

G-FINDER: Global Funding of Innovation for Neglected Diseases

The ninth G-FINDER survey reports on 2015 global investment into research and development (R&D) of new products for neglected diseases, and identifies trends and patterns across the nine years of global G-FINDER data. The survey covers:

- 39 diseases (including Ebola and other African viral haemorrhagic fevers, which have been analysed separately)
- 151 product areas for these diseases, including drugs, vaccines, diagnostics, microbicides and vector control products
- Platform technologies (adjuvants, delivery technologies, diagnostic platforms)
- All types of product-related R&D, including basic research, discovery and preclinical, clinical development, Phase IV and pharmacovigilance studies, and baseline epidemiological studies.

A note on Ebola and other African VHFs

In response to the 2014 West African Ebola epidemic, last year's G-FINDER survey tracked funding for Ebola R&D for the first time (capturing FY2014 investments). This year, the survey scope was further expanded to include other African viral haemorrhagic fevers (VHFs).

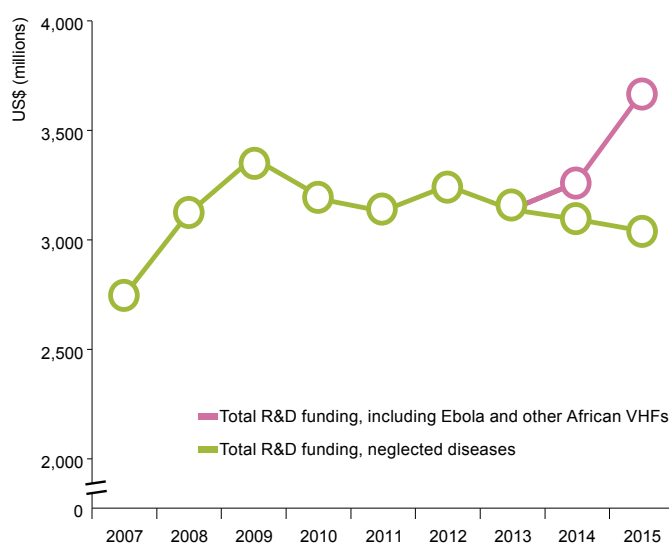
Because of the unique nature of the Ebola threat and the global response – and its distorting effect on investments in 'traditional' neglected disease R&D – funding for Ebola and other African VHFs (for both 2014 and 2015) has been analysed separately in this year's G-FINDER report. As only Ebola was included in both the FY2014 and FY2015 surveys, analysis of YOY funding changes has been restricted to Ebola-specific investment.

Executive summary

In 2015, a reported \$3,041m was invested in neglected disease R&D, consisting of \$2,906m from repeat survey participants (called year-on-year – YOY – funders) and \$135m from irregular survey participants. Total YOY funding for neglected disease R&D decreased by \$68m (-2.3%). This marked the third consecutive year of declining funding, which has also fallen in every year but one since 2009.

In addition to this investment in neglected disease R&D, a total of \$631m was invested in R&D for Ebola and other African VHFs in 2015. This was an increase of nearly half-a-billion dollars compared to 2014 (up \$464m, 288%), and meant that Ebola and other African VHFs received more R&D funding than any neglected disease except for HIV/AIDS.

Total R&D funding with Ebola and other African VHFs 2007-2015



NEGLECTED DISEASE FUNDING BY DISEASE

As in previous years, the 'top tier' diseases – HIV/AIDS, tuberculosis (TB) and malaria – collectively received the vast majority of global neglected disease R&D funding (\$2,144m, 71%). Overall funding to the top tier fell by \$71m (-3.3%). This was driven by decreased investment in both HIV/AIDS (down \$56m, -5.4%) and malaria (down \$17m, -3.0%), although this followed a sharp increase in malaria funding in 2014. TB funding remained essentially flat (up \$2.4m, 0.5%).

Funding for 'second tier' diseases fell by \$38m (-5.9%), with drops in funding for kinetoplastids (down \$21m, -18%), diarrhoeal diseases (down \$18m, -11%), hepatitis C (down \$11m, -25%) and helminths (down \$10m, -13%) partially offset by smaller increases for dengue (up \$12m, 14%), bacterial pneumonia & meningitis (up \$8.7m, 12%) and salmonella infections (up \$2.0m, 3.2%). 'Third tier' diseases – leprosy, cryptococcal meningitis, trachoma, rheumatic fever, Buruli ulcer and leptospirosis – each received less than 0.5% of global R&D funding. Non-disease-specific investment increased by \$43m (up 25%), following a sharp drop in 2014.

NEGLECTED DISEASE FUNDERS

Public sector funding for neglected disease R&D fell once again in 2015 – extending the decline seen since 2012 – while industry investment edged slightly higher, following a significant increase in 2014. Coupled with a small drop in philanthropic funding, these changes resulted in both the lowest public sector funding share and the highest industry funding share ever recorded in the history of the G-FINDER survey.

The public sector still provided close to two-thirds of all neglected disease R&D funding (\$1,925m, 63%), almost all of which came from high-income country (HIC) governments and multilaterals (\$1,866m, 97%). The philanthropic sector provided 21% of global funding (\$645m), and industry contributed the remaining 15% (\$471m).

R&D funding by disease 2007-2015[^]

Disease or R&D area	US\$ (millions)										2015 % of total
	2007	2008	2009	2010	2011	2012	2013	2014	2015		
HIV/AIDS	1,204	1,294	1,265	1,195	1,150	1,187	1,091	1,063	1,012	33.3	
Tuberculosis	444	486	596	614	568	545	559	562	567	18.6	
Malaria	493	584	639	573	594	579	533	581	565	18.6	
Diarrhoeal diseases	126	147	200	175	165	167	197	174	160	5.3	
Kinetoplastids	134	149	173	156	140	142	119	140	112	3.7	
Dengue	50.6	52.0	78.2	67.8	78.9	79.1	75.1	85.1	99.7	3.3	
Bacterial pneumonia & meningitis	32.9	98.4	74.2	100	104	108	101	74.5	92.1	3.0	
Helminths (worms & flukes)	56.1	74.4	86.4	80.0	86.6	91.5	92.2	91.8	76.8	2.5	
Salmonella infections	10.2	43.9	43.7	48.3	48.2	57.8	65.1	65.7	67.9	2.2	
Hepatitis C (genotypes 4, 5 & 6)							46.4	44.7	33.5	1.1	
Leprosy	5.9	10.7	11.7	10.1	8.8	14.7	12.6	10.5	10.8	0.4	
Cryptococcal meningitis							3.2	5.7	5.8	0.2	
Trachoma	1.6	2.2	2.0	5.2	10.9	9.9	6.0	6.8	4.8	0.2	
Rheumatic fever	1.9	2.5	3.4	2.0	0.9	0.9	0.9	1.3	2.2	0.1	
Buruli ulcer	2.4	1.9	1.8	5.5	5.7	6.0	6.4	3.6	1.8	0.1	
Leptospirosis							0.4	1.2	1.2	<0.1	
Platform technologies	9.6	17.7	24.8	30.3	18.2	49.8	43.8	22.3	33.1	1.1	
General diagnostic platforms	5.1	5.8	9.7	10.4	10.7	17.1	16.6	9.6	13.7	0.4	
Adjuvants and immunomodulators	2.5	2.5	6.2	10.1	5.7	27.7	21.2	8.4	11.9	0.4	
Delivery technologies and devices	2.0	9.3	8.8	9.8	1.9	4.9	6.1	4.3	7.4	0.2	
Core funding of a multi-disease R&D organisation	108	96.9	71.6	74.2	88.2	108	111	92.4	118	3.9	
Unspecified disease	58.1	83.5	83.0	53.7	73.1	109	89.9	68.8	76.9	2.5	
Disease total	2,738	3,144	3,354	3,190	3,140	3,254	3,153	3,094	3,041	100	

[^] 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

■ New disease added to G-FINDER in 2013

The top three public funders in 2015 were the US, the European Union (EU) and the UK, with the US contributing over two-thirds of total public R&D investment (\$1,378m, 72%). Of the top three funders, only the EU (up \$21m, 20%) significantly increased funding in 2015, reflecting its expanded contributions under the second phase of the European and Developing Countries Clinical Trials Partnership (EDCTP). Funding was lower from both the US (down \$44m, -3.0%) and the UK (down \$22m, -18%). Other notable drops in public funding came from Australia (down \$16m, -47%) and the Netherlands (down \$13m, -76%), the latter due to the Dutch Ministry of Foreign Affairs' (DGIS) transition between product development partnership (PDP) funding rounds.

Private sector investment in neglected disease R&D in 2015 was the highest ever recorded in the history of the G-FINDER survey. YOY industry funding increased marginally (up \$7.1m, 1.7%), driven by a \$4.7m increase in investment by small pharmaceutical and biotechnology firms (SMEs, up 9.9%). Philanthropic funding decreased slightly (down \$22m, -3.5%), mainly due to reduced funding from the Wellcome Trust (down \$27m, -22%). Funding from the Bill & Melinda Gates Foundation (the Gates Foundation) was steady (down \$2.3m, -0.4%).

Top neglected disease R&D funders 2015

Funder	US\$ (millions)										2015 % of total	2007-2015 trend
	2007	2008	2009	2010	2011	2012	2013	2014	2015			
US NIH	1,210	1,231	1,423	1,377	1,345	1,453	1,273	1,236	1,221	40		
Gates Foundation	518	691	627	517	513	509	526	520	518	17		
Aggregate industry	214	336	369	412	389	375	379	460	471	15		
EU	111	120	110	84	99	87	105	104	125	4.1		
Wellcome Trust	56	59	64	75	89	138	127	119	92	3.0		
USAID	92	96	97	99	93	94	81	77	80	2.6		
US DOD	84	77	106	74	83	81	95	96	72	2.4		
UK DFID	45	42	83	91	71	42	69	74	59	1.9		
Inserm	1.6	2.9	25	18	35	37	52	40	46	1.5		
UK MRC	48	51	51	57	50	45	47	46	40	1.3		
Indian ICMR		24	19	23	22	23	35	33	33	1.1		
German BMBF	4.8	0.9	6.5	8.8	8.1	15	14	17	23	0.8		
Subtotal of top 12 [^]	2,462	2,775	3,004	2,871	2,825	2,918	2,812	2,830	2,781	91		
Total R&D funding	2,738	3,144	3,354	3,190	3,140	3,254	3,153	3,094	3,041	100		

[^] Subtotals for 2007–2014 top 12 reflect the top funders for those respective years, not the top 12 for 2015

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

NEGLECTED DISEASE FUNDING FLOWS

Almost three-quarters of all neglected disease R&D funding in 2015 was external investment in the form of grants or contracts (\$2,202m, 72%). Three-quarters of this funding went directly to researchers and developers (\$1,656, 75% of external investment), \$450m (20%) went to PDPs, and the remaining \$96m (4.3%) was channelled through other intermediary organisations.

Direct YOY funding to researchers and developers decreased slightly (down \$38m, -2.3%). Funding to PDPs fell even more significantly (down \$65m, -13%), although this follows two years of successive increases, and reflects the highly cyclical nature of grant funding to PDPs, especially from the Gates Foundation. Funding to other intermediary organisations increased substantially (up \$31m, 50%), primarily driven by increased funding from S&T agencies to EDCTP2 (up \$22m, 83%).

Funding for Ebola and other African VHFs

A total of \$631m was invested in R&D for Ebola and other African VHFs in 2015. The vast majority of this was Ebola-specific (\$574m, 91%), with Ebola funding more than tripling (up \$411m, 258%) from 2014 levels. Most funding was for vaccine development (\$388m, 61%), with smaller investments in drugs (\$103m, 16%), basic research (\$59m, 9.4%) and diagnostics (\$28m, 4.4%).

The public sector (\$383m, 61%) was the source of nearly two-thirds of all R&D funding for Ebola and other African VHFs in 2015; industry investment (\$226m, 36%) accounted for most of the remainder, with just 3.4% (\$22m) coming from the philanthropic sector. Intermediaries such as PDPs played little to no role – funding was either invested in internal research programmes or given directly to researchers, including to industry.

DISCUSSION

The scale and nature of the global R&D funding response to the West African Ebola outbreak is now truly apparent

- In 2015, a total of \$631m was invested in R&D for Ebola and other African VHFs – more than in any neglected disease except for HIV/AIDS.
- The US Government provided 78% of all public funding for Ebola and other African VHFs, despite a more than five-fold increase in Ebola R&D investment by European public funders.
- Industry invested \$226m in R&D for Ebola and other African VHFs in 2015, far more than they did in any single neglected disease, and more than their combined investment in all neglected diseases other than malaria and TB.

Global funding for neglected disease R&D reached historic lows in 2015, driven by declining public sector investment

- In contrast to Ebola and other African VHFs, funding for neglected disease R&D in 2015 fell to its lowest level since 2007, with YOY global funding now \$180m below its 2012 peak.
- Public sector funding for neglected disease R&D also fell to its lowest level since 2007, driven by another drop in US Government funding (down \$44m, -3.0%), which fell to the lowest level ever recorded in the history of the G-FINDER survey.
- Increased funding from the EU (up \$21m, 20%) made it the second-largest public funder of neglected disease R&D globally in 2015, moving ahead of the UK (down \$22m, -18%).

In sharp contrast to the public sector, industry investment in neglected disease R&D reached historical highs

- 2015 was the fourth year in a row that industry has increased its investment in neglected disease R&D – the only sector to have recorded year-on-year growth for such a stretch.
- Industry's share of global funding is now comparable to that of the Gates Foundation, although this level of investment in neglected disease R&D by industry may be put at risk if public funding continues to fall.
- Industry funding was focused on a subset of neglected diseases, with malaria and TB alone accounting for more than half of all industry investment in neglected disease R&D in 2015.

The highly concentrated nature of neglected disease R&D funding remains an area of concern

- Researchers and developers continue to rely upon a small number of large funders, particularly the US Government (the US NIH especially) and the Gates Foundation.
- 40% of all neglected disease R&D funding goes to organisations that receive more than 80% of their funding from the US Government, which has reduced its funding for neglected disease R&D by a quarter of a billion dollars since 2012.
- PDPs remain highly reliant on the Gates Foundation; in 2015, nearly half of all PDPs received more than half their funding from the Gates Foundation.

Conclusion

- The findings of this year's report show that there are significant additional financial resources available – including from the pharmaceutical industry – for R&D into infectious diseases that largely exist only in the developing world.
- When funding for Ebola and other African VHFs is added to that for neglected diseases, global investment in R&D increased by \$396m (up 13%) in 2015 – the largest single year increase ever recorded by G-FINDER – with public funding growing by \$210m (up 10%) and investment by industry nearly doubling (up \$201m, 44%).
- There is an opportunity to capitalise on the lessons learned from the global response to the Ebola epidemic – not only to ensure that we are better prepared for the next emerging infectious disease outbreak, but also to secure adequate and sustainable R&D funding to address the existing and much larger challenge posed by neglected diseases.

Download the full report at: <http://www.policycuresresearch.org/g-finder/>

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