Georgetown Global Health Security (GHS) Tracking site Technical appendix

Overview

The Georgetown Global Health Security (GHS) Tracking site provides a shared resource to map the flow of committed and disbursed funds for global health security in addition to select types of in-kind support (non-monetary). GHS Tracking allows both funders and recipients to identify gaps and prioritize future investments, and helps to highlight the ways in which funds can be allocated most effectively to have the greatest impact. The dashboard aggregates data from multiple data sources tracking funding and support for global health security, and provides information on which efforts are being funded, by whom, in which locations. Data may be submitted to GHS Tracking directly by users for addition alongside data incorporated into the tool based as identified and reviewed by the research team. Details

on the data inclusion requirements for GHS Tracking, methods used for data tagging and de-duplication across sources, as well as documentation of the data currently incorporated into GHS Tracking, are provided below.

Data definitions

Table 1 below provides descriptions and possible values for each data element tracking funding and/or support (non-monetary) in the GHS Tracking database. Additional detail on each data element is provided below.

Table 1. Core data elements with descriptions and possible values. Note that currently, where event response funding and support is mentioned, only data for public health emergencies of international concern (PHEICs) declared by the World Health Organization are being tracked.

Data element	Description	Possible values
Data source	The source of the data reported in GHS Tracking	Any relevant data source name
Project name	The name of the project, or a brief title describing the project's purpose	Any project name or null if unavailable
Project description	A brief description of the project	Any project description or null if sufficient information is not available for a description
Transaction type	Whether support corresponds to a commitment or a disbursement	*Commitment:* A commitment is an official obligation from a funder to provide a specified amount of funds or support for the benefit of the recipient *Disbursement:* Disbursed funds or support have been distributed to the recipient and/or placed at the disposal of the recipient
GHSA funding or support	Whether or not the specified funds or support were provided under the Global Health Security Agenda (GHSA)	TRUE or FALSE
Response or capacity building	Whether the specified funds were provided for emergency response directly tied to an event or targeted to core health security capacity building	*Response funding or support:* Funds or support that directly support operational response efforts for health emergencies

		Capacity building funding or support: Funds or support to build capacity aligned to the definitions of the International Health Regulations (2005)
For response data only: Name of event (currently only events with PHEIC designations are included)	The name of the event to which the funding or in-kind support directly responded	The name of a public health event standardized within the tracking dataset
Core capacities	The core capacity of the Joint External Evaluation (JEE) that the project supports	Any set of core capacities corresponding to the first edition Joint External Evaluation (2005), "General IHR implementation", or null if data are not sufficient to tag core capacities
Funder name	The name of the funder, or group of funders (e.g., G-7)	Any funder name
Funder type	The type of funder, specified as government, international organization, NGO, academia, private sector, foundation, or other	Any relevant funder type from the enumerated list in the description
Funder country	The country of the funder	Any country name or null if funder is not a country or government agency
Recipient name	The name of the recipient (or group of recipients) of the funds or support	Any recipient name or "General global benefit"
Recipient type	The type of recipient, specified as government, international organization, NGO, academia, private sector, foundation, or other	Any relevant recipient type from the enumerated list in the description
Recipient country	The country of the recipient	Any country name or null if recipient is not a country or government agency

Support type	Whether the support given was financial support or in-kind (non-monetary) support	*Financial support:* transfer of funds directly from funder to recipient *In-kind support:* other forms of support and assistance that do not involve the direct transfer of funds from funder to recipient (e.g., deployment of personnel, transfer of goods and/or services)
Transaction year range	The years during which the support was disbursed or is intended to be disbursed	Any year or range of years
Transaction amount	The amount of funds committed or disbursed, for financial support data	Any amount of funds or null in the case of in-kind support
Transaction currency	The currency corresponding to the reported amount of funds committed or disbursed, for financial support data	Any currency specified based on an ISO 4217 currency Code
JEE indicator scores	Indicator-level scores for countries that have completed the Joint External Evaluation (JEE) process	Any pair of a JEE indicator and an integer score ranging from 1 to 5 for each country with data

Data source

Data source: The source of the data reported in GHS Tracking (e.g., IATI, Article X database). Data may be incorporated based on review of data sources identified by the research team, or based on data submitted directly to GHS Tracking.

Project basics

Project name: The name of the project, or a brief title describing the project's purpose.

Project description: A brief description of the project that is usually only included if available directly from the data source being incorporated. Otherwise, the description is captured as null.

For some data sources, the research team may auto-generate a descriptive project title based on the funders and recipients involved (e.g., "European Investment Bank funds WHO for COVID-19 Response"), for example this is done for projects sourced from the COVID-19 Health Funding Tracker published by the Economist Intelligence Unit (EIU).

Transaction type: Whether support corresponds to a commitment or a disbursement.
- *Commitment:* A commitment is an official obligation from a funder to provide a specified amount of funds or support for the benefit of the recipient.

- *Disbursement:* Disbursed funds have been distributed to the recipient and/or placed at the disposal of the recipient. Completed in-kind activities are also considered disbursed.

GHSA funding or support: Whether or not the specified funds or support were provided under the Global Health Security Agenda (GHSA). Only funds or support specifically identified as GHSA funding or support by the reporting entity are tagged as GHSA funding or support.

Response or capacity building: Whether the specified funds or support were provided as response funding or support, or capacity building funding or support.
- *Response funding or support:* Funds or support that directly support operational response efforts for health emergencies (currently only events with PHEIC designations are included)
- *Capacity building funding or support:* Funds or support to build capacity under the International Health Regulations (2005).

Additional details on how projects are tagged as response funding or support are available in the "Tagging response funding" section.

Response funding

PHEIC name: A standardized event name reflecting the target effort of the response funding and specified only for transactions tagged as response funding. The following public health emergencies of international concern (PHEICs) declared by the WHO are actively tagged within GHS Tracking[1]. The list of potential target efforts may be updated in the future if and as the WHO declares additional emergencies, or if the scope of target efforts tracked is broadened:

- *2019-present COVID-19 Pandemic*
- *2018-2020 Ebola in DRC*
- *2015-2016 Zika Virus*
- *2014-present Poliovirus*
- *2014-2016 Ebola in West Africa*
- *2009-2010 H1N1 Swine flu*

Additional details on how projects are tagged by target efforts are available in the "Tagging response funding" section.

Capacity-building funding

Core capacities: The core capacity (up to three) of the Joint External Evaluation (JEE)[2] that the project supports, if any. Projects that support capacity building in general but not in any one specific core capacity are tagged with "General IHR" in lieu of a core capacity. Additional details on how projects are tagged by core capacity are available in the "Tagging core capacities" section of this technical appendix.

Funder information

Funder name: The name of the funder, or group of funders (e.g., G-7). One or more funders may be listed, though funders are identified as a group only when the specific amount committed/disbursed by each individual funder is not known. In cases where the specific allocation between funders is known, then separate transactions are captured for each.

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[1] Based on WHO declarations as of August 2019, reported online: https://www.who.int/emergencies/crises/en/
[2] GHS Tracking currently uses the core capacities identified in the first edition of the Joint External Evaluation

Funder type: The type of funder, specified as government, international organization, NGO, academia, private sector, foundation, or other.

- *Government:* Any governmental organization or government (including regional and national government), or a group/coalition of States or regions
- *International Organization:* An entity established by a formal political agreement between members that have the status of international treaties (definition from OECD)
- *NGO:* Any non-profit entity without significant government participation or representation (definition from OECD)
- *Academia:* Any academic institution or academically-affiliated research group
  Private sector: Private corporations and households (definition from OECD)
  Foundation: A nonprofit corporation or a charitable trust with the principal purpose of making grants to unrelated organizations, institutions, or individuals (definition from Foundation Center)
  Other: Any other type of funder or recipient not well-categorized based on the funder types defined above

Funder types are specified based on how each funder describes themselves in public documentation. If multiple funders are defined for a given project, then all applicable types are listed.

Recipient information

Recipient name: The name of the recipient (or group of recipients) of the funds or support. One or more recipients may be identified, though recipients should be identified as a group only when the specific amount committed/disbursed to each individual recipient is not known. In cases where funding supports a global cause (e.g., a large international conference), the recipient is identified as "general global benefit."

Recipient type: The type of recipient. See definition and categories described under "Funder type" above.

Transaction information

Support type: Whether the support given was direct financial or in-kind support:

- *Financial support:* The transfer of funds directly from funder to recipient. Financial support includes debt forgiveness.
- *In-kind support:* Other forms of support or assistance that do not involve the direct transfer of funds from funder to recipient (e.g., deployment of personnel, transfer of goods and/or services, commitment to advance an action package).

Transaction year range: The year(s) during which the support was disbursed or is intended to be disbursed. Dates are captured at the level of resolution at which they are reported (e.g., specific dates vs. years), though data are typically tracked by year within the sources integrated within GHS Tracking and are reported by year on the GHS Tracking website.

Transaction amount: The amount of funds committed or disbursed, or the estimated value of the in-kind support (if any estimated amount is available). Estimated value of in-kind support is an optional value and is not displayed as part of financial support information.

Transaction currency: The currency corresponding to the reported amount of funds committed or disbursed, specified as a three-digit ISO 4217 Currency Code. The GHS Tracking site displays funds in units of nominal USD, that is, funds are not adjusted for inflation. For funds reported in currencies other than USD, the exchange rate corresponding to the transaction date is applied to convert into a value in USD.

Joint External Evaluation details

JEE scores: For country funders and recipients, indicator-level scores ranging from 1 (no capacity) to 5 (sustainable capacity) are included based on a country's Joint External Evaluation (JEE). If a country has not completed a JEE and published a public mission report or executive summary, no JEE scores are included in GHS Tracking. If a country has multiple JEEs, multiple sets of scores are tracked. Additional information on the JEE is available online at http://www.who.int/ihr/publications/WHO-WHE-CPI-2017.53/en/.

Date and version of JEE: The date that a country's JEE was completed, and the version of the JEE ("version 1" vs. "version 2").

JEE version 2 (available at https://extranet.who.int/sph/joint-external-evaluation-tool-2nd-edition) included changes in and addition of some indicators compared to version 1. However, data presented in GHS Tracking are at the core capacity level (an average of all indicators) and this method also applies to JEE version 2 allowing scores from both versions to be presented in the same way on the site.

Data processing and aggregation

GHS Tracking currently aggregates data from a number of data sources described in additional detail below. Data from each of these sources were reviewed and processed in order to:

1. tag each project, where applicable, by core capacity and/or response target effort;
2. ensure data were in the necessary format; and
3. deduplicate data across different data sources.

Deduplication

GHS Tracking incorporates funding and support data from data sources tracking different types of information with different focus areas, so overlap between these data sources is limited. However, in some instances, duplicate information is stored within a single data source (e.g., duplicate data within IATI) or is replicated in two different data sources (e.g., data within both IATI and Article X data sources).

Data are deduplicated to the extent possible based on review by the research team, and any identified duplicates are excluded from the GHS Tracking database. For large funding commitments, data are manually reviewed by the research team to identify any known duplicates. A record of all data excluded due to duplication is kept for reference by the research team.

Minimum data requirements for incorporation of data into GHS Tracking

As a minimum, each data source incorporated into GHS Tracking must include:

- Funder OR recipient information
    - Funder name (this can be a specific funder or a group of funders)
    - Recipient name (this can be a specific recipient or a group of recipients)

- Whether the project described corresponds to a *commitment* or *disbursement*
- Whether the project described provided *in-kind support* or *financial support*
  - For financial support: the amount and currency
- The timeframe of the transaction(s), at least at a resolution of year(s)
- Unique identifying information to aid deduplication with other data sources (e.g., project name, description, or other distinguishing information)

Tagging GHSA funding and support

Funds and support are only tagged as "GHSA funding and support" if the entity reporting the data specifically reported that the funds or support were allocated under the Global Health Security Agenda (GHSA).

Tagging core capacities

When funding or support was provided to directly support one or more core capacities identified by the Joint External Evaluation (JEE), data were tagged by those core capacities as defined in the first edition of the JEE. For most data sources incorporated into GHS Tracking, efforts were tagged by core capacities based on manual review of the project name and description.

Due to their high volume, data from IATI were tagged with core capacities based on a supervised, automated text search algorithm. The search terms used, and additional information, are provided in the "IATI" section below.

Tagging response funding and support

GHS Tracking currently contains response funding and in-kind support data for public health emergencies of international concern (PHEICs) declared by the World Health Organization.

New response data sources are identified through literature and internet searches approximately quarterly and on recommendation by subject matter experts. Updated data from sources already identified are added to GHS Tracking on the same schedule.

Response tagging process

In addition to all data attributes described above in "Data definitions", response projects and transactions are tagged by the target effort (event), e.g., "2019-present COVID-19 Pandemic". Projects and transactions related to an event in some way but not for direct response to the event are not currently incorporated into GHS Tracking as response data (e.g., long-term recovery or pre-event preparedness projects).

Due to the high volume of data from IATI, a mostly automated, supervised tagging process is used to tag IATI projects and transactions by response effort, supplemented by review of results by the research team. More information about the process used is available in the section "International Aid Transparency Initiative (IATI) data" below.

Deduplicating response data

Similar to other funding data in GHS Tracking, response data from different sources are checked for duplication, and the more comprehensive and/or recent data source for the event is used, including prioritizing consideration of direct reporting by funders. Media reports of response funding commitments made early during an event can be superseded by more concrete and official data released

later. Similarly, during an event, more frequently updated data sources may supersede others where conflicts are identified.

Additionally, certain data sources are updated more frequently during an ongoing event than others and may provide the best available data for some stakeholders until more official data are released. For example, COVID-19 funding data from the COVID-19 Health Funding Tracker currently supersedes data from IATI if it has the same funders and recipients. This is because the EIU COVID-19 Tracker currently appears more up-to-date than some other data sources for COVID-19 response data

Funding and support data incorporated into GHS Tracking

All data sources tracking funding and support that are currently incorporated into GHS Tracking are discussed in the following sections. Descriptions of each data source and a statement of how its data were included or excluded from the GHS Tracking application are provided. Recurring data sources are reviewed for updates approximately quarterly, most recently in April 2021.

International Aid Transparency Initiative (IATI) data

The International Aid Transparency Initiative (IATI) is a public, voluntary registry of international aid funding initiatives which aggregates data shared by over 600 organizations. As IATI includes information on funding initiatives across many sectors, only funding data from meeting the following criteria were considered for inclusion:

1. activities published by the World Health Organization,
2. activities supporting a sector related to global health security, and
3. activities determined to be response funding.

Additionally, the research team accessed IATI project data with at least one transaction (commitment, disbursement, or expenditure) having a non-zero value. Project data flagged by IATI as duplicates of other IATI data were excluded to avoid double-counting.

Sectors of IATI data incorporated into GHS Tracking

The IATI database contains ~1 million projects covering a broad range of themes, such as "fishery research", "basic health care", and "Table 2 below identifies the specific sectors from IATI for which data are incorporated.

Table 2. Names and codes of sectors tagged on International Aid Transparency Initiative (IATI) projects that mark those projects for inclusion in GHS Tracking. Sector codes are from the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC).

Sector name	DAC-5 code
Health policy and administrative management	12110
Medical education/training	12181
Medical research	12182

Medical services	12191
Basic health care	12230
Basic health infrastructure	12240
Basic nutrition	12240
Infectious disease control	12250
Health education	12261
Malaria control	12262
Tuberculosis control	12263
Health personnel development	12281
Population policy and administrative management	13010
Reproductive health care	13020
Family planning	13030
STD control including HIV/AIDS	13040
Personnel development for population and reproductive health	13081
Livestock/veterinary services	31195
Social mitigation of HIV/AIDS	16064
Pharmaceutical production	32168

Tagging core capacities for IATI data

IATI data were tagged with core capacities by text search with terms defined by the research team and informed by the language used by the Joint External Evaluation framework[3]. The zoonotic diseases identified to tag the core capacity *P.4 Zoonotic Disease* were informed by a review of OIE Listed

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[3] The string searches used to tag data from IATI were updated in April 2019

Diseases.[4] The English search terms used are listed Table 3 below. Spanish, French, German, and Dutch translations of these search terms were also used because these languages are common in IATI data.

Table 3. Search terms for core capacity tagging within International Aid Transparency Initiative (IATI) data. Text matching terms specified as a semicolon separated list.

Core capacity	Text search terms (case insensitive)
P.1 National Legislation, Policy, and Financing	legislation; legislative; financing; fiscal; regulatory; regulation; legal framework; policy; policies
P.2 IHR Coordination, Communication and Advocacy	implementation of the international health regulations; IHR coordination; IHR advocacy; IHR focal point; NFP; IHR regional contact point
P.3 Antimicrobial Resistance (AMR)	antibiotic; antimicrobial; amr; artemisinin; dr-tb; drug resist; resistance to drugs; resistant bacteria; resistant malaria; resistant tb; healthcare associated infection; HCAI
P.4 Zoonotic Disease	zoono; animal disease; animal health; animal virus; anthrax; aujeszky; avian; bluetongue; bovine; bovine; brucella; brucellosis; camelpox; caprine; chagas; chlamydophila abortus; chrysomya bezziana; cochliomyia hominivorax; contagious agalactia; coronavirus; crimean congo hemorrhagic fever; wildlife; duck virus hepatitis; echinococcus granulosus; echinococcus multilocularis; enzootic bovine leukosis; epizootic haemorrhagic disease; EAEVE; FMD; foot and mouth disease; foot-and-mouth disease; fowl typhoid; gumboro disease; haemorrhagic septicaemia; heartwater; infectious bursal disease; infectious pustular vulvovaginitis; influenza a; japanese encephalitis; leishmania; leishmaniasis; lumpy skin disease; marburg; MERS; middle east respiratory syndrome; mycoplasma gallisepticum; mycoplasma synoviae; new world screwworm; newcastle disease virus; nipah; OIE; PVS; old world screwworm; One Health; paratuberculosis, q fever; pullorum disease; rabies; rift valley fever; rinderpest; SARS; sheep and goat pox; sudden acute respiratory syndrome; SARS; surra; swine fever; theileriosis; transmissible gastroenteritis; trichinella spp; trichomonosis; trypanosoma evansi; trypanosomosis; tularemia; turkey rhinotracheitis; veterin; west nile fever; west nile virus; yellow fever; vector control; livestock

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[4] "OIE-Listed Diseases: World Organisation for Animal Health." Animal Health in the World, www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2018/

P.5 Food Safety	food safety; food security; food contamination; foodborne; food borne; food poisoning; International Food Safety Authority Network; INFOSAN; Salmonella; total diet study; harmonized total diet study; food recall
P.6 Biosafety and Biosecurity	bio-safety; bio-security; bio-risk; bio risk; biorisk; biological risk protocols; biological safety; biological security; biosaf; biosec; BSL; inventory of pathogen; pathogen inventory; pathogen control measures; access pathogen; laboratory licens; audit lab; laboratory audit; lab audit; ISO accred; specimen transport; sample transport; transport of specimen; transport of infectious; transport of sample; shipment of specimens; shipment of sample; infectious substance transport; shipping infectious; shipping sample; shipping specimen; biosafety cabinet; BSC; International Federation of Biosafety Associations; IFBA; waste management; biological waste; safety equip
P.7 Immunization	cold chain; cold stores; immun; vacc; measles eradication; GAVI; injection safety
D.1 National Laboratory System	diagnostic; RDT; lab; rapid detection; rapid test; BSL; microbiological test; bacteriology; virology; serology; parasitology; polymerase chain reaction; PCR; virus culture; microscopy; bacterial culture; case detection
D.2 Real Time Surveillance	data management system; electronic reporting; data exchange systems; detect; health information system; information management system; screen; surveil; EBS; IBS; early warning; monitoring system
D.3 Reporting	report; notifiable; EIS; event information system; global public health intelligence network; GPHIN; MedISys; WAHIS; IHR focal point; OIE delegate; OIE contact point; public health emergency of international concern; PHEIC; Early Warning and Response System
D.4 Workforce Development	capacity building; development of capacity; operational capacity; personnel; staff; train; vocational; workforce; continuing education; curriculum; Massive Open Online Course; MOOC; teach; workshop; seminar; training; conference; trainer; symposium; fellowship; field epidemiology training program; FETP
R.1 Preparedness	prepared; plan; surge capacity; risk map; resource map; resources map; risk assess; assess risk; risk profile; profile on risk

R.2 Emergency Response Operations	emergency; rapid respon; response operations; RRT; EOC; operational response; operation center; operation centre; coordinated response; IMS; incident manage; activation
R.3 Linking Public Health and Security Authorities	biological weapon; CBRN; security; criminal; crime; deliberate; interdict; intentional release; law enforcement; police; terrorism; terrorist; INTERPOL; forensic
R.4 Medical Countermeasures and Personnel Deployment	deploy; MCM; countermeasure; stockpile; SNS; supply management; warehousing and distributing drugs; sending health personnel; receiving health personnel; receipt of health personnel; request personnel; GOARN
R.5 Risk Communication	community engage; engage population; public awareness; public trust; mass awareness; awareness campaign; public communic; risk communic; emergency communication; public messag; exchange of info; engagement strateg; media; social mobilization; behavior change; newspaper; radio; tv; television; social media; misinformation; rumour management; rumor management; dynamic listening; information education communication; EIC; hotline; communications system; coordinate communication; messaging
O.1 Points of Entry	border cross; border point; border security; cross-border; cross border; entry/exit sites; port; airport; ground crossing; shipping; shipment; PoE; points of entry; point of entry; quarantine; customs; border control; ill travelers; inspection of conveyances; exit screening; entry screening; international travel; baggage; cargo; postal; smuggl; trafficking; import; export
O.2 Chemical Events	CBRN; chemical; chemistry; poison; INTOX; INCHEM; Poisindex; persistent organic pollutan; SAICM; UNECE; hazardous site; OPWC; CWC
O.3 Radiation Emergencies	CBRN; nuclear; radiological; radiation; radioactive; nuclear; IAEA; GICNT
General IHR Implementation	national action plan; NAPHS; IHR implementation; IHR cost

Tagging response data in IATI data

Response data is automatically identified among the ~1 million activities in the IATI dataset using a combination of text searching and year filtering (the data are not limited to sectors previously identified

in the method used to narrow in on funding for global health capacity building). Currently, the response efforts covered are the six WHO PHEICs that have been declared to date.

IATI project titles are searched for PHEIC-related keywords to determine whether the project may be related to a PHEIC. If there is a match, then any transactions in the project falling within the year range of the PHEIC are added to the GHS Tracking dataset as response funding for that PHEIC. The keyword matching method was iteratively refined to capture data not expected to require extensive manual review, except in select cases where specific limitations were identified and manual review is routinely performed, namely;

- Ebola PHEIC funding data are manually reviewed to ensure that the correct Ebola PHEIC was tagged in each case, primarily using the description, timeframe, and recipient specified for each project. This is because two Ebola PHEICs were declared relatively close in time and space to each other (2018-2020 in DRC and 2014-2016 in West Africa).
- Any project or transaction with more than one PHEIC tagged is also manually reviewed because this occurs only rarely.
- Finally, the research team also manually reviews any response funding data identified from other sources that may conflict with response funding data automatically identified from IATI. If conflicts are found, the more recently updated or comprehensive data source is used.

Table 4 below summarizes the PHEIC-related keywords and year ranges used to determine what IATI activities and transactions constitute response funding in the GHS Tracking dataset.

Table 4. The keywords and year ranges used to tag IATI projects and transactions as response funding for particular WHO-declared PHEICs. If at least one keyword for the PHEIC was present in the IATI project's title (case sensitive and whole word matches only), then all transactions in that project falling within the years allowed for the PHEIC were tagged as response funding for that PHEIC.

if both:		then:
Keyword(s) in project title *(one or more, case sensitive, whole words only)*	**Years allowed for transactions**	**PHEIC tagged on transactions**
2019 novel coronavirus; 2019-nCoV; corona virus; coronavirus; covid; COVID-19; covid19; nCoV; SARS-Cov-2; sarscov	2020 - present	2019-present COVID-19 Pandemic
ebola; ebola virus; ebolavirus; ebov; EVD	2018 - 2020	2018-2020 Ebola in DRC
ipv; MOPV; nopv2; opv; opv2; polio; Polio-endemic; poliomyelitis; PolioPlus; poliovirus; polioviruses; VAPP; WPV1	2014 - present	2014-present Poliovirus
zika; zika virus; zikavirus; zikv	2015 - 2016	2015-2016 Zika virus
Same as for 2018-2020 Ebola in DRC above	2014 - 2016	2014-2016 Ebola in West Africa
h1n1; H1N1pdm09; swine flu	2009 - 2010	2009-2010 H1N1

US White House GHSA Progress and Impact Reports

In February of 2018, the United States published its second annual report on progress and impact from U.S. investment in the GHSA, and in August of 2019, the third annual report was published. Where specific funders, recipients, and funding transactions were referenced in these reports, data were incorporated into the GHSA tracking dashboard. The 2018 US White House GHSA Progress and Impact Report is available online [here](#) and the 2019 US White House GHSA Progress and Impact report is available online [here](#).

Data were extracted from these written reports by the research team, and all projects were designated as GHSA funding or support. Projects were tagged by relevant core capacities based on project names and descriptions included in the written document. Excluded were any funding or support that were duplicative of information already identified within the Article X Compendiums (see below).

Article X Compendiums

A compendium of projects related to Article X of the Biological and Toxin Weapons Convention was submitted by Canada, Denmark, the European Union, Finland, Germany, Italy, Japan, Netherlands, Spain, Sweden, the United Kingdom, and the United States of America. These member countries of the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction are mutually committed to implementing global projects to combat WMD-related terrorism and proliferation. The compendium

includes detailed information on Article X-relevant projects implemented and/or funded by GP members since December 2016.

Data were manually extracted from these written reports by the research team and were tagged by relevant core capacities based on project names and descriptions.

Ebola Recovery Tracking Initiative

The Ebola Recovery Tracking Initiative tracks official development assistance towards Ebola recovery efforts in Guinea, Liberia, Sierra Leone, and the Mano River Union. The initiative is a partnership between the governments of Guinea, Liberia and Sierra Leone, the United Nations Office of the Secretary-General's Special Adviser on Community Based Medicine and Lessons from Haiti, and the United Nations Development Programme (UNDP). The Ebola Recovery Tracking Initiative is available online at: https://ebolarecovery.org/.

Data were manually extracted from this website by the research team and were tagged by relevant core capacities based on project names and descriptions. Duplication with other data sources (IATI and Multi-Partner Trust Fund Office Gateway) was resolved by keeping the more detailed or current entry in each case.

Nuclear Threat Initiative (NTI) Commitment Tracker

The Nuclear Threat Initiative (NTI) Commitment Tracker was developed to track global health security funding commitments and to foster accountability for existing commitments. The NTI Commitment Tracker tracks financial commitments as well as commitments to complete or support the JEE process, advance GHSA action packages, or to participate in other activities to build global health security.

All projects identified in the NTI Commitment Tracker were identified as GHSA funding, and projects were tagged by relevant core capacities based on project names and descriptions. Excluded were commitments of countries to undergo the JEE evaluation process (within their own country) as domestic assistance is not currently included in GHS Tracking.

WHO Contingency Fund for Emergencies (CFE)

The WHO Contingency Fund for Emergencies (CFE) was established by the World Health Assembly in 2015 as a means to respond quickly and effectively to disease outbreaks and humanitarian crises. Information about commitments made to the CFE in 2018 is available online here. Additional data on contributions to and allocations from the fund are found here.

Data were manually extracted from these websites by the research team and were tagged as supporting the Emergency Response Operations core capacity. Both the allocations and contributions data (listed separately) were incorporated into GHS Tracking. Excluded were duplicates found with data sourced from IATI -- the more detailed IATI data were incorporated instead of the conflicting CFE data.

1540 Assistance Database

The 1540 Assistance Database was developed by the 1540 Committee pursuant to UNSC Resolution 1540 (2004), for the purpose of providing additional information on the national implementation of regulations and measures related to the resolution. The 1540 Assistance Database and information about it are available online here.

As the 1540 database does not typically provide years or currencies of funding, limited financial assistance data the database are currently incorporated into GHS Tracking. All projects marked as

"completed" are assumed to correspond to disbursed efforts, and all projects marked as "active" are assumed to correspond to commitments. Moreover, projects are designated in-kind support unless they are specifically identified as "funding" within the 1540 database's 'Description of activities' and funding amounts are provided. All projects for which the CBRN Risk Addressed Code was specified as "Nuclear" were tagged by the core capacity "Radiation Emergencies," while those with the code "Chemical" were tagged as "Chemical Events."

Global Chinese Finance Dataset

AidData's Global Chinese Official Finance Dataset tracks known projects financed by China in Africa, the Middle East, Asia and the Pacific, Latin America and the Caribbean, and Central and Eastern Europe from 2000-2014. The data are publicly available online here.

Data were manually extracted from this written report by the research team and were tagged by relevant core capacities based on project names and descriptions. Projects with statuses of "commitment", "pledge", "suspended", or "canceled" were considered commitments, and those with statuses of "completion" or "implementation" disbursements. Flow types of debt forgiveness, export credits, and loans were all designated as "direct financial assistance," and all others "in-kind support." Transactions were incorporated if years of occurrence were provided.

Global Health Centre Working Paper No. 18

The Global Health Centre Working Paper No. 18, "Investing for a Rainy Day: Challenges in Financing National Preparedness for Outbreaks," authored by Suerie Moon and Rai Vaidya, identifies international investments related to national outbreak preparedness from a range of funders. The paper is publicly available online here.

Data were manually extracted from this written report by the research team and were tagged by relevant core capacities based on project names and descriptions.

Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP) Annual Project Report (2019)

The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction is a G7-led, international partnership created in 2002 that aims to prevent the spread of weapons of mass destruction (WMD). Their 2019 Annual Project Report details the contributions of countries to aid these efforts in other partner countries and regions.

Data were manually extracted from this written report by the research team and were tagged by relevant core capacities based on project names and descriptions. The funder was designated as the listed "implementing country" and recipients were designated as the "partner country/region". Financial assistance was assumed to be evenly distributed across the range of years listed in "duration."

World Bank Ebola Financing Research Brief

The World Bank Ebola Financing Research Brief provides information about World Bank contributions for the current and past Ebola outbreaks and overall pandemic preparedness.

Data were shared with the research team by stakeholders from the World Bank. Data were manually extracted from this written report by the research team and were tagged by relevant core capacities based on project names and descriptions. Where additional information was necessary to supplement information from the World Bank Ebola Financing Research Brief (e.g., information on the REDISSE

project), additional information for those projects only was obtained via the World Bank Projects and Operations site at https://projects.worldbank.org/en/projects-operations/projects-home.

BWC Working Papers

Occasionally, Member States of the BWC submit national papers describing capacity building efforts for health security. Data relevant from these papers are included in GHS Tracking.

Data from previously published papers were manually extracted by the research team and were tagged by relevant core capacities based on project names and descriptions.

COVID-19 Health Funding Tracker

The EIU's COVID-19 Health Funding Tracker provides data on the flow of money towards the development, production, and equitable access to new COVID-19 diagnostics, therapeutics and vaccines. The data are publicly available online at https://covidfunding.eiu.com/explore.

Data were automatically extracted from the downloadable data spreadsheet by the research team. Project titles were automatically generated based on funder and recipient names. Amounts with a "date pledged" but no "distribution confirmed" date were represented in GHS Tracking as commitments only, but if they did have a "distribution confirmed" date, a disbursement was also added. Table 5 shows how core capacities were automatically tagged on funding based on the "funding purpose" defined in the data.

Table 5. **Core capacities auto-tagged on EIU COVID-19 funding data based on funding purpose.**

EIU funding purpose	Tagged core capacity	Additional tagged core capacity
WHO Strategic preparedness and response plan	R.1 - Preparedness	R.2 - Emergency Response Operations
ACT-Accelerator Vaccines	P.7 - Immunization	NA
ACT-Accelerator Therapeutics	R.4 - Medical Countermeasures and Personnel Deployment	NA
ACT-Accelerator Diagnostics	R.4 - Medical Countermeasures and Personnel Deployment	NA
ACT-Accelerator Health systems	R.4 - Medical Countermeasures and Personnel Deployment	NA
Surveillance and control	D.2 - Real Time Surveillance	NA
Emergency response	R.2 - Emergency Response Operations	NA

ACT-A to be confirmed, ACT-Accelerator, R&D, Unallocated	NA	NA

Coalition for Epidemic Preparedness Innovations (CEPI) Progress Reports

The Coalition for Epidemic Preparedness Innovations (CEPI) is a partnership created in 2017 to bring together global stakeholders to develop vaccines with the goal of stopping future pandemics. During the COVID-19 pandemic that began in 2019, it operated as a facilitator in the COVAX Marketplace. CEPI announces funding calls for vaccine candidate development and coordinates partnerships to develop specific vaccines as needed. CEPI releases annual progress reports that include actual and planned donor funding amounts by year. More information about CEPI is available here.

The research team manually extracted data from the 2018 and 2019 CEPI progress reports, marking actual annual contributions from donors as disbursed commitments, and planned annual contributions as commitments only. Each transaction was designated with the core capacity "P.7 - Immunization".

Multi-Partner Trust Fund Office Gateway

The Multi-Partner Trust Fund (MPTF) Office Gateway provides access to project summaries, budgets, and expenditure information for a range of efforts that are funded by UN entities, including specific event responses such as to the 2014-2016 Ebola outbreak in West Africa, the Democratic Republic of the Congo (DRC) Humanitarian Fund, and others. More information about the MPTF can be found at https://ebolaresponse.un.org/donate, and the Gateway data can be accessed at http://mptf.undp.org/.

The research team manually extracted data from the 2014-2016 Ebola Response MPTF Certified Financial Statements that described contributions in response to the 2014-2016 Ebola outbreak in West Africa. Each donor contribution was incorporated into GHS Tracking as a disbursed commitment made during the year covered by the financial statement in which it appeared.

Philanthropic databases and press releases

Data from the following philanthropic databases and press releases are incorporated into GHS Tracking:

- Open Philanthropy Grant Database
- Bill & Melinda Gates Foundation Press Release, 26 January 2020
- Cordaid Media Release, 09 August 2018
- Médecins Sans Frontières (MSF) Media Release, 08 August 2018
- CARE International Media Release, 07 August 2018
- International Federation of Red Cross and Red Crescent Societies Media Release, 02 August 2018
- OXFAM International Media Release, 02 August 2018

Private sector websites and press releases

Data from the following private sector websites and press releases are incorporated into GHS Tracking:

- Merck Press Release 22 March 2020
- Reuters Media Release 22 March 2020
- Novartis Press Release 20 March 2020
- Bipartisan Commission on Biodefense Press Release 16 March 2020

- Salesforce Press Release, 11 March 2020
- PR Newswire Press Release, 09 March 2020
- International Federation of Pharmaceutical Manufacturers and Associations (IFPMA) Developing World Health Partnerships Directory, 2016
- Cision PR Newswire Press Release, 2019
- Johnson & Johnson Press Release, 20 November 2018
- UPS Press Release, 27 September 2018
- Merck Press Release 12 April 2018
- Johnson & Johnson Press Release, 2014

Additional media statements, including social media

Data from the following press releases and media statements are incorporated into GHS Tracking.

- City of Cambridge Press Release 25 March 2020
- Twitter account of Brian Chesky, 25 March 2020
- Twitter account of Michelle Boorstein, 25 March 2020
- Twitter account of José Andrés, 24 March 2020
- Twitter account of SickKids Foundation, 24 March 2020
- Twitter account of World Health Organization, 23 March 2020
- Twitter account of World Health Organization, 23 March 2020
- Twitter account of Marc Benioff, 22 March 2020
- Twitter account of Jack Ma, 21 March 2020
- Twitter account of Andrew Cuomo, 25 March 2020
- UCSF Media Release 19 March 2020
- Twitter account of Michael Cappetta, 16 March 2020
- Myah Ward. "Chinese businessman to donate 500,000 test kits and 1 million masks to the U.S." Politico. 13 March 2020.
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 12 March 2020
- Japan Government Media Release 11 March 2020
- Prime Minister Outlines Canada's COVID-19 Response Press Release 11 March 2020
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 09 March 2020
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 08 March 2020
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 07 March 2020
- United Kingdom Government Press Release 06 March 2020
- Twitter account of Vaqif Sadiqov, 06 March 2020
- HHS Press Release, 04 March 2020
- Australia Government Media Release 03 March 2020
- World Bank Media Release, 03 March 2020
- USAID Press Release 2 March 2020
- World Health Organization News Release 01 March 2020
- Luxembourg Government Press Release 28 February 2020
- Twitter account of BMG Bund, 27 February 2020
- Twitter account of Czech Mission Geneva, 27 February 2020
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 27 February 2020
- Twitter account of Sweden Social Department, 24 February 2020
- Denmark Government Press Release 22 February 2020
- Twitter account of Canada in Geneva, 19 February 2020
- Slovakia Government Press Release 18 February 2020

- CEPI Press Release, 17 February 2020
- Norway Government Press Release 14 February 2020
- Canada Government Press Release 11 February 2020
- CEPI Press Release, 10 February 2020
- United Kingdom Government Press Release 08 February 2020
- Twitter account of Mike Pompeo, 07 February 2020
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, 06 February 2020
- Ireland Department of Foreign Affairs and Trade Press Release 05 February 2020
- CEPI Press Release, 03 February 2020
- Twitter account of @BWCISU (BWC Implementation Support Unit), January 21, 2020
- USAID Media Release, 11 December 2019
- World Bank Media Release, 09 December 2019
- WHO Media Release, 16 October 2019, Updated 4 November 2019
- WHO Media Release, 16 October 2019
- Twitter account of Dr. Mike Ryan, BMG_Bund 04 Oct 2019
- Twitter account of Anders Nordström
- USAID Media Release, 4 September 2019
- USAID Media Release, 24 July 2019
- World Bank Media Release, 24 July 2019
- Twitter account of Dr. Tedros Adhanom Ghebreyesus, July 18, 2019
- WHO News Release, 19 June 2019
- CEPI Press Release, 22 January 2019
- CEPI Press Release, 17 January 2019
- CDC Foundation Surveillance Press Release
- World Health Organization (WHO) and Korea International Cooperation Agency joint press release, July 2019
- International Organization for Migration Media Release, 10 August 2018
- UNICEF Media Release, 10 August 2018
- CDC Media Statement, 09 August 2018
- UNICEF Media Release, 03 August 2018
- WHO News Release, 24 July 2018
- World Bank Media Release, 21 June 2018
- WFP Media Release, 07 June 2018
- USAID Media Release, 18 May 2018
- Africa CDC Media Release, 20 October 2017
- CEPI Press Release, 08 July 2017
- World Bank Media Release, 11 May 2017
- CEPI Press Release, 18 January 2017
- US Embassy in Mali Press Release 14 May 2015
- US Embassy in Mali Press Release December 18 2014
- US Embassy in Burkina Faso Press Release 3 December 2014
- Larson, Christina. China ramps up efforts to combat Ebola. 3 November, 2014. AAAS Science.
- US Embassy in Nigeria Press Release 22 August 2014

For each database, website, press release or media statement, data were manually extracted by the research team.

Additional peer reviewed publications

In addition to the above data sources, we also receive and review peer reviewed publications describing both financial and in-kind support from countries and organizations. The data from previously received publications were extracted by the research team and were tagged by relevant core capacities based on project names and descriptions. These peer reviewed publications include the following:

- Fu Gao, George & N Nkengasong, John. (2019). Public health priorities for China–Africa cooperation. The Lancet Public Health. 4. e177-e178. 10.1016/S2468-2667(19)30037-4.
- Abe, K., Ishibashi, N., Matsumura, H., & Suzuki, Y. (2019). Securing Resources for Health Emergency Management. *Health Systems & Reform,* 5(2), 104-112. 10.1080/23288604.2019.1594546.

JEE Mission Report and Executive Summary data

The Joint External Evaluation tool (JEE) measures country-specific progress in developing the capacities needed to prevent, detect, and respond to public health threats. Publicly available mission reports and executive summaries describing these evaluations are available online here.

Within JEE mission reports, each of 48 indicators are assessed on a score ranging from 1 (no capacity) to 5 (sustained capacity), as shown below in Figure 1. Within GHS Tracking, scores at the core capacity level are defined as the average of scores across indicators, for each core capacity. Overall capacity is defined as the average of all core capacity aggregate scores.

The United States of America scores

Capacities	Indicators	Score
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR. (2005)	5
	P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005)	5
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR (2005)	5
Antimicrobial resistance	P.3.1 Antimicrobial resistance (AMR) detection	4
	P.3.2 Surveillance of infections caused by AMR pathogens	4
	P.3.3 Healthcare associated infection (HCAI) prevention and control programmes	4
	P.3.4 Antimicrobial stewardship activities	3
Zoonotic diseases	P.4.1 Surveillance systems are in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or animal health workforce	4
	P.4.3 Mechanisms for responding to infectious zoonoses and potential zoonoses are established and functional	4

Figure 1. Selected JEE scores from the United States of America JEE mission report.

Data from donor countries and organizations

GHS Tracking also incorporates data received directly from donor countries and organizations, including data submitted via the "Submit data" page included on the GHS Tracking website.

Data are also included from the following sources from donor countries and organizations, including academic publications, commentaries, conference handout materials, and grey literature:

- German cooperation. Global Health - An Investment for the Future. Handout GHS 2019 conference, Sydney AU.
- Global Affairs Canada. Canada's Weapons Threat Reduction Program Strengthening Global Biological Security Programming Update – June 2019. Handout BWC 2019 meeting, Geneva CH.
- Coalition for Epidemic Preparedness Innovations (CEPI). Funds Committed and Received. Data shared directly by CEPI – June 2020.

Appendix

Appendix A: Additional detail on data sources

Data sources currently incorporated into GHS Tracking are listed below in alphabetical order. Recurring data sources have asterisked dates and are reviewed for updates approximately quarterly, most recently in April 2021.

Data source name	Owner	Public URL	Date last updated and incorporated into GHS Tracking * Source with known recurring updates
1540 Assistance Database	United Nations and The Stimson Center	https://1540assistance.stimson.org/	July 3, 2018*
Abe, K., Ishibashi, N., Matsumura, H., & Suzuki, Y. (2019). Securing Resources for Health Emergency Management. Health Systems & Reform, 5(2), 104-112. 10.1080/23288604.2019.1594546.	Abe et al	https://www.tandfonline.com/doi/full/10.1080/23288604.2019.1594546	2019
Africa CDC Media Release, 20 October 2017	Africa CDC	https://africacdc.org/news-item/africa-centres-for-disease-control-and-prevention-launches-five-year-strategic-plan-to-improve-surveillance-emergency-response-and-prevention-of-infectious-diseases/	October 20, 2017

Article X Compendium (2017)	Member countries of the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction	https://drive.google.com/drive/u/2/folders/1spP8K7xO6P4t8TPJ6NTHyshxwk8UNtax	December 2017*
Article X Compendium (2018)	Member countries of the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction	https://drive.google.com/drive/u/2/folders/1spP8K7xO6P4t8TPJ6NTHyshxwk8UNtax	December 4, 2018*
Australia Government Media Release 03 March 2020	Parliament of Australia	https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/7220000/upload_binary/7220000.pdf;fileType=application%2Fpdf#search=%22media/pressrel/7220000%22	March 3, 2020
Bill & Melinda Gates Foundation Press Release, 26 January 2020	Bill & Melinda Gates Foundation	https://www.gatesfoundation.org/ideas/media-center/press-releases/2020/01/gates-foundation-commits-10-million-to-global-response-to-2019-ncov	January 26, 2020
Bipartisan Commission on Biodefense Press Release 16 March 2020	Bipartisan Commission on Biodefense	https://biodefensecommission.org/commission-receives-2-62-million-grant-to-defend-america-against-biological-threats/	March 16, 2020
BWC Working Paper - Japan	Japan	https://drive.google.com/drive/u/2/folders/1UJy3wc_4VnWqTqruRfIBHd4cNquKRdEb	November 20, 2018

Canada Government Press Release 11 February 2020	Canada	https://www.canada.ca/en/global-affairs/news/2020/02/government-of-canada-repatriates-more-canadians-and-their-families-from-wuhan-china.html	February 11, 2020
Canada's Weapons Threat Reduction Program Programming Update, December 2019	Global Affairs Canada	Not available online, data shared directly with GHS Tracking research team	December 2019
CARE International Media Release, 07 August 2018	CARE International	https://www.care-international.org/news/press-releases/drcongo-ebola-virus-outbreak-endangers-lives-of-300000-congolese	August 7, 2018
CDC Foundation Surveillance Press Release	CDC Foundation	https://www.cdcfoundation.org/stories/global-disease-fighters-how-international-partnership-bolstering-disease-surveillance	2019
CDC Media Statement, 09 August 2018	CDC	https://www.cdc.gov/media/releases/2018/s0809-new-ebola-outbreak.html	August 9, 2018
CEPI database extract, May 2020	Coalition for Epidemic Preparedness Innovations (CEPI)	Not available online, data shared directly with GHS Tracking research team	May 2020*
CEPI Press Release, 03 February 2020	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/uk-government-supports-cepi-with-20-million-additional-funding/	February 3, 2020

CEPI Press Release, 08 July 2017	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/norway-strengthens-its-commitment-to-cepi/	July 8, 2017
CEPI Press Release, 10 February 2020	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/ethiopia-funds-coalition-for-epidemic-preparedness-innovations-to-combat-spread-of-epidemics/	February 10, 2020
CEPI Press Release, 17 February 2020	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/norway-provides-nok-36-million-additional-funding-to-cepi-in-response-to-covid-19/	February 17, 2020
CEPI Press Release, 17 January 2019	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/cepi-partners-with-university-of-queensland-to-create-rapid-response-vaccines/	January 17, 2019
CEPI Press Release, 18 January 2017	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/cepi-officially-launched/	January 18, 2017
CEPI Press Release, 22 January 2019	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/news_cepi/uk-pledges-10-million-to-support-cepi/	January 22, 2019
CEPI Progress Report (2018)	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/wp-content/uploads/2019/05/CEPI-Progress-Report_2018.pdf	2019*
CEPI Progress Report (2019)	Coalition for Epidemic Preparedness Innovations (CEPI)	https://cepi.net/wp-content/uploads/2020/04/CEPI-Annual-Progress-Report-2019_website.pdf	2020*

		https://www.prnewswire.com/news-releases/johnson--johnson-announces-commitment-to-support-republic-of-rwandas-preparedness-against-ebola-outbreak-300971018.html	
Cision PR Newswire Press Release, 2019	Cision PR Newswire		2019
City of Cambridge Press Release 25 March 2020	City of Cambridge	https://www.cambridgema.gov/covid19/timeline	March 25, 2020
Cordaid Media Release, 09 August 2018	Cordaid	https://www.cordaid.org/en/news/joint-healthcare-and-humanitarian-ebola-response-dr-congo/	August 9, 2018
Denmark Government Press Release 22 February 2020	Ministry of Foreign Affairs of Denmark	https://um.dk/en/news/newsdisplaypage/?newsID=06E7C921-6F92-4B92-913D-2A5AD25ABBFF	February 22, 2020
Ebola Recovery Tracking Initiative	Science of Implementation Initiative	https://siidata.org/ebola-in-west-africa/	May 17, 2019
EIU COVID-19 Health Funding Tracker	The Economist Intelligence Unit (EIU)	https://covidfunding.eiu.com/	April 22, 2021*
European Union Question and Answers 24 February 2020	European Commission	https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_307	February 24, 2020
Fu Gao, George & N Nkengasong, John. (2019). Public health priorities for China–Africa cooperation. The Lancet Public Health. 4. e177-e178.	Gao & Nkengasong	https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(19)30037-4/fulltext	2019

10.1016/S2468-2667(19)30037-4.			
German Cooperation. Global Health - An Investment for the Future. Handout GHS 2019 conference, Sydney, Australia	German Cooperation	Not available online, data shared directly with GHS Tracking research team	June 2019
Global Affairs Canada. Canada's Weapons Threat Reduction Program Strengthening Global Biological Security Programming Update – June 2019. Handout BWC 2019 meeting, Geneva CH.	Global Affairs Canada	Not available online, data shared directly with GHS Tracking research team	December 2019
Global Chinese Finance Dataset	AidData at the College of William & Mary	https://www.aiddata.org/data/chinese-global-official-finance-dataset	October 2017
Global Health Centre Working Paper No. 18	Global Health Centre	https://drive.google.com/drive/u/2/folders/1P-LthcEnP91xXV239EYShwOlyRCUdTNL	August 2018
GPWG Annual Project Report (2019)	Global Partnership Against the Spread of Weapons and Materials of Mass Destruction	Not available online, data shared directly with GHS Tracking research team	2019
HHS Press Release, 04 March 2020	U.S. Department of Health & Human Services	https://www.coronavirustoday.com/hhs-funds-monitoring-travelers-data-management-lab-equipment-supplies-staffing-shipping-infection	March 4, 2020

International Aid Transparency Initiative (IATI) Registry	International Aid Transparency Initiative (IATI)	https://d-portal.org/ctrack.html#view=search	April 27, 2021*
International Federation of Pharmaceutical Manufacturers and Associations (IFPMA) Developing World Health Partnerships Directory, 2016	International Federation of Pharmaceutical Manufacturers and Associations (IFPMA)	https://www.ifpma.org/resource-centre/developing-world-health-partnership-directory/	April 11, 2019
International Federation of Red Cross and Red Crescent Societies Media Release, 02 August 2018	International Federation of Red Cross and Red Crescent Societies	https://media.ifrc.org/ifrc/2018/08/02/ebola-fears-grow-fresh-outbreak-dr-congo/	August 2, 2018
International Organization for Migration Media Release, 10 August 2018	IOM	https://www.iom.int/news/iom-responds-ebola-dr-congo-continues-support-communities-affected-previous-outbreaks	August 10, 2018
Ireland Department of Foreign Affairs and Trade Press Release 05 February 2020	Government of Ireland	https://www.dfa.ie/news-and-media/press-releases/press-release-archive/2020/february/ireland-provides-500000-to-the-whos-emergency-appeal-to-respond-to-coronavirus.php	February 5, 2020
Japan Government Media Release 11 March 2020	Prime Minister of Japan's Office	https://www.kantei.go.jp/jp/singi/novel_coronavirus/th_siryou/kinkyutaiou2_kibo_corona.pdf	March 11, 2020
Johnson & Johnson Press Release, 20 November 2018	Johnson & Johnson	https://www.jnj.com/latest-news/johnson-johnson-pledges-10-million-dollars-to-partner-unicef	November 20, 2018

Johnson & Johnson Press Release, 2014	USAID	https://2012-2017.usaid.gov/news-information/press-releases/dec-11-2014-usaid-and-johnson-johnson-tackle-antibiotic-resistant-tuberculosis	2014
Larson, Christina. China ramps up efforts to combat Ebola. 3 November, 2014. AAAS Science.	Christina Larson for AAAS Science	https://www.sciencemag.org/news/2014/11/china-ramps-efforts-combat-ebola	November 3, 2014
Luxembourg Government Press Release 28 February 2020	Government of Luxembourg	https://cooperation.gouvernement.lu/fr/actualites.gouvernement%2Bfr%2Bactualites%2Btoutes_actualites%2Bcommuniques%2B2020%2B02-fevrier%2B28-covid19-cooperation.html	February 28, 2020
Médecins Sans Frontières (MSF) Media Release, 08 August 2018	Doctors Without Borders/Médecins Sans Frontières (MSF)	https://www.doctorswithoutborders.org/what-we-do/news-stories/story/ebola-outbreak-declared-north-kivu-drc	August 8, 2018
Merck Press Release 12 April 2018	Merck	https://www.emdgroup.com/en/news/accelerate-global-access-to-affordable-vaccines-12-04-2018.html	April 12, 2018
Merck Press Release 22 March 2020	Merck	https://www.merck.com/news/merck-donates-a-half-a-million-masks-to-support-covid-19-emergency-response-in-new-york-city/	March 22, 2020
Multi-Partner Trust Fund Office Gateway	United Nations	http://mptf.undp.org/	July 13, 2021*

Myah Ward. "Chinese businessman to donate 500,000 test kits and 1 million masks to the U.S." Politico. 13 March 2020.	Myah Ward for Politico	https://www.politico.com/news/2020/03/13/jack-ma-coronavirus-test-kits-128522	March 13, 2020
Norway Government Press Release 14 February 2020	Office of the Prime Minister	https://www.regjeringen.no/en/aktuelt/norway-supports-efforts-to-combat-coronavirus-covid-19-outbreak/id2690617/	February 14, 2020
Novartis Press Release 20 March 2020	Novartis	https://www.novartis.com/news/media-releases/novartis-commits-donate-130-million-doses-hydroxychloroquine-support-global-covid-19-pandemic-response	March 20, 2020
Nuclear Threat Initiative (NTI) Commitment Tracker	Nuclear Threat Initiative (NTI)	https://drive.google.com/drive/u/0/folders/1ZfmmfdxNz6qu8UVqbZKxZOwdMRYovLaJ	June 30, 2017
Open Philanthropy Grant Database	Open Philanthropy	https://www.openphilanthropy.org/giving/grants	January 22, 2019*
OXFAM International Media Release, 02 August 2018	OXFAM	https://www.oxfam.org/en/press-releases/oxfam-responds-new-ebola-outbreak-beni-north-kivu-drc	August 2, 2018
PR Newswire Press Release, 09 March 2020	KSrelief for PR Newswire	https://www.prnewswire.com/ae/news-releases/saudi-arabia-pledges-usd-10-million-to-fight-covid-19-892330976.html	March 9, 2020

Prime Minister Outlines Canada's COVID-19 Response Press Release 11 March 2020	Office of the Prime Minister	https://pm.gc.ca/en/news/news-releases/2020/03/11/prime-minister-outlines-canadas-covid-19-response	March 11, 2020
Reuters Media Release 22 March 2020	Reuters	https://www.reuters.com/article/us-health-coronavirus-facebook-masks/facebook-donates-emergency-reserve-of-720000-masks-due-to-coronavirus-outbreak-idUSKBN21911E	March 22, 2020
Salesforce Press Release, 11 March 2020, updated 12 March 2020	Salesforce	https://www.salesforce.org/blog/our-latest-efforts-to-help-those-affected/	March 11, 2020
Slovakia Government Press Release 18 February 2020	SME Domov	https://domov.sme.sk/c/22328872/slovensko-posle-na-boj-proti-koronavirusu-dvestotisic-eur.html	February 18, 2020
Twitter account of @BWCISU (BWC Implementation Support Unit), January 21, 2020	BWCISU	https://twitter.com/bwcisu	January 21, 2020
Twitter account of Anders Nordström	Anders Nordström	https://twitter.com/nordstrmanders/status/1179105748745367557?lang=en	October 1, 2019
Twitter account of Andrew Cuomo, 25 March 2020	Andrew Cuomo	https://twitter.com/NYGovCuomo	March 20, 2020
Twitter account of BMG Bund, 27 February 2020	BMG Bund	https://twitter.com/BMG_Bund/status/1233076295476621313	February 27, 2020

Twitter account of Brian Chesky, 25 March 2020	Brian Chesky	https://twitter.com/bchesky/status/1243170111449485312	March 26, 2020
Twitter account of Canada in Geneva, 19 February 2020	Canada	https://twitter.com/CanadaGeneva/status/1230153262009081856	February 19, 2020
Twitter account of Czech Mission Geneva, 27 February 2020	Czech Republic	https://twitter.com/CZmissionGeneva/status/1232991908244443136	February 27, 2020
Twitter account of Dr. Mike Ryan, BMG_Bund 04 Oct 2019	Mike Ryan	https://twitter.com/DrMikeRyan/status/1181138018486407168	October 4, 2019
Twitter account of Dr. Tedros Adhanom Ghebreyesus, 06 February 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1225360822299451392	February 6, 2020
Twitter account of Dr. Tedros Adhanom Ghebreyesus, 07 March 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1236288105382117378	March 7, 2020
Twitter account of Dr. Tedros Adhanom Ghebreyesus, 08 March 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1236652923762946049	March 8, 2020
Twitter account of Dr. Tedros Adhanom Ghebreyesus, 09 March 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1237034194355867648	March 9, 2020
Twitter account of Dr. Tedros Adhanom Ghebreyesus, 12 March 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1238010406804881413	March 12, 2020

Twitter account of Dr. Tedros Adhanom Ghebreyesus, 27 February 2020	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros/status/1233016453613391874	February 27, 2020
Twitter account of Dr. Tedros Adhanom Ghebreyesus, July 18, 2019	Tedros Adhanom Ghebreyesus	https://twitter.com/DrTedros	July 2019
Twitter account of Jack Ma, 21 March 2020	Jack Ma Foundation	https://twitter.com/foundation_ma/status/1241589737015500802?lang=en	March 21, 2020
Twitter account of José Andrés, 24 March 2020	José Andrés	https://twitter.com/chefjoseandres/status/1242512386612961286	March 24, 2020
Twitter account of Marc Benioff, 22 March 2020	Marc Benioff	https://twitter.com/benioff/status/1241879803558428672?lang=en	March 22, 2020
Twitter account of Michael Cappetta, 16 March 2020	Michael Cappetta	https://twitter.com/MCappetta/status/1239608804666417152?s=20	March 16, 2020
Twitter account of Michelle Boorstein, 25 March 2020	Michelle Boorstein	https://twitter.com/mboorstein/status/1242831985711755278	March 25, 2020
Twitter account of Mike Pompeo, 07 February 2020	Mike Pompeo	https://twitter.com/SecPompeo/status/1225857166030114816	February 7, 2020
Twitter account of SickKids Foundation, 24 March 2020	SickKids Foundation	https://twitter.com/sickkids/status/1242588369953198080	March 24, 2020

Twitter account of Sweden Social Department, 24 February 2020	Sweden Social Department	https://twitter.com/socialdep/status/1231862612041838595	February 24, 2020
Twitter account of Vaqif Sadiqov, 06 March 2020	Vaqif Sadiqov	https://twitter.com/VaqifS/status/1235918288246452225	March 6, 2020
Twitter account of World Health Organization, 23 March 2020	World Health Organization	https://twitter.com/WHO/status/1242114687556292608	March 23, 2020
Twitter account of World Health Organization, 23 March 2020	World Health Organization	https://twitter.com/WHO/status/1242114839306256384	March 23, 2020
UCSF Media Release 19 March 2020	University of California, San Francisco	https://www.ucsf.edu/news/2020/03/416946/donors-rally-support-ucsf-doctors-and-scientists-working-conquer-covid-19	March 19, 2020
UNICEF Media Release, 03 August 2018	UNICEF	https://www.unicef.org/press-releases/new-ebola-outbreak-drc-unicef-mobilizes-staff-and-supplies-help-response	August 3, 2018
UNICEF Media Release, 10 August 2018	UNICEF	https://www.unicef.org/press-releases/ebola-outbreak-drc-unicef-mobilizes-communication-specialists-support-vaccination	August 10, 2018
United Kingdom Government Press Release 06 March 2020	United Kingdom Government	https://www.gov.uk/government/news/pm-announces-new-funding-in-fight-against-spread-of-coronavirus	March 6, 2020

United Kingdom Government Press Release 08 February 2020	United Kingdom Government	https://www.gov.uk/government/news/new-uk-aid-to-help-stop-the-spread-of-coronavirus-around-the-world	February 8, 2020
UPS Press Release, 27 September 2018	United Parcel Service (UPS)	https://www.ups.com/us/en/services/knowledge-center/article.page?kid=art169767b2890&articlesource=longitudes	September 27, 2018
US Embassy in Burkina Faso Press Release 3 December 2014	US Embassy in Burkina Faso	https://bf.usembassy.gov/virtual-ebola-reporting-workshop/	December 3, 2014
US Embassy in Mali Press Release 14 May 2015	US Embassy in Mali	https://ml.usembassy.gov/u-s-embassy-donates-ambulances-motorcycles-medical-supplies-to-malis-ministry-of-health/	May 14, 2015
US Embassy in Mali Press Release December 18 2014	US Embassy in Mali	https://ml.usembassy.gov/u-s-assistance-to-mali-in-combatting-ebola/	December 18, 2014
US Embassy in Nigeria Press Release 22 August 2014	US Embassy in Nigeria	https://ng.usembassy.gov/centers-disease-control-prevention-foundation-donates-thermometers-use-port-entry-nigeria-august-22-2014/	August 22, 2014
US White House GHSA Progress and Impact Report	United States	https://www.cdc.gov/globalhealth/healthprotection/resources/pdf/GHSA-Report-_Feb-2018.pdf https://www.state.gov/wp-content/uploads/2019/11/GHSAR-2019_final.pdf	February 2018*

		https://www.state.gov/wp-content/uploads/2020/09/GHSA_ProgressImpactFY19_final.pdf	
US White House GHSA Progress and Impact Report, August 2019	United States Department of State	https://www.state.gov/wp-content/uploads/2020/09/GHSA_ProgressImpactFY19_final.pdf	August 2019
USAID Media Release, 4 September 2019	USAID	https://www.usaid.gov/news-information/press-releases/sep-4-2019-united-states-announces-more-21-million-additional-humanitarian	September 4, 2019
USAID Media Release, 11 December 2019	USAID	https://www.usaid.gov/news-information/press-releases/dec-11-2019-usaid-responds-deadly-outbreak-measles-samoa	December 11, 2019
USAID Media Release, 18 May 2018	USAID	https://www.usaid.gov/news-information/press-releases/may-18-2018-usaid-commits-1-million-assistance-dr-congo-ebola-response-plan	May 18, 2018
USAID Media Release, 24 July 2019	USAID	https://www.usaid.gov/news-information/press-releases/jul-24-2019-united-states-announces-more-38-million-additional-assistance	July 24, 2019
USAID Press Release 2 March 2020	USAID	https://www.usaid.gov/news-information/press-releases/mar-2-2020-admi	March 2, 2020

		nistrator-green-37-million-assistance-novel-coronavirus-covid-19	
WFP Media Release, 07 June 2018	World Food Program	https://www.wfp.org/news/wfp-launches-food-assistance-ebola-affected-people-democratic-republic-congo	June 7, 2018
WHO Contingency Fund for Emergencies	World Health Organization	https://www.who.int/emergencies/funding/contingency-fund-for-emergencies/contributions-and-allocations	June 30, 2021*
WHO Contingency Fund for Emergencies Allocations May 2020	World Health Organization	https://www.who.int/emergencies/funding/contingency-fund-for-emergencies/contributions-and-allocations	June 30, 2021*
WHO Contingency Fund for Emergencies May 2020	World Health Organization	https://www.who.int/emergencies/funding/contingency-fund-for-emergencies/contributions-and-allocations	June 30, 2021*
WHO COVID-19 Donors Progress	World Health Organization	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/donors-and-partners/funding#	May 8, 2020*
WHO Ebola Response Funding: donor contributions	World Health Organization	https://web.archive.org/web/20201019052219/https://www.who.int/csr/disease/ebola/funding/en/	April 2016
WHO Media Release, 16 October 2019	World Health Organization	https://mca.essensys.ro/emergencies/diseases/ebola/drc-2019/funding	October 16, 2019

WHO Media Release, 16 October 2019, Updated 4 November 2019	World Health Organization	https://mca.essensys.ro/emergencies/diseases/ebola/drc-2019/funding	November 4, 2019
WHO News Release 01 March 2020	World Health Organization	https://www.who.int/news/item/01-03-2020-un-releases-us-15-million-to-help-vulnerable-countries-battle-the-spread-of-the-coronavirus	March 1, 2020
WHO News Release, 19 June 2019	World Health Organization	https://www.who.int/news/item/19-06-2019-new-multi-partner-trust-fund-launched-to-combat-antimicrobial-resistance-globally	June 19, 2019
WHO News Release, 24 July 2018	World Health Organization	https://www.who.int/news/item/24-07-2018-ebola-outbreak-in-drc-ends--who-calls-for-international-efforts-to-stop-other-deadly-outbreaks-in-the-country	July 24, 2018
World Bank Ebola Financing Research Brief	Georgetown University Center for Global Health Science and Security and Talus Analytics	Not available online	November 13, 2018
World Bank Media Release, 03 March 2020	World Bank	https://www.worldbank.org/en/news/press-release/2020/03/03/world-bank-group-announces-up-to-12-billion-immediate-support-for-covid-19-country-response	March 3, 2020

World Bank Media Release, 09 December 2019	World Bank	https://www.worldbank.org/en/news/press-release/2019/12/09/world-bank-approves-112-million-to-strengthen-local-government-capacity-and-provide-urban-infrastructure-for-somalis	December 9, 2019
World Bank Media Release, 11 May 2017	World Bank	https://www.worldbank.org/en/news/press-release/2017/05/11/world-bank-group-board-endorses-use-of-ida-regional-funds-for-the-pandemic-emergency-financing-facility	May 11, 2017
World Bank Media Release, 21 June 2018	World Bank	https://www.worldbank.org/en/news/press-release/2018/06/21/world-bank-groups-pandemic-emergency-financing-facility-pef-welcomes-australia-as-new-donor	June 21, 2018
World Bank Media Release, 24 July 2019	World Bank	https://www.worldbank.org/en/topic/pandemics/brief/fact-sheet-world-bank-support-to-10th-ebola-outbreak-in-democratic-republic-of-congo	July 24, 2019
World Bank Projects and Operations	World Bank	https://projects.worldbank.org/en/projects-operations/projects-home	July 21, 2021*