METHODOLOGY

This analysis assesses the economic impact of US government (USG) funding for global health research and development (R&D), the footprint of global health R&D, and the burden of neglected diseases across each US state. More information about the methodology used in each portion of the analysis is included below.

USG FUNDING DATA

The funding analysis assesses USG funding for neglected diseases from 2007 to 2015 and for Ebola and select viral hemorrhagic fevers (VHFs) from 2014 to 2015. All funding data used in this analysis comes from the G-FINDER survey, conducted annually by Policy Cures Research, which has tracked global investment in R&D for neglected diseases since 2007 and for Ebola and select VHFs in 2014 and 2015. The G-FINDER survey covers funding data for basic research, drugs, vaccines, diagnostics, microbicides, vector control products, and platform technologies (including adjuvants, delivery technologies, and diagnostic platforms) for a select set of diseases that exclusively or disproportionately affect developing countries, and thus for which no commercial market exists to drive R&D. Additional in-depth information on the scope and methodology of the G-FINDER is available here.

Using the G-FINDER data outlined above, GHTC researchers conducted independent research to identify the location of each USG funding recipient named in the survey. Using this information, researchers then calculated the total amount of funding received by each institution in each US state, the overall total received by all institutions in the state, and how state-based funding was distributed across various health areas.

When GHTC began this analysis in summer 2017, Policy Cures Research tracked funding for neglected diseases since 2007 and Ebola/VHFs since 2014 jointly in the G-FINDER survey, providing data for both through its public search tool. With the release of the 2016 G-FINDER report and dataset in December 2017, Policy Cures Research announced it would henceforth only track traditional neglected diseases as part of the G-FINDER survey and would track Ebola/VHFs, along with other emerging infectious diseases, in a separate survey to be released at a future date.

Disclaimer: Limitations to this analysis

Location classification:

Due to the collaborative nature of R&D, the further dispersal of funding by recipients through subcontracts and the multinational or multi-state presence of many companies and research institutes, it is difficult to assess how funding flows across geographic locations. For purposes of this analysis, GHTC researchers determined the country and state to assign funding to based on the office location(s) of each recipient of USG funding, as identified by the G-FINDER survey.

In cases where an organization has more than one office location, GHTC conducted additional research on the organization, including cross-referencing G-FINDER entries in the National Institutes of Health's (NIH) RePORTER system, to determine the most likely office location to which particular funding flowed. In the absence of additional information to inform this state assignment, GHTC chose to assign funding to the headquarter office of each funding recipient. If GHTC researchers could not confidently determine to which organization an entry in the

G-FINDER referred or could not clearly identify office locations, the recipient was not assigned to a state and thus excluded from the state-based funding analysis.

Any listing of funding for USG agencies reflects funding the agency received as a recipient, through either self-funding or transfers from other government agencies, rather than funding appropriated to the agency that it then granted or dispersed to other recipients. For specific questions related to the state classification of organizations, contact GHTC at info@ghtcoalition.org.

Pharmaceutical industry funding and aggregated funding:

GHTC's state analysis excludes any USG funding received by the pharmaceutical industry, as well as any funding classified in the G-FINDER as "unspecified recipients." The G-FINDER survey anonymizes and aggregates pharmaceutical industry funding for confidentiality purposes. As a result, GHTC was not able to assign any of this funding to a specific location. In some cases, USG agencies reported data to G-FINDER as funding the agencies distributed to aggregated "unspecified recipients." Similarly, GHTC was not able to assign this funding to a specific location.

Organization and disease classification:

In certain, defined cases, GHTC researchers chose to combine recipient entries listed separately in the G-FINDER into a single entry in our analysis. This was the case when two or more entries were part of the same organization (i.e. funding to a university and funding to a school or institute within the aforementioned university). GHTC also made corrections to any funding recipients listed in G-FINDER data that now operate under a different name or were acquired by another company. GHTC provided details regarding these changes in parentheses next to the organization name listing in our online data tool.

Likewise, GHTC chose to combine certain diseases listed separately in the G-FINDER into a single "neglected tropical diseases (NTDs)" category. For purposes of this analysis, we've included funding for dengue, kinetoplastids, helminth infections, leprosy, buruli ulcer, trachoma, and leptospirosis in this NTDs category. More information on the classification of the diseases in G-FINDER can be found in the G-FINDER scope and methodology.

Definition of global health R&D:

There is no universal definition of what constitutes "global health" or even "R&D." The interpretation of these terms can vary depending on the context in which they are used. G-FINDER employs a specific scope that covers basic- and product development focused research for diseases it defines as neglected because they exclusively or disproportionately affect developing countries and have no commercial market to drive R&D investment. GHTC's USG funding analysis is reflective of that particular scope and does not include other areas of R&D that fall outside this scope (e.g., reproductive health and contraceptive product development for women in low- and middle-income nations (LMICS), other emerging infectious diseases beyond Ebola/VHFs, etc.)

JOBS DATA

GHTC's analysis of jobs created by USG funding for global health R&D is based on previous analysis of the economic impact of NIH R&D funding conducted by United for Medical Research (UMR). GHTC researchers used UMR's analysis of jobs created per one million dollars in NIH awards per state multiplied by GHTC's analysis described above of the USG funding received by institutions in each US state to estimate jobs created from this funding.

NEGLECTED DISEASE BURDEN DATA

Neglected disease burden data by state was obtained from the US Centers for Disease Control and Prevention. Reported case-count data is inclusive of both locally-acquired cases and travel-acquired cases. The source of data for each disease and the range of years included in GHTC's analysis are listed below. Please view the original data source for more detailed information.

- *Chikungunya cases, 2014-2017:* Chikungunya virus in the United States (2014-2016 final data, 2017 provisional data) [Accessed 1/12/18]
- *Dengue cases, 2010-2016:* Morbidity and Mortality Weekly Report Summary of Notifiable diseases (Includes all dengue virus infections) [Accessed 1/12/18]
- *HIV diagnoses, 2008-2016*: AtlasPlus [Accessed 1/11/18]
- *Malaria cases, 2008-2014:* Malaria Surveillance–United States, Morbidity and Mortality Weekly Report [Accessed 1/11/18]
- *Tuberculosis cases, 2008-2016:* AtlasPlus [Accessed 1/11/18]
- *West Nile virus cases, 2008-2016:* West Nile virus disease cases reported to CDC by state of residence [Accessed 1/12/18]
- *Zika cases, 2015-2017:* Zika Cases in the US (Final data reported to ArboNet 2015, Final data reported to ArboNET 2016, Provisional Data 2017) [Accessed 1/11/18]

INDUSTRY LISTING

The industry listing reflects private sector companies identified by GHTC researchers to be currently or previously engaged in global health R&D. GHTC researchers primarily used four data sources to identify companies engaged in this research. They include:

1. Neglected diseases: The unrecognized revolution in global health, created by Policy Cures Research, which maps the pipeline of neglected disease products in development.
2. Database of grants awarded by the Grand Challenges program, which awards grants to organizations solving global health and development problems.
3. NIH RePORTER, which is a searchable repository of NIH-funded research.
4. Original G-FINDER set used in overall funding analysis, which includes some smaller- and medium-sized companies who received USG funding for neglected disease R&D.

GHTC used the above data sources and independent research on each company's website or other authoritative sources to identify the city and state locations of each company's offices. For specific questions related to the inclusion of a company, contact info@ghtcoalition.org.

Disclaimer: Limitations to this analysis

Comprehensiveness:

While GHTC researchers sought to provide a comprehensive picture of the companies engaged in global health R&D using the above resources, it is inevitable that some companies have been missed. We welcome additions and feedback at info@ghtcoalition.org.

Location identification:

Due to the multinational and multistate presence of many companies and the limited amount of information made available by these companies regarding their operations, it is challenging to determine where companies' global health R&D activities take place. GHTC researchers took steps to control for this in cases where operational information was made available. If a company's website provided detailed information about the activities conducted at a particular office location, which led GHTC researchers to conclude it was very unlikely that office location was involved in the company's global health R&D activities (e.g., the specific office oversaw vision care or drug-screening activities), that location was excluded from GHTC's listing. However, if there was not detailed information to exclude the location's possible engagement in global health R&D, GHTC researchers included the location in our listing. Likewise, if the office appeared to support overall administrative and management functions of the company, GHTC also opted to include the location in our listing. Therefore, in some cases, GHTC's listing may include locations that are not specifically supporting the company's global health R&D activities.

For specific inquiries about a company's location, corrections, or to notify GHTC of the closure of a company or office location, please contact info@ghtcoalition.org.

Definition of global health R&D:

As stated previously, there is no universally accepted definition of "global health" or "R&D." In the context of the private sector analysis, GHTC defined global health R&D as basic and product-focused research to develop new health technologies for diseases and health issues that disproportionately impact LMICS—including emerging infectious diseases which are emergent in or likely to have a disproportionate impact on LMICS—as well as product-focused research to develop health technologies designed specifically for low-resource settings. This is broader than the scope used in the USG funding analysis. For specific questions regarding the inclusion of a company on this list, contact info@ghtcoalition.org.