

Development of Portfolios and Pipelines of Drugs for the Treatment, Prevention and Control of Neglected Tropical Diseases



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NTDs – Neglected Tropical Diseases

WHO list 20 diseases (virus, bacteria, fungi, protozoa, helminths, that impact populations in poverty:

Buruli ulcer, Chagas disease, dengue and chikungunya, dracunculiasis (Guinea-worm disease), echinococcosis, foodborne trematodiasis, human African trypanosomiasis (sleeping sickness), leishmaniasis, leprosy (Hansen's disease), lymphatic filariasis, mycetoma, chromoblastomycosis and other deep mycoses, onchocerciasis (river blindness), podoconiosis, rabies, scabies and other ectoparasitoses, schistosomiasis, soil-transmitted helminthiasis, snakebite envenoming, taeniasis/cysticercosis, trachoma, yaws and other endemic treponematoses.

Organisations focussed on the development of tools to treat, control and prevention of NTDs and Diseases of Poverty (PDPs – product development partnerships)

- Malaria Venture (MMV), established in 1999
- TB Alliance for drug discovery and development established in 2000
- Foundation for Innovative New Diagnostics (FIND) established in 2003
- Drugs for Neglected Diseases initiative (DNDi), established in 2003

DNDi - Delivering better treatments for neglected patients

DNDi's objective is to deliver 25 new treatments for neglected patients by 2028. Since 2003, DNDi has worked with its worldwide network of partners to:

- develop two *new* chemical entities: [fexinidazole](#), the first all-oral treatment for sleeping sickness, and [ravidasvir](#), a simple-to-use and affordable treatment for hepatitis C
- develop 10 new treatments from existing molecules and recombining drugs to bring better treatments to patients for malaria, Chagas disease, leishmaniasis, HIV-visceral leishmaniasis co-infection, and paediatric HIV



R&D PORTFOLIO June 2023 - 12 treatments delivered

	DISCOVERY			TRANSLATION			DEVELOPMENT		IMPLEMENTATION
	Screen	Hit-to-lead	Lead optimization	Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Stomach ulcers							Available	Phase III for T. coli-related cases	Preclinical for T. coli prevention*
Leishmaniasis	Screening		Lead optimization	Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
			Lead optimization	Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Chagas disease	Screening	Hit-to-lead	Lead optimization	Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Filaria (Lymphatic Filariasis)				Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Mycobiosis								Registration	Treatment access
Dengue				Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
HIV						Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Hepatitis C								Registration	Treatment access
COVID-19/ Respiratory syncytial virus	Screening	Hit-to-lead	Lead optimization	Pre-clinical	Phase I	Phase IIa/ Proof-of-concept	Phase IIb/III	Registration	Treatment access
Malaria								Registration	Treatment access

* Drug development phase started in the Americas & Europe between 2012

⊖ Phase III clinical trial (RCT) or RCT - not being a part

⊕ Phase III clinical trial by DNDi with partners

➤ Phase III clinical trial by DNDi, but RCT not being a success

**Have PDPs been successful ?
What have they produced over the past 20 years ?
How do we measure that success ?**

Taking DNDi as an example:

How many treatment / products have been:

- Come through the Research & Development process ?
- Come through the Development process ?
- Come through geographic extension ?

How long has the process taken ?

What has been the total cost to the PDP and funders ?

What other impacts have PDPs made on the efforts to develop new treatments ?

**Have PDPs been successful ?
What have they produced over the past 20 years ?
How do we measure success ?**

Taking DNDi as an example:

How many treatment / products have been:

- Come through the full Research & Development process ? **None so far – acoziborole for HAT close Drug Combinations, paediatric formulations, new products,**
- Come through the Development process ? **Products used in Asia to use in Africa**
- Come through geographic extension ?

How long has the process taken ?

E.g. Fexinidazole 2004 to 2018

What has been the total cost to the PDP and funders ?

Need to be examined

What other impacts have PDPs made on the efforts to develop new treatments ?

On Pharma, biotech and academic sectors

Additional References

Trans R Soc Trop Med Hyg 2021; 115: 169–175 doi:10.1093/trstmh/trab015

The history of the neglected tropical disease movement

David H. Molyneux,, Anarfi Asamoah-Bah, Alan Fenwick, Lorenzo Saviold, and Peter Hotez

Omitted from the published chapter

Nature Reviews Drug Discovery, Volume 22 | November 2023 | 865–866 | 866

<https://doi.org/10.1038/d41573-023-00167-w>

An audience with ...

The Drugs for Neglected Diseases initiative's **Delali Attipoe**, Director of the non-profit's North America branch, discusses the rising risks of climate-sensitive diseases such as dengue.