

GLOBAL INVESTMENT IN HIV CURE RESEARCH AND DEVELOPMENT IN 2019



NOVEMBER 2020

A GLOBAL STRATEGIC APPROACH TOWARDS AN HIV CURE—

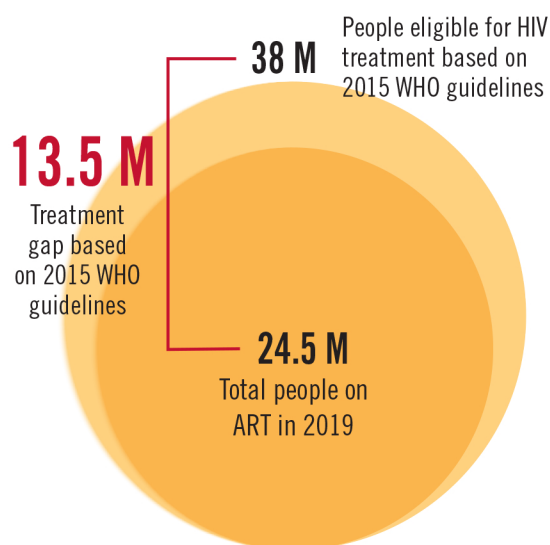
Antiretroviral treatment (ART) has radically changed the face of HIV infection, from a lethal disease into a manageable chronic condition.

All 38 million people currently living with HIV are eligible for ART based on the 2015 WHO Guidelines for ARVs for treatment and prevention – yet the latest data from December 2019 shows that only 24.5 million of these individuals are currently accessing ART. At the same time, daily antiretroviral regimens are costly and sometimes difficult for patients and most importantly not curative. HIV persists despite even the best treatment, and contributes to the development of non-AIDS morbidity.

As such, it is time to sustain our investments in the search for an HIV cure or remission. Over the last decade, our understanding and knowledge of the mechanisms of HIV persistence and latent viral reservoirs has greatly improved. Many members of the scientific community now agree that the search for a functional cure or remission for HIV/AIDS may be within reach. Indeed, the past year has seen important new developments and continued progress in the areas of cure and remission research:

- Continued advances in understanding the latency continuum that can contribute to developing better latency reversing agents and identify ways to permanently suppress the virus.
- New research into tools to quantify replication-competent virus.
- Advances in using CRISPR technology to create HIV immunity in cells and to inactivate latent virus.
- Continued progress in understanding how broadly neutralizing antibodies could be used alone, or in combination approaches, to HIV cure.
- Continued discussion and research around the use of analytic treatment interruption in HIV cure clinical trials.
- The advancement of long-acting agents including a new capsid inhibitor and long-acting injectable integrase inhibitor-based therapy.
- Increased advancements in the use of IL-15 super agonists to penetrate into B-cell follicles.
- Proof of concept for a SMAC mimetic reversing latency in both a nonhuman primate and humanized mouse model.
- A new partnership between BMGF and the NIH to fund gene-based approaches to develop a cure for both HIV and sickle cell.

TREATMENT



To ensure effective future outcomes for cure research, the International AIDS Society's (IAS) Global Scientific Strategy: Towards an HIV Cure (2016) supports the establishment of an international multi-disciplinary research alliance and global coordination of existing consortia towards an HIV cure. It also provides a strategic analysis of the state of research in the area of HIV persistence and eradication in order to develop recommendations for future studies and to promote international and cross-disciplinary research cooperation.

The IAS Global Scientific Strategy: Towards an HIV Cure (2016), identifies the following scientific focal areas:

- Molecular biology of HIV latency and reversal strategies;
- Viral reservoirs, immunology of HIV persistence and 'kill' strategies;
- Models for HIV cure or sustainable remission;
- Paediatric HIV cure;
- Gene and cell therapy;
- Novel biomarkers and technologies to quantify and analyse HIV reservoirs;
- Social sciences and health system research.

Increased investments in these areas will aid in the search for an HIV cure, but can also contribute to increased knowledge of HIV pathogenesis and control, advances in the HIV vaccine field and benefit public health globally, such as finding innovative treatments for people with cancer, Alzheimer's disease, other infectious diseases, and immune disorders.

INVESTMENT IN CURE RESEARCH: 2019 SHOWS A MODEST INCREASE IN HIV CURE FUNDING —

Investment in Cure Research: 2019 shows a moderate increase in funding

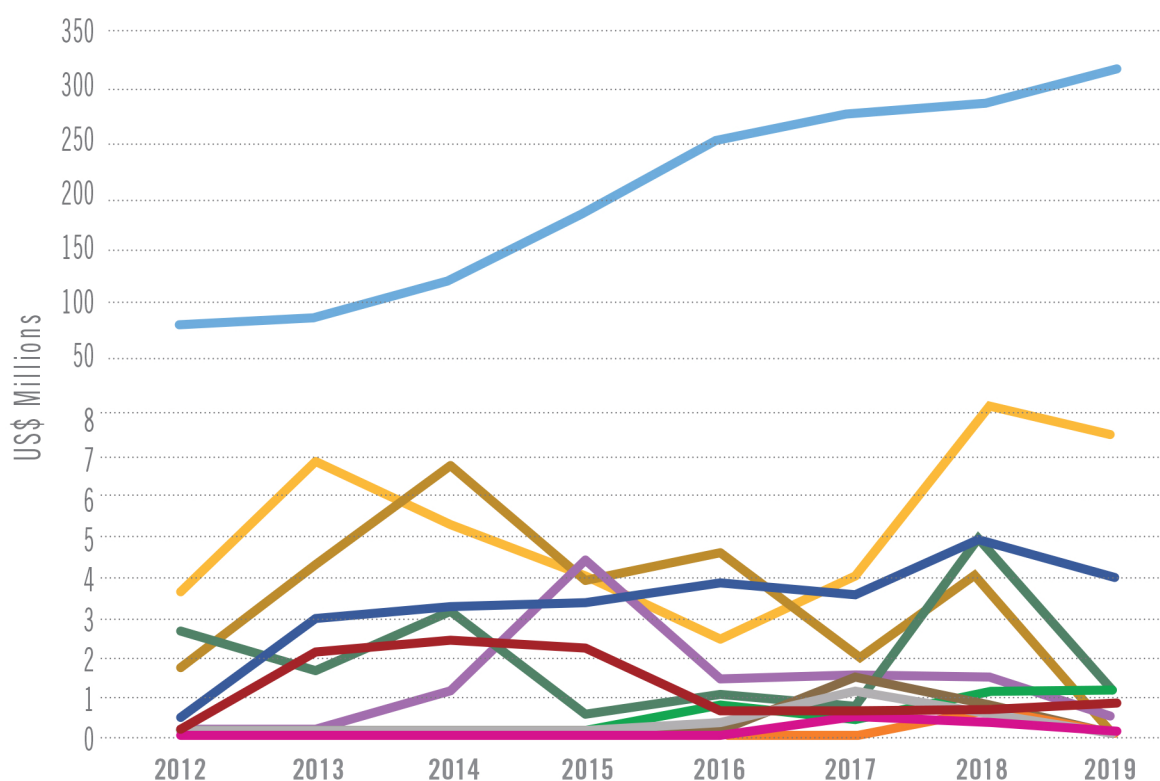
In 2013, the IAS HIV Cure resource tracking group joined forces with AVAC to estimate global investments in HIV cure research. To date, this collaboration has yielded seven years of estimates for cure research investment from 2012 to 2019.

The Working Group estimates that in 2019, US\$334.5 million was invested in cure research, representing a 3.3% increase over the US\$323.9 million invested in 2018, and an increase of 274% over the US\$88.1 million invested in 2012.

The majority of investments (US\$306.7 million) came from the public sector with US\$27.3 million invested by philanthropies such as amfAR, Aidsfonds the Bill and Melinda Gates Foundation, and Institut Pasteur. Despite outreach by the Working Group, only one company responded to the survey, whilst several companies are known to have active cure research programmes, resulting in a significant underestimation for commercial investment in cure research.

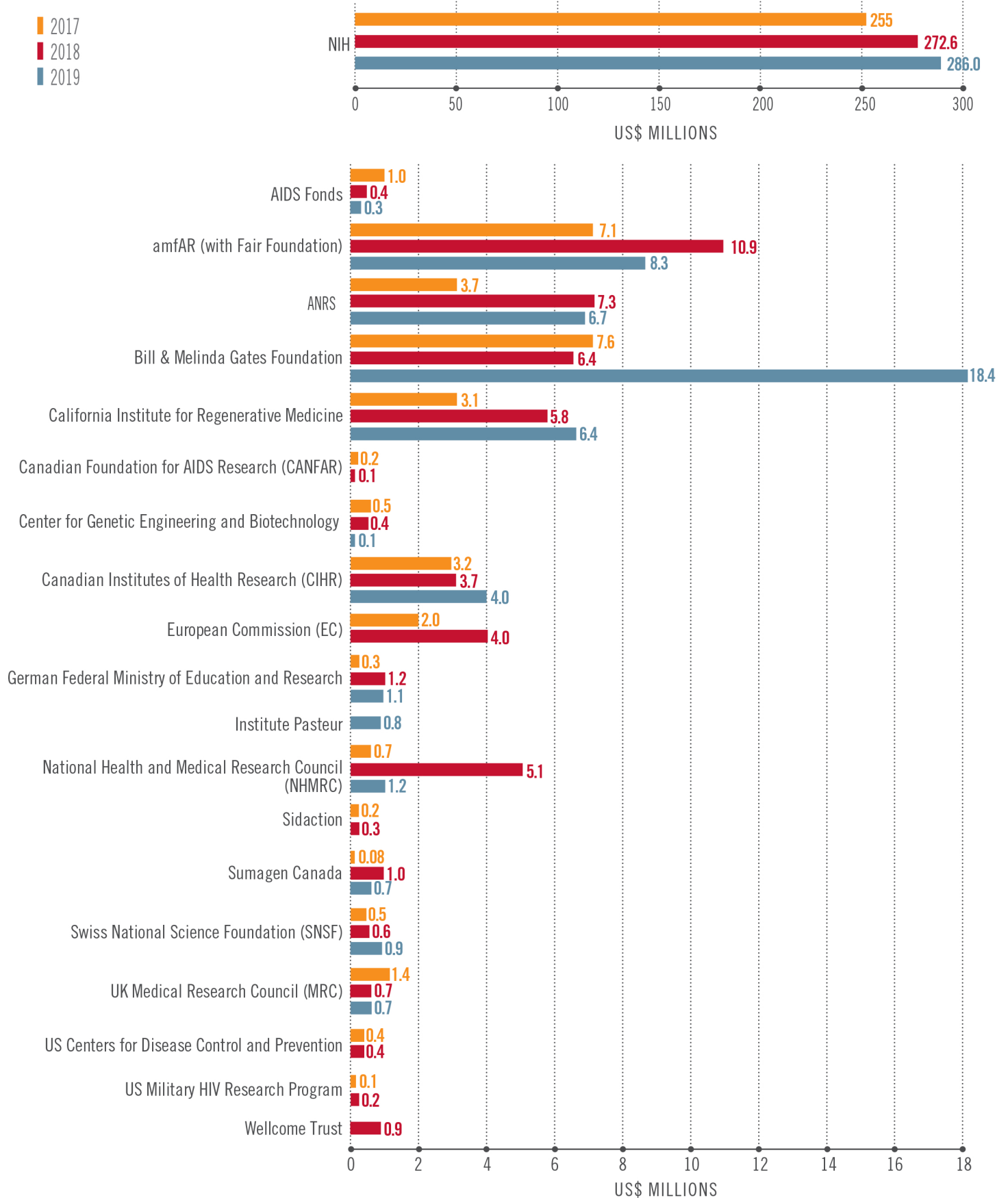
HIV Cure R&D Investments by Country, 2012–2019

	2012	2013	2014	2015	2016	2017	2018	2019
Australia	2.6	1.6	3.1	0.5	1.0	0.7	5.0	1.1
Canada	0.4	2.9	3.2	3.3	3.8	3.5	4.9	4.0
Cuba	0	0	0	0	0	0.5	0.4	0.1
European Commission	1.6	4.2	6.7	3.8	4.5	2.0	4.0	0
France	3.5	6.8	5.2	3.9	2.3	3.9	8.2	7.5
Germany	0	0	0	0	0.7	0.3	1.2	1.1
Italy	0	0	0	0	0	1.4	0.5	0
Spain	0	0	0	0	0	0	0.8	0
Switzerland	0.03	2.0	2.3	2.1	0.5	0.5	0.6	0.9
The Netherlands	0	0	0	0	0.2	1.0	0.4	0.3
United Kingdom	0.03	0.03	1.0	4.3	1.3	1.4	1.6	0.7
United States	79.4	85.9	120.4	183.2	252.1	273.6	296.0	318.7



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Investments in HIV Cure R&D by Funder, 2017-2019 (US\$ millions)



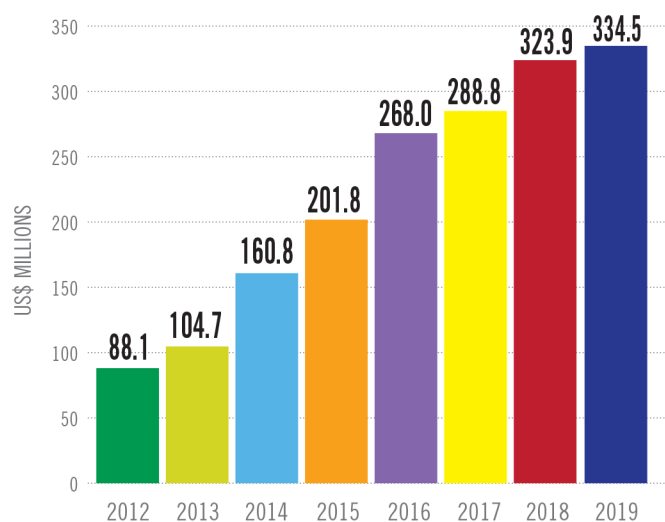
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In 2019, the United States through the US National Institutes of Health contributed the majority of public funding, with France, Canada, Australia, Germany, Switzerland, the United Kingdom and Cuba also being contributors to HIV cure research.

The successful implementation of the Global Scientific Strategy plan will require improved international scientific collaborative research teams and institutions at the international level to ensure an optimal use of resources. Active initiatives include:

- **IAS Towards an HIV cure initiative**
The revised IAS Global Scientific Strategy: Towards an HIV Cure 2016, published in Nature Medicine, was launched in Durban at the AIDS 2016 conference.
- **Martin Delaney Collaboratories**
The National Institutes of Health has awarded \$30 million in annual funding among six research collaborations working to advance basic medical science toward an HIV cure.
- **amfAR Countdown to a Cure for AIDS**
amfAR focuses investments aimed at finding the scientific underpinnings of a cure by 2020.
- **NL4Cure**
NL4Cure is a joint partnership coordinated by Aidsfonds between Dutch researchers and stakeholders that are committed to accelerating a cure for HIV. NL4Cure has developed a research agenda prior to identifying funding sources.

Current Research Investment, 2012–2019 (US\$ millions)



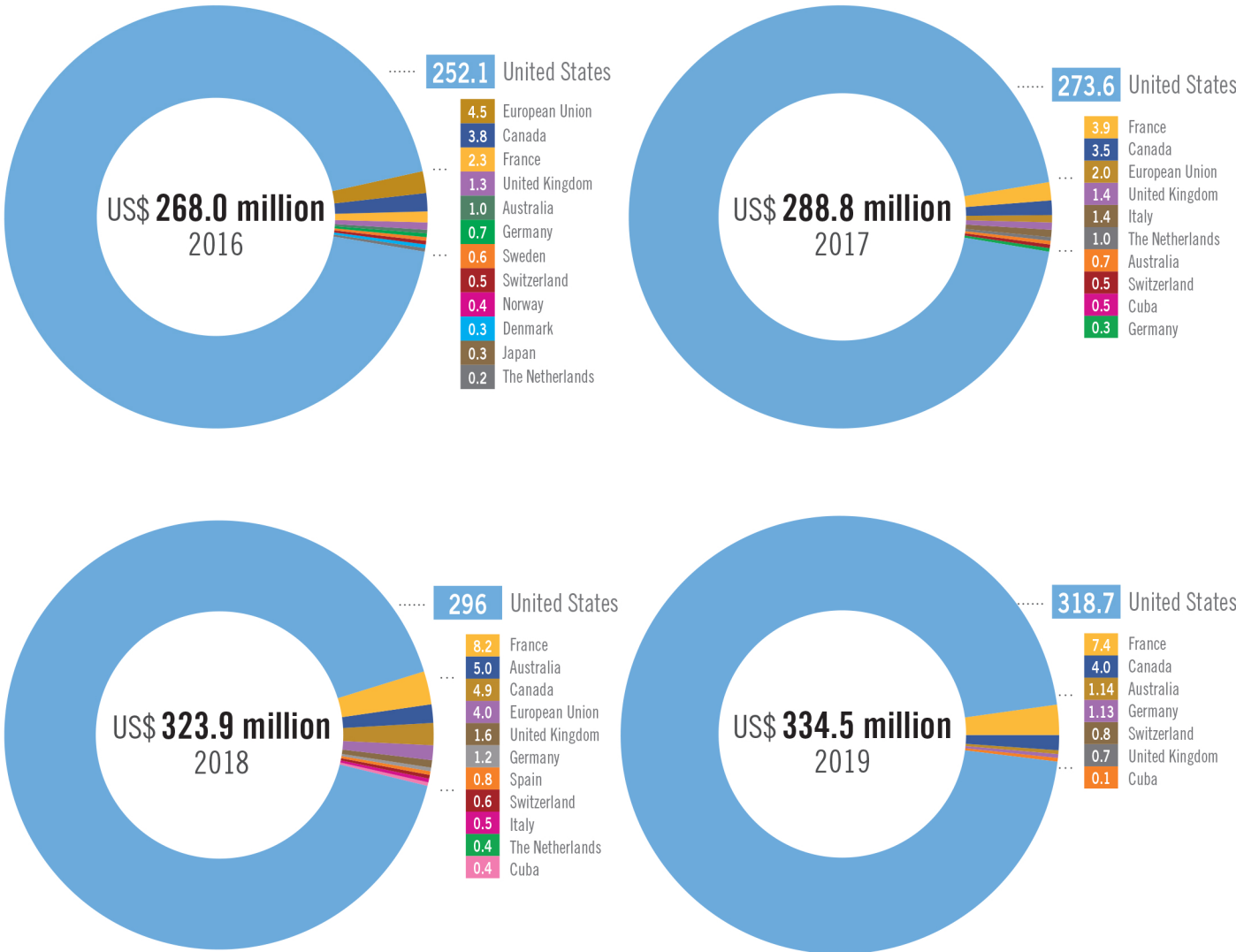
The inclusion of “cure” in the global response should not direct funding away from treatment, prevention and care programmes, or from biomedical research on HIV and its consequences, including vaccine and other prevention research. However, it is imperative that donors, governments and the AIDS community make a viable and sustained economic investment in HIV cure research.

METHODOLOGY

Data collection was undertaken by AVAC on behalf of the Resource Tracking for HIV Prevention R&D accessing public information and collecting information through direct appeals to funding agencies. Requests were made to the public, industry and philanthropic sector funders requesting information on cure research grants awarded in 2019 using the cure definition developed by the US National Institutes of Health’s Office of AIDS Research. In early 2020, surveys were sent to several dozen potential cure research funders across the globe. Responses from funders may not be comparable due to subjective determinations of whether specific grants fall within the OAR definition of cure research. Some funders also decline to provide information, and some did not always provide grant specific detail. In reviewing responses, AVAC accepted funders’ determination that specific research programs or grants are within the OAR definition.

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Investments in HIV Cure Research by Country, 2016–2019 (US\$ millions)



ACKNOWLEDGEMENTS

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