	Lead identification
MSD	company	Posaconazole	Phase IIb
Novartis	company	Discovery efforts	Preclinical
Sanofi	DNDi	Compound screening	Lead identification
Sanofi	DNDi	Focused compound library screening	Lead optimization
Takeda	DNDi, GHIT	Compound screening	Lead identification
Vaccines			
Eisai	SVI, Baylor College, Aeras, GHIT	Adjuvant to support vaccine development	Preclinical
Eisai	Fiocruz	Adjuvant to support vaccine development	Preclinical

Schistosomiasis

Disease impact Schistosomiasis is especially prevalent in poor communities with unsafe safe drinking-water sources and inadequate sanitation. At least 249 million people required treatment for schistosomiasis in 2013, 90% of them live in sub-Saharan Africa.

Available therapies The major medical intervention used to control schistosomiasis is praziquantel, accompanied by the provision of safe water and adequate sanitation.

Access/Capacity Building Merck.

Products approved since 2005 None.

Terminated/completed projects since 2005 Oxamniquine and Praziquantel (TDR), compound screening (Pfizer/TDR), compound library screening (Merck /TDR), repositioning and label extension of marked/advanced medicines (Sanofi/DNDi), focused compound library screening (AstraZeneca/UCSF).

Notes: At Merck, the eTIP Global Health has the goal to develop innovative, affordable, implementable and integrated health solutions, both drugs and diagnostics, in the area of poverty-related diseases. Beyond focusing its R&D activities on treatments for schistosomiasis & other helminths, malaria and co-infections, the eTIP Global Health aims also at contributing to the development and launch of diagnostic kits for neglected diseases.

Company	Partners	Project	Phase
Astellas, Merck	Swiss TPH, TI Pharma, Fiocruz, Simcyp	Consortium formed for new pediatric formulation of praziquantel to treat children under the age of 6 years	Phase I
AstraZeneca	DNDi	Focused compound library screening at Swiss TPH	Lead identification
Bristol-Myers Squibb	DNDi	Focused compound screening	Lead identification
Merck	Swiss TPH, Academia	In-house compound library screening	Discovery
MSD	UCSF	Targeted screening	Discovery
Pfizer	DNDi	Targeted compound screening	Discovery

Lymphatic filariasis

Disease impact Nearly 1.4 billion people in 73 countries worldwide are threatened by lymphatic filariasis, commonly known as elephantiasis. Over 120 million people are currently infected, with about 40 million disfigured and incapacitated by the disease.

Available therapies Recommended treatment for individual patients are multiple doses of either diethylcarbamazine (DEC), or the combination of albendazole and ivermectin. For mass drug administration (MDA) in disease elimination programs for endemic countries, albendazole and ivermectin are used in areas where onchocerciasis (river blindness) is also endemic, and DEC is used with albendazole where onchocerciasis is not co-endemic. Vector control strategies such as the use of bed nets are encouraged in LF endemic communities and are a useful adjunct to chemotherapy. Individuals with overt clinical disease also require physical therapy (those with lymphedema and elephantiasis) and surgery for those with hydrocele. Sub-clinical changes occur in infected individuals, including those as young as 2 years of age.

Access/Capacity Building AbbVie Foundation, Eisai, GSK, MSD, and Sanofi.

Products approved since 2005 DEC (Eisai) WHO prequalified (2013).

Terminated/completed projects since 2005 Flubendazole formulation and toxicology (AbbVie/DNDi), compound screening (AstraZeneca/McGill Uni).

Company	Partners	Project	Phase
AbbVie	LSTM	Collaborative preclinical development program	Preclinical
AbbVie	DNDi	Compound screening	Lead identification
AstraZeneca	A-WOL, LSTM	Focused compound library screening and DMPK support	Lead identification
AstraZeneca	DNDi	Compound screening/hit characterization	Lead identification
Bristol-Myers Squibb	DNDi	Focused compound screening	Lead identification
Celgene	Monclair State Uni, DNDi	Compound screening	Lead optimization
Eisai	LSTM, Liv Uni, GHIT	Novel compounds for anti-Wolbachia	Lead optimization
Janssen (J&J)	company	Formulation of flubendazole + IND enabling studies	Preclinical
Janssen (J&J)	Bonn Uni (consultant)	In vivo preclinical studies of flubendazole efficacy	Preclinical
Janssen (J&J)	Michigan State Uni (consultant)	In vivo studies of flubendazole efficacy	Preclinical
Janssen (J&J)	McGill Uni (consultant)	In vivo studies of flubendazole MOA efficacy	Preclinical
Sanofi	DNDi	Focused compound library screening	Lead identification

Soil-transmitted helminthic diseases

Disease impact More than 1.5 billion (24%) of the world's poorest and most deprived people are infected with soil-transmitted helminths. Over 270 million preschool-age children and over 600 million school-age children live in areas where these parasites are intensively transmitted, and are in need of treatment and preventive interventions. Infected children are physically and cognitively impaired.

Infections are widespread in tropical and subtropical areas, with the greatest numbers occurring in sub-Saharan Africa, the Americas, China and East Asia. The main target species are roundworm (Ascaris lumbricoides), whipworm (Trichuris trichiura) and hookworms (Necator americanus and Ancylostoma duodenale).

Available therapies Mebendazole (500 mg) and albendazole (400 mg) are effective, inexpensive and easy to administer via Mass Drug Administration programs. Donations of anthelminthic medicines are available to ministries of health in all endemic countries for the treatment of all school age children.

To further facilitate the administration of medicines in resource poor settings and reaching younger children, Janssen R&D (J&J) is currently executing a Phase 3 study (in Ethiopia and Rwanda) of a new chewable formulation that will replace the current solid dose formulation.

Access/Capacity Building AbbVie Foundation, GSK, and Johnson & Johnson.

Products approved since 2005 None.

Terminated/completed projects since 2005 None.

Company	Partners	Project	Phase
Janssen (J&J)	company	Chewable formulation of mebendezole for young children	Phase III

Ebola

Disease impact Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever, is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission.

Since the discovery of the virus in 1976, random and contained outbreaks of Ebola, mainly in Central Africa, resulted in an average 250 cases and 40 deaths annually. In accordance with sanitation guidelines, the focus on managing the Ebola virus had focused on isolating the patients and rehydration/ palliative care. Given this level of prevalence and care, Ebola was not identified as an international or national health priority.

The current outbreak in west Africa is the largest and most complex Ebola outbreak since the Ebola virus was first discovered. Since March 2014, the current Ebola crisis has seen over 21,724 cases, 8,641 of them fatal (WHO, as of 18 January 2015).

Treatments and vaccines While there is currently no approved treatment nor vaccine for Ebola there are several in development.

Access/Capacity Building Abbott, AbbVie Foundation, AstraZeneca, Bayer, Bristol-Myers Squibb, GSK, Johnson & Johnson, Lilly, Merck, MSD, Novartis, Pfizer, and Takeda.

Note: Under a worldwide exclusive agreement with TIB MOBIOL, Roche distributes the LightMix Modular Ebola Virus Zaire Assay, optimized to run on Roche's LightCycler systems. The U.S. Food and Drug Administration (FDA) has approved Roche's LightMix Ebola Zaire rRT-PCR Test for use on patients with signs and symptoms of Ebola Zaire virus infection. The diagnostic tool can generate results in three hours and allow for more rapid treatment of infected patients.

For more information about IFPMA members' efforts to address the current Ebola outbreak, please visit www.ifpma.org and http://partnerships.ifpma.org.

Company	Partners	Project	Phase
Amgen	Mapp Biopharmaceuticals, BMGF, WHO, Wellcome	Develop faster production method for Zmapp	Phase I
MedImmune (AstraZeneca)	Penn Uni, Vanderbilt, Inovio, NIH Vaccine Research Center (VRC), HuMabs	Manufacture of clinical grade mABs	Preclinical
Novartis	NIAID	Inhibitor of replication	Research of drug candidates from library
Takeda	company	-	Phase 0
Vaccines			
GSK	NIH, Wellcome, MRC, GOV UK, EC, BMGF		Phase II
Janssen (J&J)	Bavarian Nordic, NIAID	Prime-boost Ebola vaccine Regimen	Phase I
MSD	NewLink, WRAIR, NIAID, PHAC, BARDA, WHO Vaccine for Ebola Consortium, USAMRIID, DTRA, JVAP, Wellcome	rVSV-ZEBOV vaccine	Phase I
Novartis	USAMRIID	RNA-based vaccine and small molecule TLR7 agonist technologies	Preclinical

R&D Partners

Advinus	Advinus Therapeutics
AIST	National Institute of Advanced Industrial Science and Technology
Antwerp Uni	University of Antwerp
A-WOL	Anti Wolbachia (A-WOL) Consortium based at the LSTM
Aeras	Aeras Global TB Vaccine Foundation
BARDA	Biomedical Advanced Research and Development Authority
Bavarian Nordic	Bavarian Nordic A/S
Baylor College	Baylor College of Medicine
BMGF	Bill & Melinda Gates Foundation
BMRC	British Medical Research Council
Bonn Uni	Bonn University
BPRC	The Netherlands Primate Centre
British Columbia Uni	University of British Columbia
Broad Inst.	Broad Institute
Cape Town Uni	University of Cape Town (UCT)
CNRS	Centre national de la recherche scientifique
Cornell Uni	Cornell University
DTRA	Defense Threat Reduction Agency
DNDi	Drugs for Neglected Diseases initiative
Drex Uni	Drexel University
Dundee Uni	Dundee University
EC	European Commission
Frame Work 7	EU Seventh Framework Programme for Research (FP7)
Epicentre	Epicentre Biotechnologies
Fiocruz	Fundação Oswaldo Cruz
Gates TBDA	Gates Foundation TB Drug Accelerator Program
GHIT	Global Health Innovative Technology Fund
Griffith Uni	Griffith University
HMS	Harvard Medical School
IDRI	Infectious Disease Research Institute
Inst. Pasteur	Institut Pasteur
Inst. Pasteur K	Institut Pasteur
Institute Pasteur Korea	Pediatric Dengue Vaccine Initiative
iThemba	iThemba Laboratory for Accelerator Based Sciences
Johns Hopkins Uni	Johns Hopkins University
JVAP	Joint Vaccine Acquisition Program
KEK	High Energy Accelerator Research Organization
KULeuven	KULeuven Rega Institute
PATH - iOWH	PATH - Institute for OneWorld Health
Liv Uni	Liverpool University
LSHTM	London School of Hygiene and Tropical Medicine
LSTM	Liverpool School of Tropical Medicine
Mc Gill Uni	McGill University
MRC	Medical Research Council
Michigan State Uni	Michingan State University

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MMV	Medicines for Malaria Venture
Monclair State Uni	Monclair State University
MVI	Malaria Vaccine Initiative
Nagasaki Uni	Nagasaki University
NewLink	NewLink Genetics Corporation
NYU	New York University
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institutes of Health
Northeastern Uni	Northeastern University
NPIMR	Northwick Park Institute for Medical Research
PATH	
PDVI	Pediatric Dengue Vaccine Initiative
Penn Uni	University of Pennsylvania
PHAC	Public Health Agency of Canada
PHRI	Public Health Research Institute
Pittsburg Uni	University of Pittsburg
Seoul National Uni	Seoul National University Hospital
SSI	Statens Serum Institute
St. Jude	St. Jude Medical
Sussex Uni	University of Sussex
Swiss TPH	Swiss Tropical and Public Health Institute
SVI	Sabin Vaccine Institute
TBTC	Tuberculosis Trials Consortium
TB A	Global Alliance for TB Drug Development
TDR	Special Programme for Research and Training in Tropical Diseases (UNICEF, UNDP, World Bank and WHO)
TI Pharma	
Tokyo Inst. of Technology	Tokyo Institute of Technology
Tokyo Uni	University of Tokyo
Simcyp	
UCL	University College London
UCSF	University of California, San Francisco
GOV UK	UK Government
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USF	University of South Florida
Zurich Uni	University of Zurich
Wash Uni	University of Washington
Weill Cornell	Weill Cornell Medical College
Wellcome	Wellcome Trust
WEHI	Walter & Eliza Hall Institute
WHO	World Health Organization
WRAIR	Walter Reed Army Institute of Research
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About IFPMA

IFPMA represents the research-based pharmaceutical companies and associations across the globe. The research-based pharmaceutical industry's 2 million employees research, develop and provide medicines and vaccines that improve the life of patients worldwide. Based in Geneva, IFPMA has official relations with the United Nations and contributes industry expertise to help the global health community find solutions that improve global health

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