

## G-FINDER: Global Funding of Innovation for Neglected Diseases

Each year since 2007, the G-FINDER project has provided policy-makers, donors, researchers and industry with a comprehensive analysis of global investment into research and development (R&D) of new products to prevent, diagnose, control or cure neglected diseases in developing countries. It provides an up-to-date analysis of how R&D investments are being allocated across diseases and product types, funding trends over time, and where the potential gaps lie.

This is the twelfth annual G-FINDER report, providing new data on investments made in financial year 2018. In all, 262 organisations completed the survey for FY2018, which covered 36 neglected diseases and all relevant product types – drugs, vaccines, biologics, diagnostics, microbicides and vector control products (chemical and biological control agents, and reservoir targeted vaccines) – as well as basic research.

The 2018 survey added three new neglected diseases: hepatitis B, mycetoma and snakebite envenoming. It also removed the genotype restriction for hepatitis C, although restrictions to ensure that R&D is targeted at LMICs remain, and added vaccine R&D for leprosy. The therapeutic vaccine product category was expanded and relabelled as 'biologics', this category captures funding that was previously variously included under therapeutic vaccines, drugs and preventive vaccines.

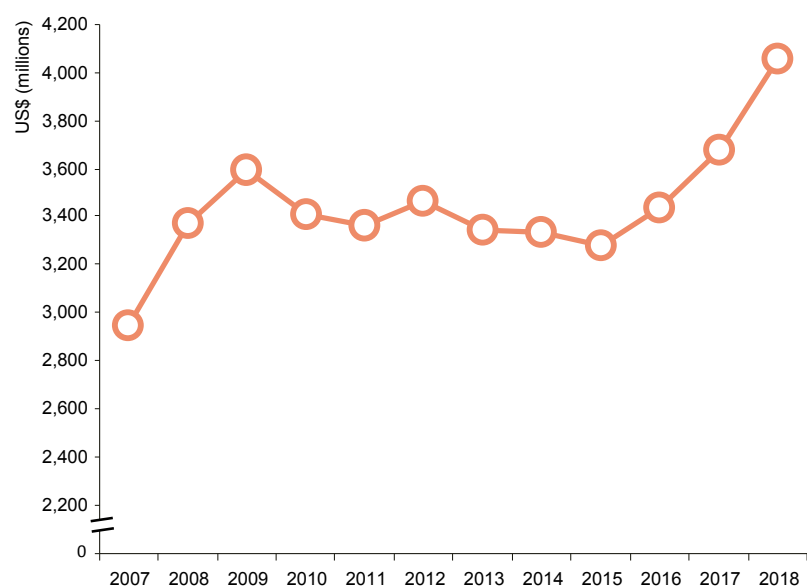
### Executive summary

Global funding for basic research and product development for neglected diseases reached a new record high of \$4,055m in 2018, easily surpassing the previous year's record. The headline increase of \$374m (up 10%) was partly due to improved reporting. After adjusting for changes in survey scope, participation and reporting, global funding for neglected disease R&D increased by \$290m in 2018 (up 7.9%); this was both the largest real annual funding increase on record, and the first time ever that funding has grown for three consecutive years.

#### FUNDING BY NEGLECTED DISEASE

As in previous years, HIV/AIDS, malaria and tuberculosis (TB) collectively received more than two-thirds (\$2,799m, 69%) of all global funding for neglected disease R&D in 2018. This was the lowest share ever received by these three diseases in the history of the G-FINDER survey (albeit only by a very slim margin), in spite of increases in funding for all three: a \$158m (12%) increase for HIV, due in large part to improved reporting from the US NIH, a \$49m (7.7%) increase for TB and \$18m (2.8%) for malaria.

Total funding for neglected disease R&D 2007-2018



Funding for diseases which received between 6% and 0.5% of global funding mostly rose or remained stable: Funding increased significantly for hepatitis C (up \$30m, 188%) and bacterial pneumonia & meningitis (up \$16m, 21%), while *Salmonella* infections (up \$4.8m, 5.7%) saw a smaller increase, with negligible funding changes for kinetoplastid diseases (down \$2.4m, -1.6%), diarrhoeal diseases (up \$1.4m, 0.8%) and helminth infections (down \$0.9m, -1.0%). The largest drop in funding was once again for dengue (down \$3.6m, -4.4%).

### R&D funding by disease 2009-2018<sup>^</sup>

Disease or R&D area	US\$ (millions)										2018 % of total
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
HIV/AIDS	1,380	1,302	1,261	1,289	1,175	1,187	1,127	1,202	1,293	1,451	36
Tuberculosis	629	654	606	579	592	607	610	611	635	685	17
Malaria	676	600	622	614	569	613	598	613	645	663	16
Diarrhoeal diseases	215	188	177	179	211	186	171	159	170	171	4.2
Kinetoplastid diseases	183	165	146	149	134	159	133	148	152	149	3.7
Bacterial pneumonia & meningitis	79	108	113	116	109	80	99	98	77	92	2.3
<i>Salmonella</i> infections	46	51	51	61	69	70	73	97	85	90	2.2
Helminth infections (worms & flukes)	92	85	91	96	93	96	80	76	90	89	2.2
Dengue	85	73	83	79	72	87	95	116	83	80	2.0
Hepatitis C					50	48	36	30	16	46	1.1
Leprosy	12	11	9.4	16	14	11	12	12	13	10	0.3
Cryptococcal meningitis					3.2	5.9	5.4	5.9	11	7.7	0.2
Snakebite envenoming										6.6	0.2
Hepatitis B										5.7	0.1
Buruli ulcer	2.0	5.9	6.2	6.5	6.9	4.0	2.0	3.0	4.4	3.3	0.1
Trachoma	1.4	3.6	6.1	2.2	2.3	1.4	1.2	2.3	2.8	2.1	0.1
Leptospirosis					0.4	1.4	1.4	2.5	3.3	1.7	0.0
Rheumatic fever	3.6	2.1	0.9	1.0	0.9	1.4	2.3	1.3	1.7	1.7	0.0
Mycetoma										0.9	0.0
Platform technologies	26	32	19	53	47	24	38	54	33	43	1.1
<i>General diagnostic platforms</i>	10	11	11	18	18	10	17	18	11	17	0.4
<i>Adjuvants and immunomodulators</i>	5.9	11	6.1	30	23	9.0	13	18	14	16	0.4
<i>Vaccine delivery technologies and devices</i>	9.2	6.5	2.0	0.9	4.7	2.4	4.9	14	2.2	8.4	0.2
<i>Drug delivery technologies and devices</i>	0.2	3.7	-	4.4	1.8	2.6	3.7	3.3	6.6	2.1	0.1
Multi-disease vector control products									26	31	0.8
Core funding of a multi-disease R&D organisation	76	78	94	112	122	112	149	168	297	363	8.9
Unspecified disease	89	58	80	117	78	41	47	39	43	63	1.5
<b>Total</b>	<b>3,595</b>	<b>3,416</b>	<b>3,364</b>	<b>3,469</b>	<b>3,348</b>	<b>3,337</b>	<b>3,282</b>	<b>3,437</b>	<b>3,681</b>	<b>4,055</b>	<b>100</b>

■ Hepatitis C, cryptococcal meningitis and leptospirosis were added to G-FINDER in 2013. Multi-disease vector control products were added in 2017. Mycetoma, snakebite envenoming and hepatitis B were added in 2018.

<sup>^</sup> Please note that some of the diseases listed are actually groups of diseases, such as the diarrhoeal illnesses and helminth infections. This reflects common practice and also the shared nature of research in some areas. For example, *Streptococcus pneumoniae* R&D is often targeted at both pneumonia and meningitis.

Funding for the six diseases with the lowest historical funding – leprosy, cryptococcal meningitis, Buruli ulcer, trachoma, leptospirosis, rheumatic fever – fell across-the-board, leaving them with their lowest-ever share of global funding.

There was another substantial increase in non-disease-specific R&D investment. This category, which includes core funding of multi-disease R&D organisations, investments in platform technologies and multi-disease vector control products, and other R&D investment not allocated to a specific disease, accounted for 12% (\$500m) of global funding in 2017. This was an increase of \$100m (up 25%), headlined by an increase in core funding for multi-disease organisations (up \$66m, 22%).

## NEGLECTED DISEASE FUNDERS

Despite its record high level of investment (\$2,599m), the public sector's share of total funding actually fell marginally, equalling its lowest ever level (64% of total funding) because of strong growth from the private sector. HIC governments once again provided the vast majority of public funding (\$2,429m, 93%), with the remainder divided between multilateral organisations (\$75m, 2.9%) and LMIC governments (\$95m, 3.7%). The philanthropic sector provided almost a fifth of total funding (\$760m, 19%), its largest contribution since 2008. Industry funding reached a record high of \$694m (17% of total funding) of which multinational pharmaceutical companies provided the vast majority (\$598m, 86%), with the remaining 14% (\$96m) coming from small pharmaceutical and biotechnology firms.

The US government was once again the largest public funder, providing nearly three-quarters (\$1,779, 71%) of all public funding in 2018. This was the largest contribution from the US government since 2009. The UK government provided \$230m (9.2% of all public funding) – its largest ever contribution – followed by the EC with \$134m (5.4%). For the second year running, each of these top three funders increased their investment. The largest increase came from the US (up \$148m, 9.1%), although more than half of this increase was due to improved reporting from NIH. UK government funding increased by \$32m (up 16%), driven by record-high funding from DHSC and DFID, while a smaller increase from the EC (up \$8.9m, 7.1%) coincided with its largest ever disbursement to the EDCTP. Other notable increases came from the governments of Japan (up \$15m, 82%), which has increased its funding for four years running, and Australia (up \$11m, 44%). The largest decrease came from France (down \$5.4m, -11%) – whose funding declined for the fifth year running – followed by the Netherlands (down \$4.7m, -19%). Multilateral funding – almost entirely from Unitaid – increased by \$22m (up 41%) to a record high of \$75m. LMIC governments, in contrast, reduced their funding (by \$7.9m, 7.6%) driven by lower funding from India (down \$9.4m, -12%, after a record high in 2017) and South Africa (down \$1.9m, -13%), offset slightly by a rebound in funding from Brazil (up \$3.6m, 45%).

Philanthropic funding for neglected disease R&D totalled \$760m in 2018, an increase of \$43m (up 6.0%). While smaller than the funding increases from the public sector and industry, this took philanthropic funding to its highest level in a decade. The sector's share of total funding remained essentially unchanged at 19%. As in previous years, the Gates Foundation and the Wellcome Trust collectively provided the vast majority of philanthropic funding, jointly accounting for 93% of the total. Both organisations further increased their funding in 2018: the Gates Foundation (up \$36m, 6.5%) to its highest level since 2009, and the Wellcome Trust (up \$11m, 10%) to its highest level since 2012.

The private sector invested a total of \$694m in neglected disease R&D in 2018, or 17% of global funding. This was significantly higher than 2017 (up \$118m, 20%), and the largest ever investment by industry. Once again, the vast majority of this funding (\$598m, 86%) came from multinational pharmaceutical companies (MNCs), with small pharmaceutical and biotechnology firms (SMEs) contributing the remainder (\$96m, 14%). The strong growth from industry was exclusively driven by MNCs, whose investments increased by \$132m (up 28%). SME investment fell for the first time in six years, though much of the apparent \$14m (-12%) drop was due to survey non-participation.

More than half (\$1,298m, 52%) of all HIC government and multilateral funding for neglected disease R&D was for basic & early-stage research, while just over a quarter (\$685m, 27%) was explicitly directed to clinical development & post-registration studies – though this excludes the \$137m (26%) directed to the clinical development-focused EDCTP. In contrast, an overwhelming majority of MNC investment was for clinical development & post-registration studies (\$418m, 70%), with just 20% (\$118m) for early-stage research, and the remainder not allocated to a specific R&D stage. MNC investment in clinical development increased considerably (up \$140m, 50%) as products progressed through the pipeline, while their investment in early stage research fell (down \$15m, -12%). SMEs likewise devoted the overwhelming majority of their funding to clinical development & post-registration studies (\$85m, 88%), more than two-thirds of which was for Phase II vaccine trials. Philanthropic funding was more balanced, with more than a third directed to basic & early-stage research (\$278m, 37%), while clinical development & post-registration studies continued to receive around a quarter (\$193m, 25%) and core funding accounting for a fifth (\$149m, 20%).

## Top neglected disease R&D funders 2018

Funder	US\$ (millions)										2018 % of total
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
US NIH	1,556	1,498	1,466	1,571	1,372	1,369	1,346	1,438	1,424	1,589	39
Aggregate industry	393	437	412	397	404	486	496	524	576	694	17
Gates Foundation	670	552	549	544	563	556	565	578	550	585	14
EC	123	96	115	99	118	116	141	85	125	134	3.3
UK DFID	78	85	66	40	64	69	55	58	107	121	2.9
Wellcome Trust	60	70	83	129	119	111	87	105	108	120	3.0
USAID	104	105	100	101	87	82	78	81	88	86	2.1
US DOD	113	79	89	87	102	102	77	83	95	77	1.9
Unitaid	-	-	-	0.4	9.0	17	20	49	51	73	1.8
UK DHSC	0.6	0.3							42	64	1.6
Indian ICMR	20	24	24	25	38	35	36	43	66	54	1.3
German BMBF	7.1	9.8	9.0	17	16	18	26	33	46	50	1.2
Subtotal of top 12 <sup>^</sup>	3,226	3,069	3,027	3,109	2,990	3,043	2,995	3,120	3,280	3,647	90
Total R&D funding	3,595	3,416	3,364	3,469	3,348	3,337	3,282	3,437	3,681	4,055	100

<sup>^</sup> Subtotals for 2009-2017 top 12 reflect the top funders for those respective years, not the top 12 for 2018.

■ Funding organisation did not participate in the survey for this year. Any contributions listed are based on data reported by funding recipients so may be incomplete.

- No reported funding

## FUNDING FLOWS

Organisations can invest in neglected disease R&D in two ways: by funding their own in-house research (internal investment/self-funding) or by giving grants to others (external investment). Almost three-quarters (\$2,948m, 73%) of all funding for neglected disease basic research and product development in 2018 was given externally. Just under three-quarters (\$2,147m, 73%) of this external funding was given directly to researchers and developers, \$553m (19%) was channelled through PDPs, and the remainder (\$248m, 8.4%) was given to other intermediaries. For the second year in a row there was a major increase in funding to intermediaries (up \$55m, 28%), driven in 2018 by notable increases in funding to EDCTP and the GHIT Fund. Funding to PDPs also increased slightly (up \$27m, 5.1%), while funding to researchers and developers reached its highest level ever (up \$178m, 9.1%), though this left its share of total funding unchanged. There were notable increases in funding directly to researchers and developers from both philanthropic funders (up \$19m, 4.1%) and public multilaterals (up \$19m, 57%). Internal investments (self-funding) accounted for just over a quarter (\$1,107m, 27%) of all funding for neglected disease R&D in 2018, rising by \$115m (up 12%), entirely due to increased investment by industry.

## DISCUSSION

### Global funding for neglected disease R&D reached a new record high in 2018, on the back of three consecutive years of growth

Global funding for basic research and product development for neglected diseases topped the \$4 billion mark for the first time in 2018, reaching a new record high of \$4,055m. This was a real increase of \$290m (up 7.9%) from the previous year's record high – the largest ever real increase in annual funding for neglected disease R&D, and the first time that funding has increased in three consecutive years.

A modest increase in funding from the philanthropic sector also (up \$43m, 6.0%) took its funding to the highest level in a decade, but the real drivers of the funding growth in 2018 were governments and pharmaceutical companies. Public sector funding increased by \$121m (up 5.1%), which was matched by a \$118m increase in industry investment (up 20%). All of the increase in public sector funding came from HIC governments and multilaterals (up \$128m, 5.6%), and all of the increase in industry investment came from MNCs (up a record \$132m, 28%).

### Investment by multinational pharmaceutical companies reached its highest ever level

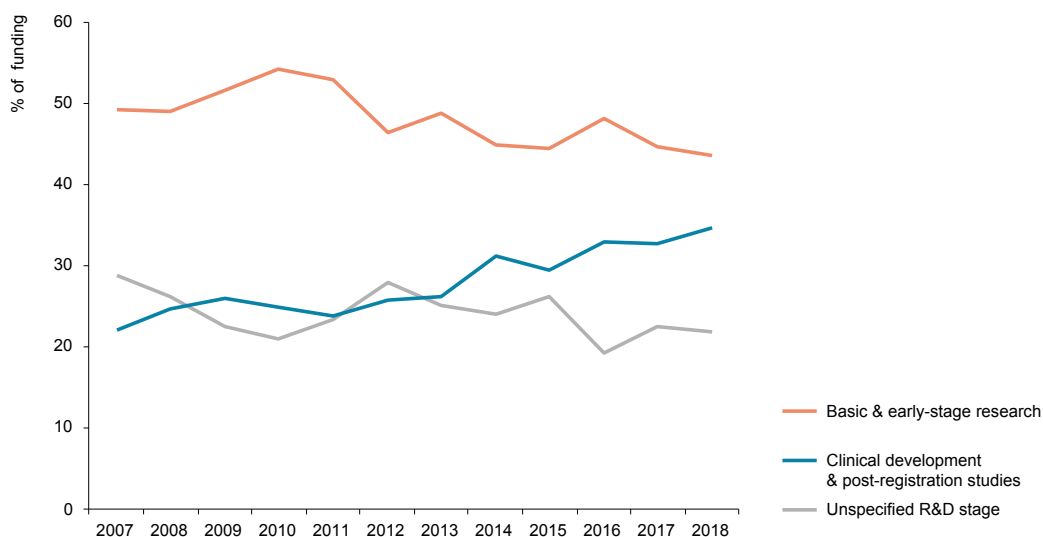
Investment in neglected disease R&D by multinational pharmaceutical companies grew by more than a quarter in 2018. Not only did this take MNC investment in neglected disease R&D to a record high of \$598m, it also meant that – for the first time ever – MNCs collectively invested more in neglected disease R&D in 2018 than did the Bill & Melinda Gates Foundation. Nor is this impact only due to the aggregation of industry investment: if companies were listed individually, three of the top twelve funders of neglected disease R&D in 2018 would be MNCs, including the third and fourth largest.

Encouragingly, the increase in MNC investment was almost across the board, with investment increasing in all but one of the diseases in which MNCs are active. Also encouraging is that the 2018 increase was distributed more evenly than in the past; HIV, malaria and TB still accounted for three-quarters (74%) of all MNC investment, but nearly half (43%) of the growth in MNC investment went to diseases outside of the ‘big three’.

### The growth in industry investment contributed to a dramatic increase in funding for clinical development & post-registration studies

Funding for basic & early-stage research has historically dominated global funding for neglected disease R&D, and still received the largest share (43%) in 2018. But funding for clinical development & post-registration studies increased by \$198m (up 16%) to a record high of \$1,405m in 2018. If core funding to the European & Developing Countries Clinical Trials Partnership is included, the total increase in funding for clinical development & post-registration studies was even higher, totalling \$238m. This growth was heavily driven by MNCs, with MNC investment in this area increasing by half (up \$140m, 50%) to \$422m, representing nearly three-quarters (71%) of all MNC investment in neglected disease R&D.

Share of total funding by R&D stage 2007-2018



While the scale of the increase in funding for clinical development & post registration studies was unprecedented, the share of total global funding for neglected disease R&D going to clinical development & post registration studies has been trending upwards over the last 12 years.

### Progress remained encouraging outside of the traditional top funders of neglected disease R&D

Almost all of the biggest funders increased their investments, with record highs from the US and UK governments, as well as from MNCs, an increase from the European Commission to its second highest level ever, and funding from the Bill & Melinda Gates Foundation reaching its highest level in a decade.

But there were also notable increases from smaller funders: 2018 saw record high levels of funding from the governments of Germany and Japan, as well as from Unitaid and Médecins Sans Frontières. Funding by the Brazilian government rebounded after a record low in 2017, and while funding from both the Indian and South African governments fell, this came after record highs in 2017.

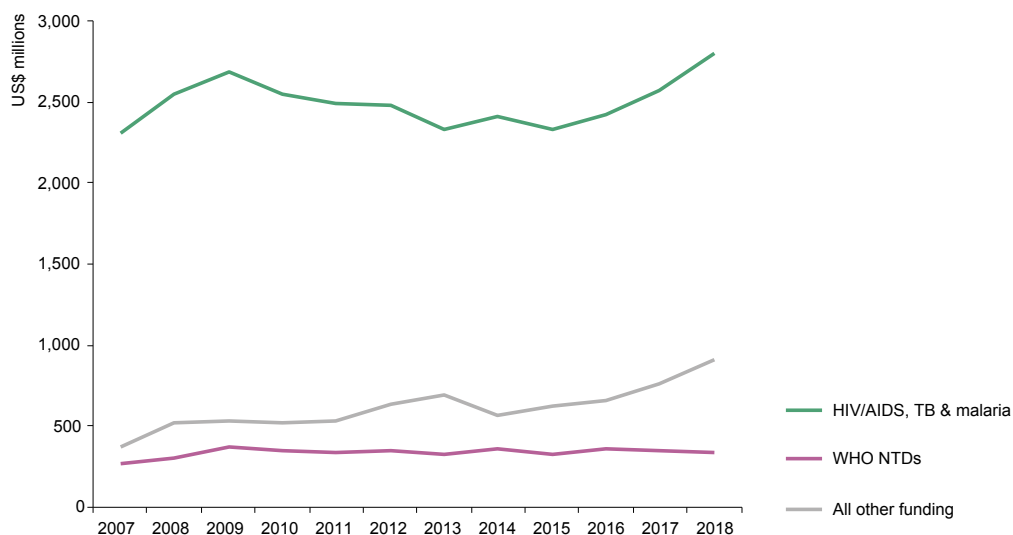
Funding was lower from both LMIC governments (down \$7.9m, -7.6%) and SMEs (down \$14m, -12%), but this follows a long period of growth from both groups.

## Not everything is trending upwards: funding for the WHO neglected tropical diseases has barely shifted over the last decade

Amidst the positive stories of widespread funding increases and record highs, there are still major areas of concern. One of these areas is the level of funding for WHO neglected tropical diseases (NTDs).

While funding for HIV/AIDS, TB and malaria has taken off in the last three years – along with funding for non-disease-specific R&D – funding for NTDs has been essentially flat for the past decade. In fact, it has gone backwards: funding for NTDs was nearly 10% lower in 2018 than it was 2009, falling by \$34m (-9.1%).

Funding by disease category 2007-2018



Industry investment in NTDs has actually been one of the few positive stories in this area. Investment in NTDs by MNCs in particular has grown steadily over the course of the last twelve years, increasing fivefold since 2007, while philanthropic funding for NTDs nearly halved over the same period. As a result, MNCs actually invested more in NTD R&D in 2018 than the philanthropic sector did.

However MNCs still only accounted for 16% of all funding for NTD R&D in 2018, meaning that funding for NTDs is heavily reliant on the public sector. This is particularly true for the least well funded diseases, many of which rely on just one or two public or philanthropic funders for the majority of their R&D funding. Of equal concern is the extremely small quantum of funding these diseases receive: there is little chance of meaningful progress in developing missing tools – especially drugs and vaccines – when total global investment in some of these diseases is just \$2m annually.

The impact of sustained investment in neglected disease R&D is clear in the growing number of newly-approved products and in a healthy and growing R&D pipeline. The corollary of this success is that even more investment will be needed: there is still a significant gap between current levels of investment and the level that will be required to translate these candidates into new tools. And not all areas are benefitting from increased funding and record highs, with a decade of stagnant funding for NTDs being one key example. Addressing this uneven progress is the challenge ahead.

Download the full report at <https://www.policycuresresearch.org/analysis>

All of the data behind this report is available online from the G-FINDER data portal at <https://gfinderdata.policycuresresearch.org>

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